GROUP 13B

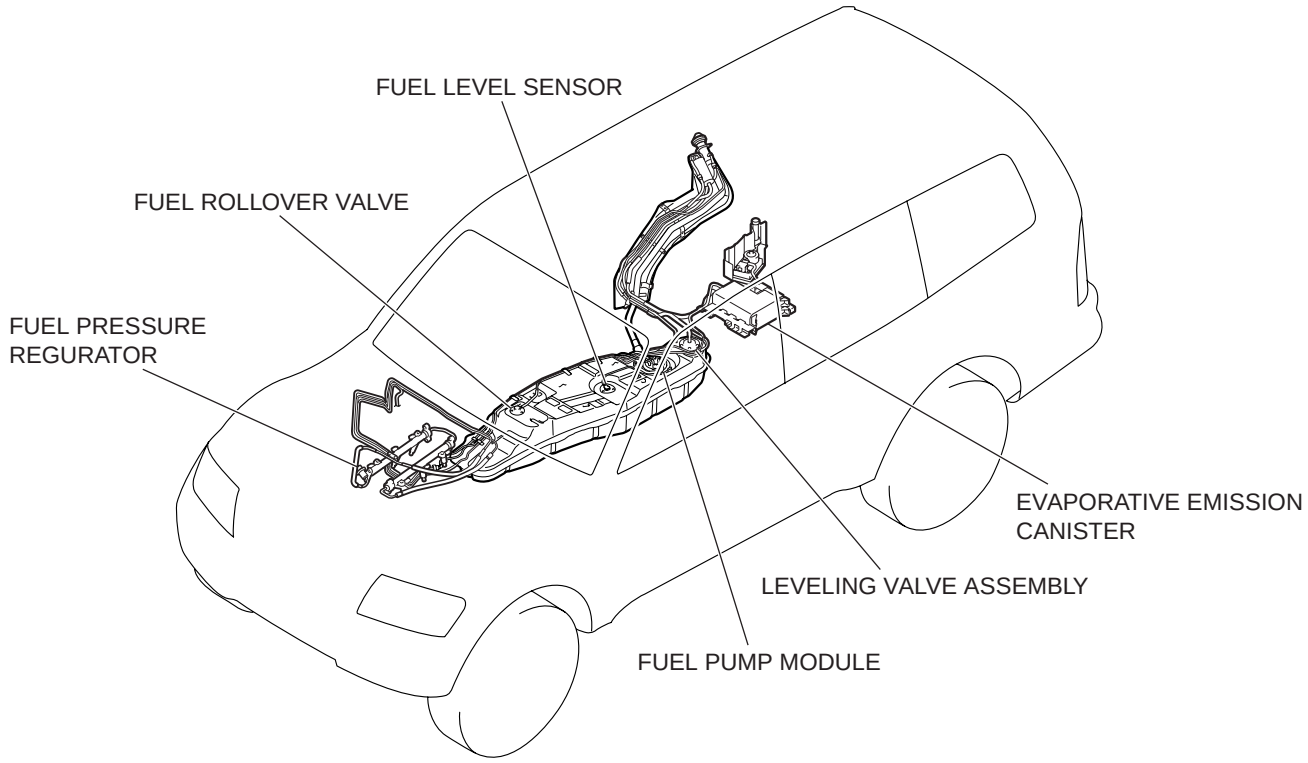
FUEL SUPPLY

CONTENTS

GENERAL DESCRIPTION

M1135000100297

1. The fuel tank is located under the floor below the rear seats.
2. A fuel tank rollover valve prevents fuel from leaking out in the event of a collision.



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FUEL SUPPLY DIAGNOSIS

INTRODUCTION TO FUEL SUPPLY DIAGNOSIS

M1135004000322

The fuel supply system supplies an appropriate air/fuel mixture to the engine. There are the fuel tank, fuel pump module assembly, and the fuel pipe that couples each part. Engine malfunctions caused by insufficient fuel supply or evaporative emission system operation malfunctions can result from faults in the vapor line, fuel pipe, hose, or fuel tank pressure control valve, etc.

FUEL SUPPLY DIAGNOSTIC TROUBLESHOOTING STRATEGY

M1135004100039

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 a fuel supply 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 Procedures.
4. Verify malfunction is eliminated.

SYMPTOM PROCEDURES

INSPECTION PROCEDURE 1: Engine Malfunctions Due to Insufficient Fuel Supply

TROUBLESHOOTING HINTS (The most likely causes for this case:)

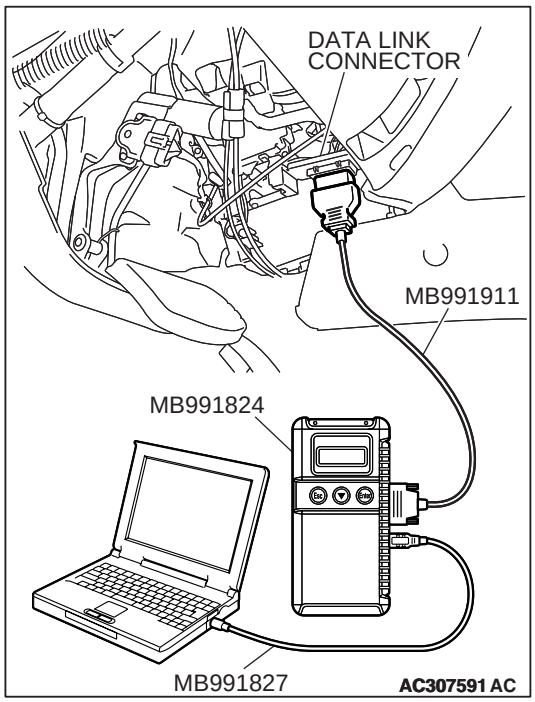
- Injector failed.
- Open or shorted injector circuit, or loose connector.
- Bent, kinked or clogged fuel pipe or hose.
- Malfunction of fuel pump module.

DIAGNOSIS

Required Special Tools:

- MB991958: Scan Tool (MUT-III Sub Assembly)
  - MB991824: Vehicle Communication Interface (V.C.I.)
  - MB991827: MUT-III USB Cable
  - MB991911: MUT-III Main Harness B

STEP 1. Using scan tool MB991958, read the diagnostic trouble code (DTC).



⚠ CAUTION
To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

(1) Ensure that the ignition switch is at the "LOCK" (OFF) position.
(2) Start up the personal computer.
(3) Connect special tool MB991827 to special tool MB991824 and the personal computer.
(4) Connect special tool MB991911 to special tool MB991824.
(5) Connect special tool MB991911 to the data link connector.
(6) Turn the power switch of special tool MB991824 to the "ON" position.

NOTE: When special tool MB991824 is energized, special tool MB991824 indicator light will be illuminated in a green color.

(7) Start the MUT-III system on the personal computer.
(8) Turn the ignition switch to the "ON" position.
(9) Select "Interactive Diagnosis" from the start-up screen.
(10) Select "System select."
(11) Choose "MFI" from the "POWER TRAIN" tab.
(12) Select "MITSUBISHI."
(13) Select "Diagnostic Trouble Code."
(14) If a DTC is set, it is shown.

Q: Is the DTC set?

YES : Refer to GROUP 13A, Diagnostic Trouble Code Chart P.13A-33.
NO : Go to Step 2.

STEP 2. Check the fuel pressure.
Refer to GROUP 13A, On-vehicle Service – Fuel Pressure Test P.13A-1048.

Q: Is the fuel pressure in good condition?
YES : Go to Step 5.
NO : Repair or replace. Then go to Step 3.

STEP 3. Check for bending, twisting or clogging of the fuel pipe or hose.

Q: Are the fuel pipe and hose in good condition?
YES : Go to Step 4.
NO : Repair or replace. Then go to Step 6.

STEP 4. Check the fuel pump module operation.
Refer to GROUP 13A, On-vehicle Service – Fuel Pump Operation Check P.13A-1051.

Q: Is the fuel pump module operation in good condition?
YES : Go to Step 5.
NO : Replace. Then go to Step 6.

STEP 5. Check the inside of the fuel tank for contamination and rust.
(1) Drain fuel.
(2) Remove the fuel tank (Refer to P.13B-8).

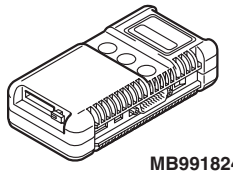
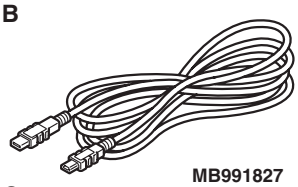
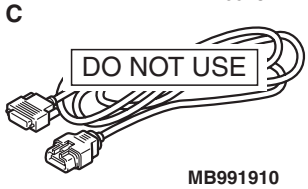
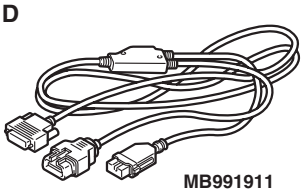
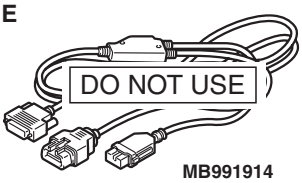
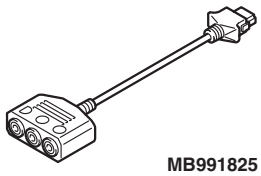
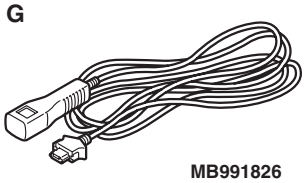
Q: Is the fuel tank in good condition?
YES : Go to Step 6.
NO : Replace the fuel filter, and clean the fuel tank and fuel line. Then go to Step 6.

STEP 6. Retest the system.

Q: Is the engine malfunction eliminated?
YES : The procedure is complete.
NO : Return to Step 1.

SPECIAL TOOLS

M1135000600463

TOOL	TOOL NUMBER AND NAME	SUPERSESSION	APPLICATION
A  MB991824 B  MB991827 C  DO NOT USE MB991910 D  MB991911 E  DO NOT USE MB991914 F  MB991825 G  MB991826 MB991958	MB991958 A: MB991824 B: MB991827 C: MB991910 D: MB991911 E: MB991914 F: MB991825 G: MB991826 MUT-III sub assembly A: Vehicle Communication Interface (V.C.I.) B: MUT-III USB cable C: MUT-III main harness A (Vehicles with CAN communication system) D: MUT-III main harness B (Vehicles without CAN communication system) E: MUT-III main harness C (for Daimler Chrysler models only) F: MUT-III measurement adapter G: MUT-III trigger harness	MB991824-KIT *NOTE: G: MB991826 MUT-III trigger harness is not necessary when pushing V.C.I. ENTER key.*	• Reading diagnostic trouble code • MFI system inspection **⚠ CAUTION** **If you connect MUT-III main harness A to a vehicle without CAN communication system to use the MUT-III, a pulse signal may interfere with the simulated vehicle speed lines, thus causing the MUT-III inoperative. Therefore, use the MUT-III main harness B instead.**
 MB991348	MB991348 Test harness set	MB991348-01	Fuel tank differential pressure sensor check

ON-VEHICLE SERVICE

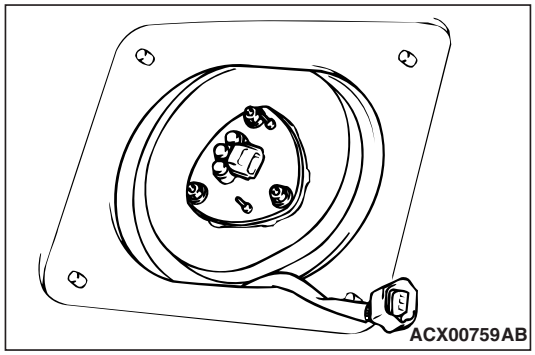
FUEL LEVEL SENSOR CHECK

M1135003100393

Refer to GROUP 54A , Combination Meter Assembly and Vehicle Speed Sensor – On-vehicle Service P.54A-72.

FUEL LEVEL SENSOR REPLACEMENT

M1135001400150



1. Tumble the second (middle) seat.
2. Remove the service hole cover (upper side) and the packing located under the second seat.
3. Remove the second seat, the rear scuff plate, the anchor bolts for the outer seat belt (second) and mounting screws of the lower quarter trim. Tear off the carpet. (Refer to GROUP 52A P.52A-18.)
4. Remove the service hole cover and the packing located between the front seat and the second seat.
5. Disconnect the harness connector.
6. Unscrew the mounting nut to remove the fuel level sensor.
7. Assemble the fuel level sensor and tighten the mounting nut to the specified torque.

   Tightening torque: 2.5 ± 0.4 N·m (22 ± 4 in-lb)
8. Connect the harness connector.
9. Attach the service hole cover and the packing located between the front seat and the second seat.
10. Restore the carpet; attach the second seat, the rear scuff plate, anchor bolts for the outer seat belt (second) and mounting screws of the lower quarter trim. (Refer to GROUP 52A P.52A-18.)
11. Attach the service hole cover located under the second seat and the packing.
12. Restore the second seat.

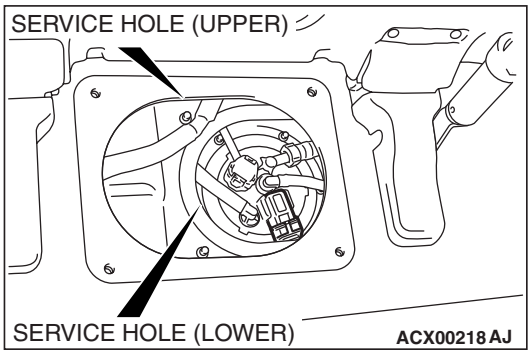
FUEL PUMP OPERATION CHECK

M1135001000033

Refer to GROUP 13A - On-vehicle Service P.13A-1051.

FUEL PUMP MODULE REPLACEMENT

M1135004900013



1. Tumble the second seat.
2. Remove the service hole cover (upper side) and the packing.
3. Remove the service hole cover (lower side) and the packing.
4. Disconnect the harness connector.
5. Disconnect the fuel high-pressure hose and the fuel tank hose.
6. Unscrew the mounting nut to remove the fuel pump module.
7. Assemble the fuel pump module and tighten the mounting nut to the specified torque.

   Tightening torque: 2.5 ± 0.4 N·m (22 ± 4 in-lb)

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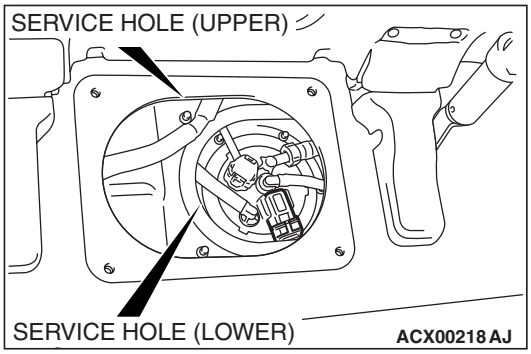
8. Connect the fuel high-pressure hose and the fuel tank hose.
9. Connect the harness connector.
10. Attach the service hole cover (lower side) and the packing.
11. Attach the service hole cover (upper side) and the packing.
12. Restore the second seat.

FUEL TANK DIFFERENTIAL PRESSURE SENSOR CHECK

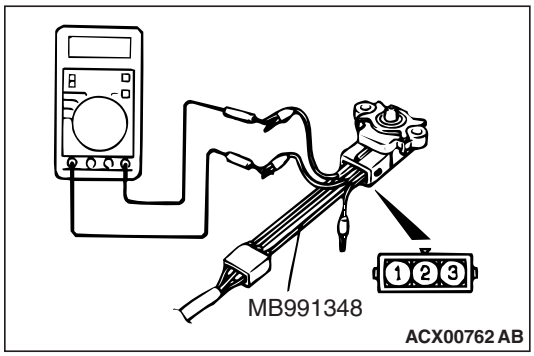
M1135003200033

1. Tumble the second seat.
2. Remove the service hole cover (upper) and packing.
3. Remove the service hole cover (lower) and packing.
4. Disconnect the harness connector.



5. Disconnect the fuel tank differential pressure sensor connector and connect special tool MB991348 between the terminals of the disconnected connector.
6. Turn the ignition switch to "ON" and take a reading of Between terminals (2) and (3).

   Standard value: 2.0 – 3.0 V

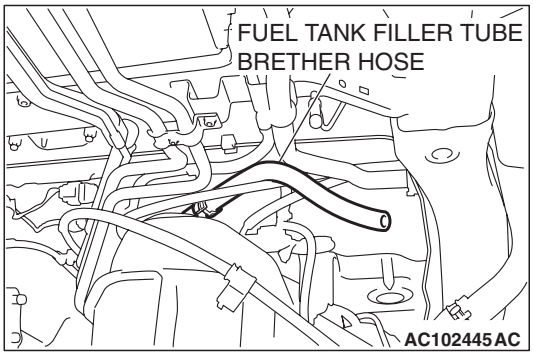


LEVELING VALVE CHECK

M1135004300077

1. Place a drain pan, and disconnect the fuel tank filler tube breather hose at pipe side.

   NOTE: If fuel leaks from the fuel tank filler tube breather hose at this stage, the leveling valve may be defective.
2. Open the fuel cap, and fill the fuel tank up.
3. If fuel does not leak from the fuel tank filler tube breather hose with the fuel tank full, the leveling valve is normal. If not so, the leveling valve may be defective. Lower the fuel tank from the vehicle and replace the valve.
4. Reconnect the fuel tank filler tube breather hose at the pipe side.

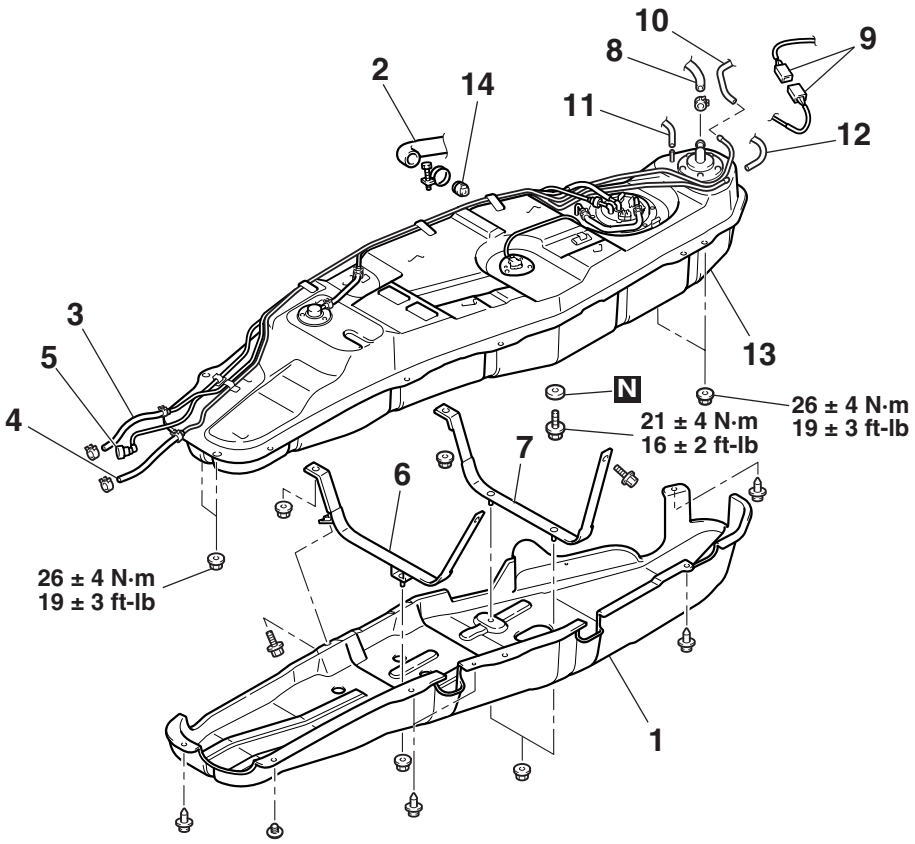


FUEL TANK

REMOVAL AND INSTALLATION

M1135001900917

Pre-removal Operation	Pre-installation Operation
• Draining Fuel • Fuel Line Pressure Reduction (Refer to GROUP 13A P.13A-1051.) • Transmission Mount Center Member Assembly (Refer to GROUP 32 P.32-5.)	• Transmission Mount Center Member Assembly (Refer to GROUP 32 P.32-5.) • Fuel Leakage Inspection • Refilling Fuel



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REMOVAL STEPS

1. FUEL TANK UNDER COVER
2. FUEL FILLER HOSE CONNECTION
3. FUEL RETURN HOSE CONNECTION
4. FUEL VAPOR HOSE CONNECTION

<<A>> >>A<< 5. FUEL HIGH-PRESSURE HOSE CONNECTION

6. FUEL TANK BAND FRONT
7. FUEL TANK BAND REAR

<<B>> 8. FUEL TANK FILLER TUBE BREATHER HOSE CONNECTION

REMOVAL STEPS (Continued)

<<B>> 9. FUEL TANK HARNESS CONNECTOR CONNECTION

10. FUEL TANK FILLER TUBE PURGE HOSE CONNECTION
11. FUEL TANK FILLER TUBE VAPOR HOSE A CONNECTION
12. FUEL TANK FILLER TUBE VAPOR HOSE C CONNECTION
13. FUEL TANK ASSEMBLY
14. FUEL TANK FILLER TUBE VALVE

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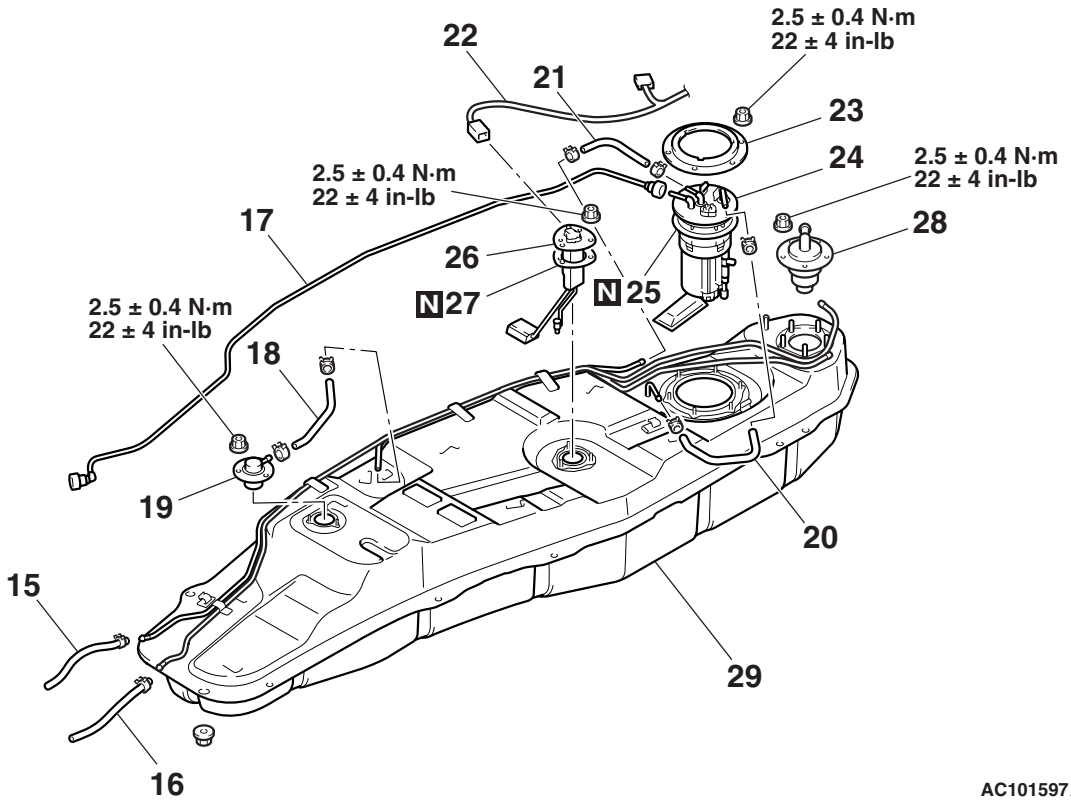

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REMOVAL STEPS

15. FUEL RETURN HOSE
16. FUEL VAPOR HOSE
17. FUEL HIGH-PRESSURE HOSE
18. FUEL TANK VAPOR HOSE
19. FUEL TANK ROLLOVER VALVE
20. FUEL TANK SUCTION HOSE
21. FUEL TANK RETURN HOSE
22. FUEL TANK HARNESS

REMOVAL STEPS (Continued)

23. TAPPING PLATE
24. FUEL PUMP MODULE ASSEMBLY
25. PACKING
26. FUEL LEVEL SENSOR
27. PACKING
28. FUEL TANK LEVELING VALVE ASSEMBLY
29. FUEL TANK

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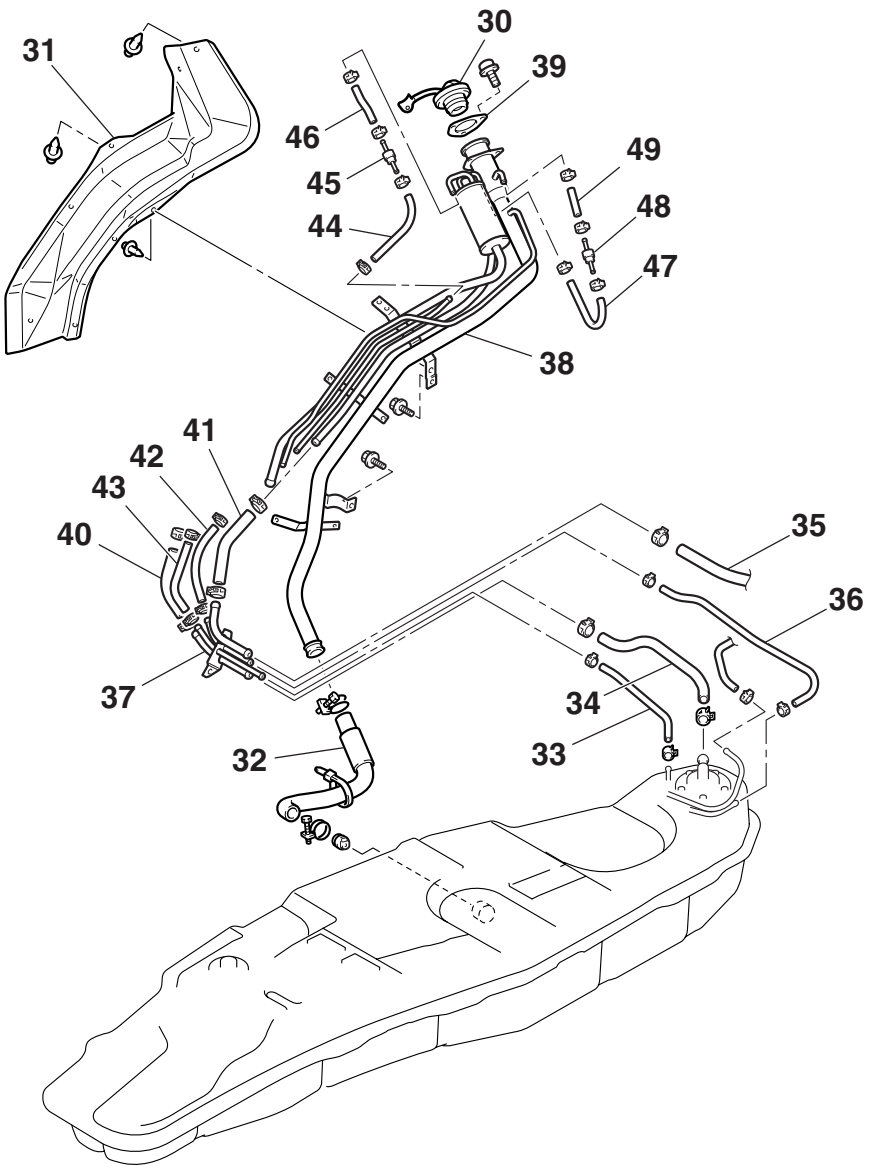

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REMOVAL STEPS

30. FUEL CAP
31. FUEL TANK FILLER TUBE PROTECTOR
32. FUEL FILLER HOSE
33. FUEL TANK FILLER TUBE BREATHER HOSE
34. FUEL TANK FILLER TUBE VAPOR HOSE
35. FUEL TANK FILLER TUBE VAPOR HOSE
36. FUEL TANK FILLER TUBE VAPOR HOSE
37. FUEL TANK LEVELING PIPE ASSEMBLY
38. FUEL TANK FILLER TUBE
39. FUEL TANK FILLER TUBE GASKET
40. FUEL TANK FILLER TUBE VAPOR HOSE

REMOVAL STEPS (Continued)

41. FUEL TANK FILLER TUBE VAPOR HOSE
42. FUEL TANK FILLER TUBE VAPOR HOSE
43. FUEL TANK FILLER TUBE VAPOR HOSE
44. FUEL TANK FILLER TUBE VAPOR HOSE
45. FUEL CHECK VALVE ASSEMBLY
46. FUEL TANK FILLER TUBE VAPOR HOSE
47. FUEL TANK FILLER TUBE VAPOR HOSE
48. FUEL CHECK VALVE ASSEMBLY
49. FUEL TANK FILLER TUBE VAPOR HOSE

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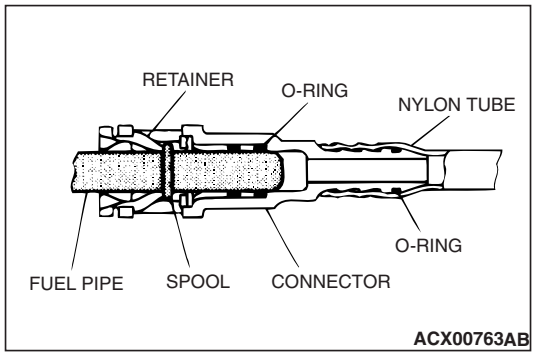
REMOVAL SERVICE POINTS

<<A>> FUEL HIGH-PRESSURE HOSE REMOVAL

⚠ CAUTION

As there will be some pressure remaining in the fuel pipe line, cover it with a shop towel to prevent fuel from spraying out.

Press the fuel high-pressure hose retainer to disengage the connector, and then remove the fuel high-pressure hose.



<<B>> FUEL TANK FILLER TUBE BREATHER HOSE/FUEL TANK HARNESS CONNECTOR DISCONNECTION

Lower the fuel tank halfway to disconnect the fuel tank filler tube breather hose and the fuel tank harness connector.

INSTALLATION SERVICE POINT

>>A<< FUEL HIGH-PRESSURE HOSE INSTALLATION

⚠ CAUTION

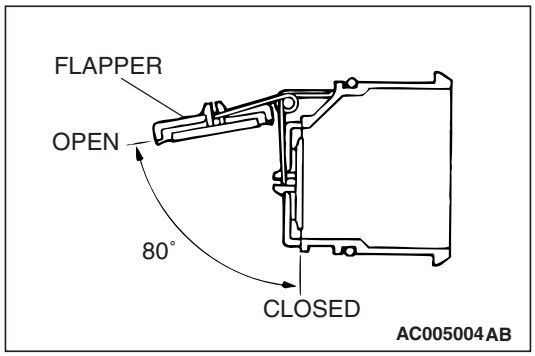
After connecting the quick action joint of the fuel high-pressure hose, pull the joint to disconnecting direction lightly to check that it is mounted securely. In addition, at this time confirm that there is a play of approx. 3 mm (0.12 inch) at the joint.

INSPECTION

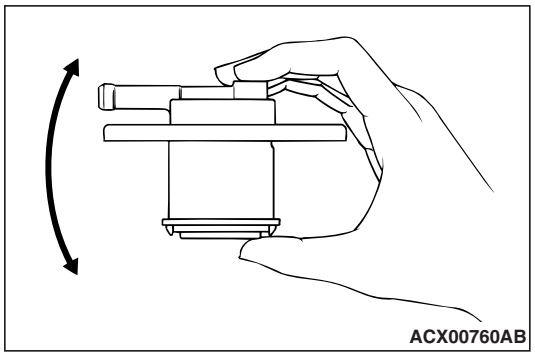
M1135002000199

FUEL SHUT-OFF VALVE CHECK

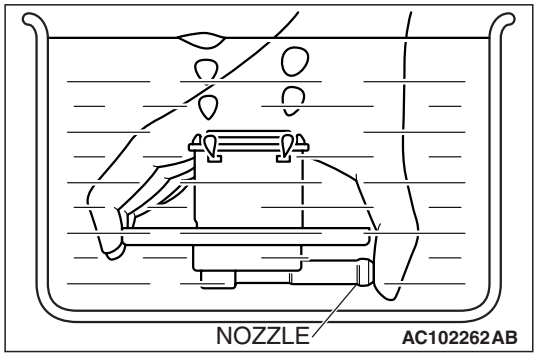
Check that the flapper and valve open and close as shown in the illustration.



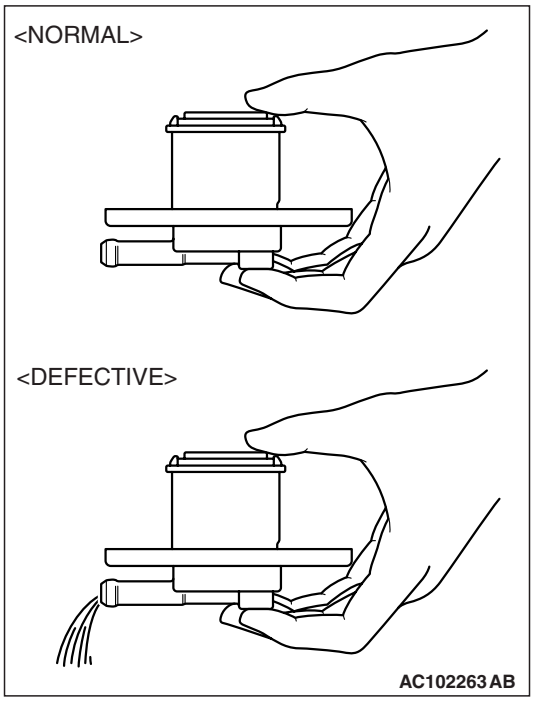
FUEL TANK ROLLOVER VALVE ASSEMBLY CHECK



1. Shake the fuel tank rollover valve assembly up and down to check if the float inside the fuel tank rollover valve assembly is not seized. If seized, replace the fuel tank rollover valve assembly.



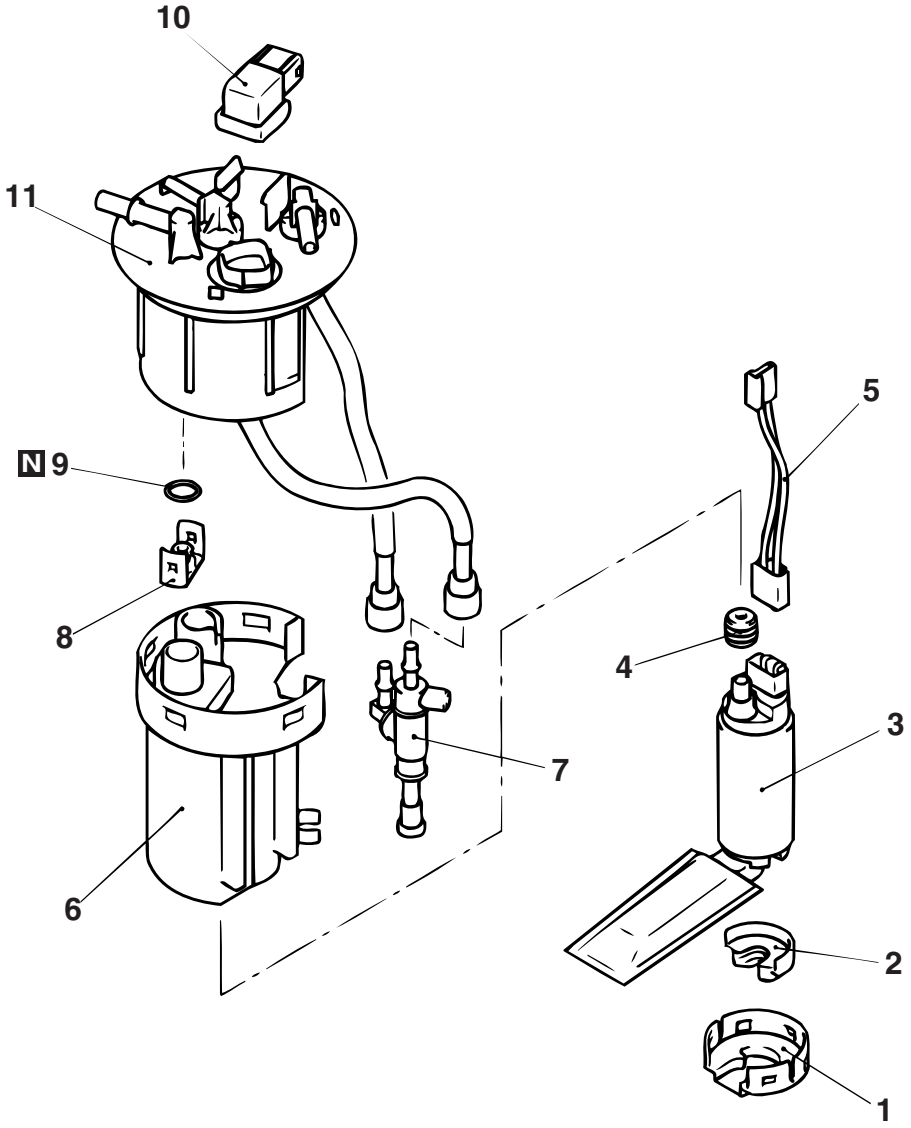
2. Obtain a container, which is full of water.
3. Invert the fuel tank rollover valve assembly, and submerge it slowly in the water while placing your fingers over the nozzle.
4. Check that no more air bubbles appears from the fuel tank rollover valve assembly, and withdraw it slowly.



5. Open the fuel tank rollover valve assembly nozzle. If no water flows out from the nozzle aperture, the valve is normal. If water flows out, the float or spring inside the fuel tank rollover valve is defective. Replace the fuel tank rollover valve assembly.

FUEL PUMP (MODULE) DISASSEMBLY AND ASSEMBLY

M1135004600023



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DISASSEMBLY STEPS

1. FUEL PUMP BRACKET
2. FUEL PUMP CUSHION
3. FUEL PUMP
>>**A**<< 4. GROMMET
5. PUMP HARNESS
6. HOUSING

DISASSEMBLY STEPS (Continued)

7. ASSIST PUMP
8. CAP
>>**A**<< 9. O-RING
10. FUEL TANK DIFFERENTIAL PRESSURE SENSOR
11. FUEL HIGH-PRESSURE FILTER

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ASSEMBLY SERVICE POINT

>>A<< O-RING / GROMMET INSTALLATION
Apply gasoline on the O-ring and the grommet before mounting them to prevent damage or twisting.

SPECIFICATIONS

FASTENER TIGHTENING SPECIFICATIONS

M1135003900258

ITEM	SPECIFICATION
Fuel level sensor	2.5 ± 0.4 N·m (22 ± 4 in-lb)
Fuel pump module	2.5 ± 0.4 N·m (22 ± 4 in-lb)
Fuel tank drain plug	21 ± 4 N·m (16 ± 2 ft-lb)
Fuel tank mounting nut	26 ± 4 N·m (19 ± 3 ft-lb)
Fuel tank rollover valve	2.5 ± 0.4 N·m (22 ± 4 in-lb)
Fuel tank leveling valve assembly	2.5 ± 0.4 N·m (22 ± 4 in-lb)

SERVICE SPECIFICATION

M1135000300031

ITEM	STANDARD VALUE
Fuel tank differential pressure sensor output voltage V	2.0 – 3.0