GROUP 15

INTAKE AND EXHAUST

CONTENTS

GENERAL INFORMATION

M1151000100101

The exhaust pipe is diveided into five <3.0L Engine> or four <2.4L Engine> parts.

INTAKE AND EXHAUST DIAGNOSIS

INTRODUCTION

M1151006900075

The occurrence of exhaust leakage or abnormal noise is caused by cracks or strain in the gasket, or by when the exhaust pipe or muffler is damaged due to impacts during travel. The exhaust leaks from these sections and causes the exhaust noise to increase. There may be cases when there is interference with the body and vibration noise is generated.

TROUBLESHOOTING STRATEGY

M1151007000075

Use these steps to plan your diagnostic strategy. If you follow them carefully, you will be sure that you have exhausted most of the possible ways to find an intake or exhaust fault.

1. Gather information from the customer.
2. Verify that the condition described by the customer exists.
3. Find the malfunction by following the SYMPTOM CHART.
4. Verify malfunction is eliminated.

SYMPTOM CHART

M1151007100072

SYMPTOMS	INSPECTION PROCEDURE	REFERENCE PAGE
Exhaust leakage	1	P.15-2
Abnormal noise generation	2	P.15-3

SYMPTOM PROCEDURES

Inspection Procedure 1

M1151007300032

Exhaust leakage

DIAGNOSIS

STEP 1. Check the gasket for cracks damage.

Q: Is the gasket damaged?
YES : Replace the gasket, then go Step 3.
NO : Go to Step 2.

STEP 2. Check for loosening in each coupling section.

Q: Is there any loosening in each section?
YES : Tighten, then go to Step 3.
NO : There is no action to be taken.

STEP 3. Check symptom.

Q: Is the exhaust leaking?
YES : Return to Step 1.
NO : This diagnosis is complete.

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Inspection Procedure 2

M1151007400028

Abnormal noise

DIAGNOSIS

STEP 1. Check for missing parts in the muffler. Tap the muffler lightly to check for loose baffles, etc.

Q: Are there any missing parts in the muffler?
YES : Replace, then go to Step 6.
NO : Go to Step 2.

STEP 2. Check the hanger for cracks.

Q: Is the hanger cracked?
YES : Replace, then go to Step 6.
NO : Go to Step 3.

STEP 3. Check for interference of the pipes and muffler with the body.

Q: Are the pipes and muffler interfering with the body?
YES : Repair, then go to Step 6.
NO : Go to Step 4.

STEP 4. Check the heat protectors.

Q: Are any heat protectors loose or damaged?
YES : Tighten or replace, then go to Step 6.
NO : Go to Step 5.

STEP 5. Check the pipes, catalytic converters and muffler for damage.

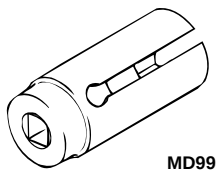
Q: Are the pipes, catalytic converters and muffler damaged?
YES : Replace, then go to Step 6.
(For the removal of the catalytic converter, refer to GROUP 17P.17-98.)
NO : There is no action to be taken.

STEP 6. Check symptom.

Q: Is any abnormal noise generated?
YES : Return to Step 1.
NO : This diagnosis is complete.

SPECIAL TOOL

M1151000600076

TOOL	TOOL NUMBER AND NAME	SUPERSESSION	APPLICATION
 MD998770	MD998770 Oxygen sensor wrench	MD998770-01 or general service tool	Heated oxygen sensor removal and installation

ON-VEHICLE SERVICE

INTAKE MANIFOLD VACUUM CHECK

M1151001800051

<2.4L ENGINE>

Refer to GROUP 11A, On-vehicle ServiceP.11A-9.

<3.0L ENGINE>

Refer to GROUP 11C, On-vehicle ServiceP.11C-8.

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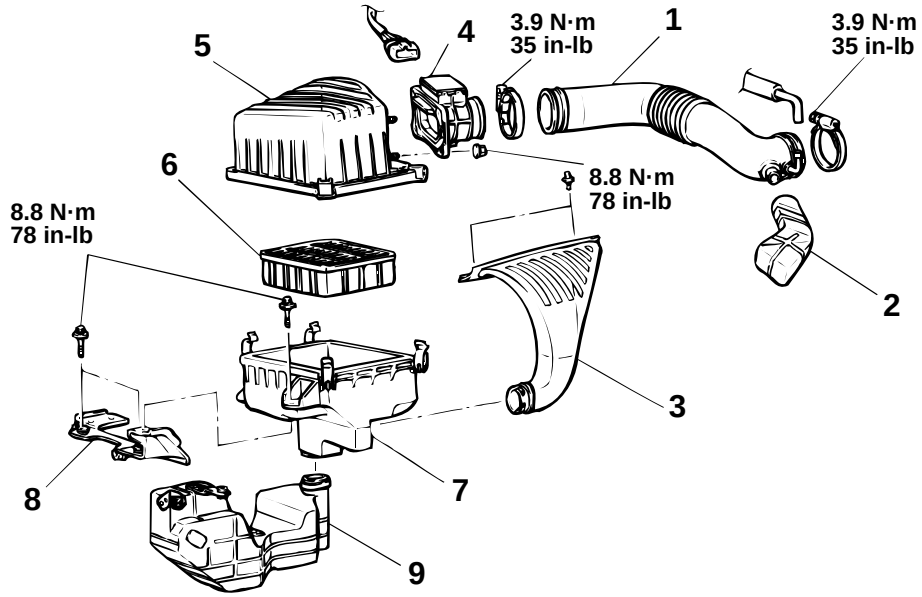
AIR CLEANER

AIR CLEANER REMOVAL AND INSTALLATION

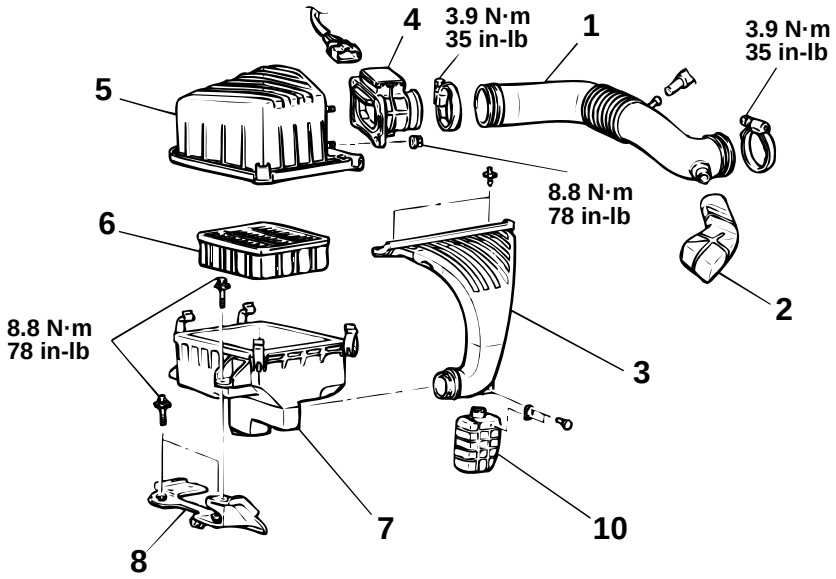
M1151002100088

Pre-removal and Post-installation Operation
Battery Removal and Installation (Refer to GROUP 54A, BatteryP.54A-8.)

<2.4L ENGINE>



<3.0L ENGINE>



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REMOVAL STEPS
1. AIR INTAKE HOSE
2. RESONATOR A
3. AIR DUCT
4. AIR FLOW SENSOR ASSEMBLY
5. AIR CLEANER COVER

REMOVAL STEPS (Continued)
6. AIR CLEANER ELEMENT
7. AIR CLEANER BODY
8. AIR CLEANER BRACKET
9. RESONATOR B <2.4L ENGINE>
10. RESONATOR C <3.0L ENGINE>

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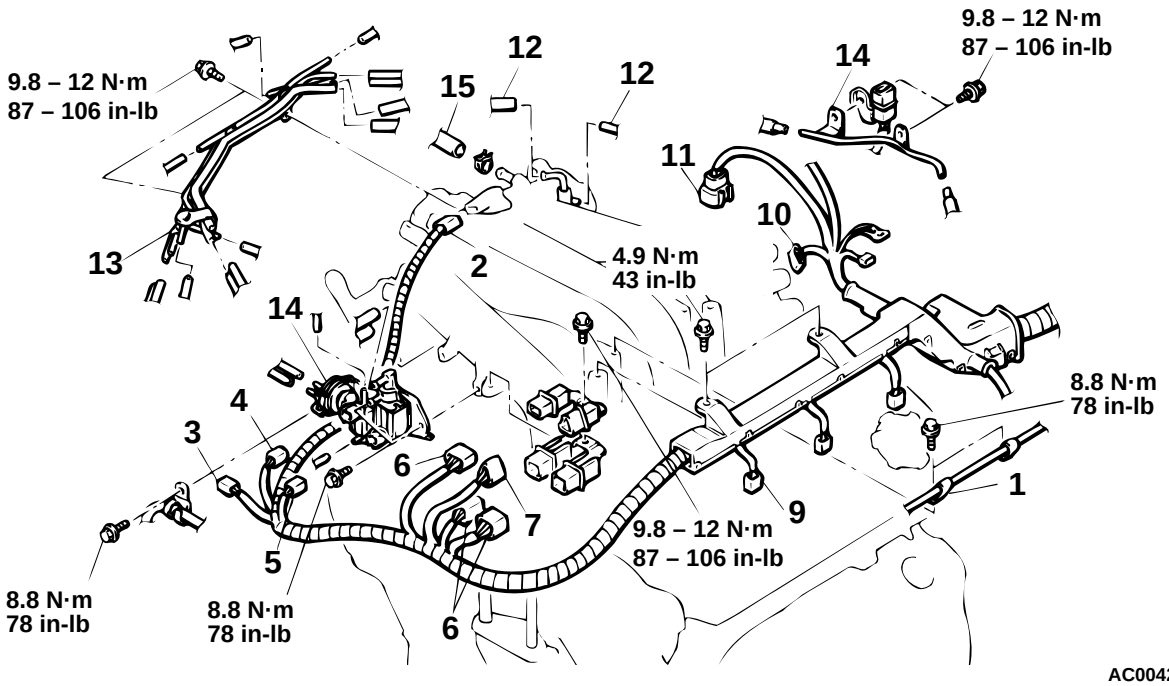
INTAKE MANIFOLD PLENUM

REMOVAL AND INSTALLATION

M1151002700057

Pre-removal Operation	Post-installation Operation
• Fuel Discharge Prevention [Refer to GROUP 13B, On-vehicle ServiceP.13B-523.] • Engine Coolant Draining [Refer to GROUP 00, Maintenance Service – Engine Coolant (Change)P.00-50.] • Air Cleaner Removal (Refer to P.15-4.) • Throttle Body Removal (Refer to GROUP 13B, Throttle BodyP.13B-528.)	• Throttle Body Installation (Refer to GROUP 13B, Throttle BodyP.13B-528.) • Air Cleaner Installation (Refer to P.15-4.) • Engine Coolant Supplying [Refer to GROUP 00, Maintenance Service – Engine Coolant (Change)P.00-50.]



REMOVAL STEPS

1. ACCELERATOR CABLE CONNECTION
2. MANIFOLD DIFFERENTIAL PRESSURE SENSOR CONNECTOR
3. CONTROL WIRING HARNESS AND POWER STEERING WIRING HARNESS COMBINATION CONNECTOR
4. EGR SOLENOID VALVE CONNECTOR
5. EVAPORATIVE EMISSION PURGE SOLENOID VALVE CONNECTOR
6. KNOCK SENSOR CONNECTOR
7. CRANKSHAFT POSITION SENSOR CONNECTOR

REMOVAL STEPS (Continued)

8. RIGHT BANK HEATED OXYGEN SENSOR CONNECTOR
9. INJECTOR CONNECTOR
10. DISTRIBUTOR CONNECTOR
11. CONTROL WIRING HARNESS AND INJECTOR WIRING HARNESS COMBINATION CONNECTOR
12. VACUUM HOSE CONNECTION
13. VACUUM PIPE
14. EGR SOLENOID VALVE, EVAPORATIVE EMISSION PURGE SOLENOID VALVE AND VACUUM CONTROL VALVE
15. BRAKE BOOSTER VACUUM HOSE CONNECTION

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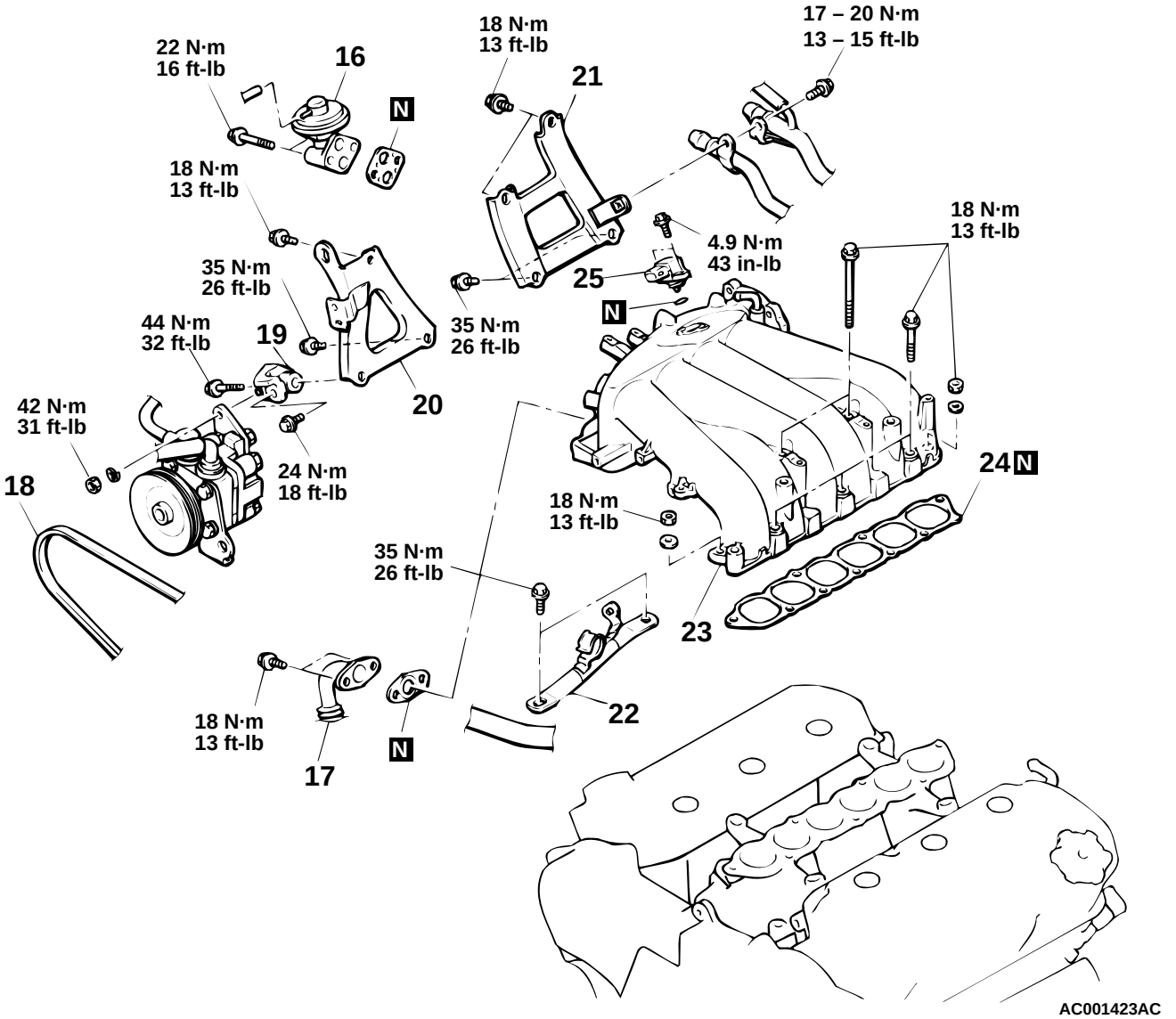

REMOVAL STEPS

16. EGR VALVE
17. EGR PIPE CONNECTION
18. DRIVE BELT <POWER STEERING OIL PUMP>
19. POWER STEERING OIL PUMP BRACKET STAY
20. INTAKE MANIFOLD PLENUM STAY, FRONT

REMOVAL STEPS (Continued)

21. INTAKE MANIFOLD PLENUM STAY, REAR
22. ENGINE MOUNT STAY
23. INTAKE MANIFOLD PLENUM
>>A<< 24. INTAKE MANIFOLD PLENUM GASKET
25. MANIFOLD DIFFERENTIAL PRESSURE SENSOR

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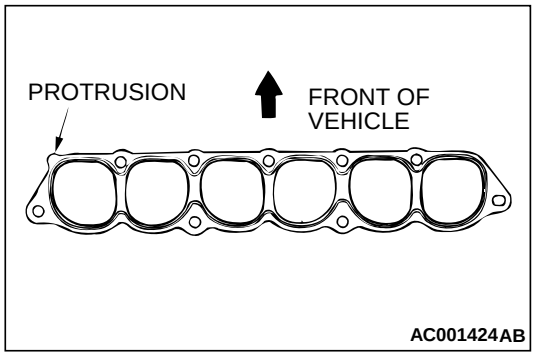
INSTALLATION SERVICE POINT

>>A<< INTAKE MANIFOLD PLENUM GASKET INSTALLATION

Install the gasket with the protrusion in the position illustrated.



INTAKE MANIFOLD <2.4L>

REMOVAL AND INSTALLATION

M1151003000114

Pre-removal Operation	Post-installation Operation
• Fuel Discharge Prevention [Refer to GROUP 13A, On-vehicle Service – Fuel Pump Relay Disconnection (How to Reduce Pressurized Fuel Lines)P.13A-442.] • Engine Coolant Draining [Refer to GROUP 00, Maintenance Service – Engine Coolant (Change)P.00-50.] • Air Cleaner Removal (Refer to P.15-4.) • Throttle Body Removal (Refer to GROUP 13A, Throttle BodyP.13A-451.) • Thermostat Case Assembly Removal (Refer to GROUP 14, Water Hose and Water PipeP.14-23.)	• Thermostat Case Assembly Installation (Refer to GROUP 14, Water Hose and Water PipeP.14-23.) • Throttle Body Installation (Refer to GROUP 13A, Throttle BodyP.13A-451.) • Air Cleaner Installation (Refer to P.15-4.) • Engine Coolant Supplying [Refer to GROUP 00, Maintenance Service – Engine Coolant (Change)P.00-50.] • Fuel Leakage Inspection

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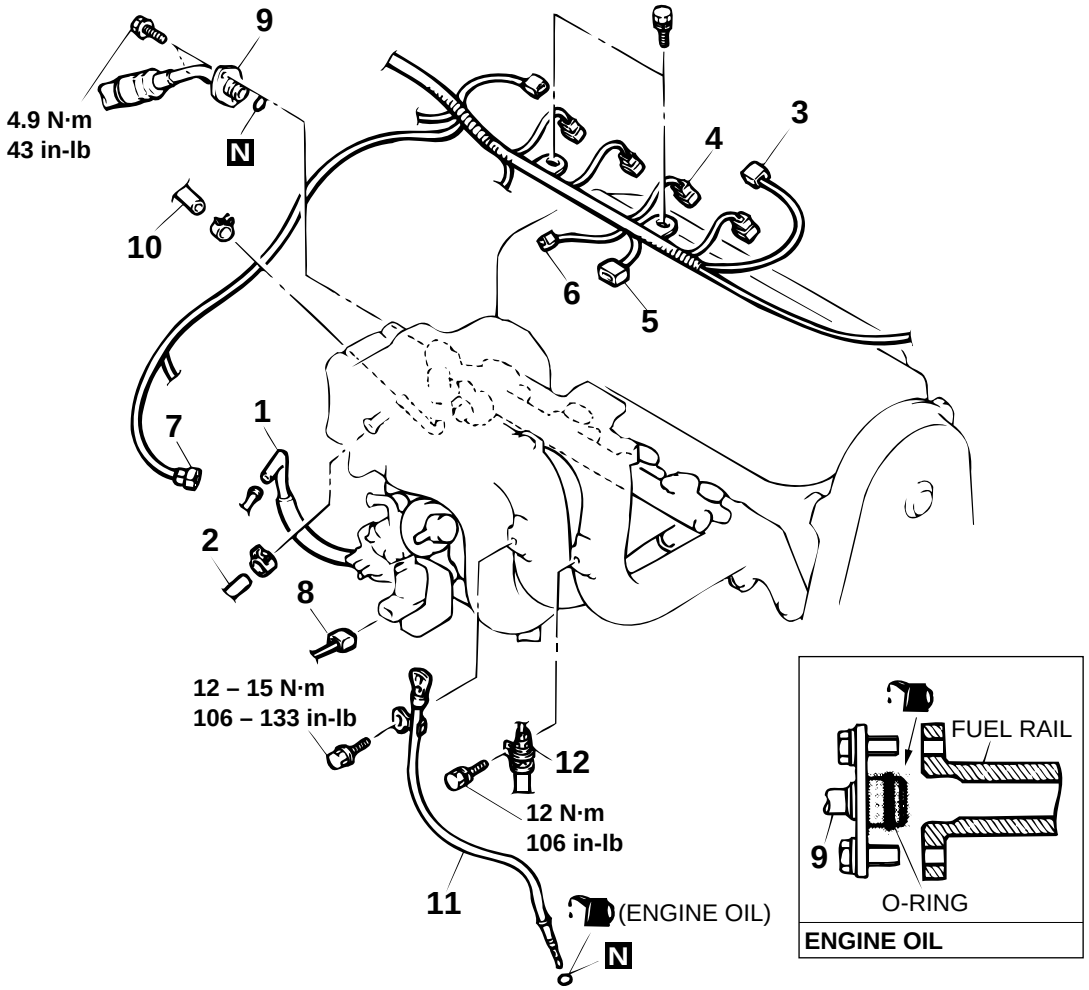

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REMOVAL STEPS

1. PURGE HOSE CONNECTION
2. BRAKE BOOSTER VACUUM HOSE CONNECTION
3. IGNITION COIL CONNECTOR
4. INJECTOR CONNECTOR
5. IGNITION FAILURE SENSOR CONNECTOR
6. MANIFOLD DIFFERENTIAL PRESSURE SENSOR CONNECTOR
7. EVAPORATIVE EMISSION PURGE SOLENOID VALVE CONNECTOR

REMOVAL STEPS (Continued)

8. EGR SOLENOID VALVE CONNECTOR

>>A<<

9. HIGH-PRESSURE FUEL HOSE CONNECTION
10. FUEL RETURN HOSE CONNECTION
11. OIL DIPSTICK AND DIPSTICK GUIDE
12. PRESSURE HOSE CONNECTION

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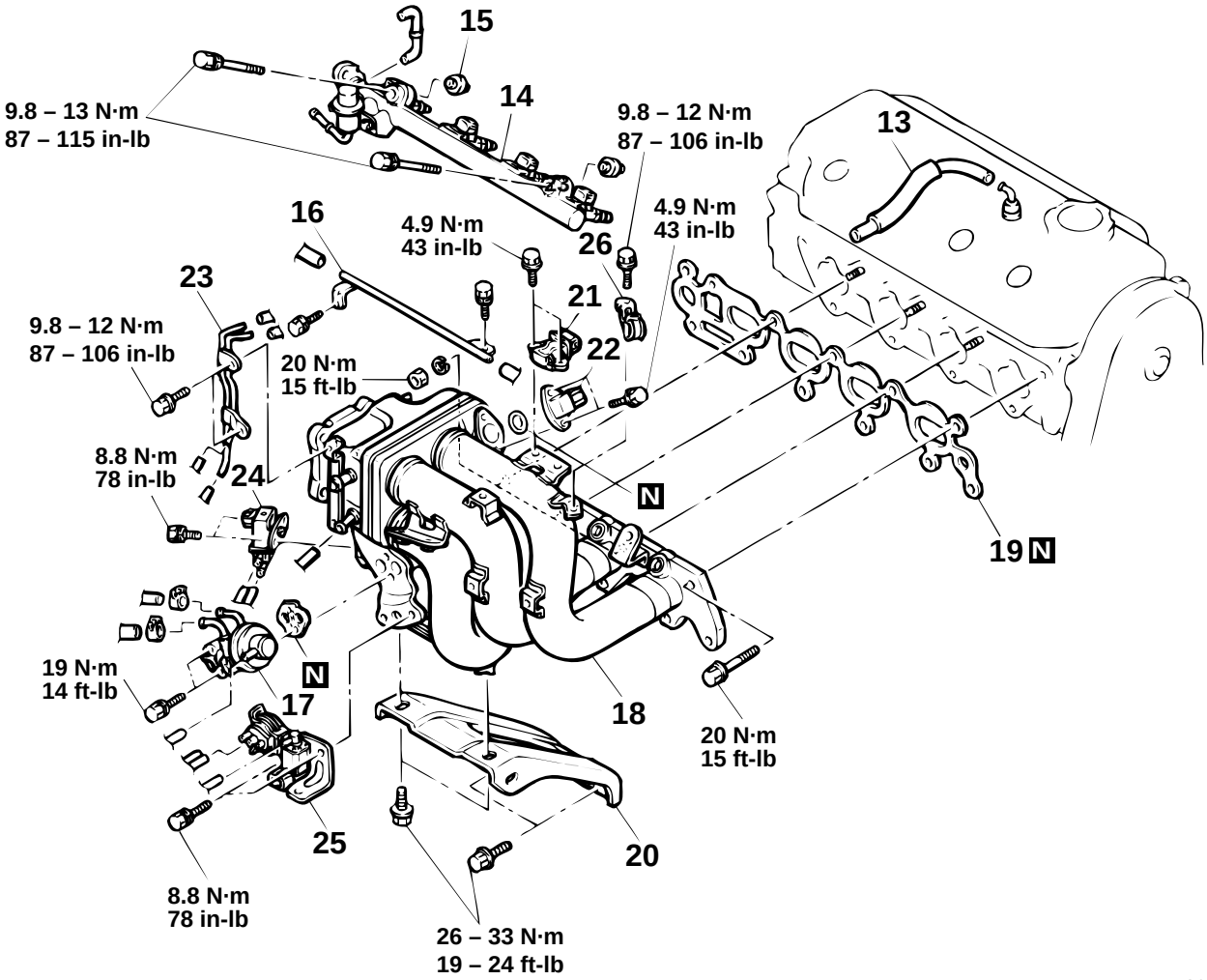

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REMOVAL STEPS

<<A>>
13. PCV HOSE
14. FUEL RAIL, INJECTOR AND FUEL PRESSURE REGULATOR
15. INSULATOR
16. VACUUM PIPE <VEHICLES WITH AUTO-CRUISE CONTROL SYSTEM
17. EGR VALVE
18. INTAKE MANIFOLD
19. INTAKE MANIFOLD GASKET
20. INTAKE MANIFOLD STAY

REMOVAL STEPS (Continued)

21. IGNITION FAILURE SENSOR
22. MANIFOLD DIFFERENTIAL PRESSURE SENSOR
23. VACUUM PIPE
24. EVAPORATIVE EMISSION PURGE SOLENOID VALVE
25. EGR SOLENOID VALVE AND VACUUM CONTROL VALVE
26. ACCELERATOR CABLE CLAMP

REMOVAL SERVICE POINT

<<A>> FUEL RAIL, INJECTOR AND FUEL PRESSURE REGULATOR REMOVAL

⚠ CAUTION

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

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

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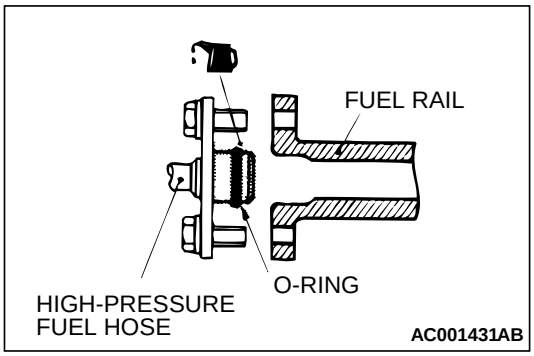

INSTALLATION SERVICE POINT

>>A<< HIGH-PRESSURE FUEL HOSE INSTALLATION

⚠ CAUTION

Be careful not to allow any engine oil to enter the fuel rail.

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.
2. While turning the high-pressure fuel hose to the left and right, install it to the fuel rail.
3. Check that the injector 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 fuel rail and check again.

INSPECTION

M1151003100081

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 (0.006 inch) or less
   Limit: 0.20 mm (0.008 inch)

INTAKE MANIFOLD <3.0L>

REMOVAL AND INSTALLATION

M1151003000125

Pre-removal Operation	Post-installation Operation
• Fuel Discharge Prevention [Refer to GROUP 13B, On-vehicle Service – Fuel Pump Relay Disconnection (How to Reduce Pressurized Fuel Lines)P.13B-523.] • Intake Manifold Plenum Removal (Refer to P.15-5.)	• Intake Manifold Plenum Installation (Refer to P.15-5.) • Fuel Leakage Inspection

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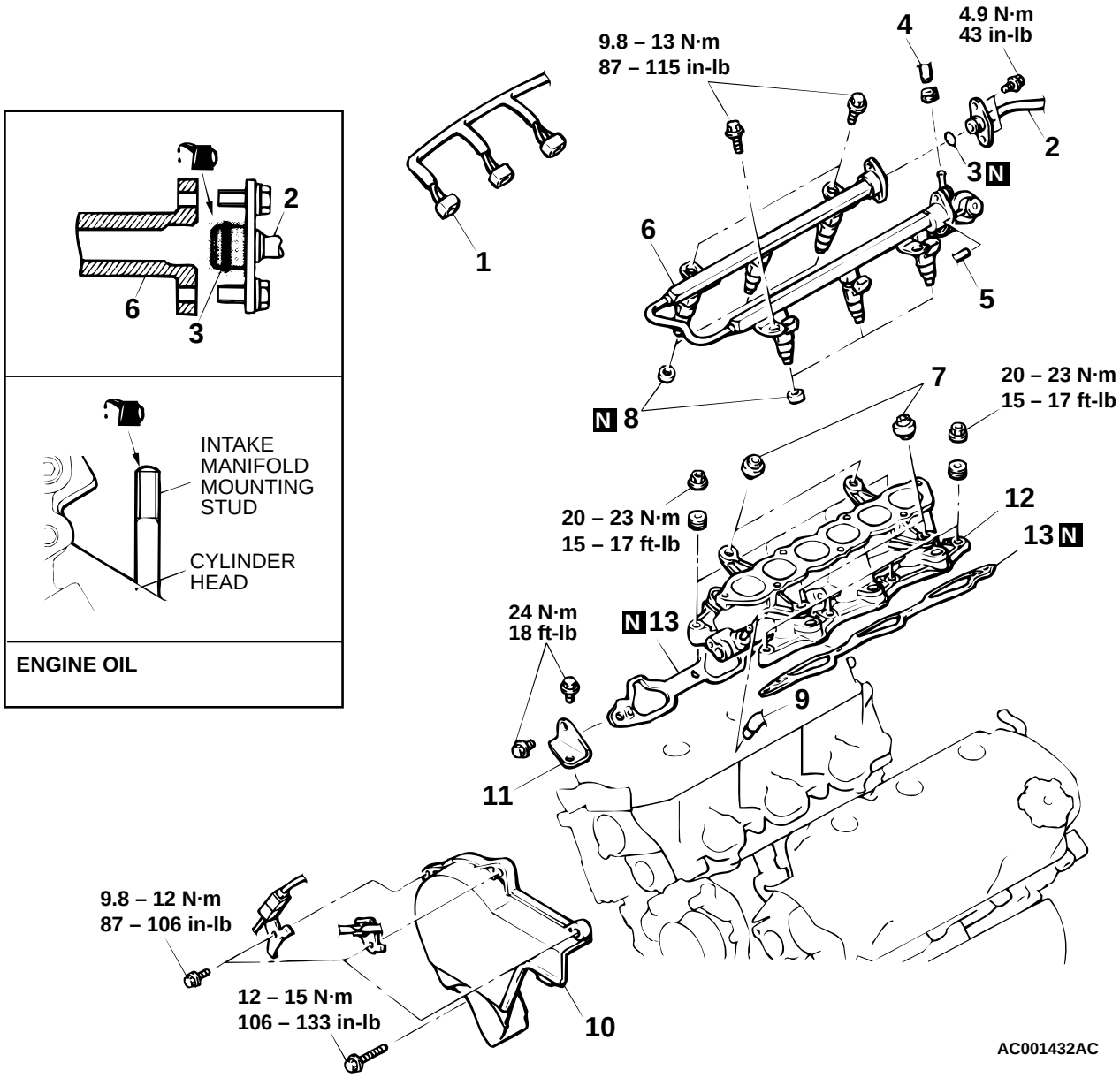

REMOVAL STEPS

1. INJECTOR CONNECTOR
>>C<< 2. HIGH-PRESSURE FUEL HOSE CONNECTION
3. O-RING
4. FUEL RETURN HOSE CONNECTION
5. VACUUM HOSE CONNECTION
<<A>> 6. FUEL RAIL, INJECTOR AND FUEL PRESSURE REGULATOR

REMOVAL STEPS (Continued)

7. INSULATORS
8. INSULATORS
9. PCV HOSE CONNECTION
10. TIMING BELT FRONT UPPER COVER, RIGHT
11. BRACKET
>>B<< 12. INTAKE MANIFOLD
>>A<< 13. INTAKE MANIFOLD GASKET

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REMOVAL SERVICE POINT

<<A>> FUEL RAIL, INJECTOR AND FUEL PRESSURE REGULATOR REMOVAL

⚠ CAUTION

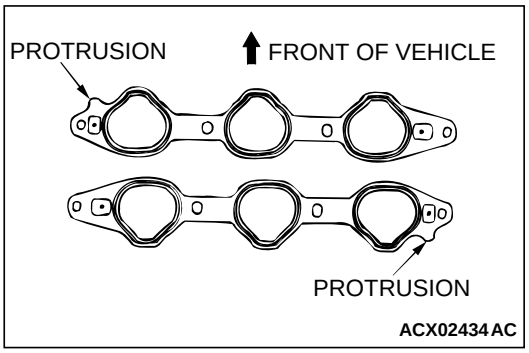
Care must be taken when removing the fuel rail not to drop the injector.

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

INSTALLATION SERVICE POINTS

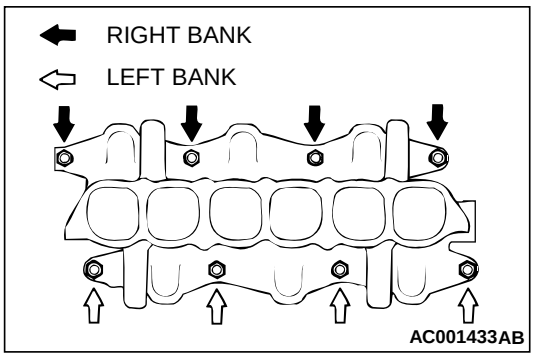
>>A<< INTAKE MANIFOLD GASKET INSTALLATION

Install the gasket with the protrusions in the position illustrated.

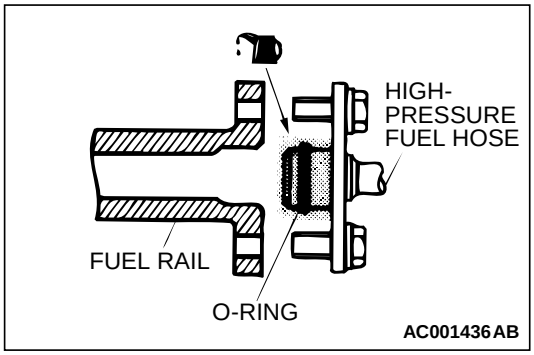


>>B<< INTAKE MANIFOLD INSTALLATION

1. Coat the intake manifold mounting studs with engine oil.
2. Tighten the intake manifold mounting nuts by the following procedure.



ORDER	MOUNTING NUTS	TIGHTENING TORQUE
1st	Right-bank nuts	6.9 N·m (61 in-lb)
2nd	Left-bank nuts	20 – 23 N·m (15 – 17 ft-lb)
3rd	Right-bank nuts	20 – 23 N·m (15 – 17 ft-lb)
4th	Left-bank nuts	20 – 23 N·m (15 – 17 ft-lb)
5th	Right-bank nuts	20 – 23 N·m (15 – 17 ft-lb)



>>C<< HIGH-PRESSURE FUEL HOSE INSTALLATION

⚠ CAUTION

Be careful not to allow any engine oil to enter the fuel rail.

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.
2. While turning the high-pressure fuel hose to the left and right, install it to the fuel rail.
3. Check that the injector 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 fuel rail and check again.

INSPECTION

M1151003100092

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

INTAKE MANIFOLD CHECK

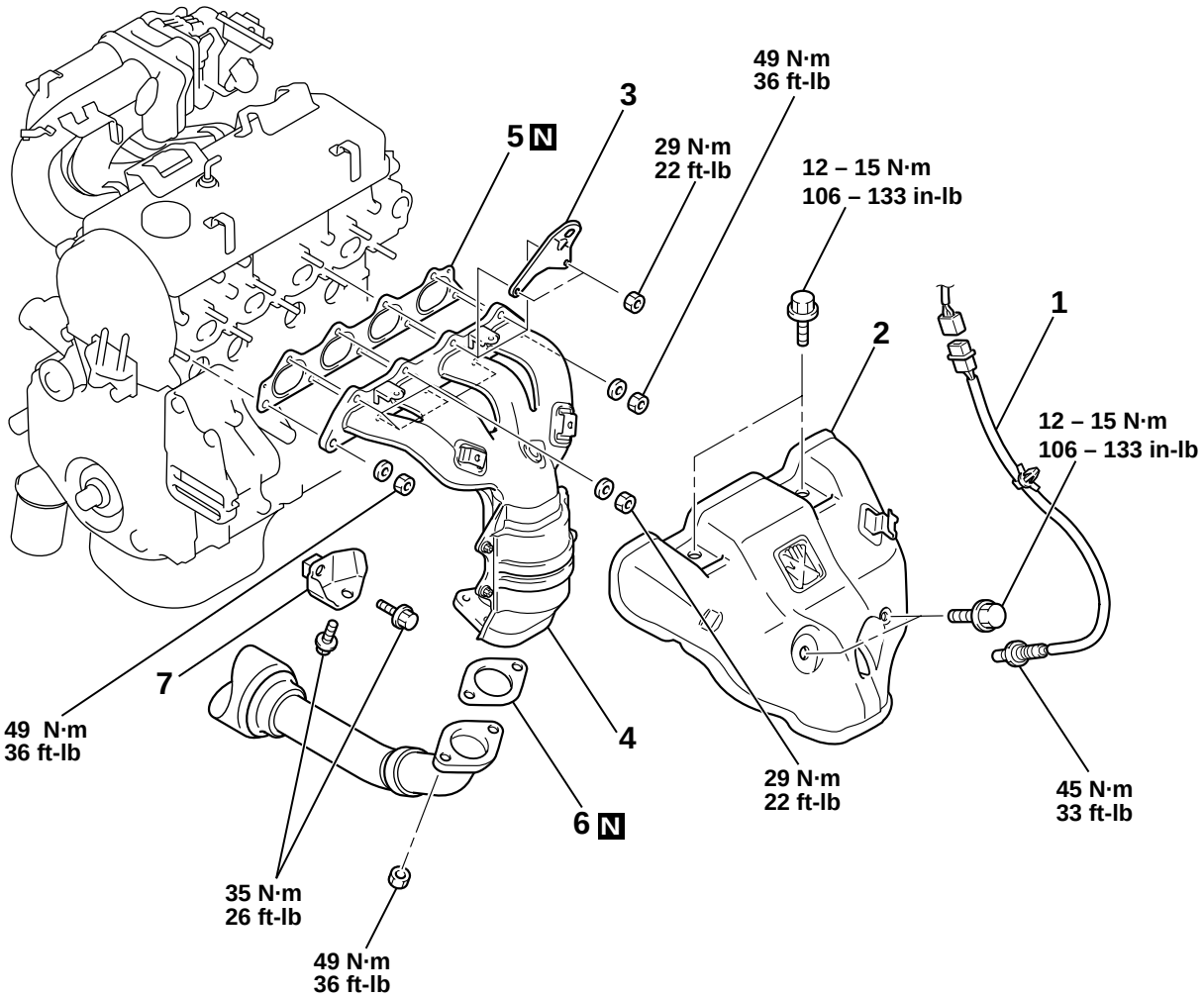
1. Check for damage or cracking of any part.
2. Check for obstruction of the negative pressure (vacuum) outlet port, and for obstruction of the water passage or gas passage.
3. Using a straight edge and feeler gauge, check for distortion of the cylinder head installation surface.

   Standard value: 0.15 mm (0.006 inch) or less
   Limit: 0.20 mm (0.008 inch)

EXHAUST MANIFOLD <2.4L>

REMOVAL AND INSTALLATION

M1151003300074



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REMOVAL STEPS

<<A>> >>A<< 1. HEATED OXYGEN SENSOR (FRONT)
2. HEAT PROTECTOR
3. ENGINE HANGER

REMOVAL STEPS (Continued)

4. EXHAUST MANIFOLD
5. EXHAUST MANIFOLD GASKET
6. GASKET
7. EXHAUST MANIFOLD BRACKET

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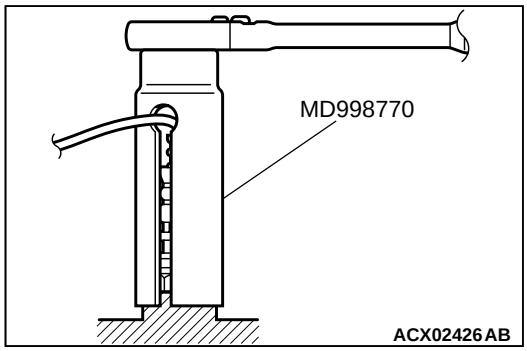
REMOVAL SERVICE POINT

<<A>>HEATED OXYGEN SENSOR (FRONT) REMOVAL

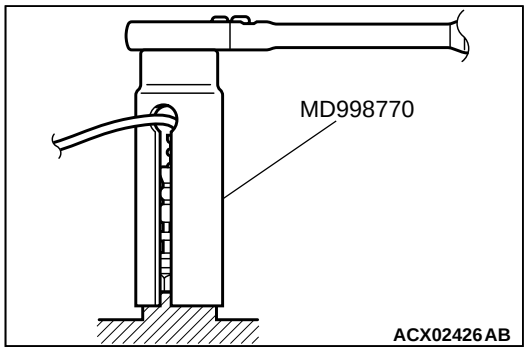
Use special tool MD998770 to remove the oxygen sensor.



INSTALLATION SERVICE POINT

>>A<<HEATED OXYGEN SENSOR (FRONT) INSTALLATION

Use special tool MD998770 to installation the oxygen sensor.



INSPECTION

M1151003400060

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

EXHAUST MANIFOLD CHECK

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

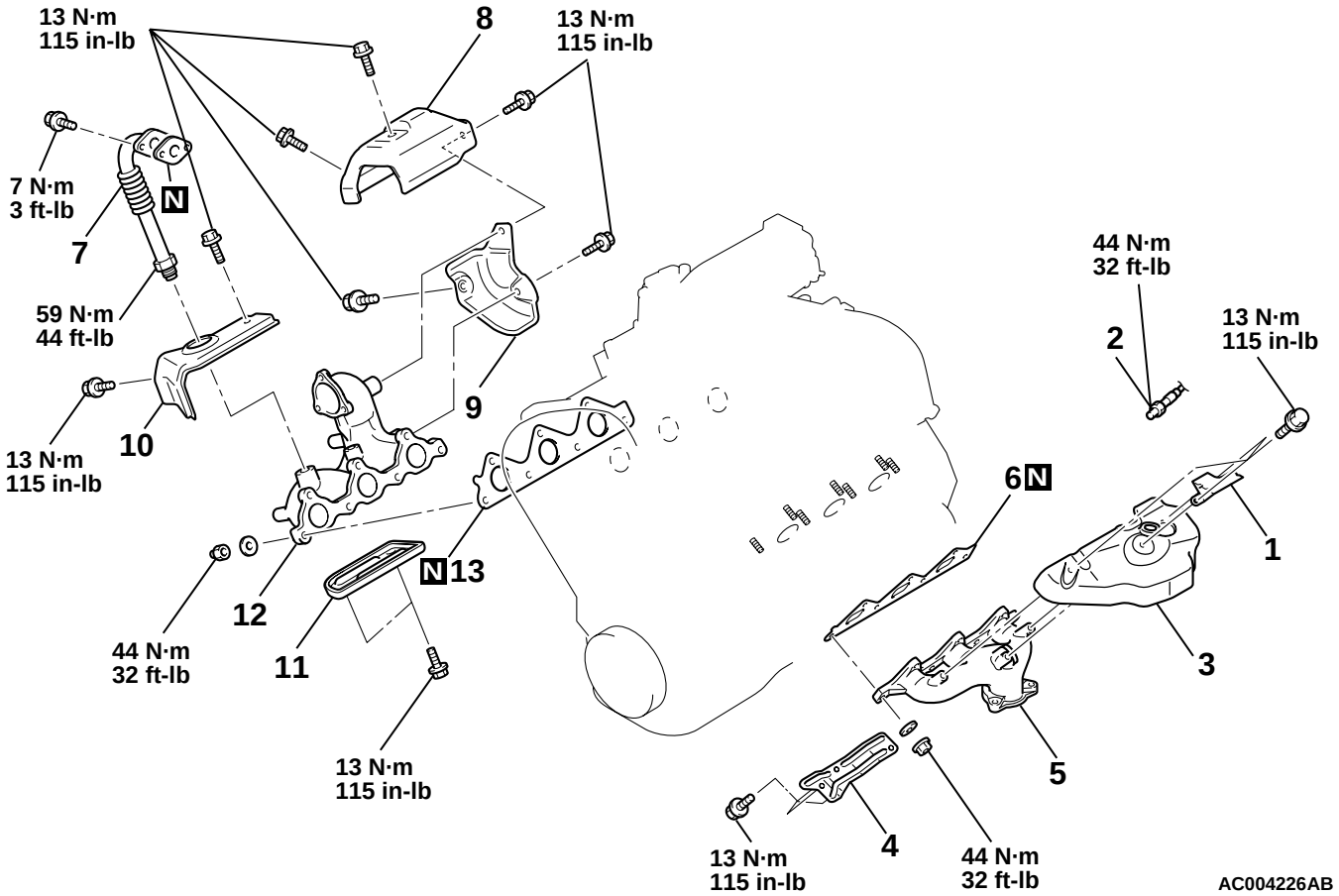
   Standard value: 0.15 mm (0.006 inch) or less
   Limit: 0.20 mm (0.008 inch)

EXHAUST MANIFOLD <3.0L>

REMOVAL AND INSTALLATION

M1151003300085

Pre-removal and Post-installation Operation
- Front Exhaust Pipe Removal and Installation (Refer to P.15-19.)
- Air Cleaner Removal and Installation (Refer to P.15-4.)
- Battery and Battery Tray Removal and Installation (Refer to GROUP 54A, BatteryP.54A-8.)
- Engine Oil Dipstick Guide, A/T Oil Dipstick Guide Removal and Installation



REMOVAL STEPS
1. HEAT UPPER PROTECTOR <LEFT BANK>

<<A>> >>A<<
2. LEFT BANK HEATED OXYGEN SENSOR (FRONT)
3. HEAT PROTECTOR <LEFT BANK>
4. HEAT LOWER PROTECTOR <LEFT BANK>
5. EXHAUST MANIFOLD <LEFT BANK>
6. EXHAUST MANIFOLD GASKET <LEFT BANK>
7. EGR PIPE

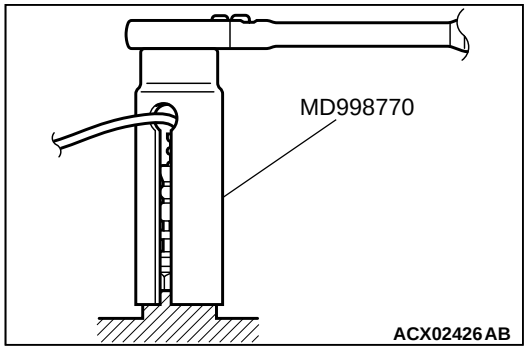
REMOVAL STEPS (Continued)
8. HEAT UPPER PROTECTOR <RIGHT BANK>
9. HEAT PROTECTOR <RIGHT BANK>
10. HEAT FRONT PROTECTOR <RIGHT BANK>
11. HEAT LOWER PROTECTOR <RIGHT BANK>
12. EXHAUST MANIFOLD <RIGHT BANK>
13. EXHAUST MANIFOLD GASKET <RIGHT BANK>

TSB Revision

REMOVAL SERVICE POINT

<<A>> LEFT BANK HEATED OXYGEN SENSOR (FRONT) REMOVAL

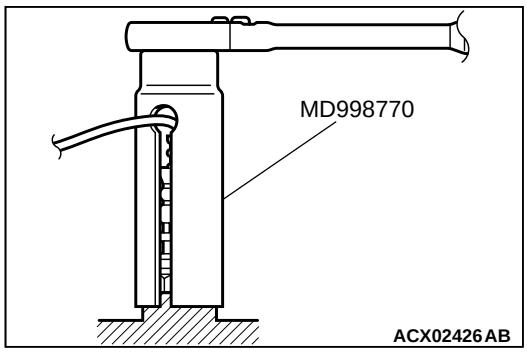
Use special tool MD998770 to remove the oxygen sensor.



INSTALLATION SERVICE POINT

>>A<< LEFT BANK HEATED OXYGEN SENSOR (FRONT) INSTALLATION

Use special tool MD998770 to installation the oxygen sensor.



INSPECTION

M1151003400071

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

EXHAUST MANIFOLD CHECK

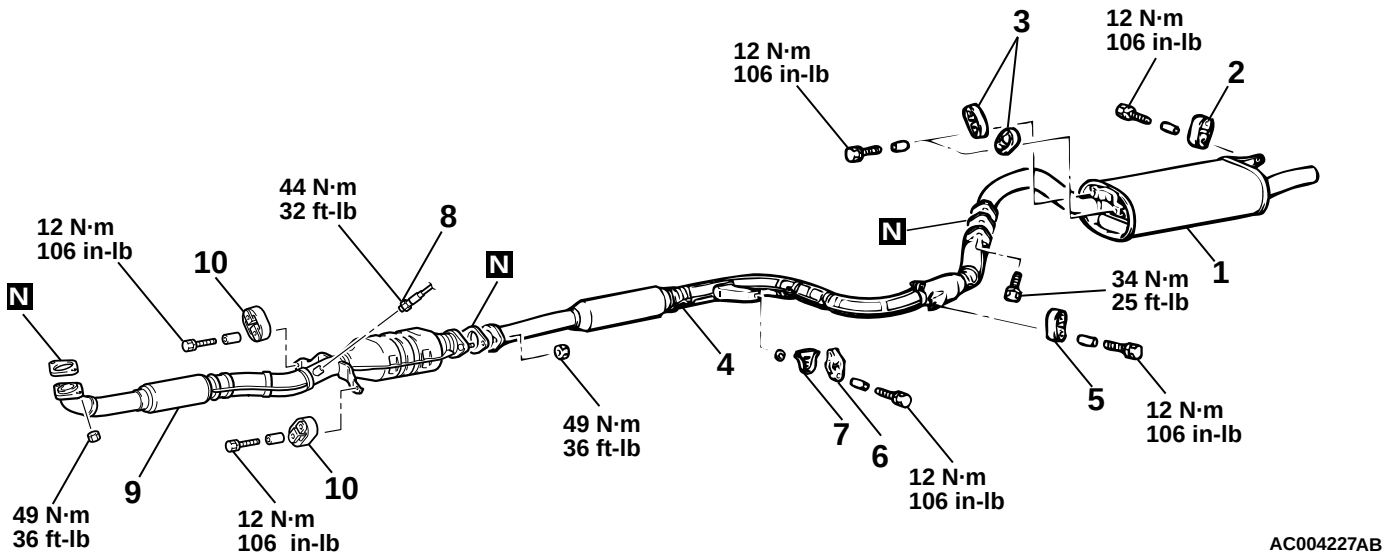
1. Check for damage or cracking of any part.
2. Using a straight edge and a feeler gauge, check for distortion of the cylinder head installation surface.

   Standard value: 0.15 mm (0.006 inch) or less
   Limit: 0.20 mm (0.008 inch)

EXHAUST PIPE, MAIN MUFFLER AND CATALYTIC CONVERTER<2.4L>

REMOVAL AND INSTALLATION

M1151005400077



MAIN MUFFLER REMOVAL STEPS

1. MAIN MUFFLER
2. HANGER
3. HANGER

CENTER EXHAUST PIPE REMOVAL STEPS

4. CENTER EXHAUST PIPE
5. HANGER
6. HANGER
7. PROTECTOR

<<A>> >>A<<

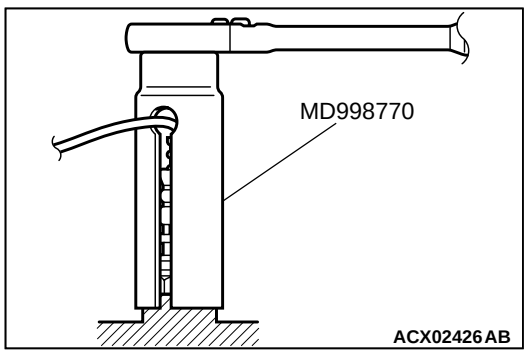
FRONT EXHAUST PIPE REMOVAL STEPS

8. HEATED OXYGEN SENSOR (REAR)
9. FRONT EXHAUST PIPE (CATALYTIC CONVERTER INCORPORATED)
10. HANGER

REMOVAL SERVICE POINT

<<A>> HEATED OXYGEN SENSOR (REAR) REMOVAL

Use special tool MD998770 to remove the oxygen sensor.



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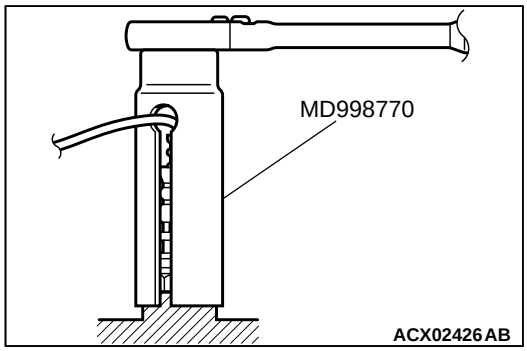
INSTALLATION SERVICE POINT

>>A<< HEATED OXYGEN SENSOR (REAR) INSTALLATION

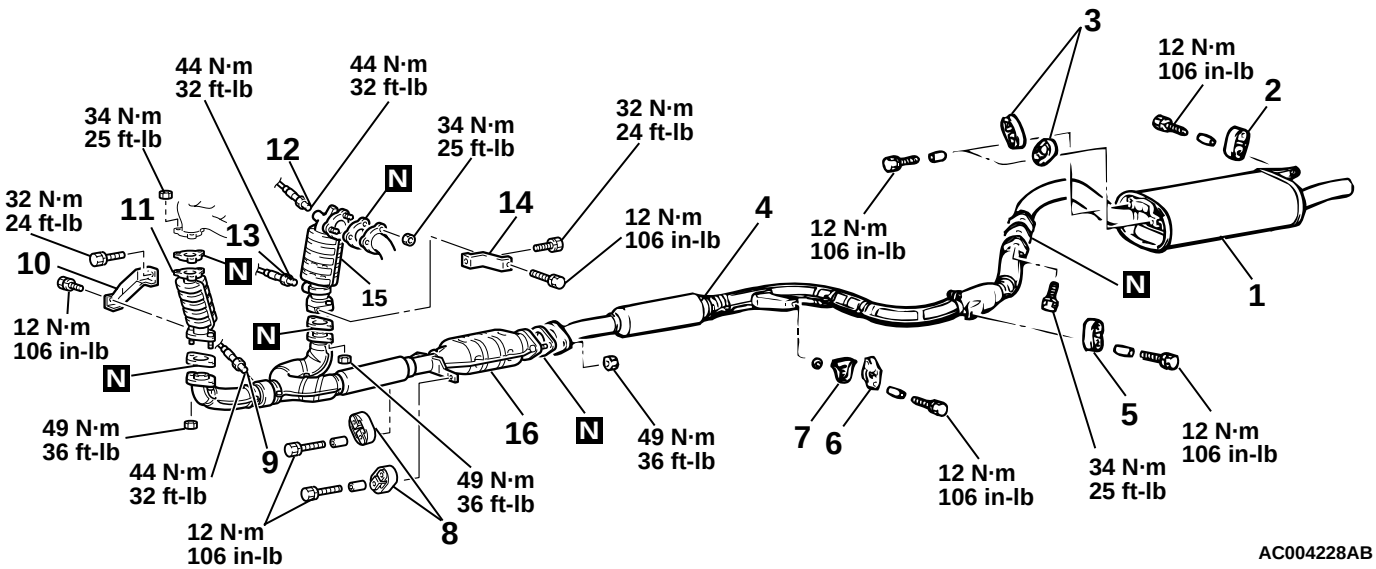
Use special tool MD998770 to installation the oxygen sensor.



EXHAUST PIPE, MAIN MUFFLER AND CATALYTIC CONVERTER<3.0L>

REMOVAL AND INSTALLATION

M1151005400088



MAIN MUFFLER REMOVAL STEPS

1. MAIN MUFFLER
2. HANGER
3. HANGER

CENTER EXHAUST PIPE REMOVAL STEPS

4. CENTER EXHAUST PIPE
5. HANGER
6. HANGER
7. PROTECTOR

<<A>> >>A<<

<<A>> >>A<<

<<A>> >>A<<

FRONT EXHAUST PIPE REMOVAL STEPS (LEFT BANK SIDE)

8. HANGER
9. LEFT BANK HEATED OXYGEN SENSOR (REAR)
10. EXHAUST FITTING STAY (LH)
11. FRONT CATALYTIC CONVERTER (LH)

FRONT EXHAUST PIPE REMOVAL STEPS (RIGHT BANK SIDE)

12. RIGHT BANK HEATED OXYGEN SENSOR (FRONT)
13. RIGHT BANK HEATED OXYGEN SENSOR (REAR)
14. EXHAUST FITTING STAY (RH)

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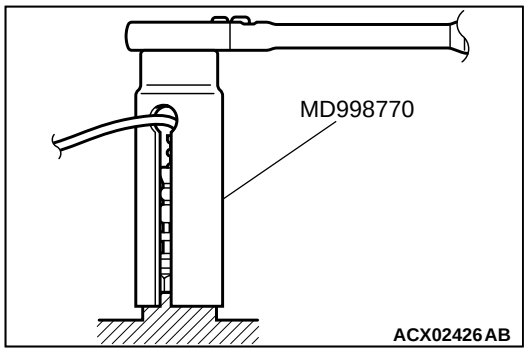
FRONT EXHAUST PIPE REMOVAL STEPS (LEFT BANK SIDE) (Continued)

15. FRONT CATALYTIC CONVERTER (RH)
16. FRONT EXHAUST PIPE (CATALYTIC CONVERTER INCORPORATED)

REMOVAL SERVICE POINT

<<A>> LEFT BANK HEATED OXYGEN SENSOR (REAR)/ RIGHT BANK HEATED OXYGEN SENSOR (REAR)/RIGHT BANK HEATED OXYGEN SENSOR (FRONT) REMOVAL

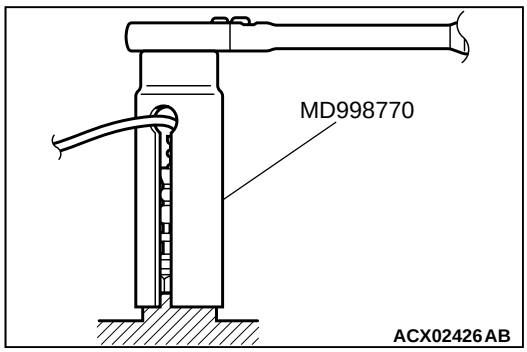
Use special tool MD998770 to remove the oxygen sensor.



INSTALLATION SERVICE POINT

>>A<<RIGHT BANK HEATED OXYGEN SENSOR (FRONT)/ RIGHT BANK HEATED OXYGEN SENSOR (REAR)/LEFT BANK HEATED OXYGEN SENSOR (REAR) INSTALLATION

Use special tool MD998770 to installation the oxygen sensor.



SPECIFICATIONS

FASTENER TIGHTENING SPECIFICATIONS

M1151006800078

ITEMS	SPECIFICATIONS
Air cleaner	
Air cleaner bolt	8.8 N·m (78 in-lb)
Air flow sensor nut	8.8 N·m (78 in-lb)

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ITEMS		SPECIFICATIONS
Air intake hose clamp bolt		3.9 N·m (35 in-lb)
Exhaust manifold <2.4L Engine>		
Engine hanger nut		29 N·m (22 ft-lb)
Exhaust manifold bracket bolt		35 N·m (26 ft-lb)
Exhaust manifold nut	M8	29 N·m (22 ft-lb)
	M10	49 N·m (35 ft-lb)
Front exhaust pipe nut		49 N·m (35 ft-lb)
Heat protector bolt		12 – 15 N·m (105 – 133 in-lb)
Heated oxygen sensor (front)		44 N·m (32 ft-lb)
Exhaust manifold <3.0L Engine>		
EGR pipe bolt		59 N·m (44 ft-lb)
EGR pipe gasket bolt		17 N·m (13 ft-lb)
Exhaust manifold nut		44 N·m (32 ft-lb)
Heat front protector <right bank> bolt		13 N·m (115 in-lb)
Heat lower protector <left bank> bolt		13 N·m (115 in-lb)
Heat lower protector <right bank> bolt		13 N·m (115 in-lb)
Heat protector <left bank> bolt		13 N·m (115 in-lb)
Heat protector <right bank> bolt		13 N·m (115 in-lb)
Heat upper protector <left bank> bolt		13 N·m (115 in-lb)
Heat upper protector <right bank> bolt		13 N·m (115 in-lb)
Left bank heated oxygen sensor (front)		44 N·m (32 ft-lb)
Exhaust pipe and main muffler <2.4L Engine>		
Center exhaust pipe bolt		34 N·m (25 ft-lb)
Front exhaust pipe nut		49 N·m (36 ft-lb)
Hanger bolt		12 N·m (106 in-lb)
Heated oxygen sensor (rear)		44 N·m (32 ft-lb)
Exhaust pipe and main muffler <3.0L Engine>		
Center exhaust pipe bolt		34 N·m (25 ft-lb)
Exhaust fitting stay (LH)	M8	12 N·m (106 in-lb)
	M12	32 N·m (24 ft-lb)
Exhaust fitting stay (RH)	M8	12 N·m (106 in-lb)
	M12	32 N·m (24 ft-lb)
Front catalytic converter (LH) nut		34 N·m (25 ft-lb)
Front catalytic converter (RH) nut		34 N·m (25 ft-lb)
Front exhaust pipe nut		49 N·m (36 ft-lb)
Hanger bolt		12 N·m (106 in-lb)
Left bank heated oxygen sensor (rear)		44 N·m (32 ft-lb)
Right bank heated oxygen sensor (front)		44 N·m (32 ft-lb)
Right bank heated oxygen sensor (rear)		44 N·m (32 ft-lb)

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ITEMS		SPECIFICATIONS
Intake manifold <2.4L Engine>		
Accelerator cable clamp bolt		9.8 – 12 N·m (87 – 106 in-lb)
EGR solenoid valve bolt		8.8 N·m (78 in-lb)
EGR valve bolt		19 N·m (14 ft-lb)
Evaporative emission purge solenoid valve bolt		8.8 N·m (78 in-lb)
Fuel rail bolt		9.8 – 13 N·m (87 – 115 in-lb)
High pressure fuel hose connection bolt		4.9 N·m (43 in-lb)
Intake manifold bolt and nut		20 N·m (15 ft-lb)
Intake manifold stay bolt		26 – 33 N·m (19 – 24 ft-lb)
Manifold differential pressure sensor and ignition failure sensor bolt		4.9 N·m (43 in-lb)
Oil dipstick guide bolt		12 – 15 N·m (106 – 133 in-lb)
Vacuum pipe bolt		9.8 – 12 N·m (87 – 106 in-lb)
Intake manifold <3.0L Engine>		
Bracket bolt		24 N·m (18 ft-lb)
Fuel rail bolt		9.8 – 13 N·m (87 – 115 in-lb)
High pressure fuel hose connection bolt		4.9 N·m (43 in-lb)
Intake manifold nut		20 – 23 N·m (15 – 17 ft-lb)
Timing belt front upper cover bolt	M6	9.8 – 12 N·m (87 – 106 in-lb)
	M8	12 – 15 N·m (106 – 133 in-lb)
Intake manifold plenum <3.0L Engine>		
Accelerator cable bolt		8.8 N·m (78 in-lb)
Control wiring harness connector bracket bolt		4.9 N·m (43 in-lb)
EGR pipe connection bolt		18 N·m (13 ft-lb)
EGR valve bolt		22 N·m (16 ft-lb)
Engine mount stay bolt		35 N·m (26 ft-lb)
Heater pipe bolt		17 – 20 N·m (13 – 15 ft-lb)
Intake manifold plenum bolt and nut		18 N·m (13 ft-lb)
Intake manifold plenum stay bolt, front and rear	M8	18 N·m (13 ft-lb)
	M10	35 N·m (26 ft-lb)
Manifold differential pressure sensor bolt		4.9 N·m (43 in-lb)
Power steering oil pump stay bolt (bolt, washer assembly)		44 N·m (32 ft-lb)
Power steering oil pump stay bolt (bolt, flange)		24 N·m (18 ft-lb)
Power steering oil pump nut		42 N·m (31 ft-lb)

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ITEMS	SPECIFICATIONS
Sensor connector assembly bolt	9.8 – 12 N·m (87 – 106 in-lb)
Vacuum pipe assembly bolt	9.8 – 12 N·m (87 – 106 in-lb)
Valve assembly bolt	8.8 N·m (78 in-lb)

SERVICE SPECIFICATION

M1151000300064

ITEM	STANDARD VALUE	LIMIT
Manifold distortion of the installation surface mm (in)	0.15 (0.006) or less	0.20 (0.008)

NOTES