

INTAKE AND EXHAUST

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15109000137

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GENERAL INFORMATION

15100010092

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

For 1.8L engine, the exhaust manifold is made of stainless steel. The exhaust pipe is divided into four parts for California and three parts for Federal, respectively.

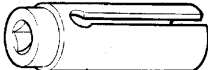
SERVICE SPECIFICATIONS

15100030098

Items	Standard value	Limit
Intake manifold	Distortion of the installation surface mm (in.)	0.15 (.006) or less 0.20 (.008)

SPECIAL TOOL

15100060097

Tool	Tool number and name	Supersession	Application
	MD998770 Oxygen sensor wrench		Removal/Installation of heated oxygen sensor

TROUBLESHOOTING

15100070014

Symptom	Probable cause	Remedy
Exhaust gas leakage	Loose joints	Retighten
	Broken pipe or muffler	Repair or replace
Abnormal noise	Broken separator in muffler	Replace
	Broken rubber hangers	Replace
	Interference of pipe or muffler with vehicle body	Correct
	Broken pipe or muffler	Repair or replace

ON-VEHICLE SERVICE

15100180120

INTAKE MANIFOLD VACUUM CHECK

1.5L Engine: Refer to GROUP 11A - On-vehicle Service.
1.8L Engine: Refer to GROUP 11C - On-vehicle Service.

INTAKE MANIFOLD

REMOVAL AND INSTALLATION

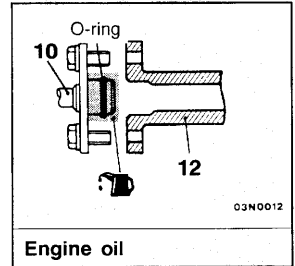
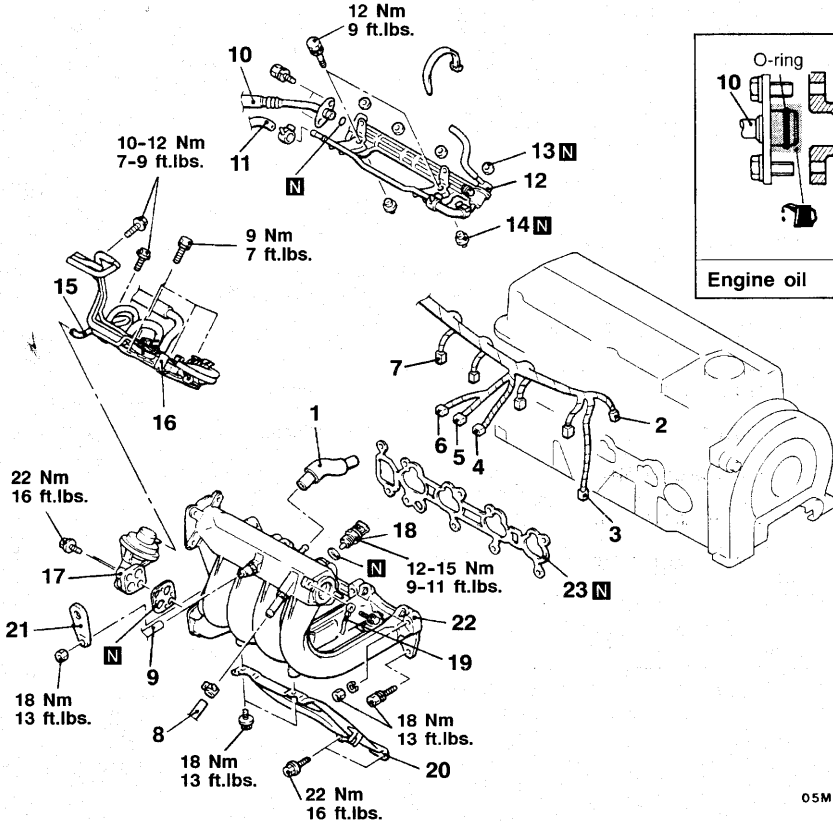
<1.5L Engine>

Pre-removal Operation

- (1) Fuel Discharge Prevention
(Refer to GROUP 13A - On-vehicle Service.)
- (2) Thermostat Case Assembly Removal
(Refer to GROUP 14 - Water Hose and Water Pipe.)
- (3) Throttle Body Removal (Refer to GROUP 13A.)

Post-installation Operation

- (1) Throttle Body Installation (Refer to GROUP 13A.)
- (2) Thermostat Case Assembly Installation
(Refer to GROUP 14 - Water Hose and Water Pipe.)



05M0097 00006890

Removal steps

- | | |
|---|---|
| <p>▶A◀</p> <ol style="list-style-type: none"> 1. PCV hose 2. Crank angle sensor connector 3. Heated oxygen sensor connector 4. Intake air temperature sensor connector 5. Evaporative emission purge solenoid connector 6. EGR solenoid connector 7. Injector connector 8. Brake booster vacuum hose connection 9. Vacuum hose connection 10. High-pressure fuel hose connection 11. Fuel return hose connection | <p>◀A▶</p> <ol style="list-style-type: none"> 12. Fuel rail, injector and pressure regulator assembly 13. Insulator 14. Insulator 15. Vacuum hose connection 16. Solenoid valve and vacuum hose assembly 17. EGR valve 18. Intake air temperature sensor 19. Ground cable 20. Intake manifold stay 21. Engine hanger 22. Intake manifold 23. Intake manifold gasket |
|---|---|

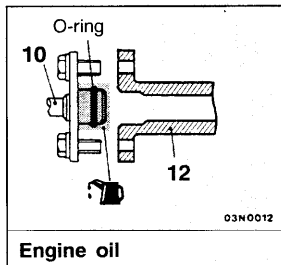
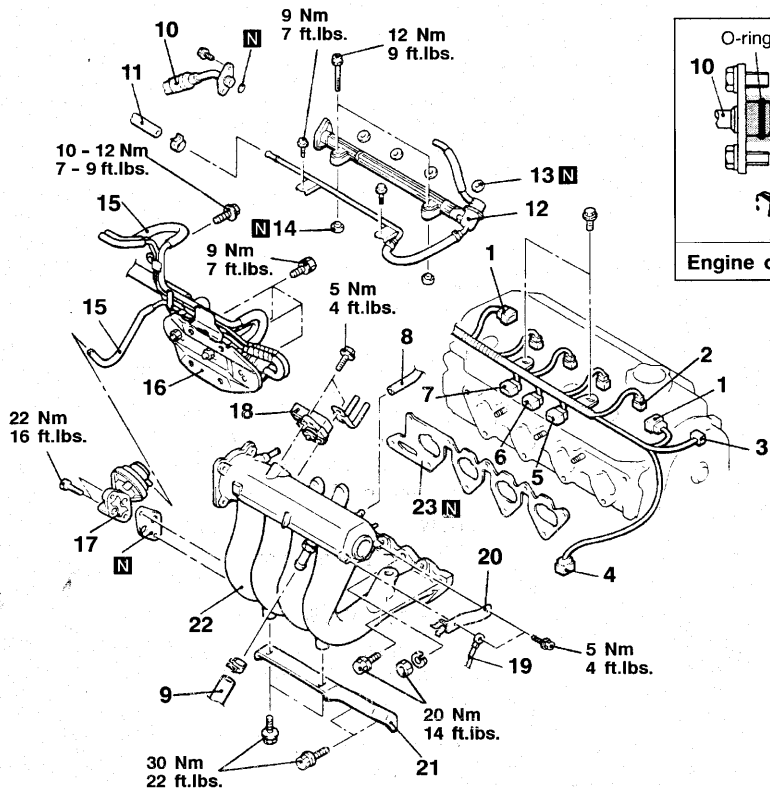
<1.8L Engine>

Pre-removal Operation

- (1) Fuel Discharge Prevention
(Refer to GROUP 13A - On-vehicle Service.)
- (2) Engine Coolant Draining
(Refer to GROUP 00 - Maintenance Service.)
- (3) Throttle Body Removal (Refer to GROUP 13A.)

Post-installation Operation

- (1) Throttle Body Installation (Refer to GROUP 13A.)
- (2) Engine Coolant Supplying
(Refer to GROUP 00 - Maintenance Service.)



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Removal steps

1. Ignition coil connector
2. Injector connector
3. Crank angle sensor connector
4. Heated oxygen sensor connector
5. Evaporative emission purge solenoid connector
6. EGR solenoid connector
7. Manifold differential pressure sensor connector
8. PCV hose connection
9. Brake booster vacuum hose connection
- ▶A◀ 10. High-pressure fuel hose connection
- ◀A▶ 11. Fuel return hose connection
12. Fuel rail, injector and pressure regulator assembly

13. Insulator
14. Insulator
15. Vacuum hose connection
16. Solenoid valve and vacuum hose assembly
17. EGR valve
18. Manifold differential pressure sensor
19. Ground cable
20. Bracket <vehicles with auto-cruise control system>
21. Intake manifold stay
22. Intake manifold
23. Intake manifold gasket

REMOVAL SERVICE POINT

◀▶ FUEL RAIL, INJECTOR AND PRESSURE REGULATOR REMOVAL

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

Caution

Care must be taken when removing the fuel rail not to drop the injector.

INSTALLATION SERVICE POINT

▶◀ HIGH-PRESSURE FUEL HOSE INSTALLATION

1. When connecting the high-pressure fuel hose to the fuel rail, 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 fuel rail.

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

INSPECTION

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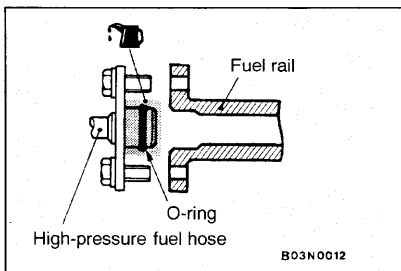
Check the following points; replace the part if a problem is found.

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 water passage or gas passage.
3. Using a straight edge and feeler gauge, check for distortion of the cylinder head installation surface.

Standard value: 0.15 mm (.006 in.) or less

Limit: 0.20 mm (.008 in.)



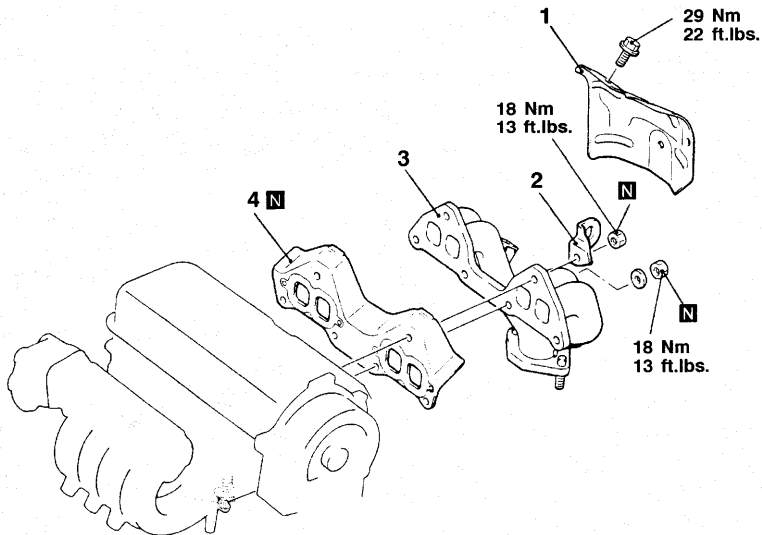
EXHAUST MANIFOLD

REMOVAL AND INSTALLATION

<1.5L Engine>

Pre-removal and Post-installation Operation

- Front Exhaust Pipe Removal and Installation
(Refer to P.15-8.)



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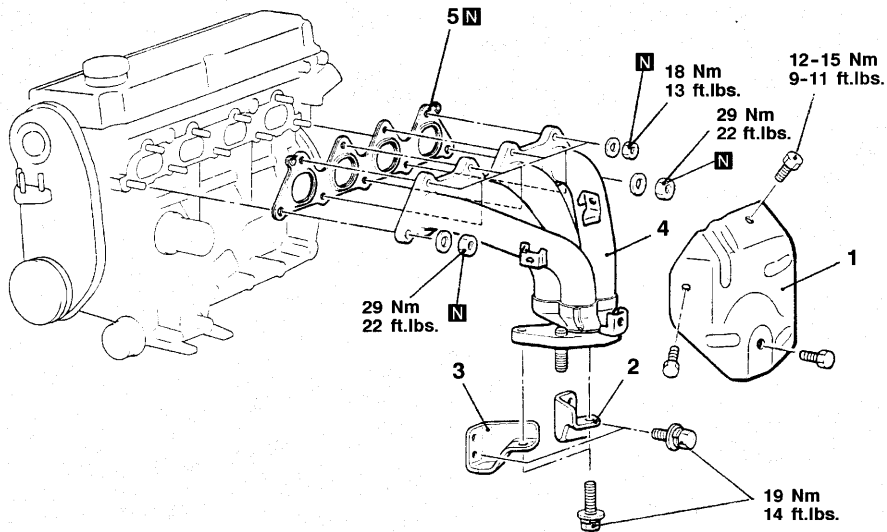
Removal steps

1. Exhaust manifold cover
2. Engine hanger
3. Exhaust manifold
4. Exhaust manifold gasket

1.8L Engine>

Pre-removal and Post-installation Operation

- Front Exhaust Pipe Removal and Installation (Refer to P.15-8.)



A05M0023

Removal steps

1. Exhaust manifold cover
2. Exhaust manifold bracket (A)
3. Exhaust manifold bracket (B)
4. Exhaust manifold
5. Exhaust manifold gasket

INSPECTION

15100340078

EXHAUST MANIFOLD CHECK

1. Check for damage or cracking of any part.
2. Using a straight edge and feeler gauge, check for distortion of the cylinder head installation surface.

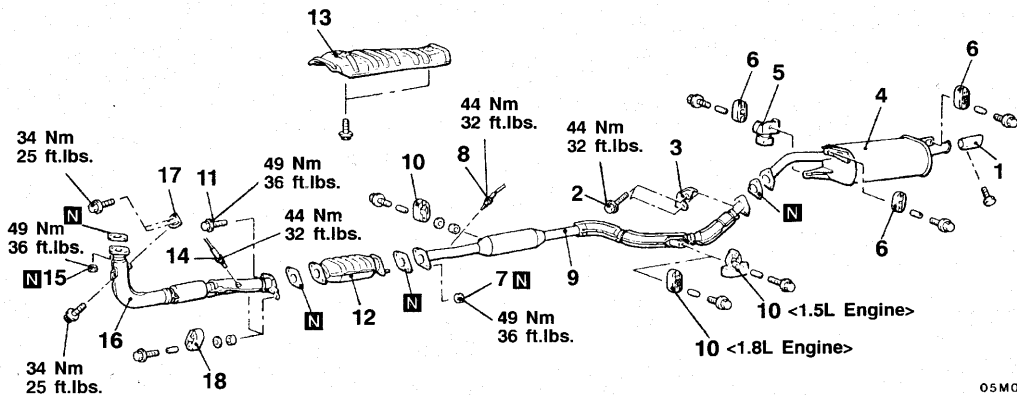
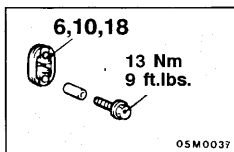
Standard value: 0.15 mm (.006 in.) or less

Limit: 0.20 mm (.008 in.)

EXHAUST PIPE AND MAIN MUFFLER

REMOVAL AND INSTALLATION

<Vehicles for Federal>

05M0100
00006911**Main muffler removal steps**

1. Muffler cutter <1.8L Engine>
2. Bolt
3. Protector
4. Main muffler
5. Dynamic damper <1.8L Engine>
6. Hanger

Center exhaust pipe removal steps

2. Bolt
3. Protector
7. Self-locking nuts
8. Heated oxygen sensor

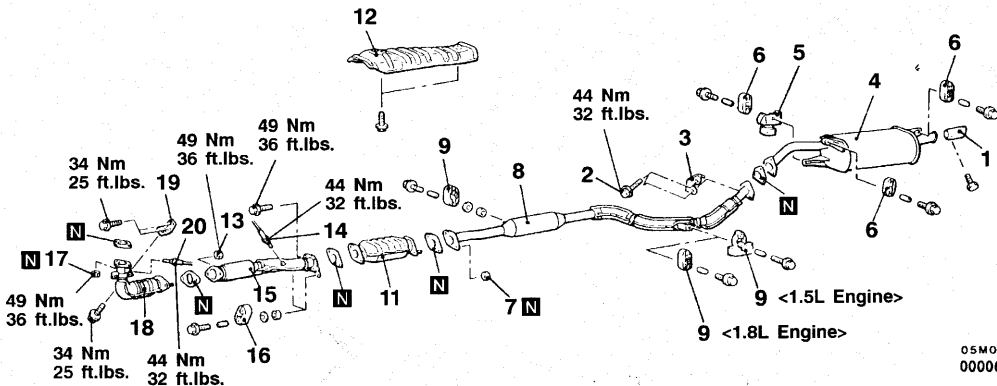
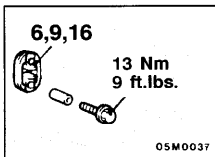
9. Center exhaust pipe
10. Hanger
11. Bolts
12. Catalytic converter
13. Front floor heat protector panel

Front exhaust pipe removal steps

11. Bolts
14. Heated oxygen sensor
15. Self-locking nuts
16. Front exhaust pipe
17. Front exhaust pipe bracket
18. Hanger



<Vehicles for California>



05M0099
00006912

Main muffler removal steps

1. Muffler cutter <1.8L Engine>
2. Bolt
3. Protector
4. Main muffler
5. Dynamic damper <1.8L Engine>
6. Hanger

Center exhaust pipe removal steps

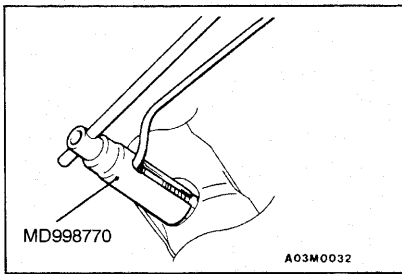
2. Bolt
3. Protector
7. Self-locking nuts
8. Center exhaust pipe
9. Hanger

10. Bolts

11. Catalytic converter
12. Front floor heat protector panel

Front exhaust pipe removal steps

10. Bolts
13. Self-locking nuts
14. Heated oxygen sensor
15. Front exhaust pipe
16. Hanger
17. Self-locking nuts
18. Front catalytic converter
19. Front exhaust pipe bracket
20. Heated oxygen sensor



MD998770

A03M0032

REMOVAL SERVICE POINT

◀A▶ HEATED OXYGEN SENSOR REMOVAL

INSTALLATION SERVICE POINT

◀A▶ HEATED OXYGEN SENSOR INSTALLATION