

GROUP 15

INTAKE AND EXHAUST

CONTENTS

GENERAL DESCRIPTION	15-2	INTAKE MANIFOLD <3.0L>	15-12
INTAKE AND EXHAUST DIAGNOSIS	15-2	REMOVAL AND INSTALLATION	15-12
INTRODUCTION TO INTAKE AND EXHAUST		INSPECTION	15-14
DIAGNOSIS	15-2	EXHAUST MANIFOLD <2.4L>	15-15
TROUBLESHOOTING STRATEGY	15-2	REMOVAL AND INSTALLATION	15-15
SYMPTOM CHART	15-2	INSPECTION	15-16
SYMPTOM PROCEDURES	15-3	EXHAUST MANIFOLD <3.0L>	15-17
SPECIAL TOOL	15-4	REMOVAL AND INSTALLATION	15-17
ON-VEHICLE SERVICE	15-4	INSPECTION	15-18
INTAKE MANIFOLD VACUUM CHECK ...	15-4	EXHAUST PIPE, MAIN MUFFLER AND	
AIR CLEANER	15-5	CATALYTIC CONVERTER <2.4L> ..	15-19
REMOVAL AND INSTALLATION	15-5	REMOVAL AND INSTALLATION	15-19
INTAKE MANIFOLD PLENUM	15-6	EXHAUST PIPE, MAIN MUFFLER AND	
REMOVAL AND INSTALLATION	15-6	CATALYTIC CONVERTER <3.0L> ..	15-21
INTAKE MANIFOLD <2.4L>	15-8	REMOVAL AND INSTALLATION	15-21
REMOVAL AND INSTALLATION	15-8	SPECIFICATIONS	15-22
INSPECTION	15-11	FASTENER TIGHTENING	
		SPECIFICATIONS	15-22
		SERVICE SPECIFICATION	15-24

GENERAL DESCRIPTION

M1151000100134

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

INTAKE AND EXHAUST DIAGNOSIS

INTRODUCTION TO INTAKE AND EXHAUST DIAGNOSIS

M1151006900105

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

M1151007000105

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

M1151007100102

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

SYMPTOM PROCEDURES

M1151007300054

INSPECTION PROCEDURE 1: 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.

M1151007400040

INSPECTION PROCEDURE 2: 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 17 [P.17-105.](#))

NO : There is no action to be taken.

STEP 6. Check symptom.

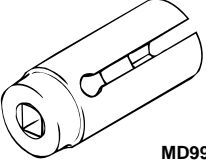
Q: Is any abnormal noise generated?

YES : Return to Step 1.

NO : This diagnosis is complete.

SPECIAL TOOL

M1151000600106

TOOL	TOOL NUMBER AND NAME	SUPERSESION	APPLICATION
 <p>MD998770</p>	MD998770 Oxygen sensor wrench	MD998770-01 or general service tool	Heated oxygen sensor removal and installation

ON-VEHICLE SERVICE**INTAKE MANIFOLD VACUUM CHECK**

M1151001800062

<2.4L ENGINE>Refer to GROUP 11A, On-vehicle Service [P.11A-9](#).**<3.0L ENGINE>**Refer to GROUP 11C, On-vehicle Service [P.11C-9](#).

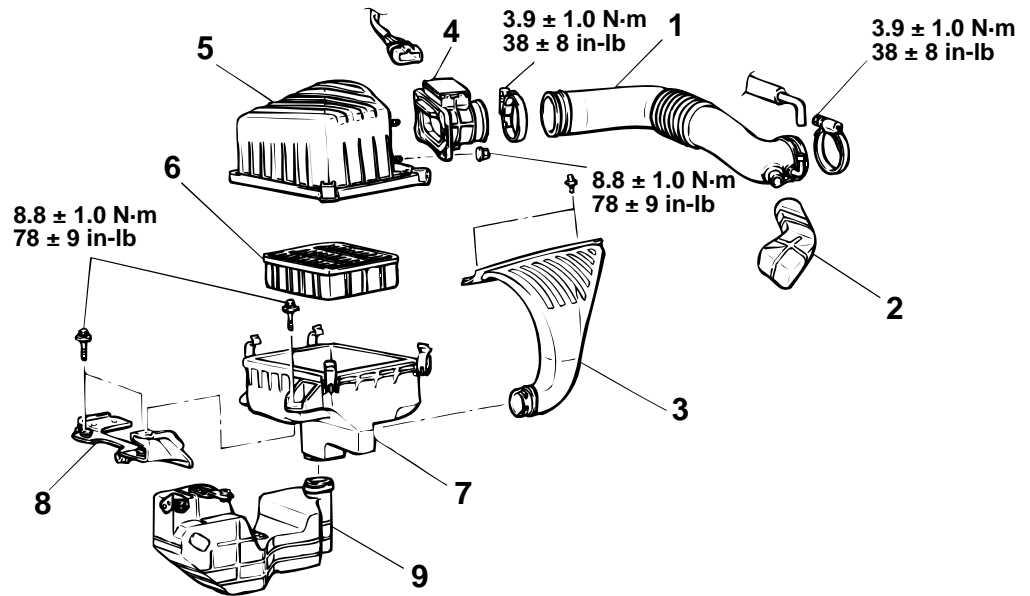
AIR CLEANER

REMOVAL AND INSTALLATION

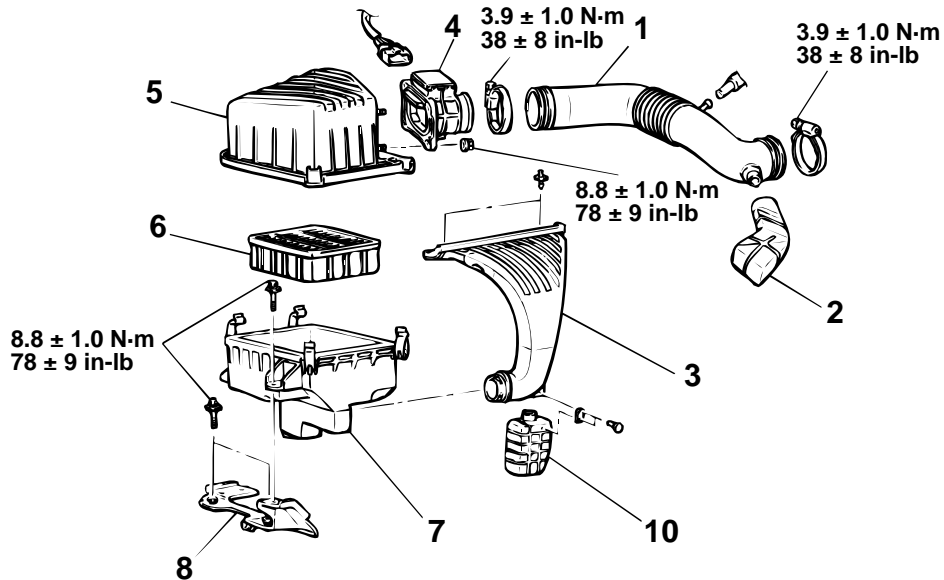
M1151002100099

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

<2.4L ENGINE>



<3.0L ENGINE>



AC001421AB

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

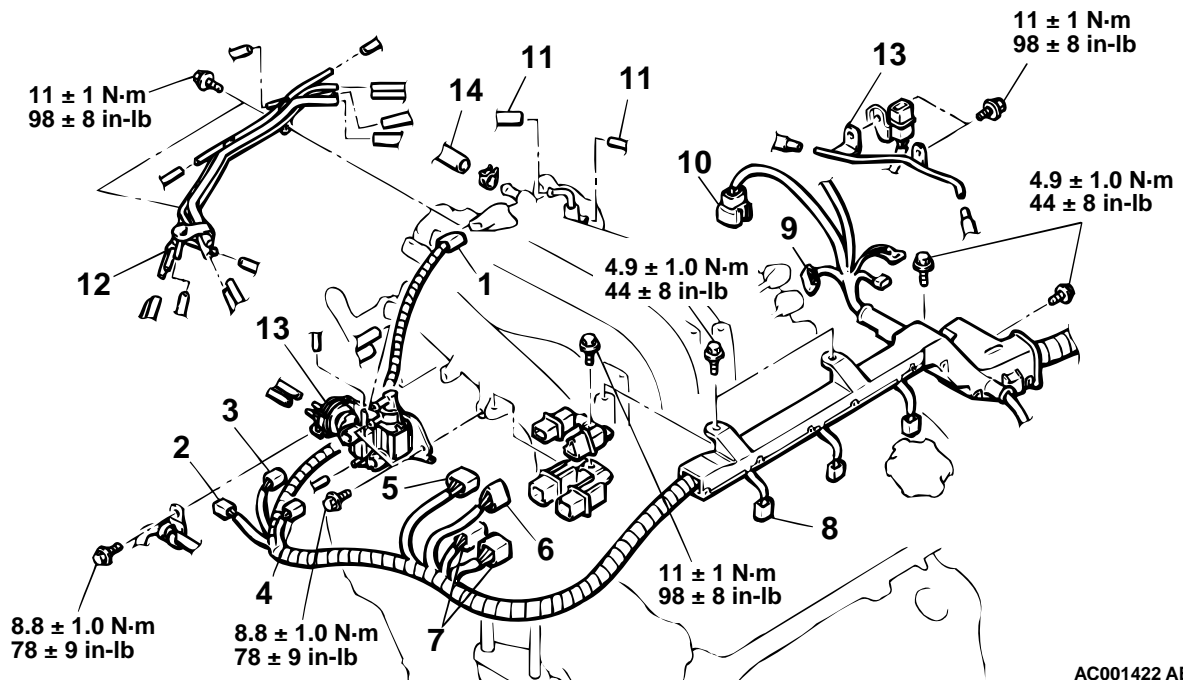
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Pre-removal Operation

- Fuel Discharge Prevention [Refer to GROUP 13B, On-vehicle Service P.13B-556.]
- Engine Coolant Draining [Refer to GROUP 00, Maintenance Service – Engine Coolant (Change) P.00-52.]
- Air Cleaner Removal (Refer to P.15-5.)
- Throttle Body Removal (Refer to GROUP 13B, Throttle Body P.13B-563.)
- Strut Tower Bar Removal (Refer to GROUP 42, Strut Tower Bar P.42-11.)

Post-installation Operation

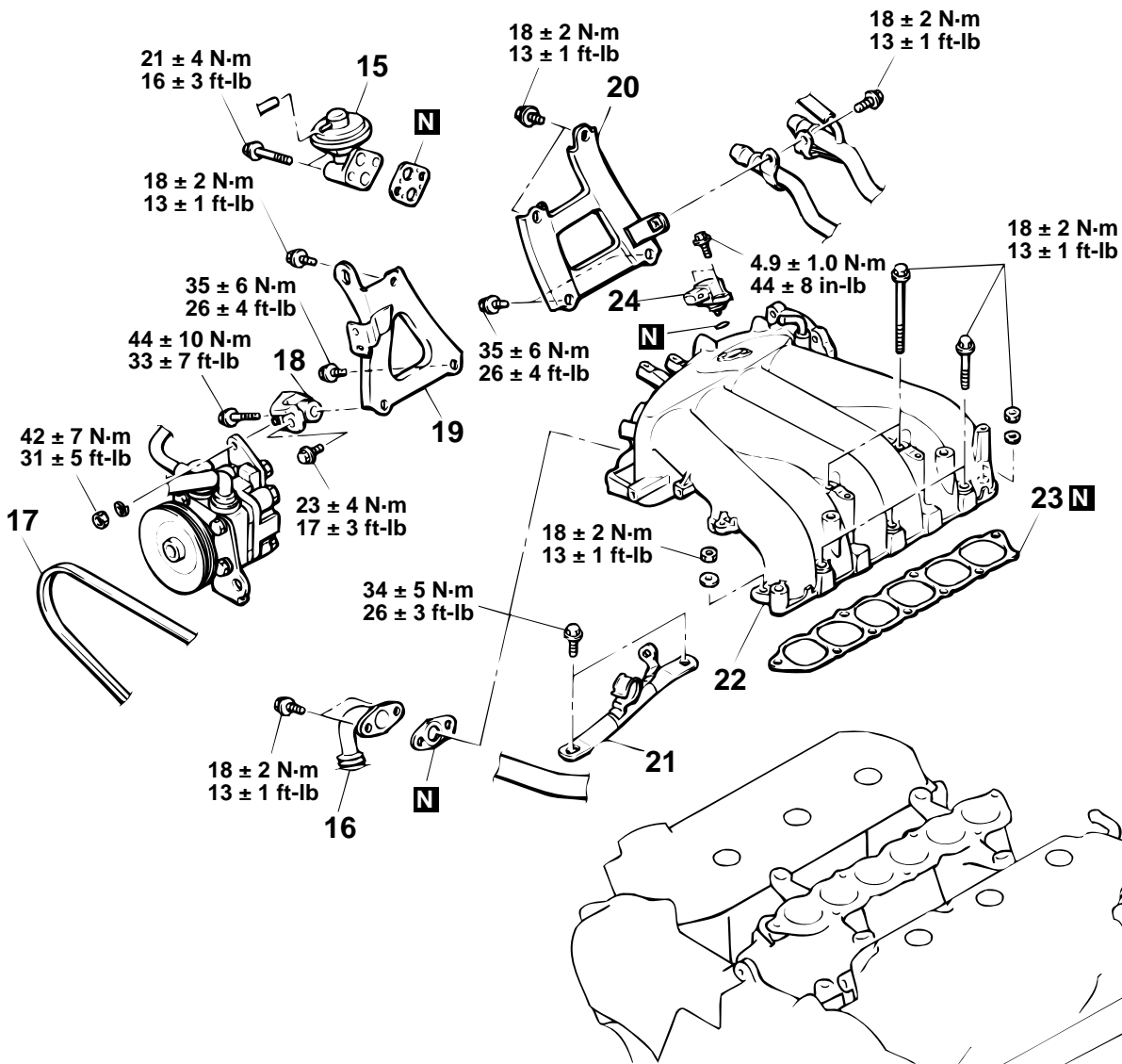
- Throttle Body Installation (Refer to GROUP 13B, Throttle Body P.13B-563.)
- Air Cleaner Installation (Refer to P.15-5.)
- Engine Coolant Supplying [Refer to GROUP 00, Maintenance Service – Engine Coolant (Change) P.00-52.]
- Strut Tower Bar Installation (Refer to GROUP 42, Strut Tower Bar P.42-11.)

**REMOVAL STEPS**

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

REMOVAL STEPS (Continued)

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



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REMOVAL STEPS

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

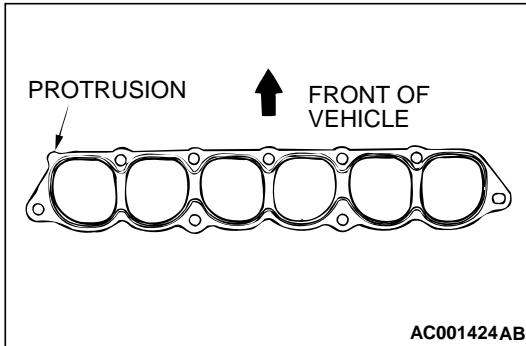
REMOVAL STEPS (Continued)

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

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

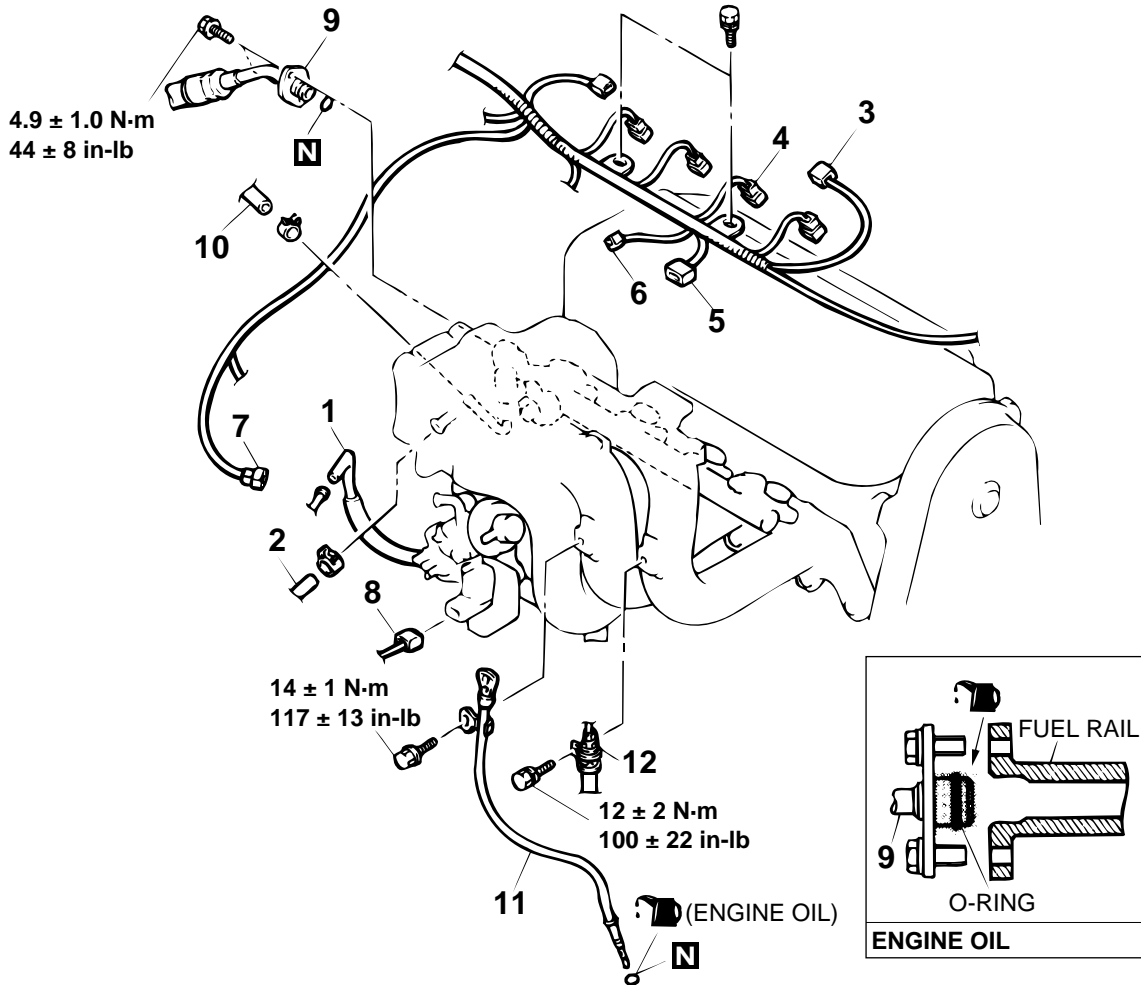
M1151003000147

Pre-removal Operation

- Fuel Discharge Prevention [Refer to GROUP 13A, On-vehicle Service – Fuel Pump Relay Disconnection (How to Reduce Pressurized Fuel Lines) .]
- Engine Coolant Draining [Refer to GROUP 00, Maintenance Service – Engine Coolant (Change) P.00-52.]
- Air Cleaner Removal (Refer to P.15-5.)
- Throttle Body Removal (Refer to GROUP 13A, Throttle Body P.13A-488.)
- Thermostat Case Assembly Removal (Refer to GROUP 14, Water Hose and Water Pipe P.14-26.)

Post-installation Operation

- Thermostat Case Assembly Installation (Refer to GROUP 14, Water Hose and Water Pipe P.14-26.)
- Throttle Body Installation (Refer to GROUP 13A, Throttle Body P.13A-488.)
- Air Cleaner Installation (Refer to P.15-5.)
- Engine Coolant Supplying [Refer to GROUP 00, Maintenance Service – Engine Coolant (Change) P.00-52.]
- Fuel Leakage Inspection



AC004224 AC

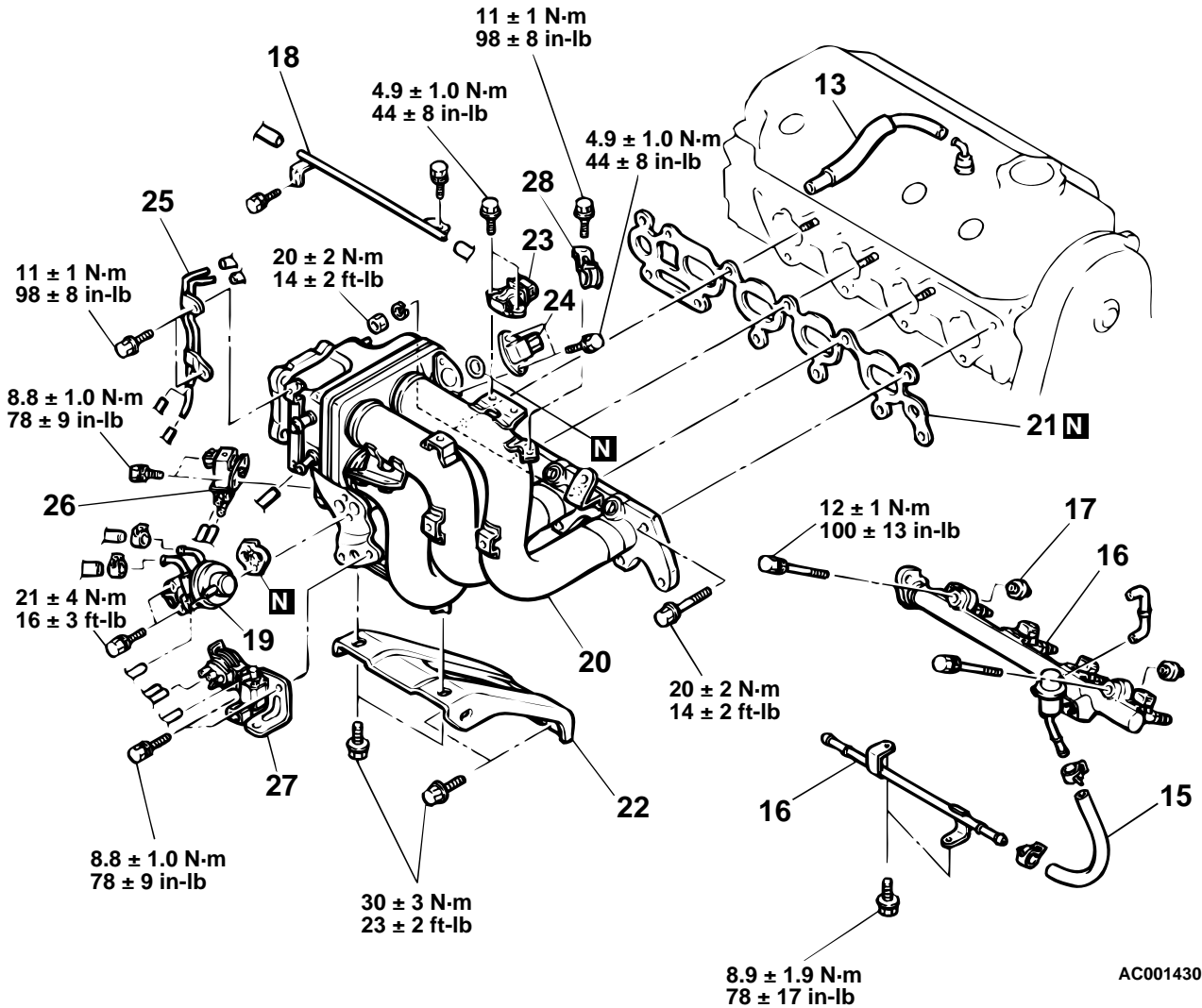
REMOVAL STEPS

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

>>A<<

REMOVAL STEPS (Continued)

8. EGR SOLENOID VALVE CONNECTOR
9. HIGH-PRESSURE FUEL HOSE CONNECTION
10. FUEL RETURN HOSE CONNECTION
11. OIL DIPSTICK AND DIPSTICK GUIDE
12. PRESSURE HOSE CONNECTION



AC001430AC

REMOVAL STEPS

- 13. PCV HOSE
- 14. FUEL RETURN PIPE
- 15. FUEL HOSE
- 16. FUEL RAIL, INJECTOR AND FUEL PRESSURE REGULATOR
- 17. INSULATOR
- 18. VACUUM PIPE
- 19. EGR VALVE
- 20. INTAKE MANIFOLD
- 21. INTAKE MANIFOLD GASKET

REMOVAL STEPS (Continued)

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

<<A>>

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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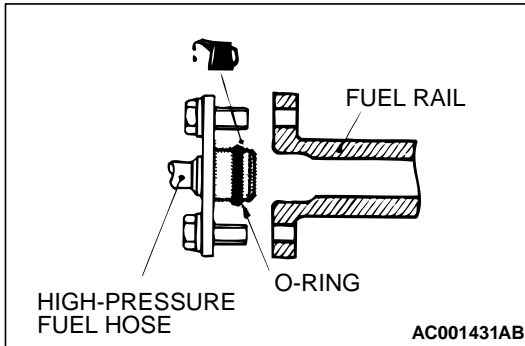
INSTALLATION SERVICE POINT

>>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

M1151003100111

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

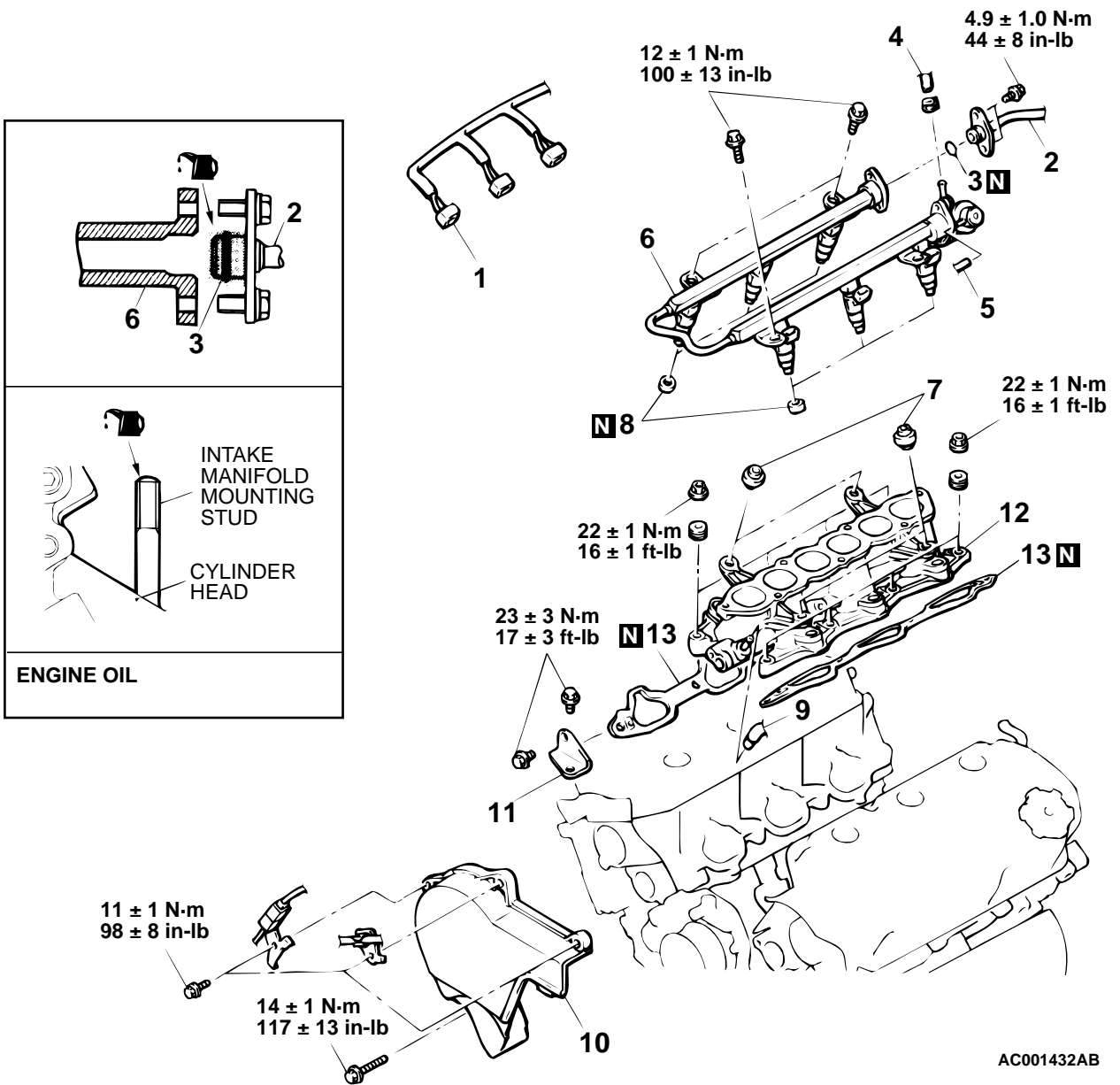
Limit: 0.20 mm (0.008 inch)

INTAKE MANIFOLD <3.0L>

REMOVAL AND INSTALLATION

M1151003000158

<p>Pre-removal Operation</p> <ul style="list-style-type: none"> Fuel Discharge Prevention [Refer to GROUP 13B, On-vehicle Service – Fuel Pump Relay Disconnection (How to Reduce Pressurized Fuel Lines) P.13B-556.] Intake Manifold Plenum Removal (Refer to P.15-6.) 	<p>Post-installation Operation</p> <ul style="list-style-type: none"> Intake Manifold Plenum Installation (Refer to P.15-6.) Fuel Leakage Inspection
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- REMOVAL STEPS**
- >>>C<<<
1. INJECTOR CONNECTOR
 2. HIGH-PRESSURE FUEL HOSE CONNECTION
 3. O-RING
 4. FUEL RETURN HOSE CONNECTION
 5. VACUUM HOSE CONNECTION

<<A>>

- REMOVAL STEPS (Continued)**
6. FUEL RAIL, INJECTOR AND FUEL PRESSURE REGULATOR
 7. INSULATORS
 8. INSULATORS
 9. PCV HOSE CONNECTION
 10. TIMING BELT FRONT UPPER COVER, RIGHT
 11. BRACKET

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REMOVAL STEPS (Continued)

- >>B<< 12. INTAKE MANIFOLD
- >>A<< 13. INTAKE MANIFOLD GASKET

REMOVAL SERVICE POINT

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

⚠ CAUTION

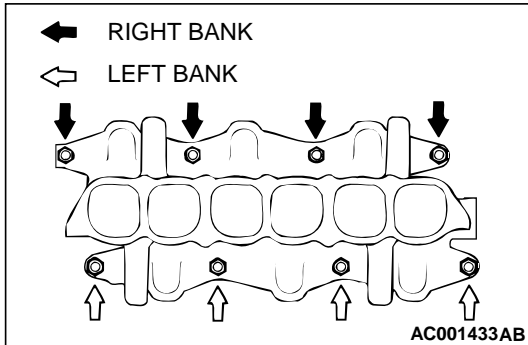
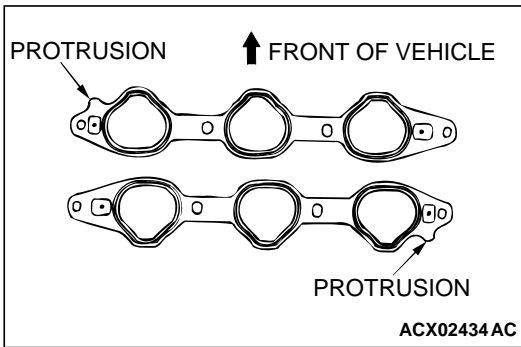
Care must be taken when removing the fuel rail not to drop the injector.

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.

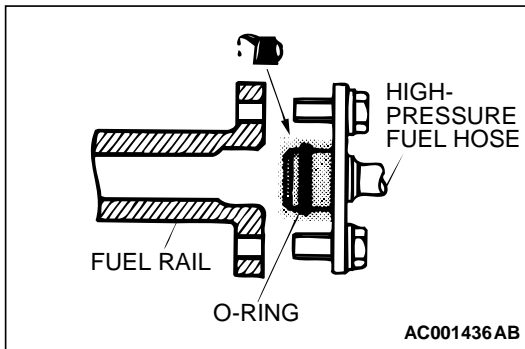
ORDER	MOUNTING NUTS	TIGHTENING TORQUE
1st	Right-bank nuts	6.4 ± 1.4 N·m (56 ± 13 in-lb)
2nd	Left-bank nuts	22 ± 1 N·m (16 ± 1 ft-lb)
3rd	Right-bank nuts	22 ± 1 N·m (16 ± 1 ft-lb)
4th	Left-bank nuts	22 ± 1 N·m (16 ± 1 ft-lb)
5th	Right-bank nuts	22 ± 1 N·m (16 ± 1 ft-lb)

>>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**

M1151003100122

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

INTAKE MANIFOLD CHECK

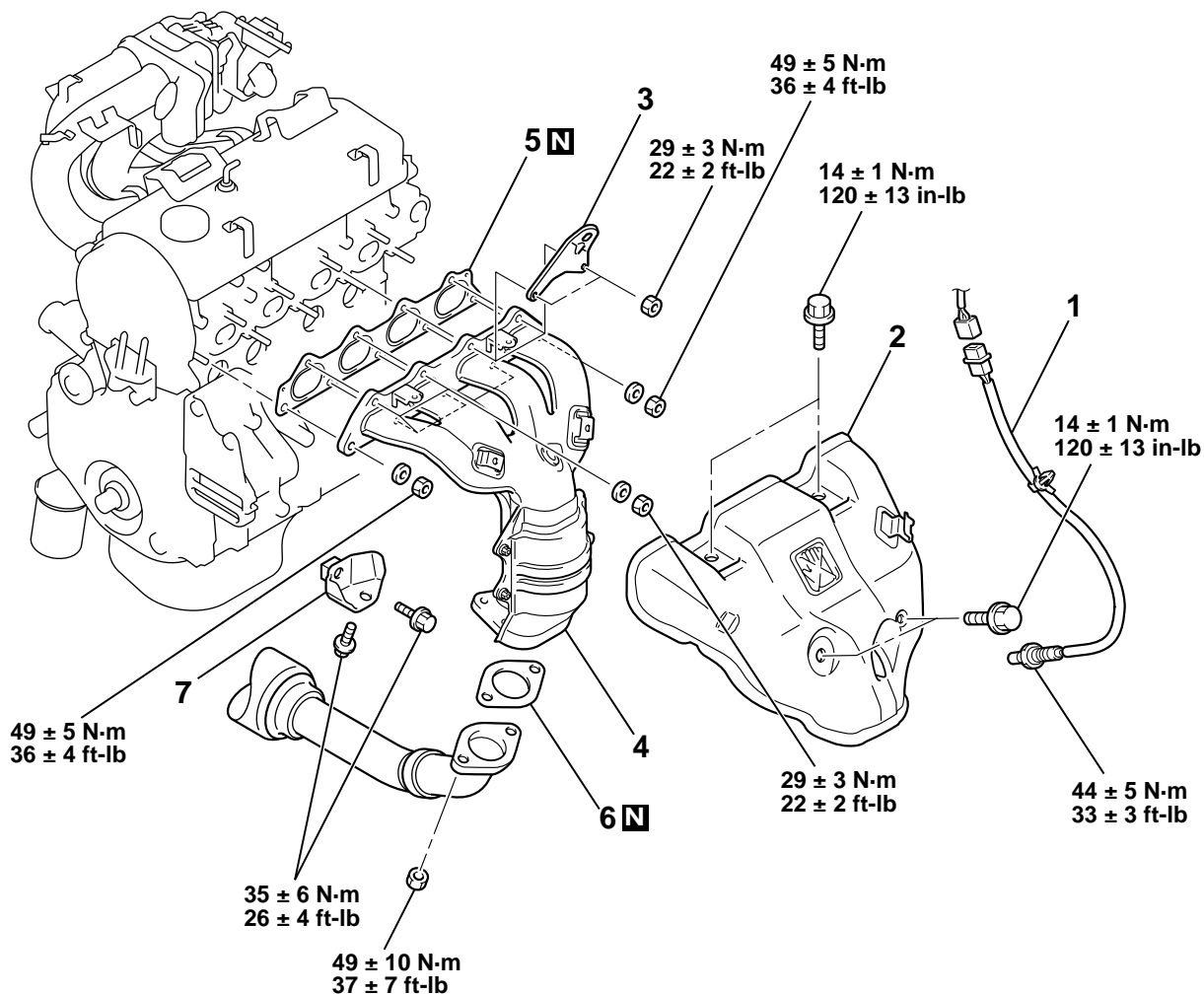
1. Check for damage or cracking of any part.
2. Check for obstruction of the negative pressure (vacuum) outlet port, and for obstruction of the water passage or gas passage.
3. Using a straight edge and feeler gauge, check for distortion of the cylinder head installation surface.

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

EXHAUST MANIFOLD <2.4L>

REMOVAL AND INSTALLATION

M1151003300115



AC001808AD

REMOVAL STEPS

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

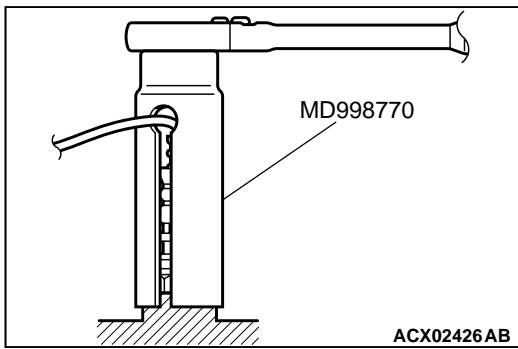
REMOVAL STEPS (Continued)

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

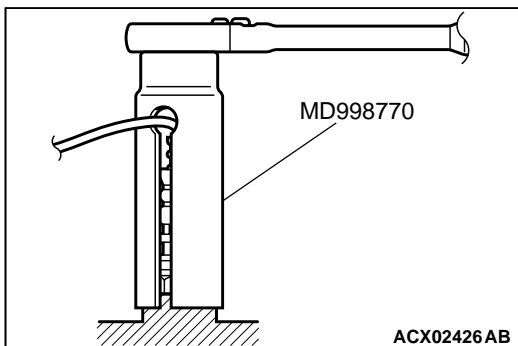
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REMOVAL SERVICE POINT**<<A>> HEATED OXYGEN SENSOR (FRONT) REMOVAL**

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**

M1151003400101

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)

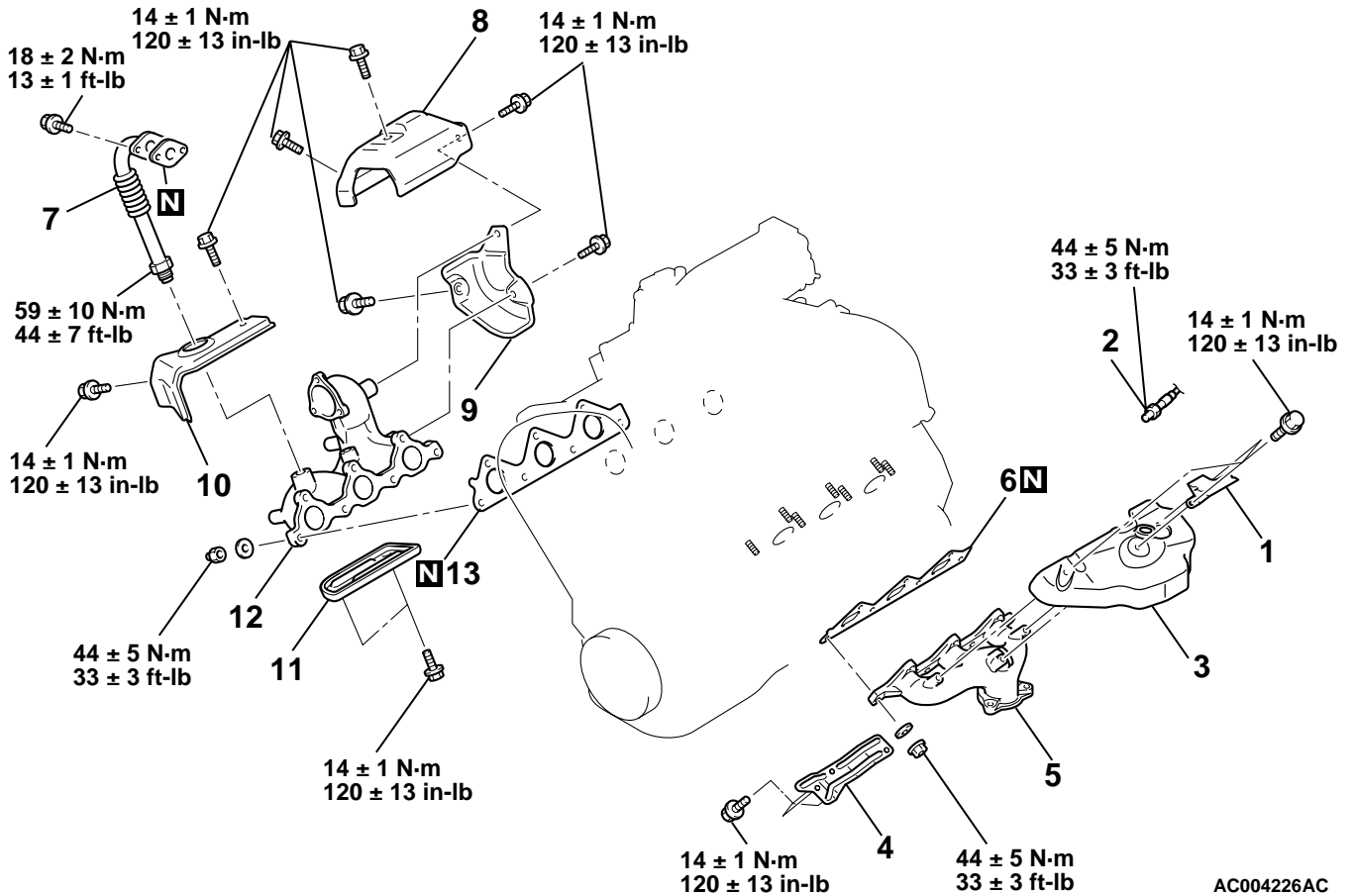
EXHAUST MANIFOLD <3.0L>

REMOVAL AND INSTALLATION

M1151003300126

Pre-removal and Post-installation Operation

- Front Exhaust Pipe Removal and Installation (Refer to P.15-21.)
- Air Cleaner Removal and Installation (Refer to P.15-5.)
- Battery and Battery Tray Removal and Installation (Refer to GROUP 54A, Battery P.54A-8.)
- Engine Oil Dipstick Guide, A/T Oil Dipstick Guide Removal and Installation
- Strut Tower Bar Removal and Installation (Refer to GROUP 42, Strut Tower Bar P.42-11.)



AC004226AC

REMOVAL STEPS

- <<A>> >>A<<
1. HEAT UPPER PROTECTOR <LEFT BANK>
 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

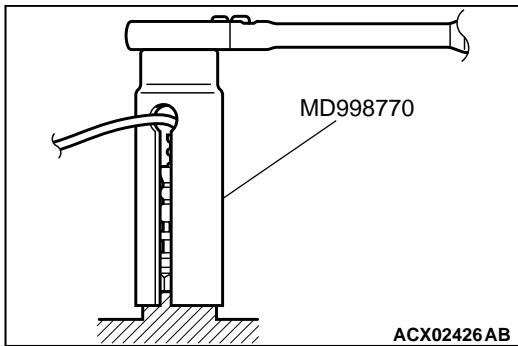
REMOVAL STEPS (Continued)

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>

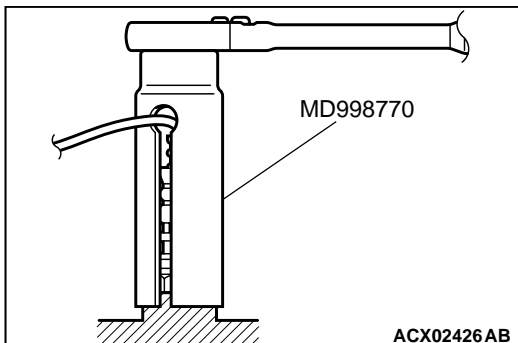
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REMOVAL SERVICE POINT**<<A>> LEFT BANK HEATED OXYGEN SENSOR (FRONT)
REMOVAL**

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**

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

M1151003400112

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.

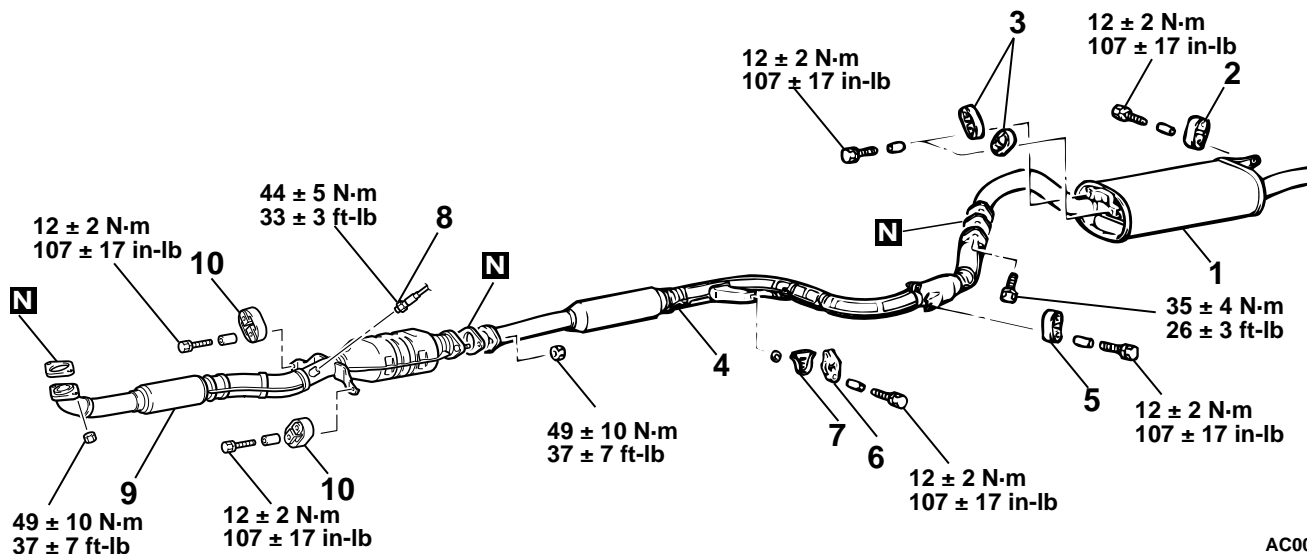
Standard value: 0.15 mm (0.006 inch) or less

Limit: 0.20 mm (0.008 inch)

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

REMOVAL AND INSTALLATION

M1151005400118



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

FRONT EXHAUST PIPE REMOVAL STEPS

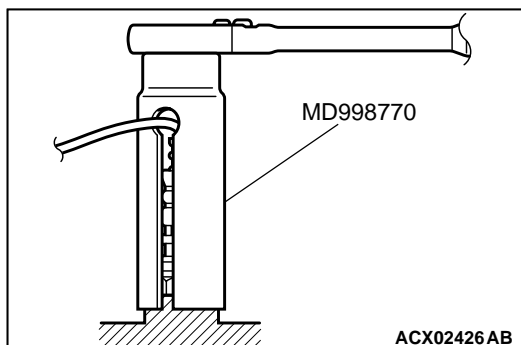
8. HEATED OXYGEN SENSOR (REAR)
9. FRONT EXHAUST PIPE (CATALYTIC CONVERTER INCORPORATED)
10. HANGER

<<A>> >>A<<

REMOVAL SERVICE POINT

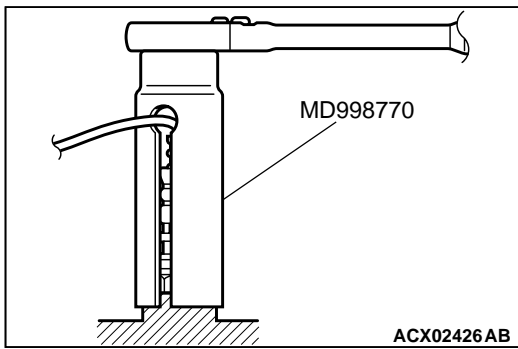
<<A>> HEATED OXYGEN SENSOR (REAR) REMOVAL

Use special tool MD998770 to remove the oxygen sensor.



INSTALLATION SERVICE POINT**>>A<< HEATED OXYGEN SENSOR (REAR) INSTALLATION**

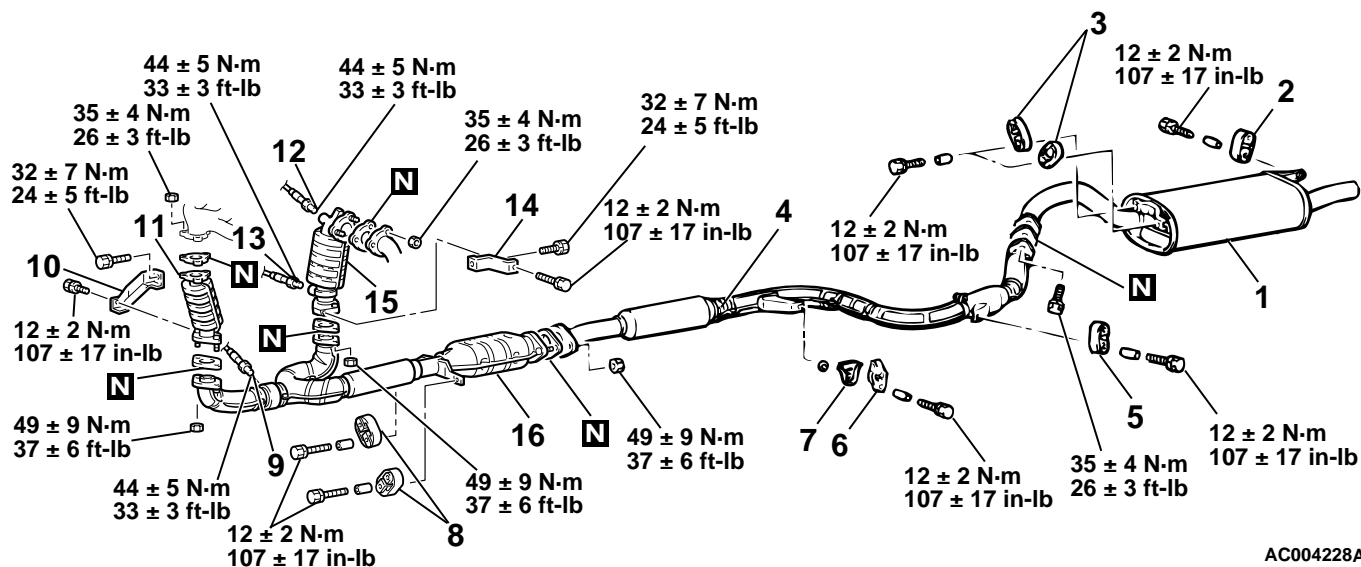
Use special tool MD998770 to install the oxygen sensor.



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

REMOVAL AND INSTALLATION

M1151005400129



AC004228AC

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

FRONT EXHAUST PIPE REMOVAL STEPS (LEFT BANK SIDE)

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

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

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

<<A>> >>A<<

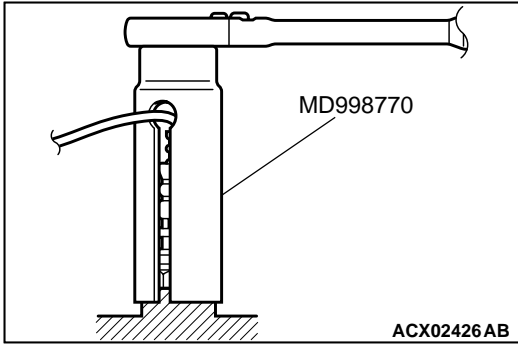
<<A>> >>A<<

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REMOVAL SERVICE POINT

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

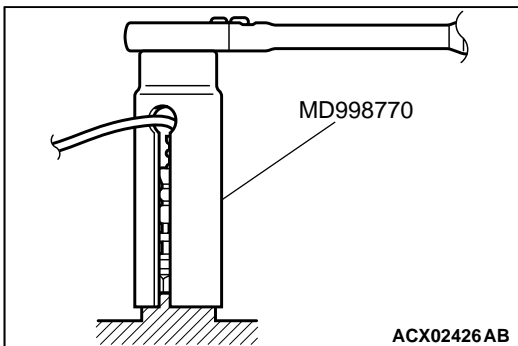
Use special tool MD998770 to remove the oxygen sensor.



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 install the oxygen sensor.



SPECIFICATIONS

FASTENER TIGHTENING SPECIFICATIONS

M1151006800108

ITEMS		SPECIFICATIONS
Air cleaner		
Air cleaner bolt		8.8 ± 1.0 N·m (78 ± 9 in-lb)
Air flow sensor nut		8.8 ± 1.0 N·m (78 ± 9 in-lb)
Air intake hose clamp bolt		3.9 ± 1.0 N·m (38 ± 8 in-lb)
Exhaust manifold <2.4L Engine>		
Engine hanger nut		29 ± 3 N·m (22 ± 2 ft-lb)
Exhaust manifold bracket bolt		35 ± 6 N·m (26 ± 4 ft-lb)
Exhaust manifold nut	M8	29 ± 3 N·m (22 ± 2 ft-lb)
	M10	49 ± 5 N·m (36 ± 4 ft-lb)
Front exhaust pipe nut		49 ± 10 N·m (37 ± 7 ft-lb)

TSB Revision

ITEMS	SPECIFICATIONS	
Heat protector bolt	14 ± 1 N·m (120 ± 13 in-lb)	
Heated oxygen sensor (front)	44 ± 5 N·m (33 ± 3 ft-lb)	
Exhaust manifold <3.0L Engine>		
EGR pipe bolt	59 ± 10 N·m (44 ± 7 ft-lb)	
EGR pipe gasket bolt	18 ± 2 N·m (13 ± 2 ft-lb)	
Exhaust manifold nut	44 ± 5 N·m (33 ± 3 ft-lb)	
Heat front protector <right bank> bolt	14 ± 1 N·m (120 ± 13 in-lb)	
Heat lower protector <left bank> bolt	14 ± 1 N·m (120 ± 13 in-lb)	
Heat lower protector <right bank> bolt	14 ± 1 N·m (120 ± 13 in-lb)	
Heat protector <left bank> bolt	14 ± 1 N·m (120 ± 13 in-lb)	
Heat protector <right bank> bolt	14 ± 1 N·m (120 ± 13 in-lb)	
Heat upper protector <left bank> bolt	14 ± 1 N·m (120 ± 13 in-lb)	
Heat upper protector <right bank> bolt	14 ± 1 N·m (120 ± 13 in-lb)	
Left bank heated oxygen sensor (front)	44 ± 5 N·m (33 ± 3 ft-lb)	
Exhaust pipe and main muffler <2.4L Engine>		
Center exhaust pipe bolt	35 ± 4 N·m (26 ± 3 ft-lb)	
Front exhaust pipe nut	49 ± 10 N·m (37 ± 7 ft-lb)	
Hanger bolt	12 ± 2 N·m (107 ± 17 in-lb)	
Heated oxygen sensor (rear)	44 ± 5 N·m (33 ± 3 ft-lb)	
Exhaust pipe and main muffler <3.0L Engine>		
Center exhaust pipe bolt	35 ± 4 N·m (26 ± 3 ft-lb)	
Exhaust fitting stay (LH)	M8	12 ± 2 N·m (107 ± 17 in-lb)
	M12	32 ± 7 N·m (24 ± 5 ft-lb)
Exhaust fitting stay (RH)	M8	12 ± 2 N·m (107 ± 17 in-lb)
	M12	32 ± 7 N·m (24 ± 5 ft-lb)
Front catalytic converter (LH) nut	35 ± 4 N·m (26 ± 3 ft-lb)	
Front catalytic converter (RH) nut	35 ± 4 N·m (26 ± 3 ft-lb)	
Front exhaust pipe nut	49 ± 9 N·m (37 ± 6 ft-lb)	
Hanger bolt	12 ± 2 N·m (107 ± 17 in-lb)	
Left bank heated oxygen sensor (rear)	44 ± 5 N·m (33 ± 3 ft-lb)	
Right bank heated oxygen sensor (front)	44 ± 5 N·m (33 ± 3 ft-lb)	
Right bank heated oxygen sensor (rear)	44 ± 5 N·m (33 ± 3 ft-lb)	
Intake manifold <2.4L Engine>		
Accelerator cable clamp bolt	11 ± 1 N·m (98 ± 8 in-lb)	
EGR solenoid valve bolt	8.8 ± 1.0 N·m (78 ± 9 in-lb)	
EGR valve bolt	21 ± 4 N·m (16 ± 3 ft-lb)	
Evaporative emission purge solenoid valve bolt	8.8 ± 1.0 N·m (78 ± 9 in-lb)	
Fuel rail bolt	12 ± 1 N·m (100 ± 13 in-lb)	
High pressure fuel hose connection bolt	4.9 ± 1.0 N·m (44 ± 8 in-lb)	
Intake manifold bolt and nut	20 ± 2 N·m (14 ± 2 ft-lb)	

ITEMS		SPECIFICATIONS
Intake manifold stay bolt		30 ± 3 N·m (23 ± 2 ft-lb)
Manifold differential pressure sensor and ignition failure sensor bolt		4.9 ± 1.0 N·m (44 ± 8 in-lb)
Oil dipstick guide bolt		14 ± 1 N·m (117 ± 13 in-lb)
Vacuum pipe bolt		11 ± 1 N·m (98 ± 8 in-lb)
Intake manifold <3.0L Engine>		
Bracket bolt		23 ± 3 N·m (17 ± 3 ft-lb)
Fuel rail bolt		12 ± 1 N·m (100 ± 13 in-lb)
High pressure fuel hose connection bolt		4.9 ± 1.0 N·m (44 ± 8 in-lb)
Intake manifold nut		22 ± 1 N·m (16 ± 1 ft-lb)
Timing belt front upper cover bolt	M6	11 ± 1 N·m (98 ± 8 in-lb)
	M8	14 ± 1 N·m (117 ± 13 in-lb)
Intake manifold plenum <3.0L Engine>		
Control wiring harness connector bracket bolt		4.9 ± 1.0 N·m (44 ± 8 in-lb)
EGR pipe connection bolt		18 ± 2 N·m (13 ± 1 ft-lb)
EGR valve bolt		21 ± 4 N·m (16 ± 3 ft-lb)
Engine mount stay bolt		34 ± 5 N·m (26 ± 3 ft-lb)
Heater pipe bolt		18 ± 2 N·m (13 ± 1 ft-lb)
Intake manifold plenum bolt and nut		18 ± 2 N·m (13 ± 1 ft-lb)
Intake manifold plenum stay bolt, front and rear	M8	18 ± 2 N·m (13 ± 1 ft-lb)
	M10	35 ± 6 N·m (26 ± 4 ft-lb)
Manifold differential pressure sensor bolt		4.9 ± 1.0 N·m (44 ± 8 in-lb)
Power steering oil pump stay bolt (bolt, washer assembly)		44 ± 10 N·m (33 ± 7 ft-lb)
Power steering oil pump stay bolt (bolt, flange)		23 ± 4 N·m (17 ± 3 ft-lb)
Power steering oil pump nut		42 ± 7 N·m (31 ± 5 ft-lb)
Sensor connector assembly bolt		11 ± 1 N·m (98 ± 8 in-lb)
Vacuum pipe assembly bolt		11 ± 1 N·m (98 ± 8 in-lb)
Valve assembly bolt		8.8 ± 1.0 N·m (78 ± 9 in-lb)

SERVICE SPECIFICATION

M1151000300097

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

TSB Revision