GROUP 13C

FUEL SUPPLY

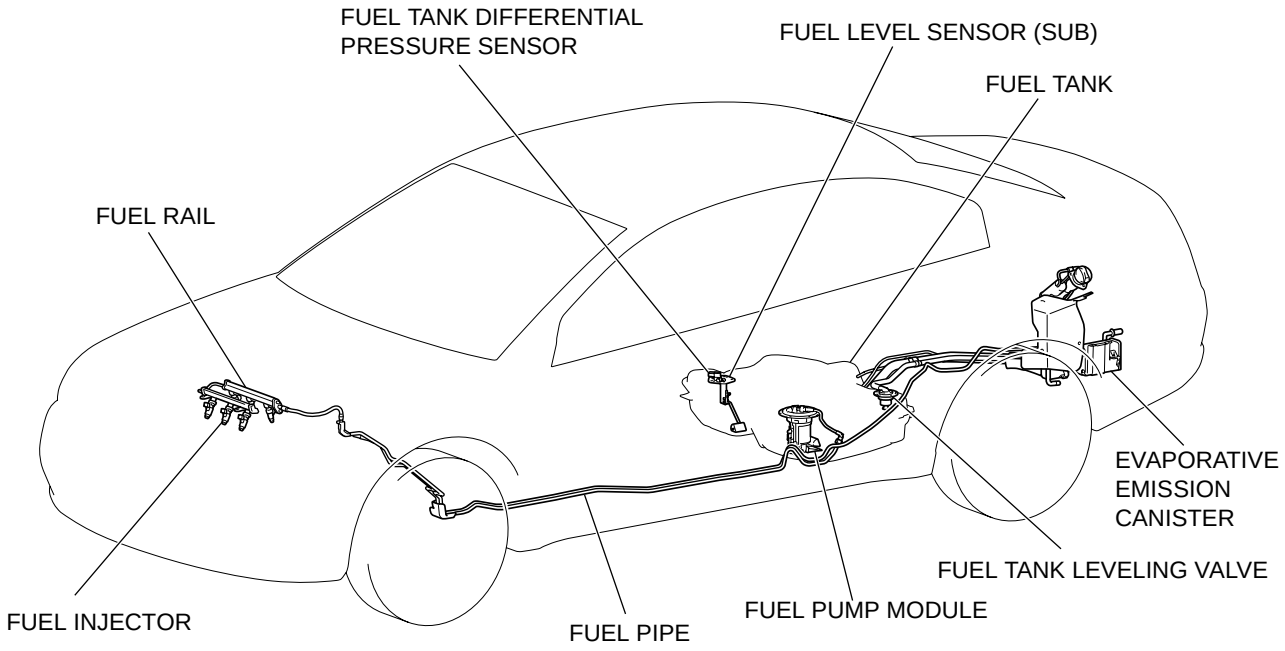
CONTENTS

GENERAL DESCRIPTION

M1135000100435

- The fuel tank is located under the floor below the rear seats.
- A fuel cut-off valve is utilized to prevent fuel from leaking out in the event of a collision.
- A fuel pump module, including fuel pump, fuel filter, reservoir and fuel level sensor, is used to lighten weight and improve serviceability.

CONSTRUCTION DIAGRAM



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FUEL SUPPLY DIAGNOSIS

INTRODUCTION

M1135004000388

The fuel system is used to supply an appropriate fuel mixture to the engine. The system consists of the fuel tank, fuel filter, fuel pump and fuel pipes. An evaporative emission system is provided to prevent evaporated fuel from escaping into the atmosphere.

Engine malfunctions caused by insufficient fuel supply and evaporative emission system operation malfunctions can be caused by faults in the vapor line, fuel pipe, hose, or fuel tank pressure control valve, etc.

TROUBLESHOOTING STRATEGY

M1135004100277

Use these steps to plan your diagnostic strategy. If you follow them carefully, you will be sure to find most of the fuel supply faults.

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

M1135004200382

SYMPTOM	INSPECTION PROCEDURE	REFERENCE PAGE
Engine Malfunctions Due to Insufficient Fuel Supply	1	P.13C-3

TSB Revision

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, twisted or clogged fuel pipe or hose.
- Malfunction of the fuel pump module.

DIAGNOSIS

Required Special Tools:

- MB991958: Scan Tool (MUT-III Sub Assembly)
  - MB991824: V.C.I.
  - MB991827: USB Cable
  - MB991910: Main Harness A

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

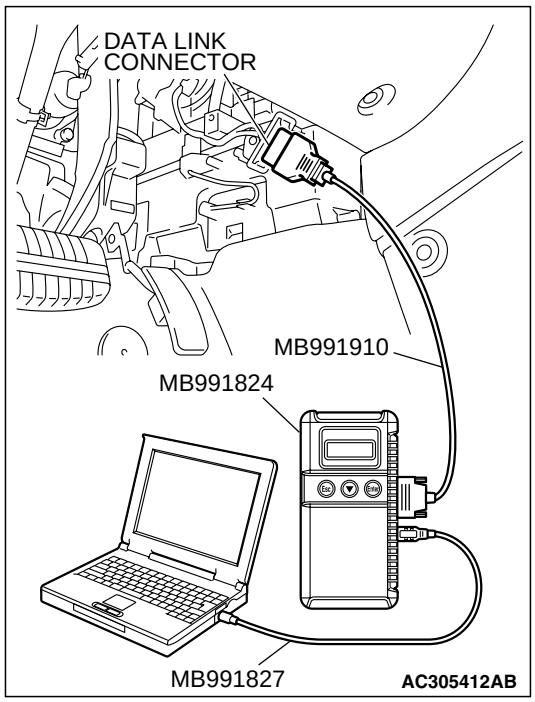
⚠ CAUTION

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 MB991910 to special tool MB991824.
(5) Connect special tool MB991910 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 Diagnostic Trouble Code Chart. <2.4L Engine>P.13A-33 , <3.8L Engine>P.13B-34 .

NO : Turn the ignition switch to the "LOCK" (OFF) position, and then remove scan tool MB991958 in the reverse order of installation. Go to Step 2.

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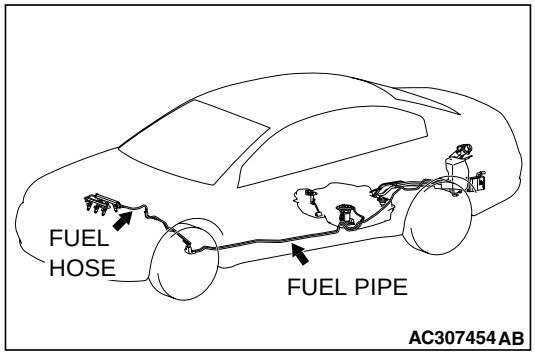
STEP 2. Check the fuel pressure.
Release residual pressure from the fuel line to prevent fuel spray. Refer to Fuel Pressure Test. <2.4L Engine>P.13A-1124 ,<3.8L Engine>P.13B-1179 .

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 Fuel Pump Operation Check. <2.4L Engine>P.13A-1128 ,<3.8L Engine>P.13B-1181 .

Q: Is the fuel pump module operation in good condition?

YES : Then go to Step 5.
NO : Replace (Refer to P.13C-10). 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.13C-10).

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.

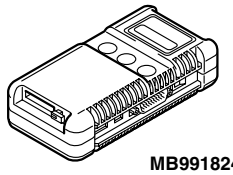
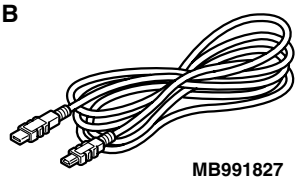
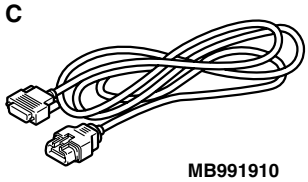
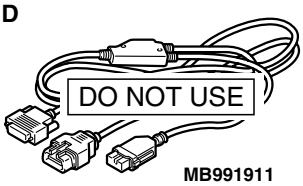
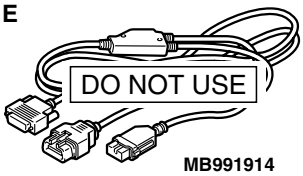
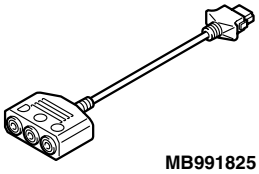
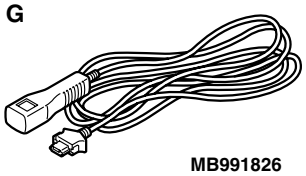
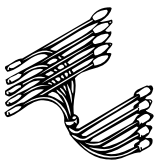
STEP 6. Retest the system.

Q: Is the engine malfunction eliminated?

YES : The procedure is complete.
NO : Return to Step 1.

SPECIAL TOOLS

M1135000600300

TOOL	TOOL NUMBER AND NAME	SUPERSESSION	APPLICATION
A  MB991824 B  MB991827 C  MB991910 D  MB991911 E  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.*	Checking diagnostic trouble codes **⚠ CAUTION** **For vehicles with CAN communication, use MUT-III main harness A to send simulated vehicle speed. If you connect MUT-III main harness B instead, the CAN communication does not function correctly.**
 MB991658	MB991658 Test harness set	Tool not available	Fuel tank differential pressure sensor check

ON-VEHICLE SERVICE

FUEL LEVEL SENSOR CHECK

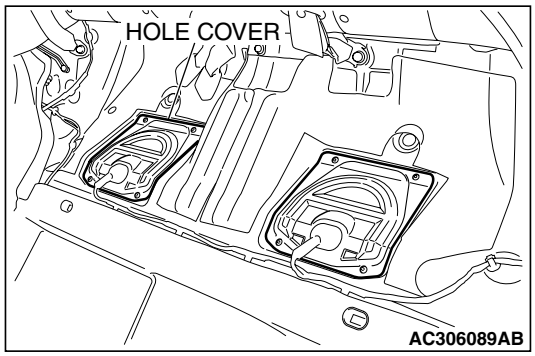
M1135005300069

Refer to GROUP 54A - Combination Meter, On-vehicle Service, Fuel Level Sensor Check P.54A-104.

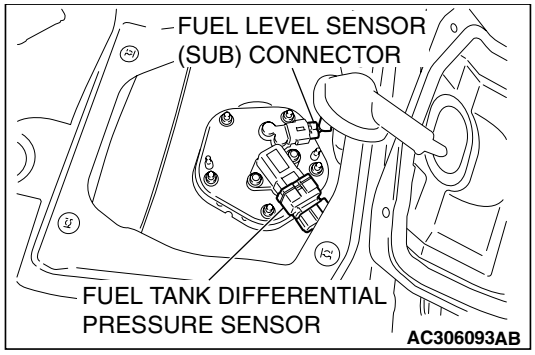
FUEL LEVEL SENSOR REPLACEMENT

M1135005600026

1. Remove the rear seat cushion assembly. (Refer to GROUP 52A, Rear Seat Assembly P.52A-29.)
2. Remove the hole cover (RH).



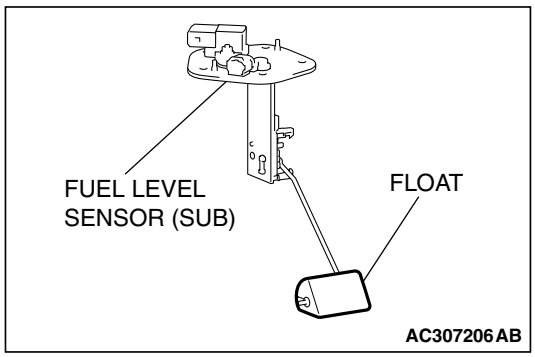
3. Disconnect the fuel level sensor (sub) connector and fuel tank differential pressure sensor connector.



⚠ CAUTION

When withdrawing the fuel level sensor (sub) from the fuel tank, be careful not damage the sensor unit and the float.

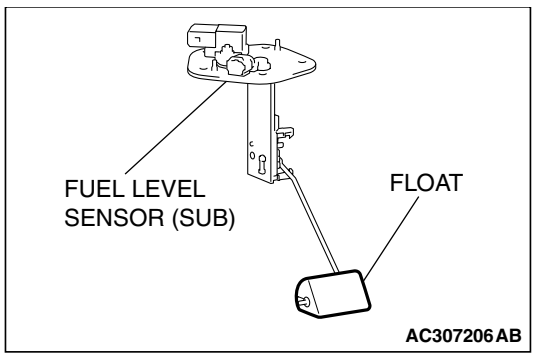
4. Remove the fuel level sensor (sub) mounting bolts and remove the fuel tank gauge unit from service hole.

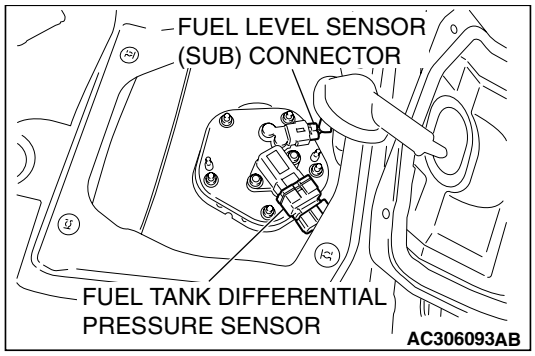


⚠ CAUTION

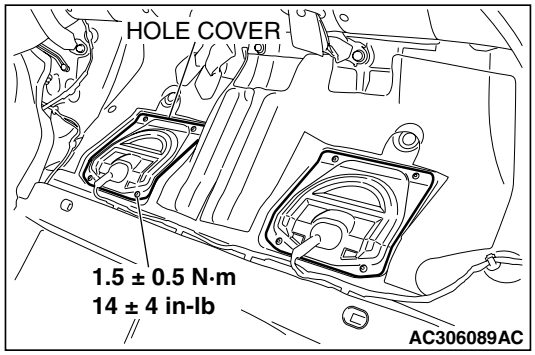
When inserting the fuel level sensor (sub) into the fuel tank, be careful not damage the sensor unit and the float.

5. Install the fuel level sensor to the fuel tank through the service hole.





6. Connect the fuel level sensor (sub) connector and fuel tank differential pressure sensor connector.



7. Install the hole cover (RH).
   Tightening torque: 1.5 ± 0.5 N·m (14 ± 4 in-lb)
8. Install the rear seat cushion assembly. (Refer to GROUP 52A, Rear Seat Assembly P.52A-29.)

FUEL PUMP OPERATION CHECK

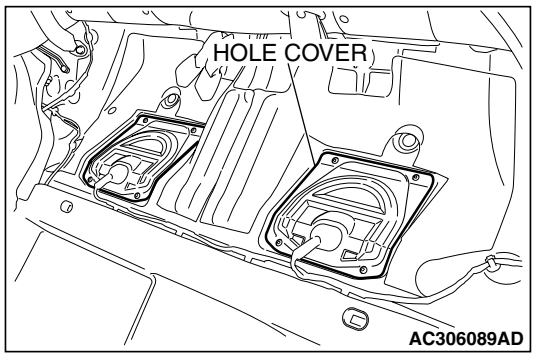
M1135001000152

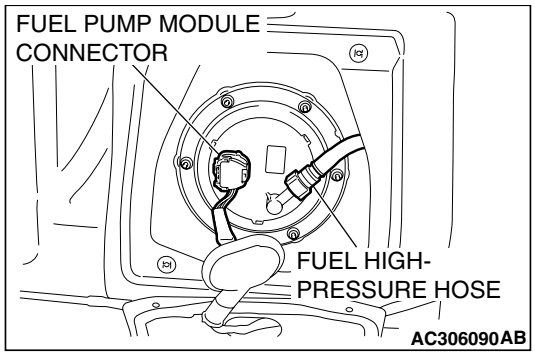
<2.4L Engine>: Refer to GROUP 13A - On-vehicle Service, Fuel Pump Operation Check P.13A-1128.
<3.8L Engine>: Refer to GROUP 13B - On-vehicle Service, Fuel Pump Operation Check P.13B-1181.

FUEL PUMP MODULE REPLACEMENT

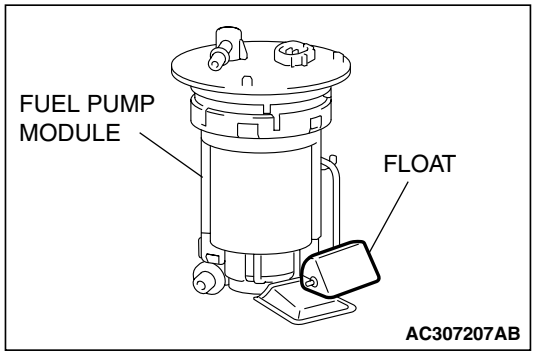
M1135004900314

1. Remove the rear seat cushion assembly. (Refer to GROUP 52A, Rear Seat Assembly P.52A-29.)
2. Remove the hole cover (LH).



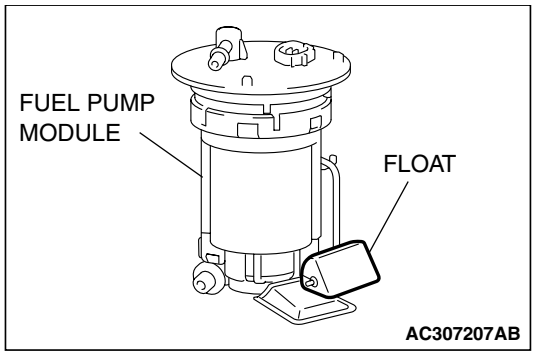


3. Disconnect the fuel pump module connector and fuel high-pressure hose.

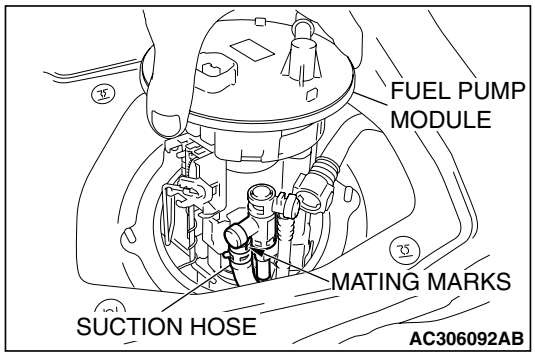


⚠ CAUTION
When withdrawing the fuel pump module from the fuel tank, be careful not to damage the module unit and the float.

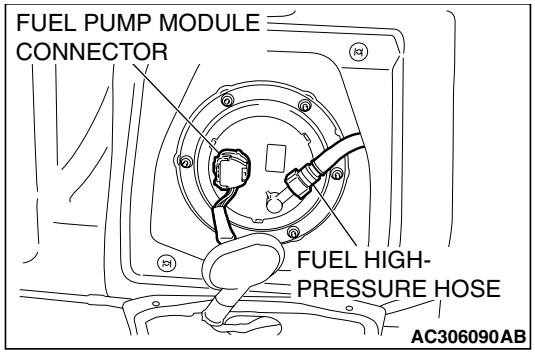
4. Remove the mounting nuts and plate, and remove the fuel pump module from the fuel tank.



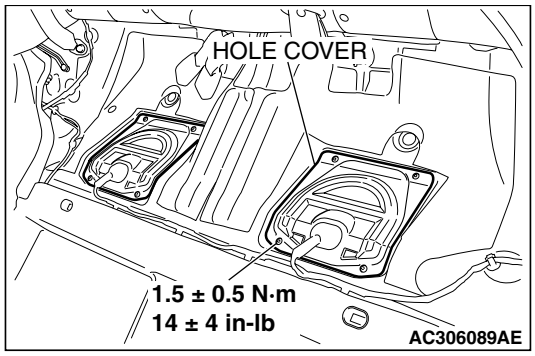
⚠ CAUTION
When installing the fuel pump module into the fuel tank, be careful not to damage the module unit and the float.



5. Connect the suction hose to the fuel pump module, and install the fuel pump module to the fuel tank whilst ensuring that the suction hose is not kinked.
6. Install the plate to the fuel tank.



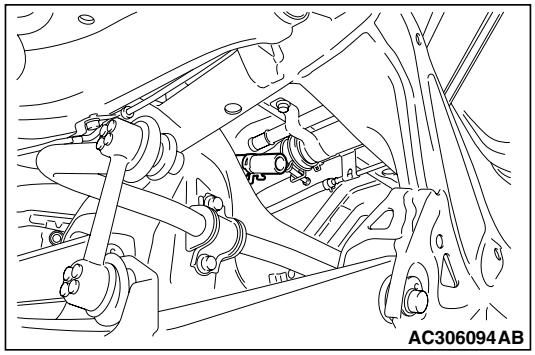
7. Connect the fuel pump module connector and fuel high-pressure hose.



8. Install the hole cover (LH).
   Tightening torque: 1.5 ± 0.5 N·m (14 ± 4 in-lb)
9. Install the rear seat cushion assembly. (Refer to GROUP 52A, Rear Seat Assembly P.52A-29.)

LEVELING VALVE CHECK

M1135004300129



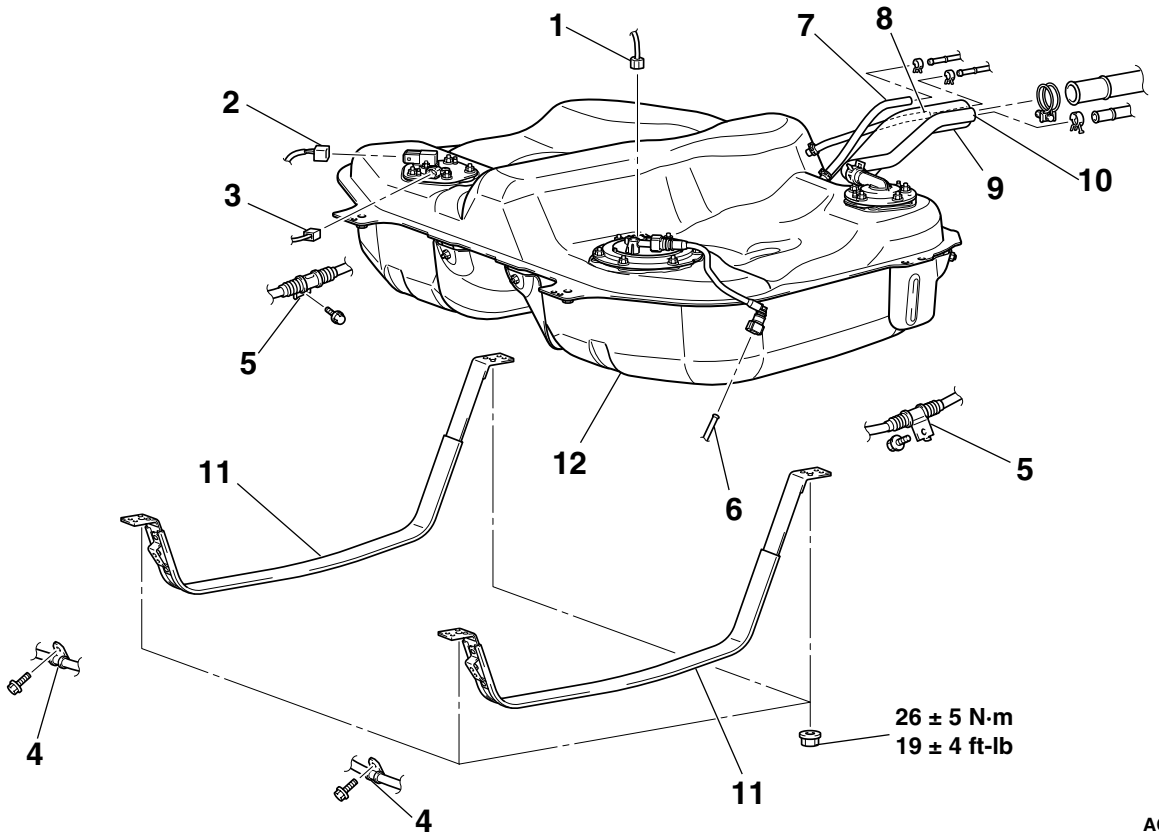
1. Place a drain pan, and disconnect the fuel leveling hose at pipe side.
   NOTE: If fuel leaks from the fuel leveling hose at this stage, the leveling valve may be defective.
2. Open the fuel cap, and fill the fuel tank up.
3. If fuel does not leak from the fuel tank filler leveling hose with the fuel 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 leveling hose at the pipe side.

FUEL TANK

REMOVAL AND INSTALLATION

M1135001900508

Pre-removal Operation	Pre-installation Operation
• Draining Fuel • Fuel Pump Connector Disconnection (How to Reduce Fuel Pressure) (Refer to GROUP 13A - On-vehicle Service P.13A-1127). • Center Exhaust Pipe Removal (Refer to GROUP 15 P.15-20).	• Center Exhaust Pipe Installation (Refer to GROUP 15 P.15-20). • Refilling Fuel • Checking for Fuel Leaks



		FUEL TANK REMOVAL STEPS
<<A>>	1.	FUEL PUMP MODULE CONNECTOR CONNECTION
<<B>>	2.	FUEL TANK DIFFERENTIAL PRESSURE SENSOR CONNECTOR CONNECTION
<<B>>	3.	FUEL LEVEL SENSOR (SUB) CONNECTOR CONNECTION
	4.	PARKING BRAKE CABLE CLAMP CONNECTION
	5.	PARKING BRAKE CABLE CLAMP CONNECTION
<<C>> >>C<<	6.	FUEL HIGH-PRESSURE HOSE CONNECTION
	7.	FUEL TANK VAPOR HOSE C CONNECTION
	8.	FUEL TANK VAPOR HOSE B CONNECTION
	9.	FUEL FILLER HOSE CONNECTION
	10.	FUEL VAPOR HOSE A CONNECTION
<<D>> >>D<<	11.	FUEL TANK ASSEMBLY
<<D>> >>D<<	12.	FUEL TANK BAND

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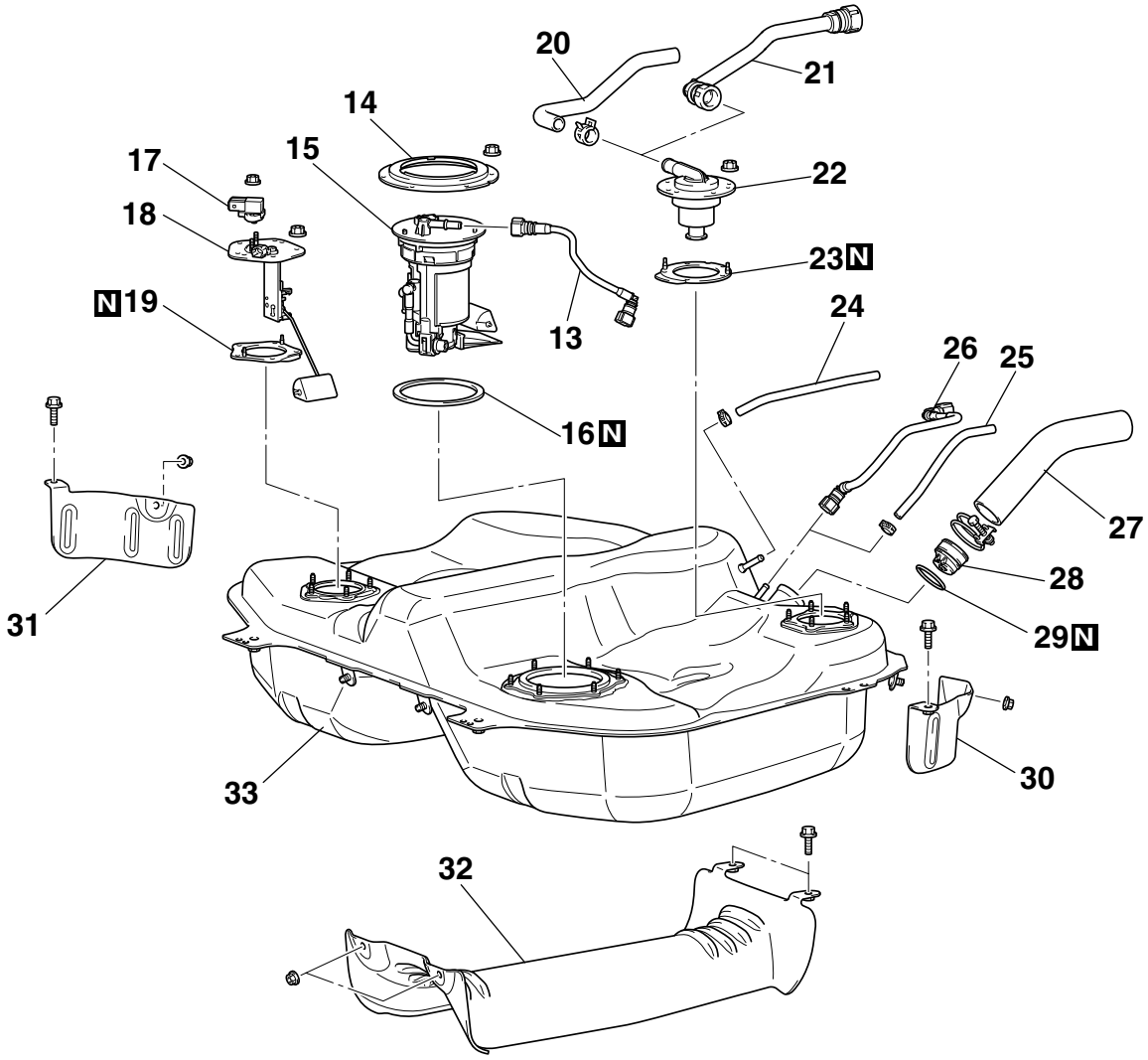

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FUEL TANK REMOVAL STEPS

>>C<< 13. FUEL HIGH-PRESSURE HOSE
14. PLATE
<<E>> >>B<< 15. FUEL PUMP MODULE
16. PACKING
17. FUEL TANK DIFFERENTIAL PRESSURE SENSOR
<<F>> >>A<< 18. FUEL LEVEL SENSOR (SUB)
19. PACKING
20. FUEL TANK VAPOR HOSE A <EXCEPT VEHICLES FOR CALIFORNIA EMISSION REGULATION>
21. FUEL TANK VAPOR TUBE A <VEHICLES FOR CALIFORNIA EMISSION REGULATION>
22. LEVELING VALVE ASSEMBLY
23. PACKING

FUEL TANK REMOVAL STEPS

24. FUEL TANK VAPOR HOSE C
25. FUEL TANK VAPOR HOSE B <EXCEPT VEHICLES FOR CALIFORNIA EMISSION REGULATION>
26. FUEL TANK VAPOR TUBE B <VEHICLES FOR CALIFORNIA EMISSION REGULATION>
27. FUEL FILLER HOSE
28. FUEL SHUT-OFF VALVE
29. O-RING
30. FUEL TANK PROTECTOR (A)
31. FUEL TANK PROTECTOR (B)
32. FUEL TANK CENTER PROTECTOR
33. FUEL TANK

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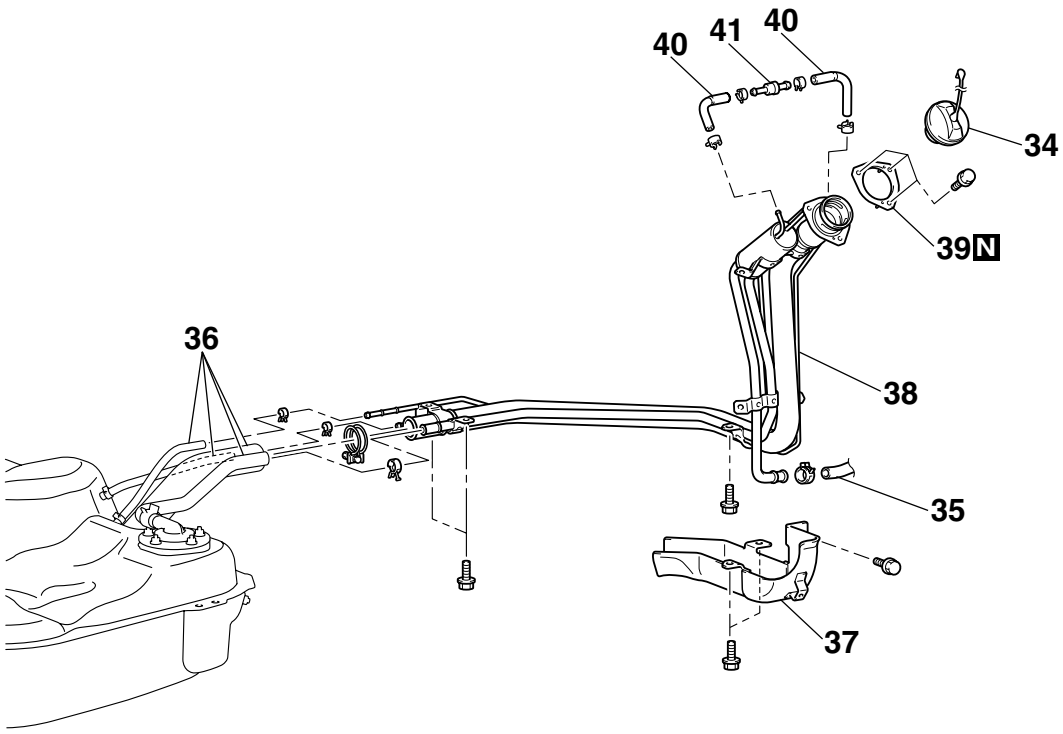

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FUEL TANK FILLER TUBE REMOVAL STEPS

34. FUEL CAP
35. VAPOR HOSE CONNECTION
36. FUEL FILLER HOSE AND FUEL TANK VAPOR HOSE CONNECTION
37. FUEL TANK FILLER TUBE PROTECTOR

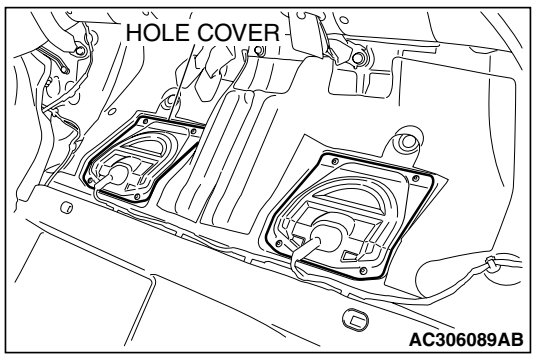
FUEL TANK FILLER TUBE REMOVAL STEPS (Continued)

38. FUEL TANK FILLER TUBE
39. FUEL TANK FILLER TUBE PACKING
40. FUEL TANK FILLER TUBE VAPOR HOSE
41. CHECK VALVE

REMOVAL SERVICE POINTS

<<A>> FUEL PUMP MODULE CONNECTOR CONNECTION REMOVAL

1. Remove the rear seat cushion assembly. (Refer to GROUP 52A, Rear Seat Assembly P.52A-29.)
2. Remove the hole cover (LH).



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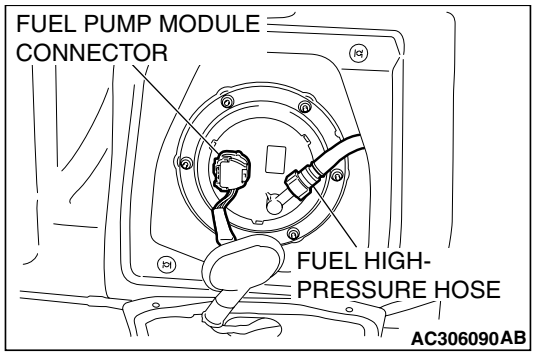
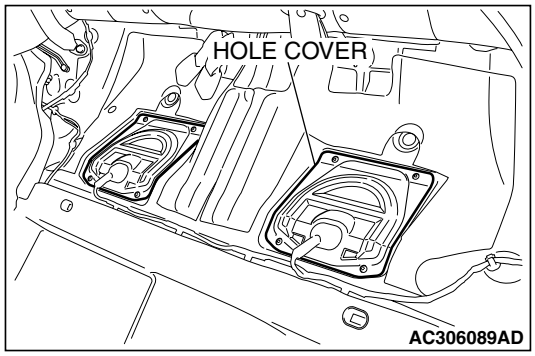
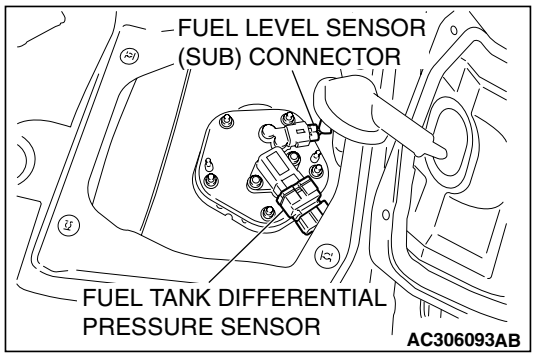


3. Disconnect the fuel pump module connector.

<<B>> FUEL TANK DIFFERENTIAL PRESSURE SENSOR CONNECTOR/FUEL LEVEL SENSOR (SUB) CONNECTOR CONNECTION REMOVAL



1. Remove the hole cover (RH).



2. Disconnect the fuel level sensor (sub) connector and fuel tank differential pressure sensor connector.

<<C>> FUEL HIGH-PRESSURE HOSE CONNECTION REMOVAL

⚠ CAUTION

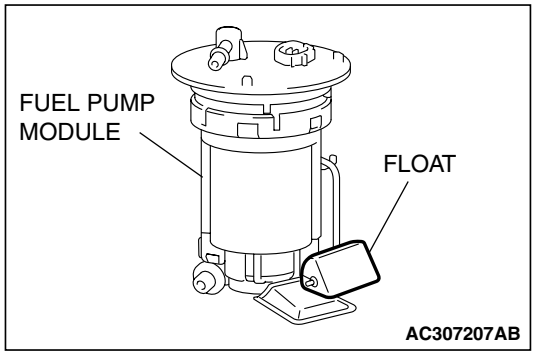
As there will be some pressure remaining in the fuel pipe line, cover it with a shop towel to prevent fuel from spraying out.

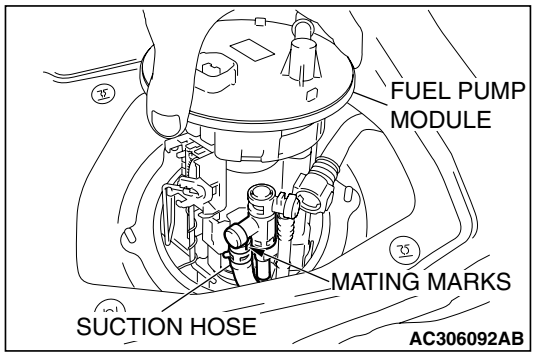
<<D>> FUEL TANK ASSEMBLY/FUEL TANK BAND REMOVAL

1. Support the fuel tank with a transaxle jack.
2. Remove the fuel tank band and fuel tank assembly as follows.
   (1) Remove the front securing nut of the fuel tank band.
   (2) Tilt the fuel tank assembly forward and lower it gradually to remove it.
   (3) Remove the fuel tank band.

<<E>> FUEL PUMP MODULE REMOVAL

⚠ CAUTION
When withdrawing the fuel pump module from the fuel tank, be careful not to damage the module unit and the float.

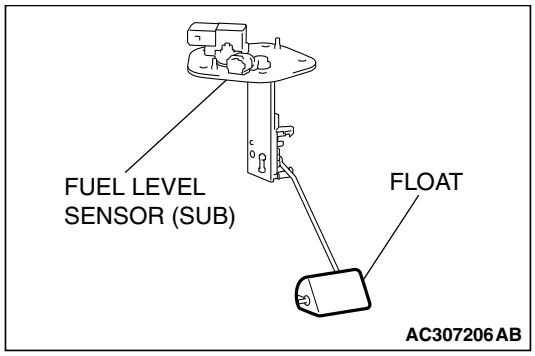




Make alignment marks between the suction hose and the fuel pump module and then disconnect the suction hose to remove the fuel pump module.

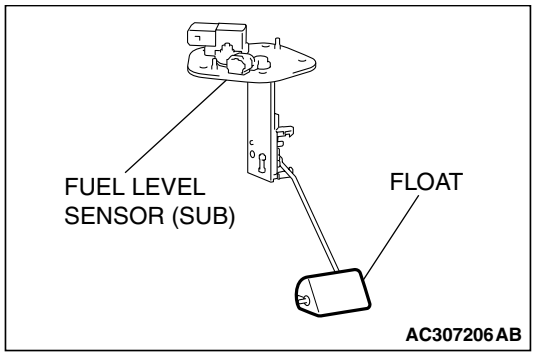
<<F>> FUEL LEVEL SENSOR (SUB) REMOVAL

⚠ CAUTION
When withdrawing the fuel level sensor (sub) from the fuel tank, be careful not to damage the sensor unit and the float.



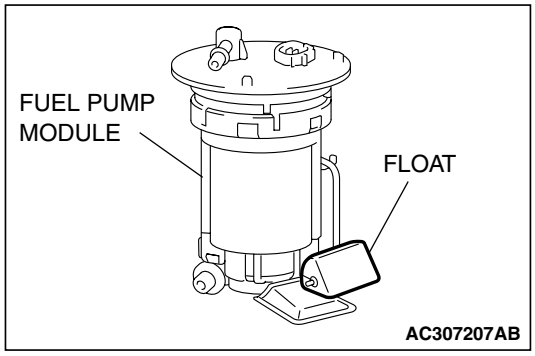
INSTALLATION SERVICE POINS

>>A<< FUEL LEVEL SENSOR (SUB) INSTALLATION

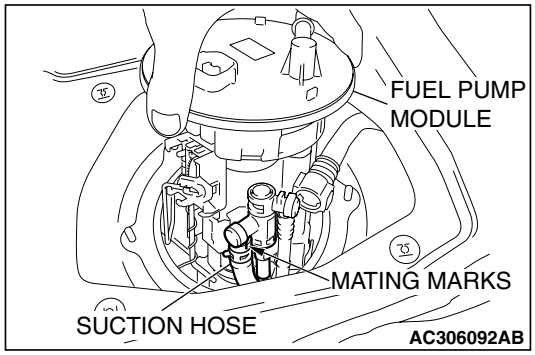


⚠ CAUTION
When inserting the fuel level sensor (sub) into the fuel tank, be careful not to damage the sensor unit and the float.

>>B<< FUEL PUMP MODULE INSTALLATION

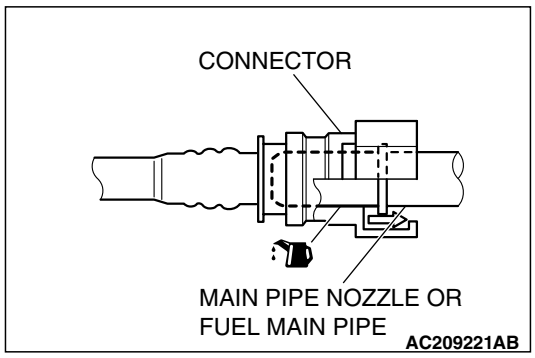


⚠ CAUTION
When installing the fuel pump module into the fuel tank, be careful not to damage the module unit and the float.



1. Align the mark of the suction hose with that of the fuel pump module, and then connect the suction hose to the fuel pump module.
2. Install the fuel pump module into the fuel tank while ensuring that the suction hose is not kinked.

>>C<< FUEL HIGH-PRESSURE HOSE/FUEL HIGH-PRESSURE HOSE CONNECTION INSTALLATION



⚠ CAUTION

Connect the fuel high-pressure hose, and then pull it gently in the direction of removal to check that the hose is firmly connected.

Apply clean engine oil to the tips of the main pipe nozzle and the fuel main pipe, and connect connector of the fuel high-pressure hose to them.

>>D<< FUEL TANK BAND/FUEL TANK ASSEMBLY INSTALLATION

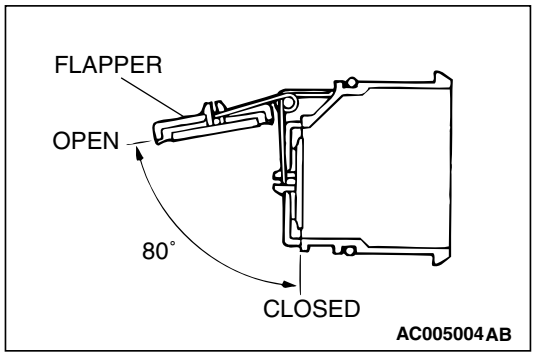
1. Raise the fuel tank assembly carefully with a transaxle jack.
2. Ensure that the fuel tank assembly does not interfere with surrounding parts. Then install the fuel tank band and tighten the mounting nuts to the specified torque.

   Tightening torque: 26 ± 4 N·m (19 ± 3 ft-lb)
3. Again, ensure that the fuel tank assembly does not interfere with surrounding components. If the fuel tank assembly interferes surrounding components, remove the fuel tank assembly and the tank band and reinstall them.

INSPECTION

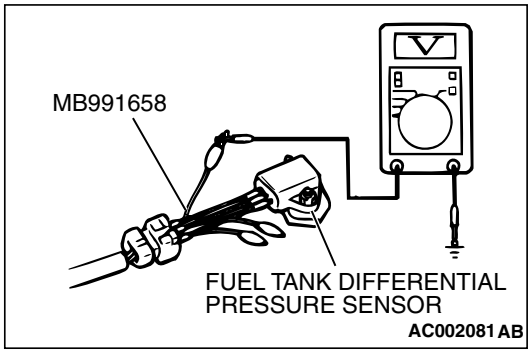
M1135002000241

FUEL SHUT-OFF VALVE CHECK



Check that the flapper of the fuel shut-off valve opens and closes as shown in the illustration.

FUEL TANK DIFFERENTIAL PRESSURE SENSOR CHECK



Requird Special Tool:

- MB991658: Test Harness Set

1. Disconnect the fuel tank differential pressure sensor connector and connect special tool MB991658 between the terminals of the disconnected connector.
2. Turn the ignition switch to “ON” position and measure the voltage between terminal 1 and ground.

   Standard value: 2.0 – 3.0 V

SPECIFICATIONS

FASTENER TIGHTENING SPECIFICATIONS

M1135003900322

ITEM	SPECIFICATIONS
Fuel tank band nut	26 ± 4 N·m (19 ± 3 ft-lb)
Hole cover screw	1.5 ± 0.5 N·m (14 ± 4 in-lb)

SERVICE SPECIFICATION

M1135000300257

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

NOTES