SECTION FL
FUEL SYSTEM

CONTENTS

PRECAUTION

PRECAUTIONS

General Precautions

INFOID:0000000010430516

WARNING:

When replacing fuel line parts, be sure to observe the following.

- **Put a “CAUTION: FLAMMABLE” sign in the workshop.**
- **Be sure to work in a well ventilated area and furnish workshop with a CO_2 fire extinguisher.**
- **Never smoke while servicing fuel system. Keep open flames and sparks away from the work area.**

CAUTION:

- **Use gasoline required by the regulations for octane number. Refer to GI-35, "Fuel".**
- **Before removing fuel line parts, perform out the following procedures:**
  - **Put drained fuel in an explosion-proof container and put the lid on securely. Keep the container in safe area.**
  - **Release fuel pressure from the fuel lines. Refer to ECH-121, "Work Procedure".**
  - **Disconnect the battery cable from the negative terminal.**
- **Always replace O-ring and clamps with new ones.**
- **Never kink or twist tubes when they are being installed.**
- **Never tighten hose clamps excessively to avoid damaging hoses.**
- **After installing tubes, check there is no fuel leakage at connections in the following steps.**
  - **Apply fuel pressure to fuel lines with turning ignition switch “ON” (with engine stopped). Then check for fuel leakage at connections.**
  - **Start engine and rev it up and check for fuel leakage at connections.**
- **Use only a genuine NISSAN fuel filler cap as a replacement. If an incorrect fuel filler cap is used, the “MI” may come on.**

PREPARATION

PREPARATION

Special Service Tool

INFOID:0000000010430517

Tool number Tool name	Description
KV101207S0 Lock ring wrench	Removing and Installing lock ring

PERIODIC MAINTENANCE

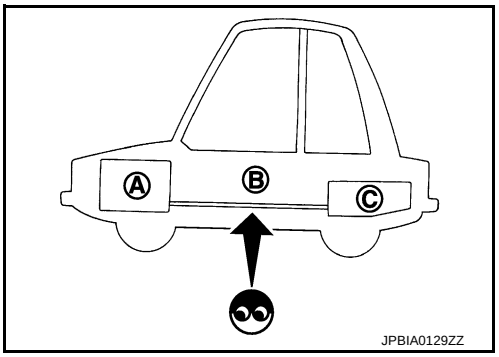
FUEL SYSTEM

Inspection

INFOID:0000000010418977

Inspect fuel lines, fuel filler cap and fuel tank for improper attachment, leaks, cracks, damage, loose connections, chafing or deterioration.
If necessary, repair or replace damaged parts.

A : Engine
B : Fuel line
C : Fuel tank



JPBIA0129ZZ

Quick Connector

INFOID:0000000010418978

CAUTION:
- **After connecting fuel tube quick connectors, make sure quick connectors are secure.**
- **Ensure that connector and resin tube do not contact any adjacent parts.**

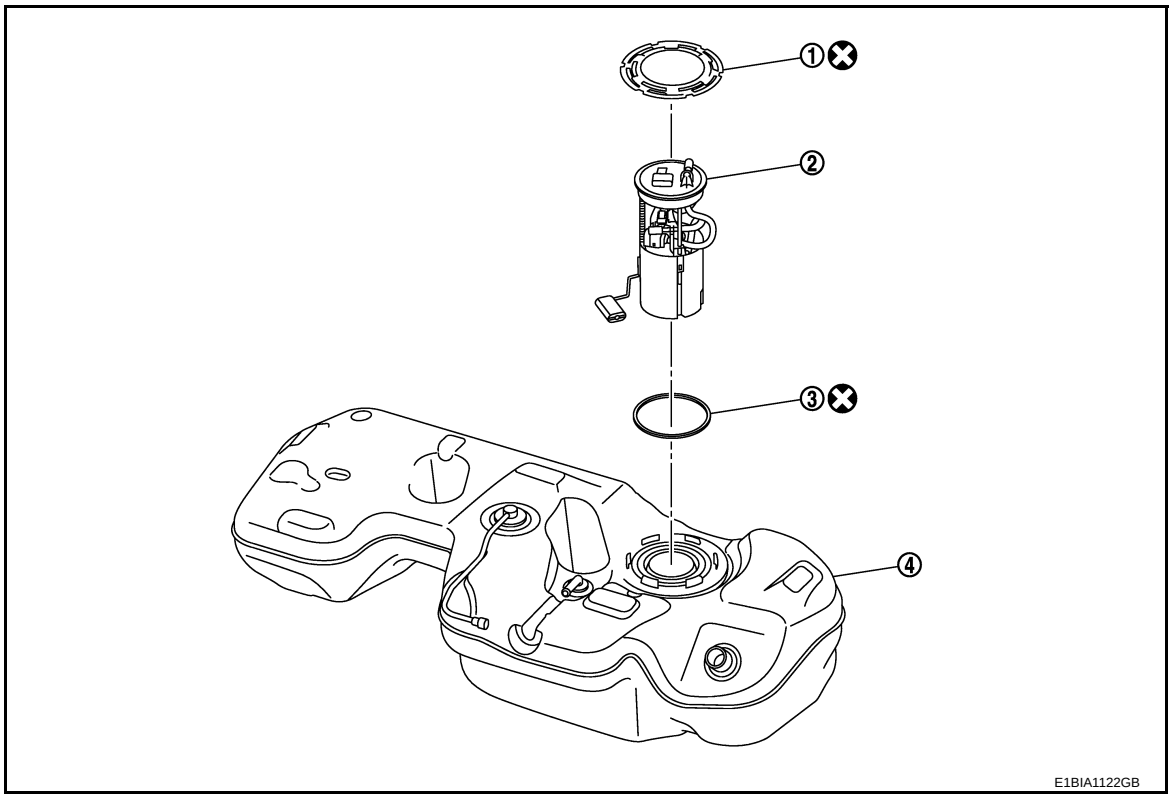
REMOVAL AND INSTALLATION

FUEL LEVEL SENSOR UNIT, FUEL FILTER AND FUEL PUMP ASSEMBLY

Exploded View

INFOID:0000000010418979

Removal and Installation



1. Lock ring
2. Fuel level sensor unit, fuel filter and fuel pump assembly
3. O-ring
4. Fuel tank

Refer to GI-4, "Components" for symbol marks in the figure.

Removal and Installation

INFOID:0000000010421504

WARNING:
Read “General Precautions” when working on the fuel system. Refer to FL-3, "General Precautions".

REMOVAL

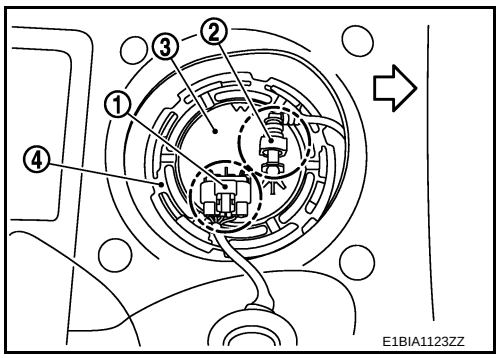
1. Release the fuel pressure from the fuel lines. Refer to ECH-121, "Work Procedure".
2. Check fuel level on a level ground. If the fuel level is at 1/2 or higher, drain enough fuel so that the level on the fuel gauge is at half or below.
   - This is to prevent overflow of fuel from the tank when the fuel level sensor unit, fuel filter and fuel pump assembly is removed

   Guideline : Draw approximately 27 liters (6 Imp gal) from a full-tank condition.

   - In the event of malfunction in fuel pump, insert a hose measuring less than 20mm (0.79 in) in diameter into fuel filler tube through fuel filler opening to draw fuel from filler tube.
   - Disconnect fuel filler hose from fuel filler tube. Refer to FL-10, "Exploded View".
   - Insert hose into fuel tank through fuel filler hose to draw fuel from fuel tank.
3. Disconnect batterie cable from negative terminal.

4. Open fuel filler lid and filler cap to release the pressure inside fuel tank.
5. Remove rear seat. Refer to SE-35, "Removal and Installation".
6. Remove inspection hole cover.
7. Disconnect harness connector and fuel feed tube.

1 : Harness connector
2 : Quick connector
3 : Fuel level sensor unit, fuel filter and fuel pump assembly
4 : Lock ring
⇦ : Vehicle front



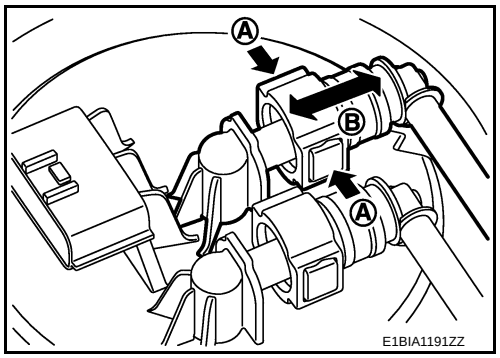
- Remove quick connector in the following procedures.

- **NOTE:**
  - The figure show the process of quick connector disconnection. Parts arround quick connector could have a different shape compare to the figure.

- Hold the sides of quick connector, press tabs and pull out fuel feed tube.

A : Push in tabs
B : Pull

- If quick connector sticks to tube of main fuel level sensor unit, push and pull quick connectors several times until they start to move. Then disconnect them by pulling.

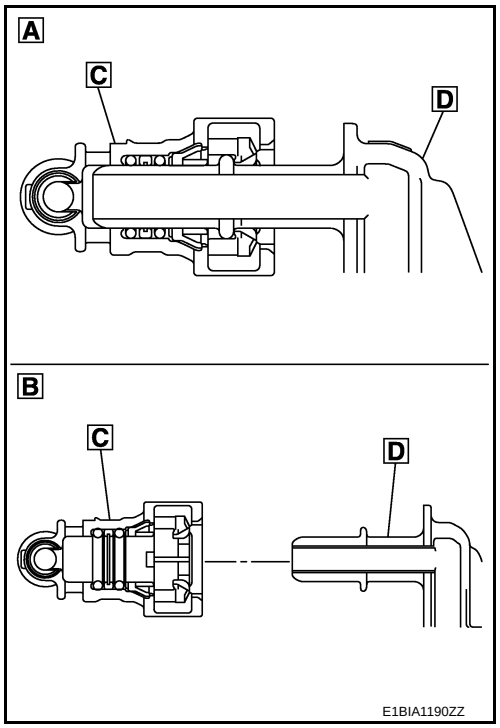


CAUTION:

- **Quick connector can be disconnected when the tabs are depressed completely. Never twist it more than necessary.**

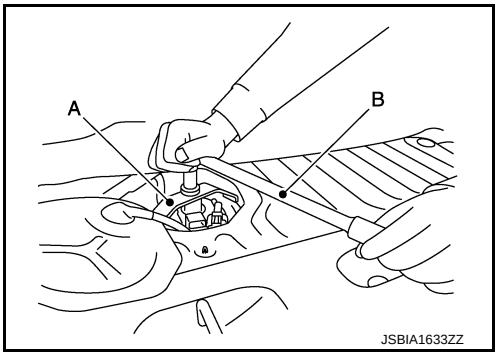
A : Connection (cross-section)
B : Disconnection (cross-section)
C : Quick connector
D : Hard tube

- **Never use any tools to disconnected quick connector.**
- **Keep resin tube away from heat. Be especially careful when welding near the resin tube.**
- **Prevent acid liquid such as battery electrolyte, etc. from getting on resin tube.**
- **Never bend or twist resin tube during installation and disconnection.**
- **Never insert plug, preventing damage to O–ring in quick connector.**
- **To keep the connecting portion clean and to avoid damage and foreign materials, cover them completely with plastic bags or something similar.**



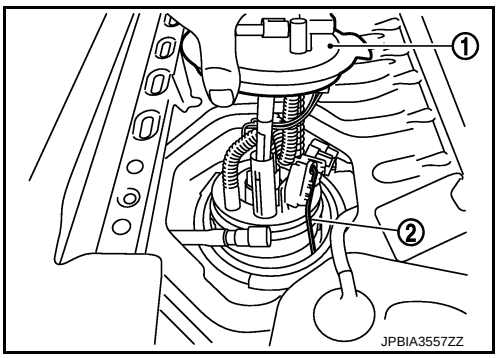
8. Use lock ring wrench [SST: KV101207S0] (A) to remove lock ring.

CAUTION:
- **To prevent lock ring wrench from being detached, securely hold down spinner handle (B) by hand.**
- **To reduce impact caused by removal operation, use long spinner handle [handle length: 60 cm (23.62 in) or more] and slowly turn it counterclockwise.**



9. Remove fuel level sensor unit, fuel filter and fuel pump assembly (1).

CAUTION:
- **Never bend float arm (2) during removal.**
- **Never pollute the residual fuel inside of the tank. Draw out avoiding inclination by supporting with a cloth.**
- **Never cause impacts such by dropping when handling components.**



INSTALLATION

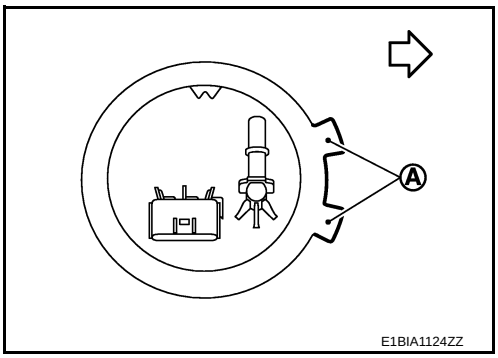
Note to the following, and install in the reverse order of removal.

Fuel Level Sensor Unit

1. Install new O-ring to fuel tank without any twist.
2. Install the fuel gauge on the fuel tank with the fuel gauge top surface (A) faced the front of the vehicle.

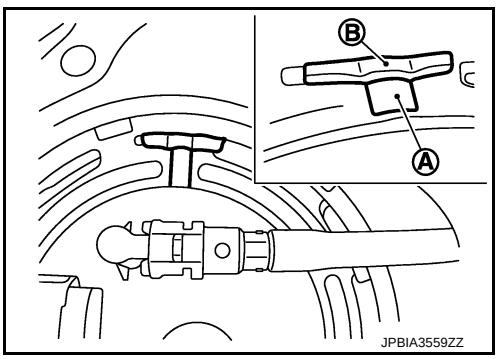
⇦ : Vehicle front

CAUTION:
- **Never allow O-ring to drop.**
- **Never bend float arm during installing.**



3. Install lock ring for fuel level sensor unit, fuel filter and fuel pump assembly with lock ring wrench [SST: KV101207S0] by turning clockwise.

CAUTION:
- **Install lock ring horizontally.**
- **Turn the lock ring (A) until it is engaged in the fuel tank side (B) as shown in the figure.**

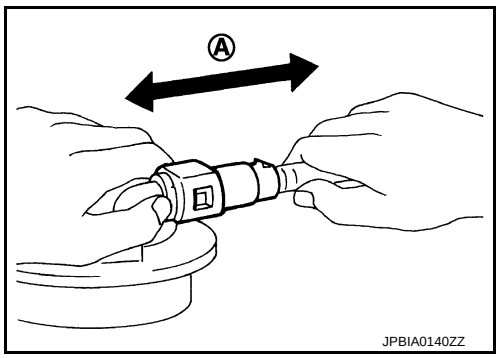


Quick Connector

- Connect quick connector as follows:

1. Check the connection for damage or any foreign materials.

2. Align the connector with the tube, then insert the connector straight into the tube until a “click” sound is heard.
3. After connecting, check that the connection is secured with following procedures.
   - Visually confirm that the two tabs are connected to the connector.
   - Pull (A) the tube and the connector to check that they are securely connected.



4. Reattach harness connector.

Inspection

INFOID:0000000010418981

INSPECTION AFTER INSTALLATION

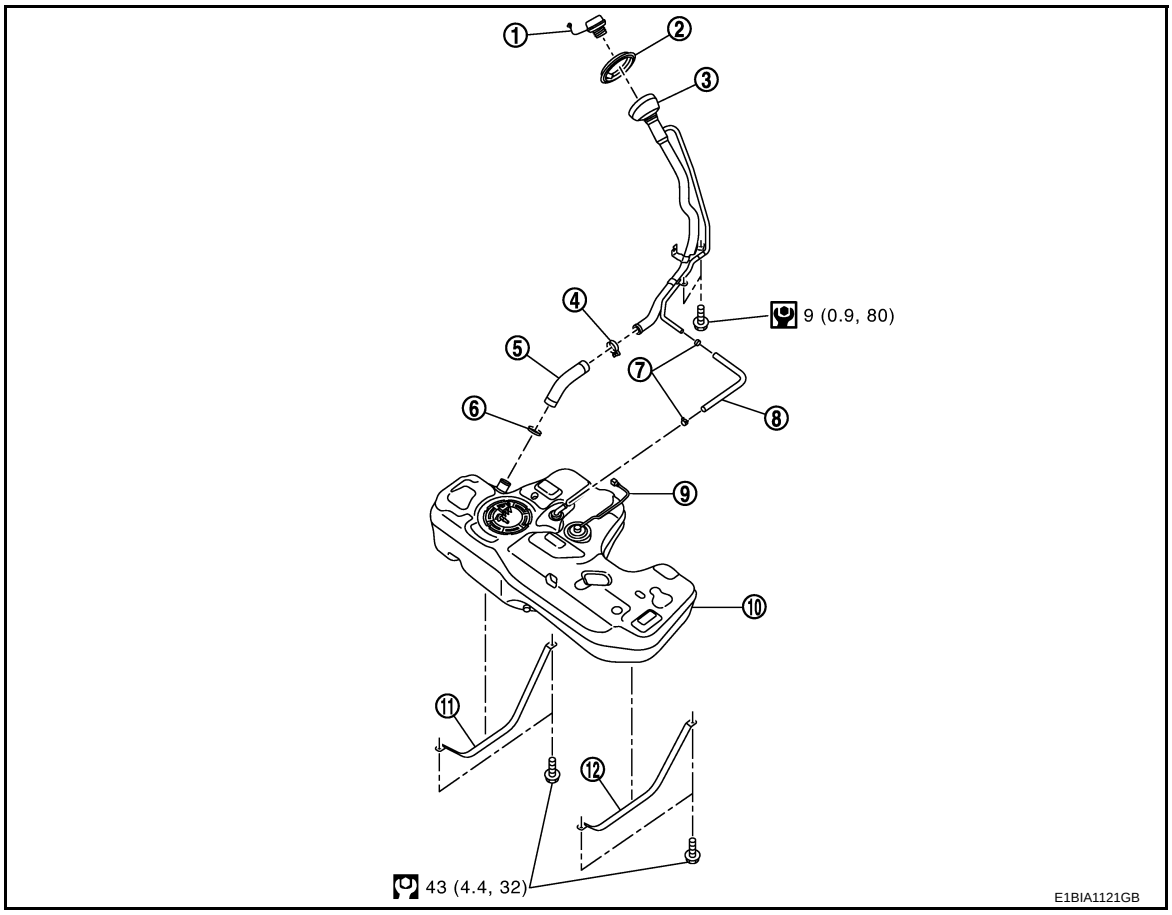
Use the following procedure to check for fuel leaks.

1. Turn ignition switch “ON” (with engine stopped), then check connections for leaks by applying fuel pressure to fuel piping.
2. Start engine and let it idle and make sure there are no fuel leaks at the fuel system connections.

FUEL TANK

Exploded View

INFOID:0000000010418985



1. Fuel filler cap
2. Grommet
3. Fuel filler tube
4. Clamp
5. Fuel filler hose
6. Clamp
7. Clamp
8. Vent hose
9. EVAP hose
10. Fuel tank
11. Fuel tank band (RH)
12. Fuel tank band (LH)

Refer to GI-4, "Components" for symbol marks in the figure.

Removal and Installation

INFOID:0000000010418986

REMOVAL

WARNING:

Be sure to read “General Precautions” when working on the fuel system. Refer to FL-3, "General Precautions".

1. Perform the steps 1 to 7 of “REMOVAL” in “ FUEL LEVEL SENSOR UNIT, FUEL FILTER AND FUEL PUMP ASSEMBLY”. Refer to FL-6, "Removal and Installation".
2. Drain fuel from fuel tank if necessary. Refer to FL-6, "Removal and Installation".
   CAUTION:
   - **Fuel tank will become unstable whilst removing. Fuel should be drained from tank prior to removal to reduce this effect.**
   - **Situate vehicle on a flat and solid surface.**
3. Remove main muffler. Refer to EX-6, "Exploded View".
4. Remove vent hose from filler tube.

5. Remove fuel filler hose from fuel tank.

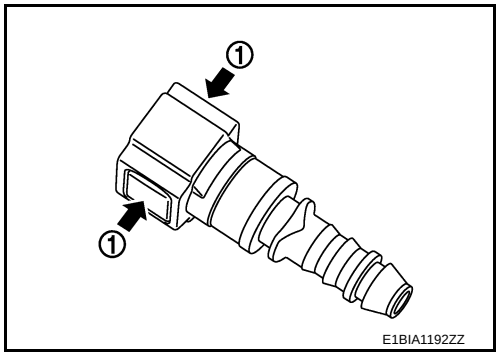
CAUTION:

- **Do not remove fuel filler hose from fuel filler tube to prevent interference with suspension when installing.**
- **If removal of fuel filler hose from fuel filler tube is necessary use mating marks to ensure correct orientation.**

6. Disconnect EVAP hose.
   - Remove quick connector in the following procedures.
   - Hold the sides of quick connector, press tabs and disconnect EVAP hose.
   - If quick connector sticks to tube, push and pull quick connectors several times until they start to move. Then disconnect them by pulling.

CAUTION:

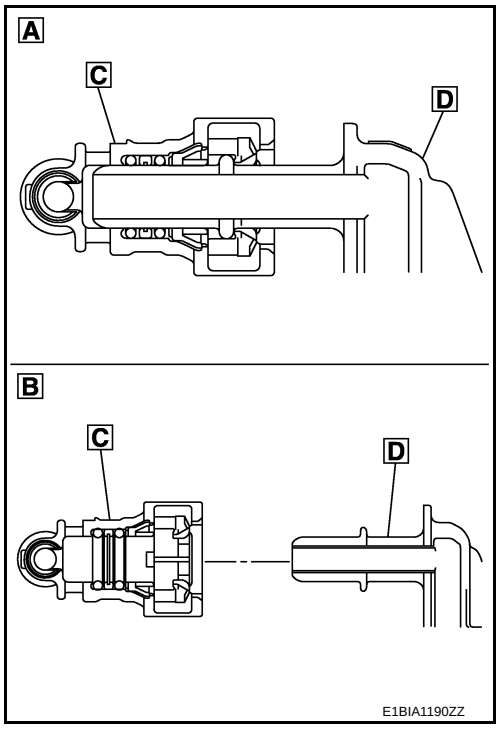
- **Quick connector can be disconnected when the tabs (1) are depressed completely. Never twist it more than necessary.**



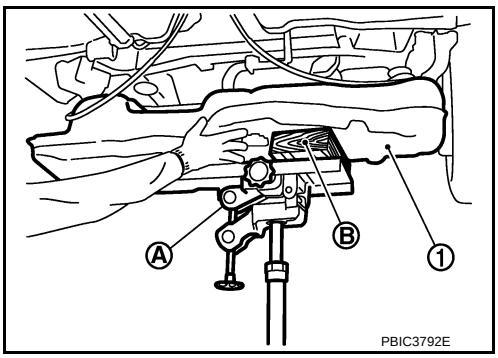
- **Never use any tools to disconnected quick connector.**

A : Connection (cross-section)
B : Disconnection (cross-section)
C : Quick connector
D : Hard tube

- **Keep resin tube away from heat. Be especially careful when welding near the resin tube.**
- **Prevent acid liquid such as battery electrolyte, etc. from getting on resin tube.**
- **Never bend or twist resin tube during installation and disconnection.**
- **Never insert plug, preventing damage to O–ring in quick connector.**
- **To keep the connecting portion clean and to avoid damage and foreign materials, cover them completely with plastic bags or something similar.**



7. Support center of fuel tank (1) with transmission jack (A) and piece of wood (B).
   CAUTION:
   - **Make sure the tank bottom surface is supported well enough to prevent an unstable condition when lowering the tank.**
   - **Make sure to hold it securely as tank surface may not be flat.**



8. Remove fuel tank band (RH and LH).
9. Lower transmission jack carefully to remove fuel tank while holding it by hand.
   CAUTION:
   Make sure to avoid any interference with surrounding component that may cause damage.

INSTALLATION

Note the following, and install in the reverse order of removal.

CAUTION:

- **Make sure hose clamps and hoses clips are not secured on top of the filler tube bulges.**
- **Make sure all quick connectors and their mating part are free of foreign matter, check for damage.**
- **Ensure the tank bands are correctly assembled as per their identification marks "L" and "R".**
- **Make sure that the torques of the mounting bolts are correct as per exploded view. Refer to FL-10, "Exploded View".**
- **Make sure that when installing the connectors, the confirmation click sound is heard. Pull back on the connector to ensure proper engagement.**

Fuel Filler Hose

- Insert fuel filler hose to the length below.

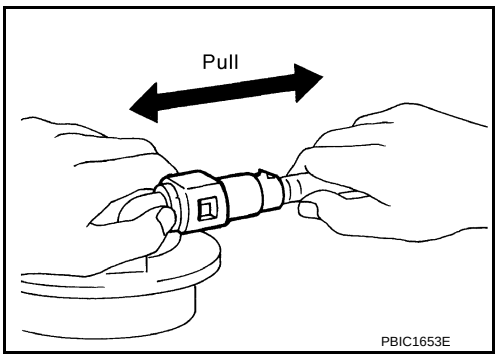
: 35 mm (1.38 in)

- Be sure hose clamp is not placed on swelled area of fuel filler tube.
- Tighten fuel filler hose clamp so that the remaining length of screw thread becomes to the following.

Fuel filler tube side : 7 - 11 mm (0.28 - 0.43 in)
Fuel tank side : 5 - 9 mm (0.20 - 0.35 in)

EVAP Hose

1. Check connections for damage or foreign material.
2. Align the matching side connection part with the center of shaft, and insert connector straight until it clicks.
3. After connecting, pull out quick connector and centralized under-floor piping by hand. Make sure connections are secure.



Inspection

INFOID:0000000010418987

INSPECTION AFTER INSTALLATION

Use the following procedure to check for fuel leaks.

1. Turn ignition switch “ON” (with engine stopped), and check connections for leakage by applying fuel pressure to fuel piping.

2. Start engine and rev it up and make sure there are no fuel leaks at the fuel system tube and hose connections.

SERVICE DATA AND SPECIFICATIONS (SDS)

SERVICE DATA AND SPECIFICATIONS (SDS)

Fuel Tank

INFOID:0000000010418991

Standard and Limit

Fuel tank capacity	Approximate 55 ℓ (12-1/8 Imp gal)
Fuel recommendation	Refer to GI-35, "Fuel"

PRECAUTION

PRECAUTIONS

General Precautions

INFOID:0000000010683781

WARNING:

When replacing fuel line parts, be sure to observe the following.

- **Put a “CAUTION: FLAMMABLE” sign in the workshop.**
- **Be sure to work in a well ventilated area and furnish workshop with a CO_2 fire extinguisher.**
- **Never smoke while servicing fuel system. Keep open flames and sparks away from the work area.**

CAUTION:

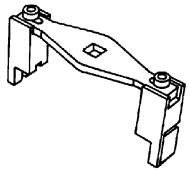
- **Use gasoline required by the regulations for octane number. Refer to GI-35, "Fuel".**
- **Before removing fuel line parts, perform out the following procedures:**
  - **Put drained fuel in an explosion-proof container and put the lid on securely. Keep the container in safe area.**
  - **Release fuel pressure from the fuel lines. Refer to ECH-121, "Work Procedure".**
  - **Disconnect the battery cable from the negative terminal.**
- **Always replace O-ring and clamps with new ones.**
- **Never kink or twist tubes when they are being installed.**
- **Never tighten hose clamps excessively to avoid damaging hoses.**
- **After installing tubes, check there is no fuel leakage at connections in the following steps.**
  - **Apply fuel pressure to fuel lines with turning ignition switch “ON” (with engine stopped). Then check for fuel leakage at connections.**
  - **Start engine and rev it up and check for fuel leakage at connections.**
- **Use only a genuine NISSAN fuel filler cap as a replacement. If an incorrect fuel filler cap is used, the “MI” may come on.**

PREPARATION

PREPARATION

Special Service Tools

INFOID:0000000010683799

Tool number Tool name	Description
KV99104700 Lock ring wrench  ZZA0122D	Removing and installing lock ring

PERIODIC MAINTENANCE

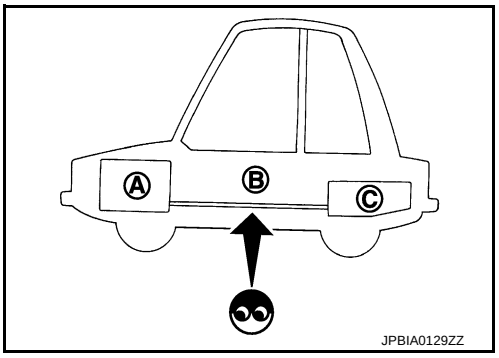
FUEL SYSTEM

Inspection

INFOID:0000000010683783

Inspect fuel lines, fuel filler cap and fuel tank for improper attachment, leaks, cracks, damage, loose connections, chafing or deterioration.
If necessary, repair or replace damaged parts.

A : Engine
B : Fuel line
C : Fuel tank



JPBIA0129ZZ

Quick Connector

INFOID:0000000010683784

CAUTION:
- **After connecting fuel tube quick connectors, make sure quick connectors are secure.**
- **Ensure that connector and resin tube do not contact any adjacent parts.**

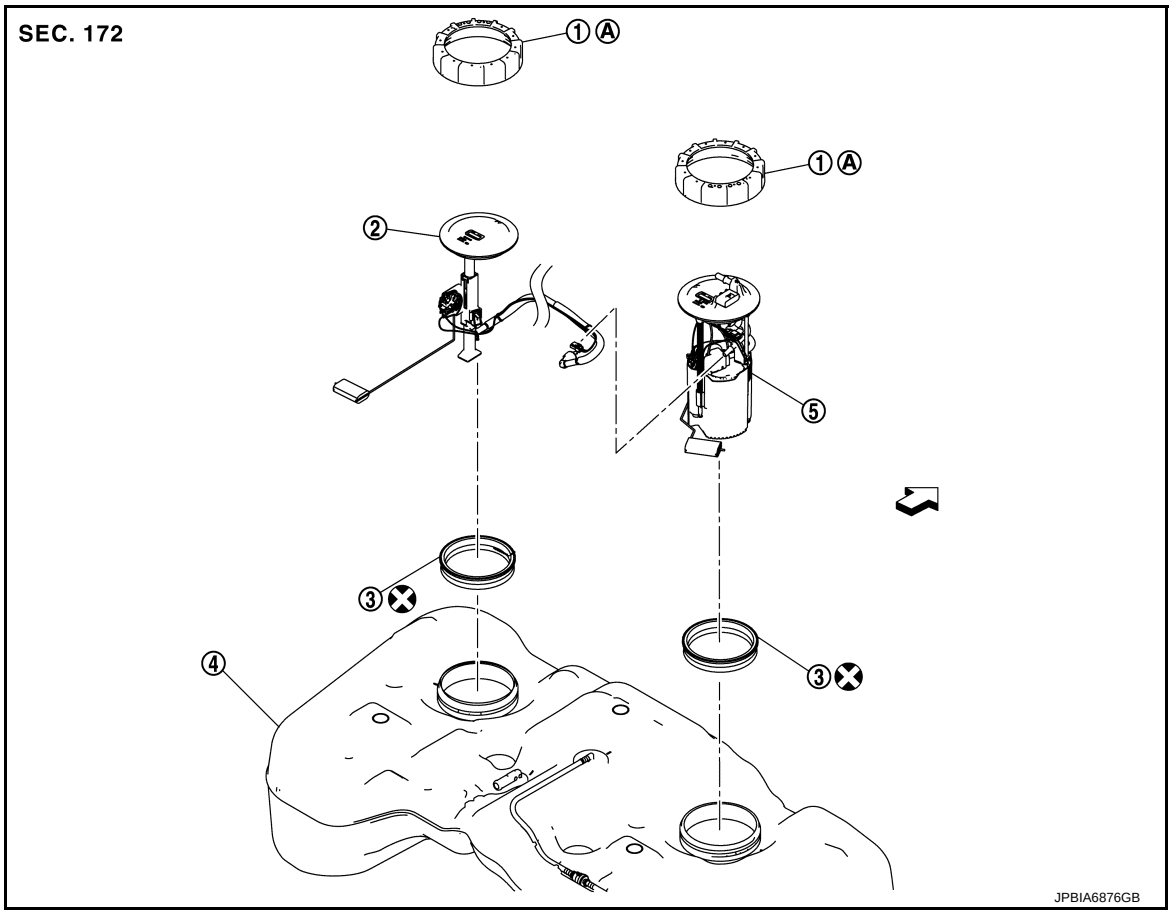
REMOVAL AND INSTALLATION

FUEL LEVEL SENSOR UNIT, FUEL FILTER AND FUEL PUMP ASSEMBLY

Exploded View

INFOID:0000000010714502

REMOVAL



① Lock ring
② Sub fuel level sensor assembly
③ O-ring
④ Fuel tank
⑤ Fuel level sensor unit, fuel filter and fuel pump assembly

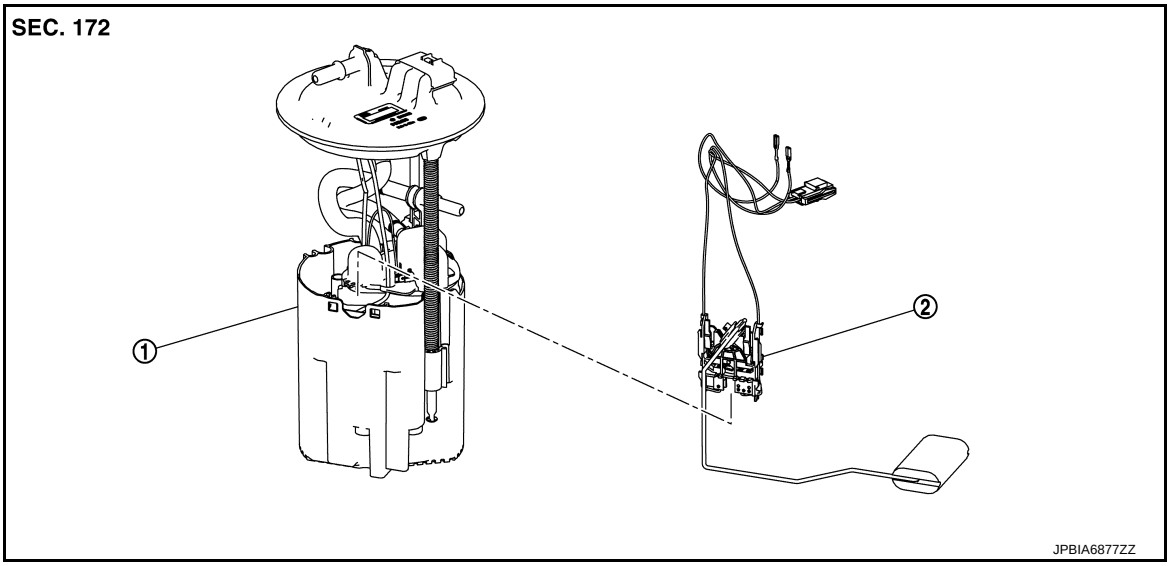
⇦ : Vehicle front

Ⓐ Tightening must be done following the Installation procedure. Refer to FL-19, "Removal and Installation".

⊗ : Always replace after every disassembly.

CAUTION:
Never remove or disassemble parts unless instructed as shown in the figure.

DISASSEMBLY



① Fuel filter and fuel pump assembly ② Fuel level sensor unit

Removal and Installation

INFOID:0000000010769779

REMOVAL

Fuel Level Sensor Unit

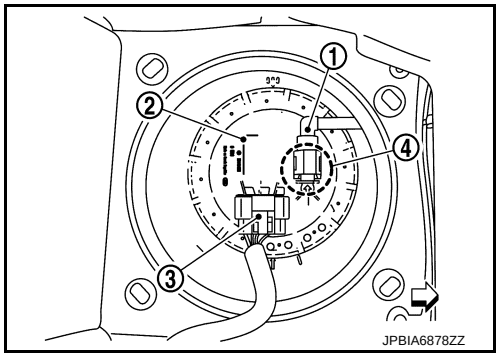
WARNING:

Be sure to read “General Precautions” before working on the fuel system. Refer to FL-43, "General Precautions".

1. Release the fuel pressure from the fuel lines. Refer to ECK-153, "Work Procedure".
2. Check fuel level on a level ground. If the fuel level is at 1/2 or higher, drain enough fuel so that the level on the fuel gauge is at half or below.
   - This is to prevent overflow of fuel from the tank when the fuel level sensor unit, fuel filter and fuel pump assembly is removed

   Guideline : Draw approximately 32 liters (7 Imp gal) from a full-tank condition.

   - In the event of malfunction in fuel pump, insert a hose measuring less than 20mm (0.79 in) in diameter into fuel filler tube through fuel filler opening to draw fuel from filler tube.
   - Disconnect fuel filler hose from fuel filler tube. Refer to FL-10, "Exploded View".
   - Insert hose into fuel tank through fuel filler hose to draw fuel from fuel tank.
3. Disconnect batterie cable from negative terminal.
4. Open fuel filler lid and filler cap to release the pressure inside fuel tank.
5. Remove rear seat. Refer to SE-35, "Removal and Installation".
6. Remove inspection hole cover.
   - Using a screwdriver, remove it by turning clips clockwise by 90 degrees.
7. Disconnect harness connector (3) and quick connectors (4).



1 : Fuel feed tube
2 : Fuel level sensor unit, fuel filter and fuel pump assembly
⇦ : Vehicule front

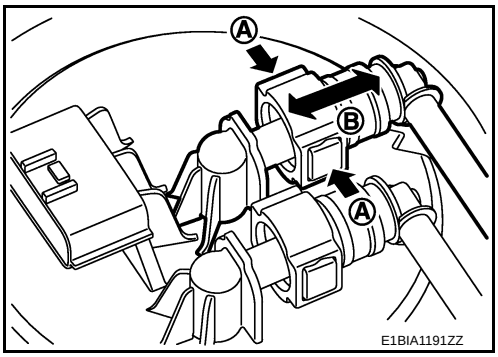
• Remove quick connector in the following procedures.

- **NOTE:**
  • The figure show the process of quick connector disconnection. Parts arround quick connector could have a different shape compare to the figure.

- Hold the sides of quick connector, press tabs and pull out fuel feed tube.

A : Push in tabs
B : Pull

- If quick connector sticks to tube of main fuel level sensor unit, push and pull quick connectors several times until they start to move. Then disconnect them by pulling.

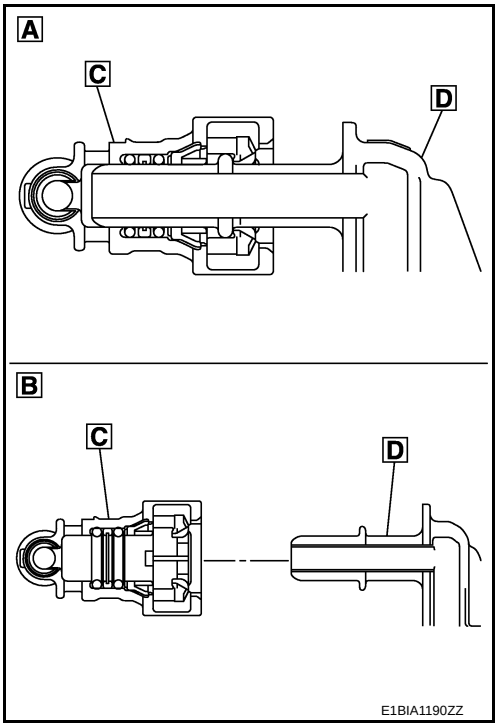


CAUTION:

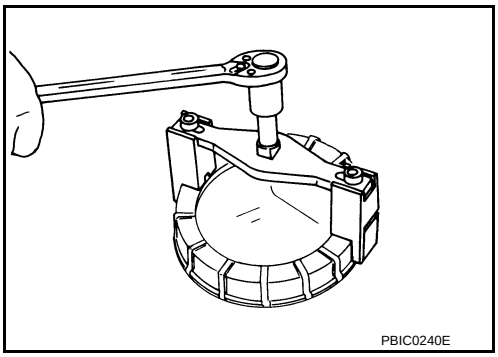
- **Quick connector can be disconnected when the tabs are depressed completely. Never twist it more than necessary.**

A : Connection (cross-section)
B : Disconnection (cross-section)
C : Quick connector
D : Hard tube

- **Never use any tools to disconnected quick connector.**
- **Keep resin tube away from heat. Be especially careful when welding near the resin tube.**
- **Prevent acid liquid such as battery electrolyte, etc. from getting on resin tube.**
- **Never bend or twist resin tube during installation and disconnection.**
- **Never insert plug, preventing damage to O–ring in quick connector.**
- **To keep the connecting portion clean and to avoid damage and foreign materials, cover them completely with plastic bags or something similar.**



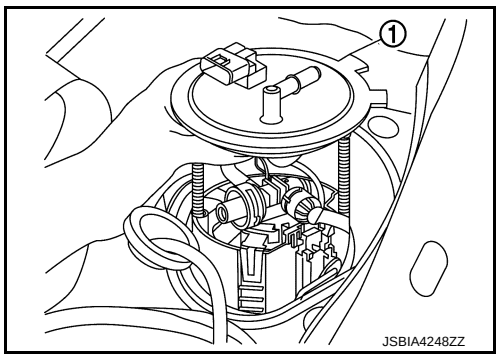
8. Using lock ring wrench [SST: KV99104700], remove lock ring.
NOTE:
For reference when installing, put a matching mark on lock ring, fuel level sensor unit and fuel tank.



9. Raise fuel level sensor unit.

CAUTION:

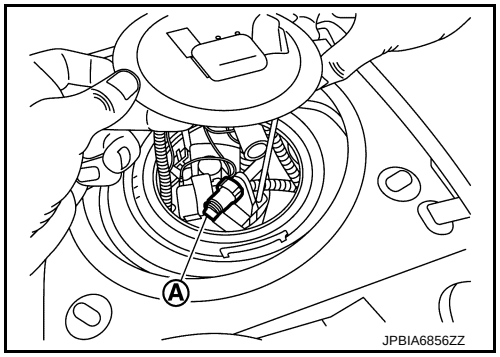
- **Never bend float arm during removal.**
- **Never pollute the residual fuel inside of the tank. Draw out avoiding inclination by supporting with a cloth.**
- **Never cause impacts such by dropping when handling components.**



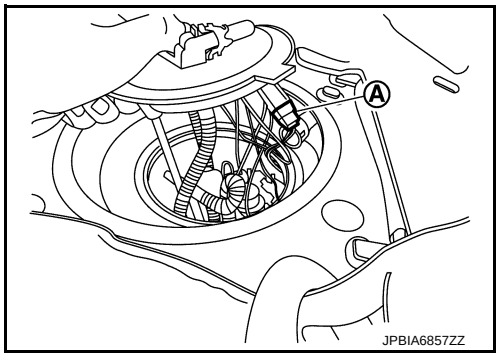
10. Separate fuel tube as per the following steps to remove fuel level sensor unit.
    - Pinch quick connector (A) square-part with your fingers, and pull out the quick connector by hand.
    - If quick connector and tube on sender unit are stuck, push several times until they move, and pull out.

    NOTE:

    When separating the fuel tube, tie a diesel-resistance rope to the tip of the fuel tube and leave the rope on the fuel tank side to easily pull the fuel tube for installation.

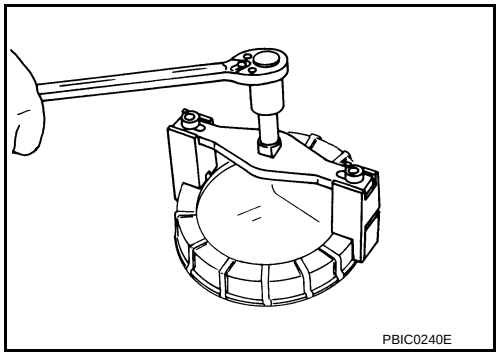


    - Disconnect harness connector (A).

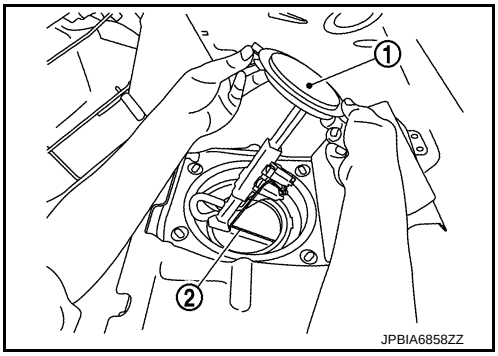


Sub Fuel Level Sensor Assembly

1. Remove fuel level sensor unit, fuel filter and fuel pump assembly.
2. Use lock ring wrench [SST: KV99104700] to remove lock ring.



3. Remove sub fuel level sensor assembly (1).



CAUTION:

- **Never disassemble a fuel tube (2) from sub fuel sensor assembly.**
- **Never bend float arm during removal.**
- **Never pollute the residual fuel inside of the tank. Draw out avoiding inclination by supporting with a cloth.**
- **Never cause impacts such by dropping when handling components.**

NOTE:

Tie a gasoline-resistance rope to a tip of the tube. Draw and leave the rope to the fuel tank side so that the rope can be the guide for installation.

INSTALLATION

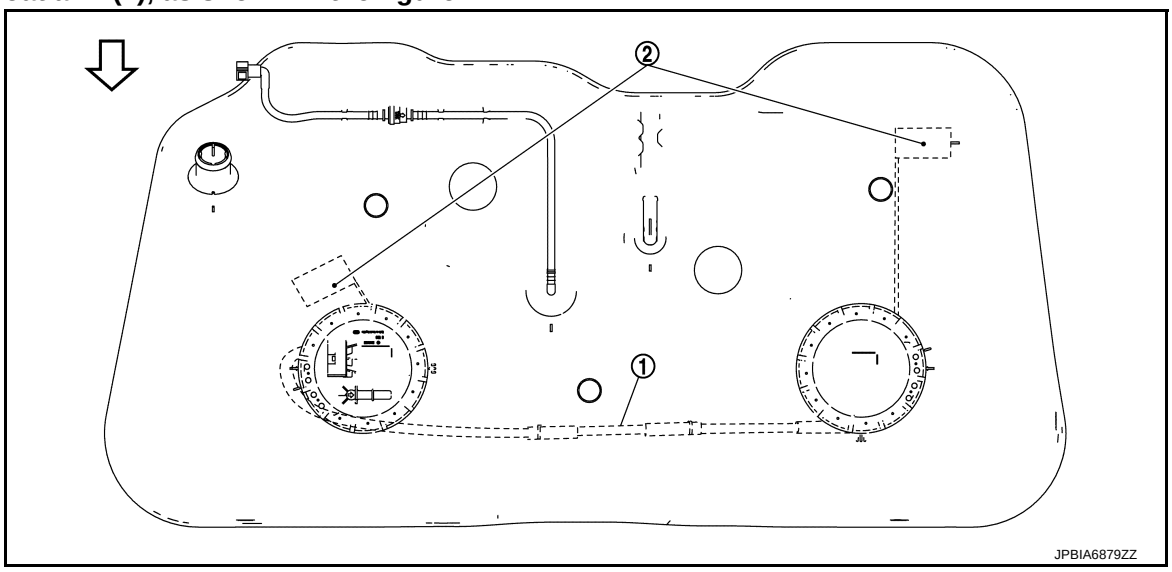
Note the following, and install in the reverse order of removal.

Sub Fuel Level Sensor Assembly

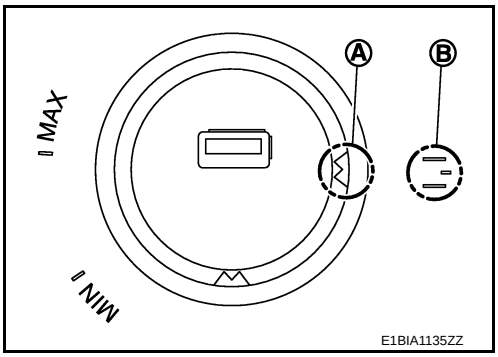
1. Install O-ring to fuel tank without any twist.
2. Using the rope left on the fuel tank side at removal, run the fuel tube inside the fuel tank to install the sub fuel level sensor assembly to the fuel tank.

CAUTION:

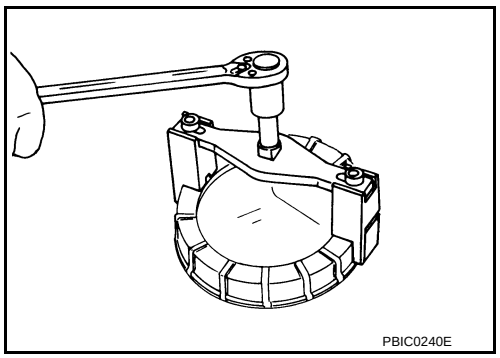
- **Never bend float arm during installation.**
- **To install, fuel tube (1) must run to the front (⇦) of the vehicle to avoid the interference with the float arm (2), as shown in the figure.**



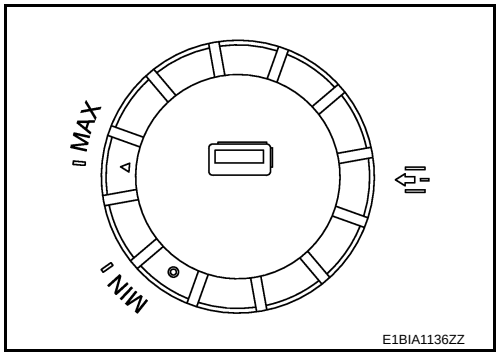
3. Install sub fuel level sensor assembly with its matching mark (A) aligned with fuel tank matching mark (B) as shown in the figure.



4. Use lock ring wrench [SST: 99104700] to install lock ring as per the following steps.



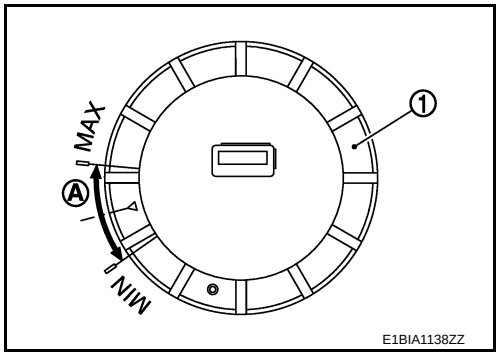
a. Align the "△" mark located on the rim of the lock ring (1) with the "MAX" position of the fuel tank. Press the locking ring horizontally to prevent the lock ring from tilting.
NOTE:
- Figure shows fuel level sensor unit, fuel filter and fuel pump assembly side of fuel tank.
- For sub fuel level sensor assembly matching mark is located on the fuel tank of the vehicle front side.



b. After aligning the "△" mark with "MAX" turn the lock ring counterclockwise until the lock ring thread engages with the tank.
Turn the lock ring roughly 540° until the "△" mark is between "MIN" and "MAX" position.

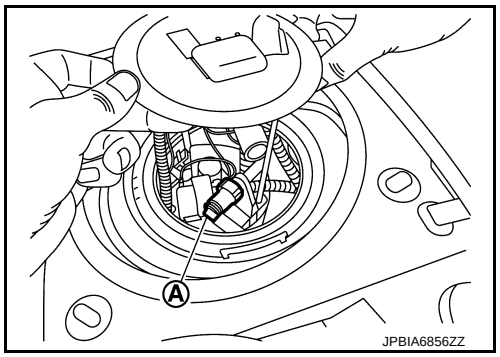
Tightening angle : Approximately 540°

c. Check that the "△" mark of the lock ring (1) is between MIN and MAX [i.e. within (A)].
NOTE:
- Figure shows fuel level sensor unit, fuel filter and fuel pump assembly side of fuel tank.
- For sub fuel level sensor assembly matching mark is located on the fuel tank of the vehicle front side.

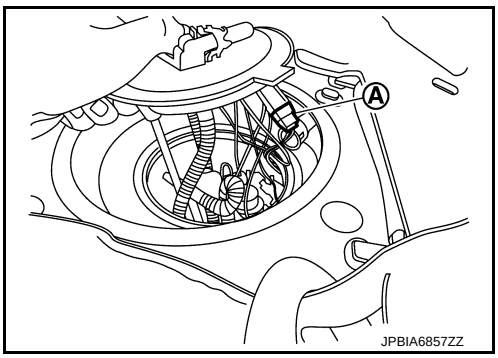


Fuel Level Sensor Unit

1. Temporarily install the O-ring to the fuel level sensor unit.
CAUTION:
Do not reuse O-ring.
2. Connect the fuel tube as per the following steps.
- Insert the quick connector (A) straight to the fuel level sensor unit.
- Judge a good fit from connecting sound and tactile feedback.
- Pull the fuel tube by hand to check a secure fit.



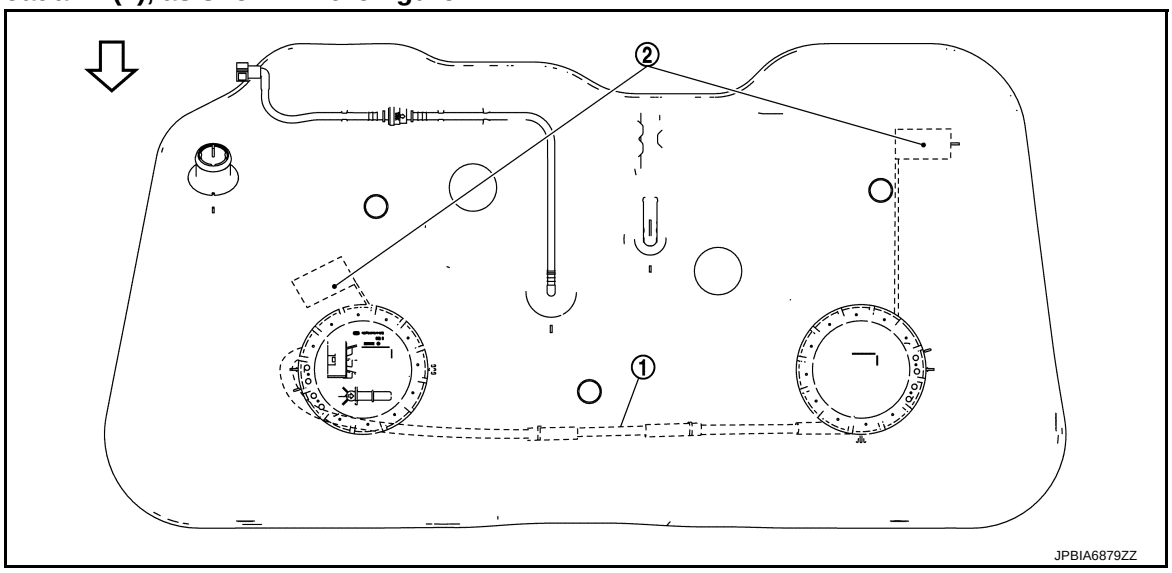
3. Connect harness connector (A).



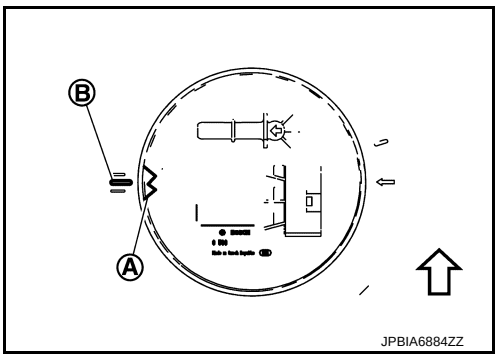
4. Insert the fuel level sensor unit to the fuel tank, and then install the temporarily installed O-ring (Step 1) to the opening of the fuel tank.

CAUTION:

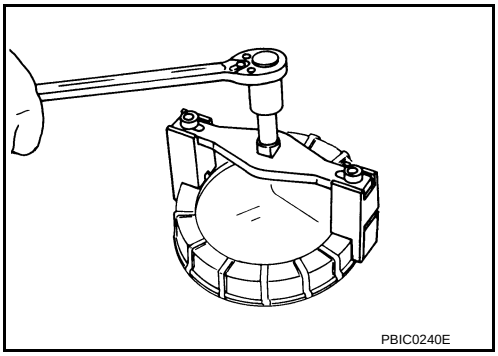
- **Never bend float arm during installation.**
- **To install, fuel tube (1) must run to the front (⇦) of the vehicle to avoid the interference with the float arm (2), as shown in the figure.**



5. Install fuel level sensor unit with its matching mark (A) aligned with fuel tank matching mark (B) as shown in the figure.



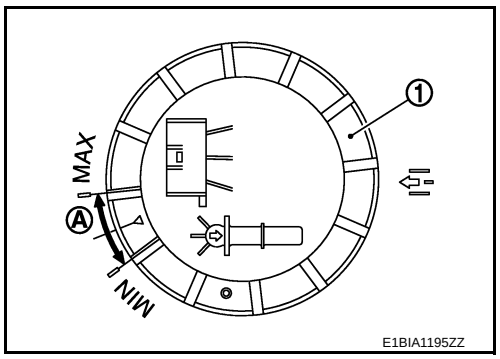
6. Use lock ring wrench [SST: KV99104700] to install lock ring as per the following steps.



a. Align the "△" mark located on the rim of the lock ring (1) with the "MAX" position of the fuel tank. Press the locking ring horizontally to prevent the lock ring from tilting.

b. After aligning the "△" mark with "MAX" turn the lock ring counterclockwise until the lock ring thread engages with the tank.
Turn the lock ring roughly 540° until the "△" mark is between "MIN" and "MAX" position.

Tightening angle : Approximately 540°



c. Check that the "△" mark of the lock ring (1) is between MIN and MAX [i.e. within (A)].

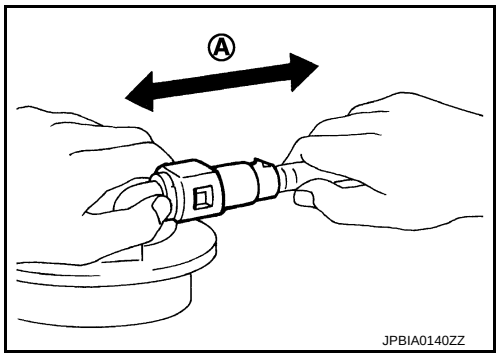
7. Connect quick connector of fuel feed tube as per following procedures.

a. Check the connection for damage or any foreign materials.

b. Align the connector with the tube, then insert the connector straight into the tube until a "click" sound is heard.

c. After connecting, check that the connection is secured with following procedures.
- Visually confirm that the two tabs are connected to the connector.
- Pull (A) the tube and the connector to check that they are securely connected.

8. Connect harness connector.



Inspection Hole Cover

- Before installing inspection hole cover, check that the connecting part has no fuel leakage.

1. Install inspection hole covers with the front mark (arrow) facing front of vehicle.
2. Lock clips by turning counterclockwise.

INSPECTION AFTER INSTALLATION

Check that there is no fuel leakage at connections in the following steps.

- Start engine and rev it up and check that there is no fuel leakage at connections.

Inspection

INFOID:0000000010714505

INSPECTION AFTER INSTALLATION

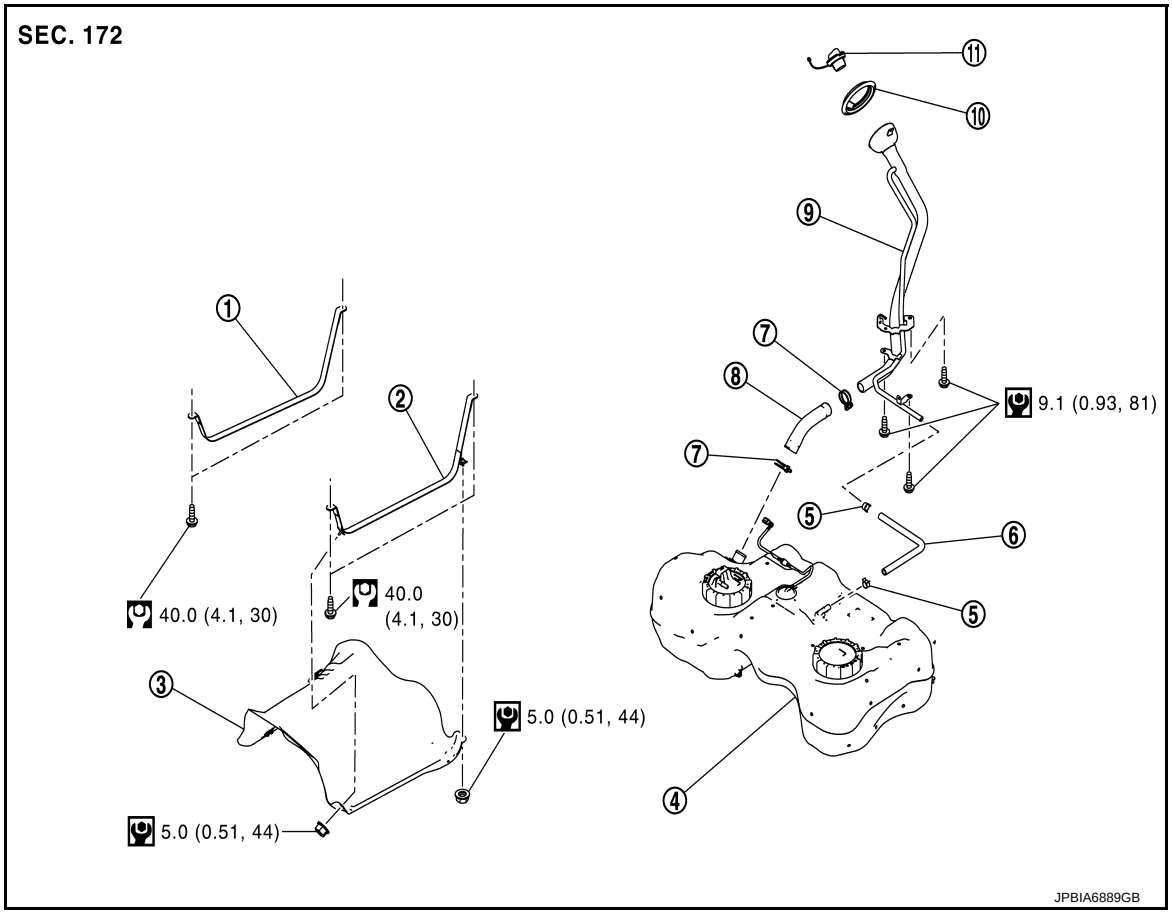
Use the following procedure to check for fuel leakage.

1. Turn ignition switch "ON" (with engine stopped), then check connections for leakage by applying fuel pressure to fuel piping.
2. Start engine. Then let it idle and check that there is no fuel leakage at the fuel system connections.

FUEL TANK

Exploded View

INFOID:0000000010714506



① Fuel tank band (RH)	② Fuel tank band (LH)	③ Protector
④ Fuel tank	⑤ Clamp	⑥ Vent hose
⑦ Clamp	⑧ Fuel filler hose	⑨ Fuel filler tube
⑩ Grommet	⑪ Fuel filler cap	

: N·m (kg-m, ft-lb)

: N·m (kg-m, in-lb)

Removal and Installation

INFOID:0000000010714507

REMOVAL

WARNING:

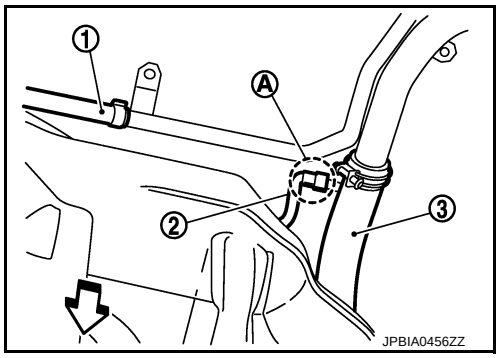
Be sure to read “General Precautions” when working on the fuel system. Refer to FL-15, "General Precautions".

1. Perform the steps 1 to 7 of “REMOVAL” in “ FUEL LEVEL SENSOR UNIT, FUEL FILTER AND FUEL PUMP ASSEMBLY”. Refer to FL-19, "Removal and Installation".
2. Drain fuel from fuel tank if necessary. Refer to FL-19, "Removal and Installation".
   CAUTION:
   - **Fuel tank will become unstable whilst removing. Fuel should be drained from tank prior to removal to reduce this effect.**
   - **Situate vehicle on a flat and solid surface.**
3. Remove main muffler. Refer to EX-11, "Exploded View".

4. Remove rear propeller shaft. Refer to DLN-186, "Removal and Installation". (4WD models)
5. Remove protector from fuel tank.
6. Disconnect vent hose ①, EVAP tube ②, and fuel filler hose ③ at rear side of fuel tank.

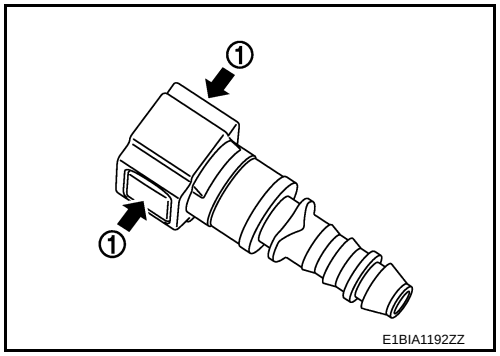
⇦ : Vehicle front

- Instruction for quick connector Ⓐ of EVAP tube.



CAUTION:

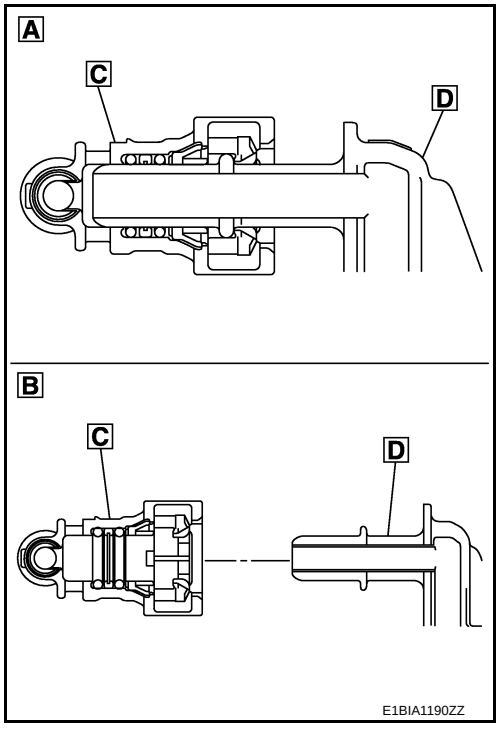
- **Quick connector can be disconnected when the tabs (1) are depressed completely. Never twist it more than necessary.**



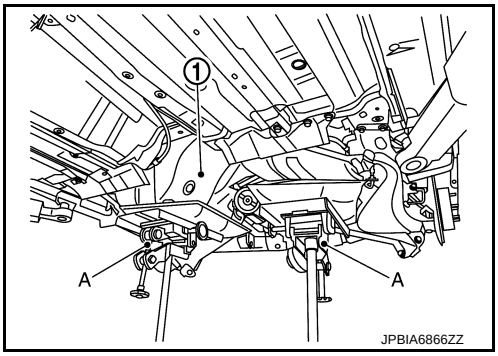
- **Never use any tools to disconnected quick connector.**

A : Connection (cross-section)
B : Disconnection (cross-section)
C : Quick connector
D : Hard tube

- **Keep resin tube away from heat. Be especially careful when welding near the resin tube.**
- **Prevent acid liquid such as battery electrolyte, etc. from getting on resin tube.**
- **Never bend or twist resin tube during installation and disconnection.**
- **Never insert plug, preventing damage to O–ring in quick connector.**
- **To keep the connecting portion clean and to avoid damage and foreign materials, cover them completely with plastic bags or something similar.**



7. Support the lower part of fuel tank ① with transmission jack (A).
CAUTION:
Support the position that fuel tank mounting bands never engage.



8. Remove fuel tank band (RH and LH).
9. Lower transmission jack carefully to remove fuel tank while holding it by hand.
CAUTION:
Fuel tank may be in an unstable condition because of the shape of fuel tank bottom. Never rely on jack too much. Be sure to hold tank securely.

INSTALLATION

Note the following, and install in the reverse order of removal.
- Surely clamp fuel hoses and insert hose to the length below.

Fuel filler hose	**: 35 mm (1.38 in)**
The other hoses	**: 25 mm (0.98 in)**

- Be sure hose clamp is not placed on swelled area of fuel tube.
- Tighten fuel filler hose clamp.

	Remaining length of screw thread	Specified torque
Fuel filler tube side	**: 7 - 11 mm (0.28 - 0.43 in)**	**: 2.5 N·m (0.26 kg-m, 22 in-lb)**
Fuel tank side	**: 5 - 9 mm (0.20 - 0.35 in)**	**: 2.5 N·m (0.26 kg-m, 22 in-lb)**

- To connect quick connector, refer to FL-19, "Removal and Installation".

Inspection

INFOID:0000000010714508

INSPECTION AFTER INSTALLATION

Use the following procedure to check for fuel leakage.
1. Turn ignition switch “ON” (with engine stopped), and check connections for leakage by applying fuel pressure to fuel piping.
2. Start engine and rev it up and check that there is no fuel leakage at the fuel system tube and hose connections.

SERVICE DATA AND SPECIFICATIONS (SDS)

SERVICE DATA AND SPECIFICATIONS (SDS)

Fuel Tank

INFOID:0000000010683791

Standard and Limit

Fuel tank capacity	Approximate 65 ℓ (14-1/4 Imp gal)
Fuel recommendation	Refer to GI-35, "Fuel"

PRECAUTION

PRECAUTIONS

General Precautions

INFOID:0000000010418992

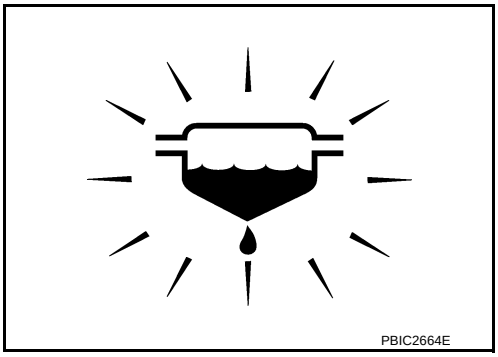
WARNING:

When replacing fuel line parts, be sure to observe the following.

- **Put a “CAUTION: FLAMMABLE” sign in the workshop.**
- **Be sure to work in a well ventilated area and furnish workshop with a CO_2 fire extinguisher.**
- **Never smoke while servicing fuel system. Keep open flames and sparks away from the work area.**

CAUTION:

- **Use diesel fuel required by the regulations for cetane number. Refer to EM-263, "Precaution for Diesel Equipment".**
- **Before removing fuel line parts, perform the following procedures:**
  - **Put drained fuel in an explosion-proof container and put the lid on securely. Keep the container in safe area.**
  - **Disconnect the battery cable from the negative terminal.**
- **Always replace O-ring and clamps with new ones.**
- **Never kink or twist tubes when they are being installed.**
- **Never tighten hose clamps excessively to avoid damaging hoses.**
- **After installing tubes, check that there is no fuel leakage at connections in the following steps.**
  - **Start engine and rev it up and check for fuel leakage at connections.**
- **Use only a genuine NISSAN fuel filler cap as a replacement. If an incorrect fuel filler cap is used, the “MI” may come on.**
- **Drain water from fuel filter, when the fuel filter warning lamp turns ON (with fuel filter warning). Refer to FL-34, "Water Draining".**



PREPARATION

PREPARATION

Special Service Tool

INFOID:0000000010430518

Tool number Tool name	Description
KV101207S0 Lock ring wrench	Removing and Installing lock ring

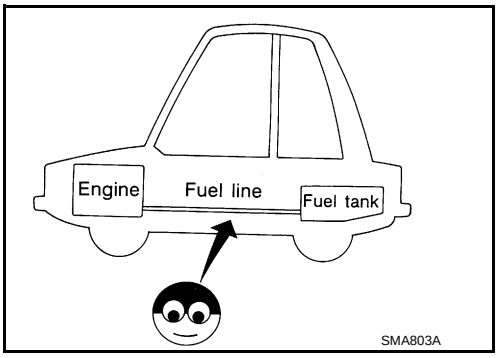
PERIODIC MAINTENANCE

FUEL SYSTEM

Inspection

INFOID:0000000010418994

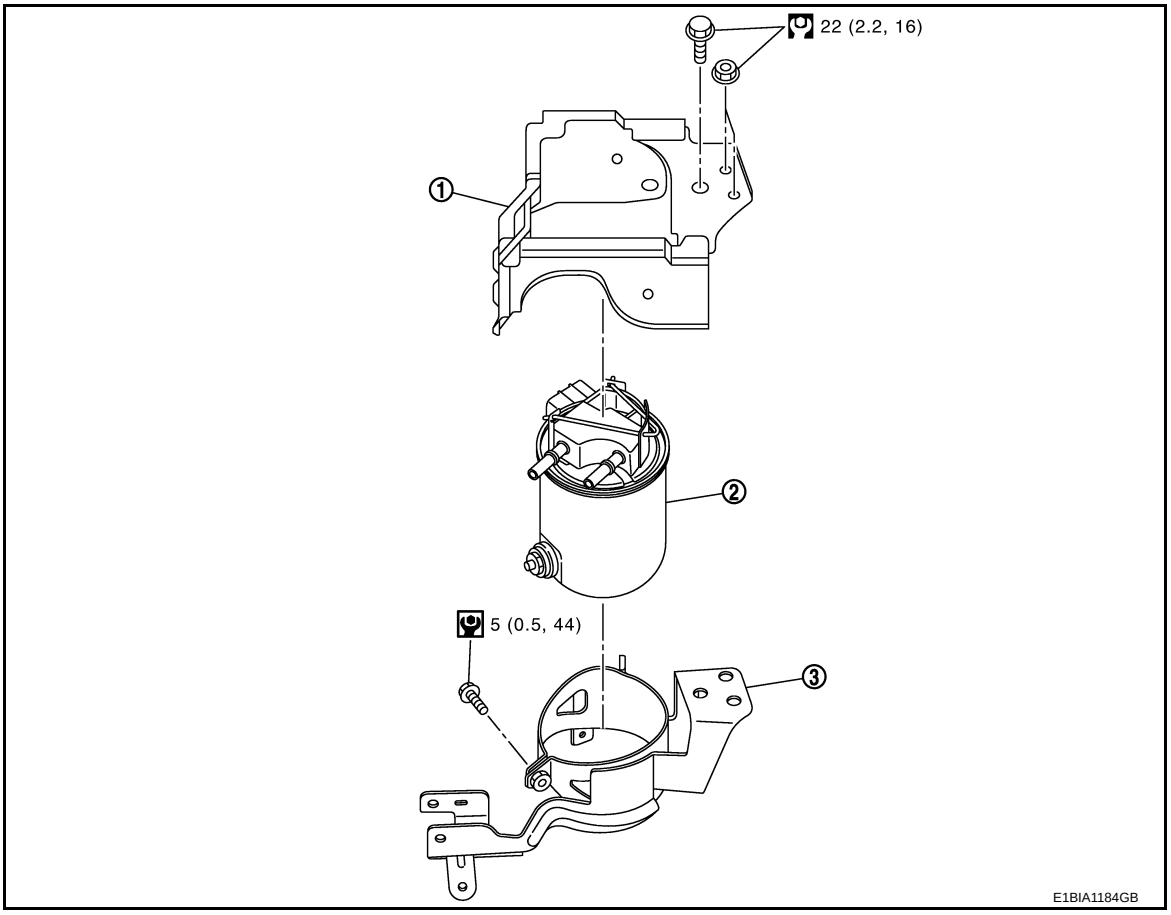
Inspect fuel lines and tank for improper attachment, leaks, cracks, damage, chafing and deterioration. If necessary, repair or replace.



FUEL FILTER

Exploded View

INFOID:0000000010428755



1. Fuel filter protector
2. Fuel filter
3. Fuel filter bracket

Refer to GI-4, "Components" for symbol marks in the figure.

Removal and Installation

INFOID:0000000010428756

REMOVAL

1. Remove fuel protector.
2. Disconnect quick connectors, and remove fuel hoses.
   CAUTION:
   Never splash fuel during removal. If fuel is splashed, immediately wipe it off.
3. Disconnect fuel filter connector.
4. Remove fuel filter.

INSTALLATION

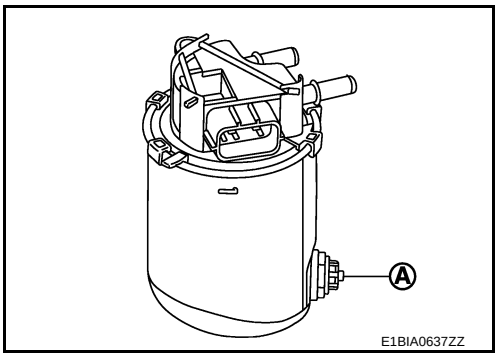
1. Note the following, and install in the reverse order of removal.
   - After installation, bleed air from fuel line. Refer to FL-34, "Air Bleeding".

   CAUTION:
   Never bend or twist the fuel tube during installation and removal.

Water Draining

INFOID:0000000010428757

1. Connect drain hose (suitable hose) to the end of drain plug (A).
2. Prepare a tray at the drain plug open end.
3. Loosen drain plug, and operate priming bulb to drain water from fuel filter.
   CAUTION:
   - **Water in filter is drained with fuel. Prepare larger capacity pan than fuel filter volume.**
   - **Drained water is mixed with fuel. Prevent fuel from adhering to rubber parts such as engine mounting insulator.**
4. After draining, close drain plug by hand.
   CAUTION:
   If drain plug is tightened excessively, it may be damaged and fuel will leak. Never use tools to tighten drain plug.
5. Bleed air in fuel piping. Refer to FL-34, "Air Bleeding".
6. Start engine and check there is no fuel leakage.



Air Bleeding

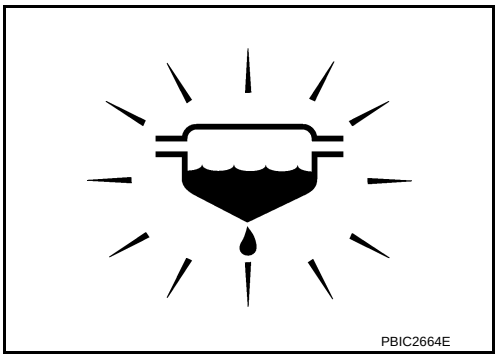
INFOID:0000000010428758

1. Degassing from the diesel circuit is automatic.

Fuel Filter Sensor (With Fuel Filter Warning)

INFOID:0000000010428759

- Drain water from fuel filter, when the fuel filter warning lamp turns ON. Refer to FL-34, "Water Draining".



Inspection

INFOID:0000000010428760

INSPECTION AFTER INSTALLATION

Check that there is no fuel leakage at connections in the following steps.

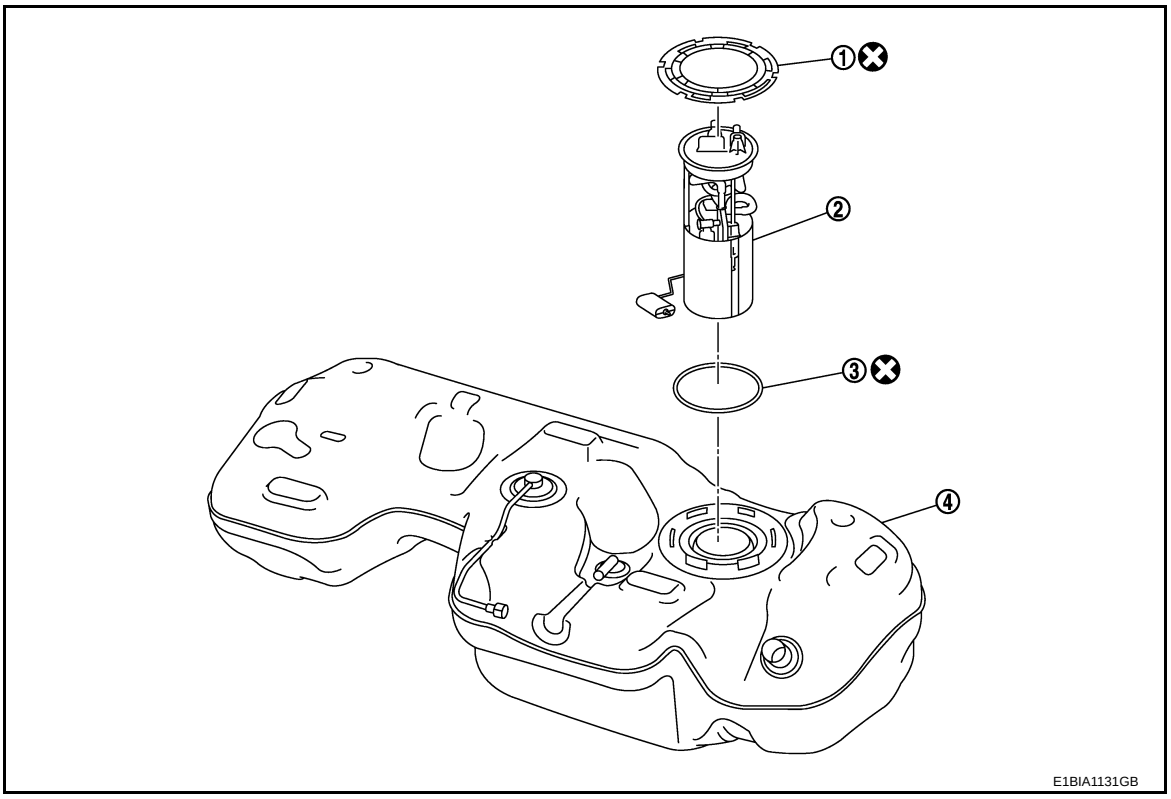
- Start engine and rev it up and check that there is no fuel leakage at connections.

REMOVAL AND INSTALLATION

FUEL LEVEL SENSOR UNIT, FUEL FILTER AND FUEL PUMP ASSEMBLY

Exploded View

INFOID:0000000010419005



1. Lock ring
2. Fuel level sensor unit, fuel filter and fuel pump assembly
3. O-ring
4. Fuel tank

Refer to GI-4, "Components" for symbol marks in the figure.

Removal and Installation

INFOID:0000000010430536

WARNING:
Read “General Precautions” when working on the fuel system. Refer to FL-30, "General Precautions".

REMOVAL

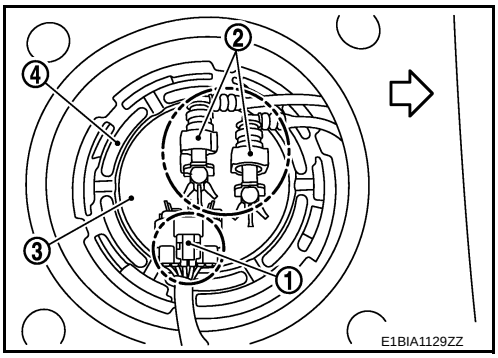
1. Release the fuel pressure from the fuel lines. Refer to ECK-153, "Work Procedure".
2. Check fuel level on a level ground. If the fuel level is at 1/2 or higher, drain enough fuel so that the level on the fuel gauge is at half or below.
   - This is to prevent overflow of fuel from the tank when the fuel level sensor unit, fuel filter and fuel pump assembly is removed

   Guideline : Draw approximately 27 liters (6 Imp gal) from a full-tank condition.

   - In the event of malfunction in fuel pump, insert a hose measuring less than 20mm (0.79 in) in diameter into fuel filler tube through fuel filler opening to draw fuel from filler tube.
   - Disconnect fuel filler hose from fuel filler tube. Refer to FL-10, "Exploded View".
   - Insert hose into fuel tank through fuel filler hose to draw fuel from fuel tank.
3. Disconnect batterie cable from negative terminal.
4. Open fuel filler lid and filler cap to release the pressure inside fuel tank.

5. Remove rear seat. Refer to SE-35, "Removal and Installation".
6. Remove inspection hole cover.
7. Disconnect harness connector and fuel feed tube.

NOTE:
Make sure that identification between the feed line and return line is made to enable correct assembly during installation.

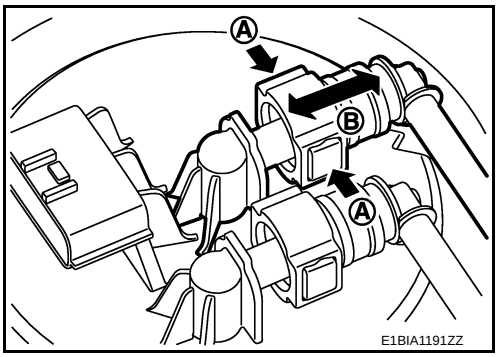


1 : Harness connector
2 : Quick connector
3 : Fuel level sensor unit, fuel filter and fuel pump assembly
4 : Lock ring
⇦ : Vehicle front

- Remove quick connector in the following procedures.

- **NOTE:**
  - The figure show the process of quick connector disconnection. Parts arround quick connector could have a different shape compare to the figure.

- Hold the sides of quick connector, press tabs and pull out fuel feed tube.

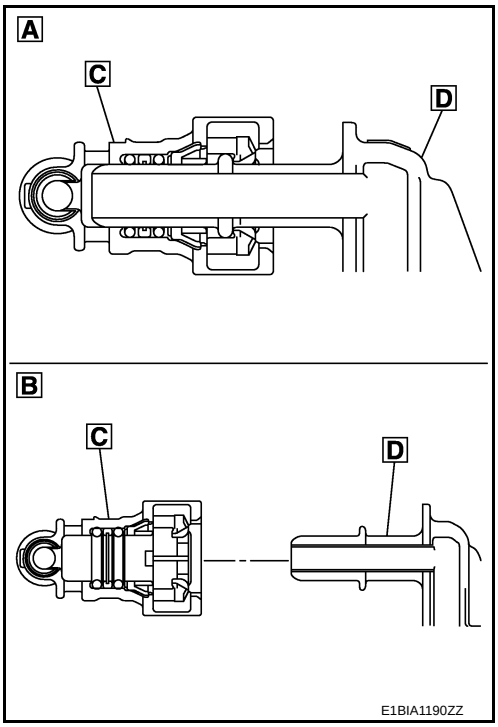


A : Push in tabs
B : Pull

- If quick connector sticks to tube of main fuel level sensor unit, push and pull quick connectors several times until they start to move. Then disconnect them by pulling.

CAUTION:

- **Quick connector can be disconnected when the tabs are depressed completely. Never twist it more than necessary.**

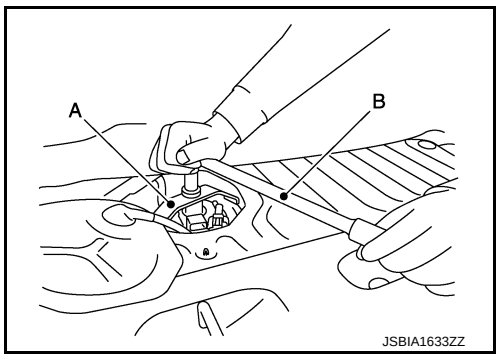


A : Connection (cross-section)
B : Disconnection (cross-section)
C : Quick connector
D : Hard tube

- **Never use any tools to disconnected quick connector.**
- **Keep resin tube away from heat. Be especially careful when welding near the resin tube.**
- **Prevent acid liquid such as battery electrolyte, etc. from getting on resin tube.**
- **Never bend or twist resin tube during installation and disconnection.**
- **Never insert plug, preventing damage to O–ring in quick connector.**
- **To keep the connecting portion clean and to avoid damage and foreign materials, cover them completely with plastic bags or something similar.**

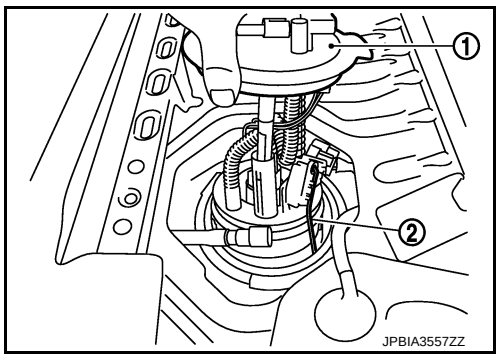
8. Use lock ring wrench [SST: KV101207S0] (A) to remove lock ring.

CAUTION:
- **To prevent lock ring wrench from being detached, securely hold down spinner handle (B) by hand.**
- **To reduce impact caused by removal operation, use long spinner handle [handle length: 60 cm (23.62 in) or more] and slowly turn it counterclockwise.**



9. Remove fuel level sensor unit, fuel filter and fuel pump assembly (1).

CAUTION:
- **Never bend float arm (2) during removal.**
- **Never pollute the residual fuel inside of the tank. Draw out avoiding inclination by supporting with a cloth.**
- **Never cause impacts such by dropping when handling components.**



INSTALLATION

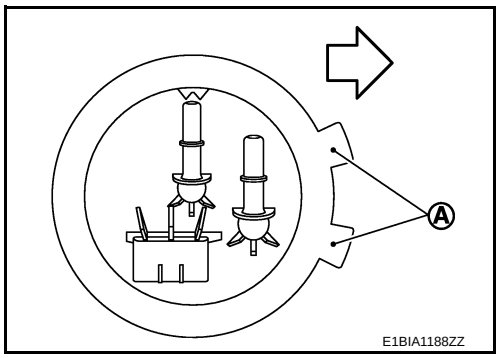
Note to the following, and install in the reverse order of removal.

Fuel Level Sensor Unit

1. Install new O-ring to fuel tank without any twist.
2. Install the fuel gauge on the fuel tank with the fuel gauge top surface (A) faced the front of the vehicle.

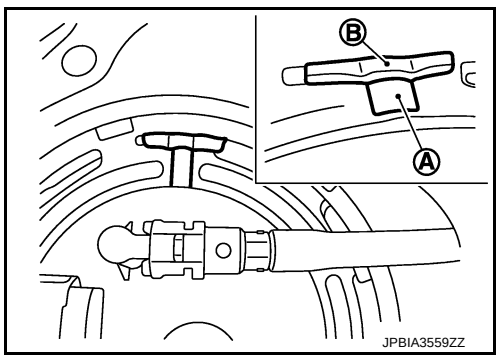
⇦ : Vehicle front

CAUTION:
- **Never allow O-ring to drop.**
- **Never bend float arm during installing.**



3. Install lock ring for fuel level sensor unit, fuel filter and fuel pump assembly with lock ring wrench [SST: KV101207S0] by turning clockwise.

CAUTION:
- **Install lock ring horizontally.**
- **Turn the lock ring (A) until it is engaged in the fuel tank side (B) as shown in the figure.**

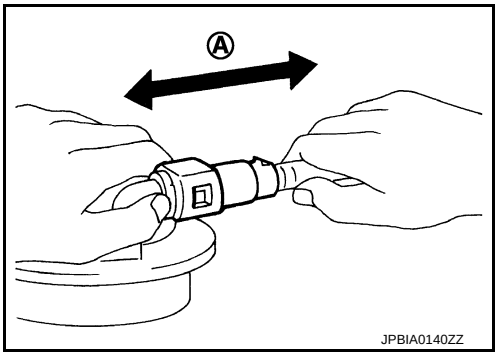


Quick Connector

- Connect quick connector as follows:

1. Check the connection for damage or any foreign materials.

2. Align the connector with the tube, then insert the connector straight into the tube until a “click” sound is heard.
3. After connecting, check that the connection is secured with following procedures.
   - Visually confirm that the two tabs are connected to the connector.
   - Pull (A) the tube and the connector to check that they are securely connected.



4. Reattach harness connector.

Inspection

INFOID:0000000010430519

INSPECTION AFTER INSTALLATION

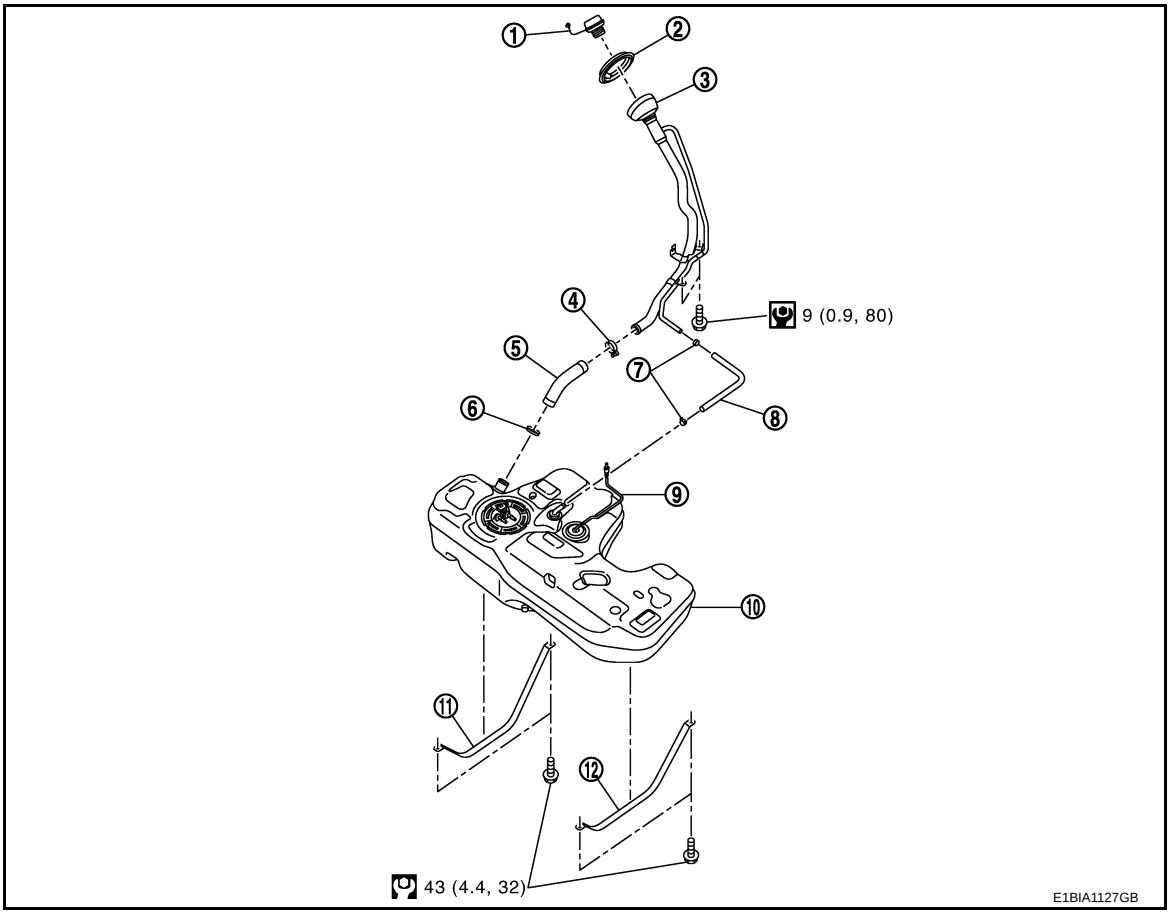
Use the following procedure to check for fuel leaks.

1. Turn ignition switch “ON” (with engine stopped), then check connections for leaks by applying fuel pressure to fuel piping.
2. Start engine and let it idle and make sure there are no fuel leaks at the fuel system connections.

FUEL TANK

Exploded View

INFOID:0000000010419002



1. Fuel filler cap	2. Grommet	3. Fuel filler tube
4. Clamp	5. Fuel filler hose	6. Clamp
7. Clamp	8. Vent hose	9. Evap hose
10. Fuel tank	11. Fuel tank band (RH)	12. Fuel tank band (LH)

Refer to GI-4, "Components" for symbol marks in the figure.

Removal and Installation

INFOID:0000000010430532

REMOVAL

WARNING:

Be sure to read “General Precautions” when working on the fuel system. Refer to FL-30, "General Precautions".

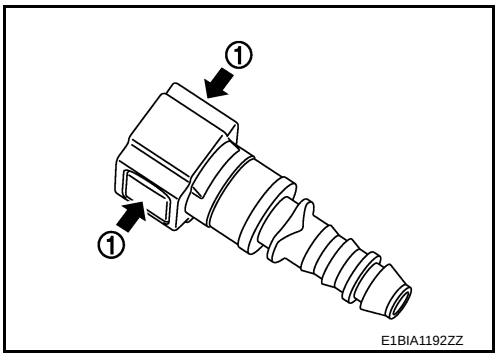
1. Perform the steps 1 to 7 of “REMOVAL” in “ FUEL LEVEL SENSOR UNIT, FUEL FILTER AND FUEL PUMP ASSEMBLY”. Refer to FL-6, "Removal and Installation".
2. Drain fuel from fuel tank if necessary. Refer to FL-6, "Removal and Installation".
   CAUTION:
   - **Fuel tank will become unstable whilst removing. Fuel should be drained from tank prior to removal to reduce this effect.**
   - **Situate vehicle on a flat and solid surface.**
3. Remove main muffler. Refer to EX-6, "Exploded View".
4. Remove vent hose from filler tube.
5. Remove fuel filler hose from fuel tank.
   CAUTION:

- **Do not remove fuel filler hose from fuel filler tube to prevent interference with suspension when installing.**
- **If removal of fuel filler hose from fuel filler tube is necessary use mating marks to ensure correct orientation.**

6. Disconnect EVAP hose.
   - Remove quick connector in the following procedures.
   - Hold the sides of quick connector, press tabs and disconnect EVAP hose.
   - If quick connector sticks to tube, push and pull quick connectors several times until they start to move. Then disconnect them by pulling.

CAUTION:

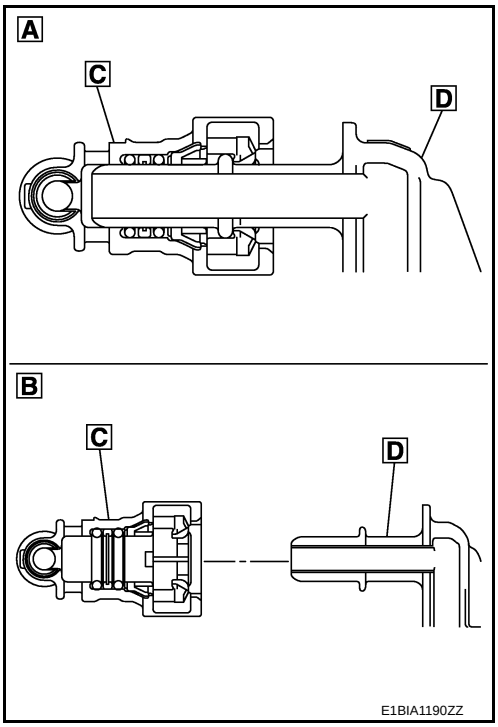
- **Quick connector can be disconnected when the tabs (1) are depressed completely. Never twist it more than necessary.**



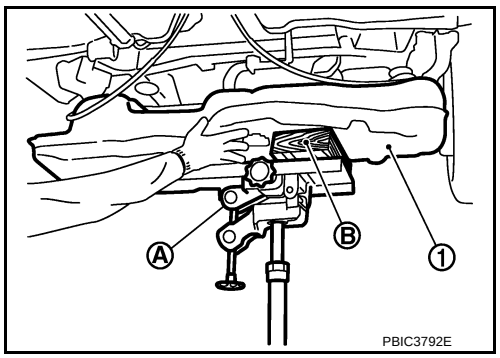
- **Never use any tools to disconnected quick connector.**

  A : Connection (cross-section)
  B : Disconnection (cross-section)
  C : Quick connector
  D : Hard tube

- **Keep resin tube away from heat. Be especially careful when welding near the resin tube.**
- **Prevent acid liquid such as battery electrolyte, etc. from getting on resin tube.**
- **Never bend or twist resin tube during installation and disconnection.**
- **Never insert plug, preventing damage to O–ring in quick connector.**
- **To keep the connecting portion clean and to avoid damage and foreign materials, cover them completely with plastic bags or something similar.**



7. Support center of fuel tank (1) with transmission jack (A) and piece of wood (B).
   CAUTION:
   - **Make sure the tank bottom surface is supported well enough to prevent an unstable condition when lowering the tank.**
   - **Make sure to hold it securely as tank surface may not be flat.**



8. Remove fuel tank band (RH and LH).
9. Lower transmission jack carefully to remove fuel tank while holding it by hand.
   CAUTION:
   Make sure to avoid any interference with surrounding component that may cause damage.

INSTALLATION

Note the following, and install in the reverse order of removal.

CAUTION:

- **Make sure hose clamps and hoses clips are not secured on top of the filler tube bulges.**
- **Make sure all quick connectors and their mating part are free of foreign matter, check for damage.**
- **Ensure the tank bands are correctly assembled as per their identification marks "L" and "R".**
- **Make sure that the torques of the mounting bolts are correct as per exploded view. Refer to FL-39, "Exploded View".**
- **Make sure that when installing the connectors, the confirmation click sound is heard. Pull back on the connector to ensure proper engagement.**

Fuel Filler Hose

- Insert fuel filler hose to the length below.

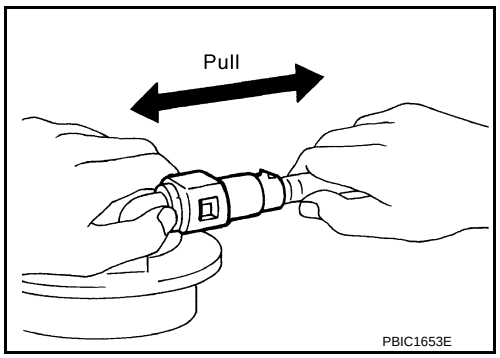
: 35 mm (1.38 in)

- Be sure hose clamp is not placed on swelled area of fuel filler tube.
- Tighten fuel filler hose clamp so that the remaining length of screw thread becomes to the following.

Fuel filler tube side : 7 - 11 mm (0.28 - 0.43 in)
Fuel tank side : 5 - 9 mm (0.20 - 0.35 in)

EVAP Hose

1. Check connections for damage or foreign material.
2. Align the matching side connection part with the center of shaft, and insert connector straight until it clicks.
3. After connecting, pull out quick connector and centralized under-floor piping by hand. Make sure connections are secure.



Inspection

INFOID:0000000010419004

INSPECTION AFTER INSTALLATION

Make sure there is no fuel leakage at connections in the following procedure.

- Start engine, rev it up and make sure there is no fuel leakage at connections.

SERVICE DATA AND SPECIFICATIONS (SDS)

SERVICE DATA AND SPECIFICATIONS (SDS)

Fuel Tank

INFOID:0000000010419009

Fuel tank capacity	Approx. 55 ℓ (12-1/8 Imp gal)
Fuel recommendation	Refer to GI-35, "Fuel"

PRECAUTION

PRECAUTIONS

General Precautions

INFOID:0000000010419010

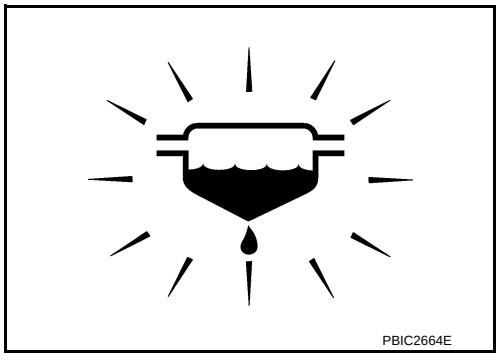
WARNING:

When replacing fuel line parts, be sure to observe the following.

- **Put a “CAUTION: FLAMMABLE” sign in the workshop.**
- **Be sure to work in a well ventilated area and furnish workshop with a CO_2 fire extinguisher.**
- **Never smoke while servicing fuel system. Keep open flames and sparks away from the work area.**

CAUTION:

- **Use diesel fuel required by the regulations for cetane number. Refer to GI-35, "Fuel".**
- **Before removing fuel line parts, perform the following procedures:**
- **Put drained fuel in an explosion-proof container and put the lid on securely. Keep the container in safe area.**
- **Disconnect the battery cable from the negative terminal.**
- **Always replace O-ring and clamps with new ones.**
- **Never kink or twist tubes when they are being installed.**
- **Never tighten hose clamps excessively to avoid damaging hoses.**
- **After installing tubes, check that there is no fuel leakage at connections in the following steps.**
- **Start engine and rev it up and check for fuel leakage at connections.**
- **Use only a genuine NISSAN fuel filler cap as a replacement. If an incorrect fuel filler cap is used, the “MI” may come on.**
- **Drain water from fuel filter, when the fuel filter warning lamp turns ON (with fuel filter warning). Refer to FL-47, "Water Draining".**

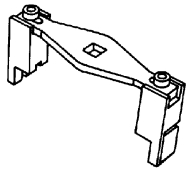


PREPARATION

PREPARATION

Special Service Tools

INFOID:0000000010419011

Tool number Tool name	Description
KV101207S0 Lock ring wrench	Removing and Installing lock ring 2WD
KV99104700 Lock ring wrench  ZZA0122D	Removing and Installing lock ring 4WD

PERIODIC MAINTENANCE

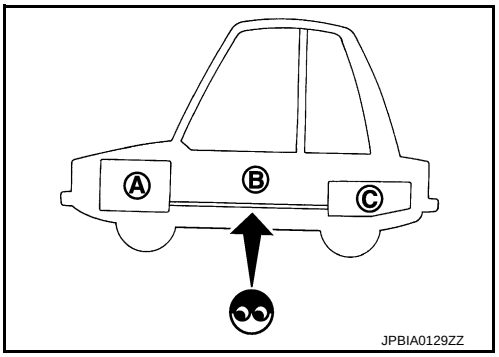
FUEL SYSTEM

Inspection

INFOID:0000000010419012

Inspect fuel lines, fuel filler cap and fuel tank for improper attachment, leakage, cracks, damage, loose connections, chafing or deterioration.
If necessary, repair or replace damaged parts.

A : Engine
B : Fuel line
C : Fuel tank



JPBIA0129ZZ

Quick Connector

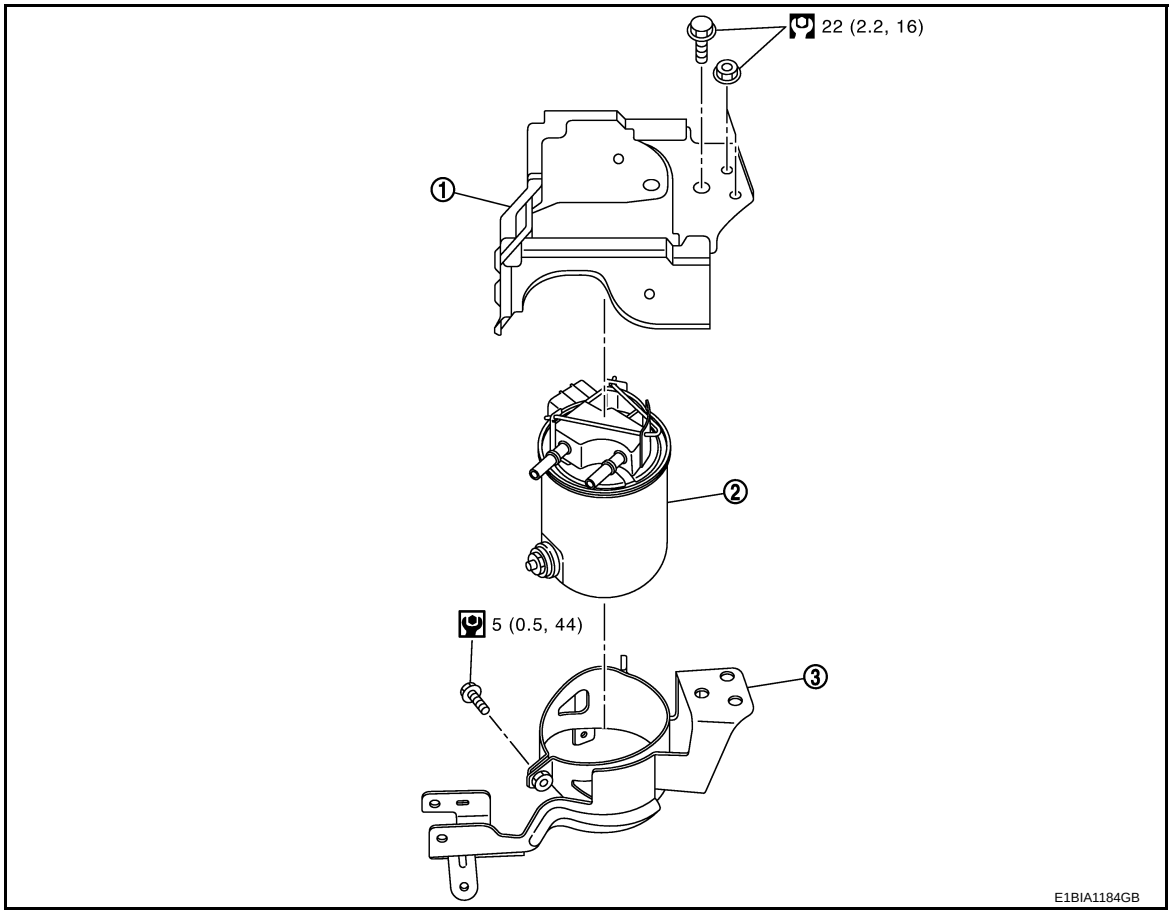
INFOID:0000000010419013

CAUTION:
- **After connecting fuel tube quick connectors, check that quick connectors are secure.**
- **Ensure that connector and resin tube never contact any adjacent parts.**

FUEL FILTER

Exploded View

INFOID:0000000010419014



1. Fuel filter protector
2. Fuel filter
3. Fuel filter bracket

Refer to GI-4, "Components" for symbol marks in the figure.

Removal and Installation

INFOID:0000000010419015

REMOVAL

1. Disconnect quick connectors, and remove fuel hoses.
   CAUTION:
   Never splash fuel during removal. If fuel is splashed, immediately wipe it off.
2. Remove fuel protector.
3. Disconnect fuel filter connector.
4. Remove fuel filter.

INSTALLATION

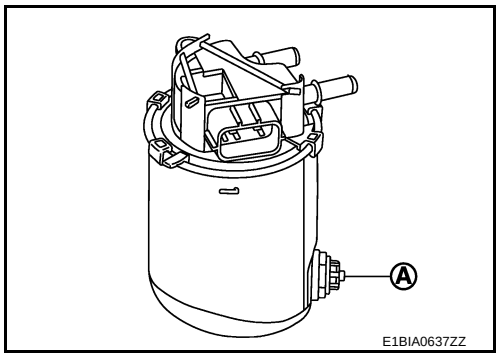
1. Note the following, and install in the reverse order of removal.
   - After installation, bleed air from fuel line. Refer to FL-47, "Air Bleeding".

   CAUTION:
   Never bend or twist the fuel tube during installation and removal.

Water Draining

INFOID:0000000010419016

1. Connect drain hose (suitable hose) to the end of drain plug (A).
2. Prepare a tray at the drain plug open end.
3. Loosen drain plug, and operate priming bulb to drain water from fuel filter.
   CAUTION:
   - **Water in filter is drained with fuel. Prepare larger capacity pan than fuel filter volume.**
   - **Drained water is mixed with fuel. Prevent fuel from adhering to rubber parts such as engine mounting insulator.**
4. After draining, close drain plug by hand.
   CAUTION:
   If drain plug is tightened excessively, it may be damaged and fuel will leak. Never use tools to tighten drain plug.
5. Bleed air in fuel piping. Refer to FL-47, "Air Bleeding".
6. Start engine and check there is no fuel leakage.



Air Bleeding

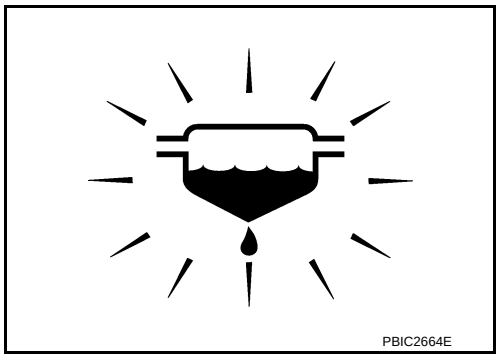
INFOID:0000000010419017

1. Degassing from the diesel circuit is automatic.

Fuel Filter Sensor (With Fuel Filter Warning)

INFOID:0000000010419018

- Drain water from fuel filter, when the fuel filter warning lamp turns ON. Refer to FL-47, "Water Draining".



Inspection

INFOID:0000000010419019

INSPECTION AFTER INSTALLATION

Check that there is no fuel leakage at connections in the following steps.

- Start engine and rev it up and check that there is no fuel leakage at connections.

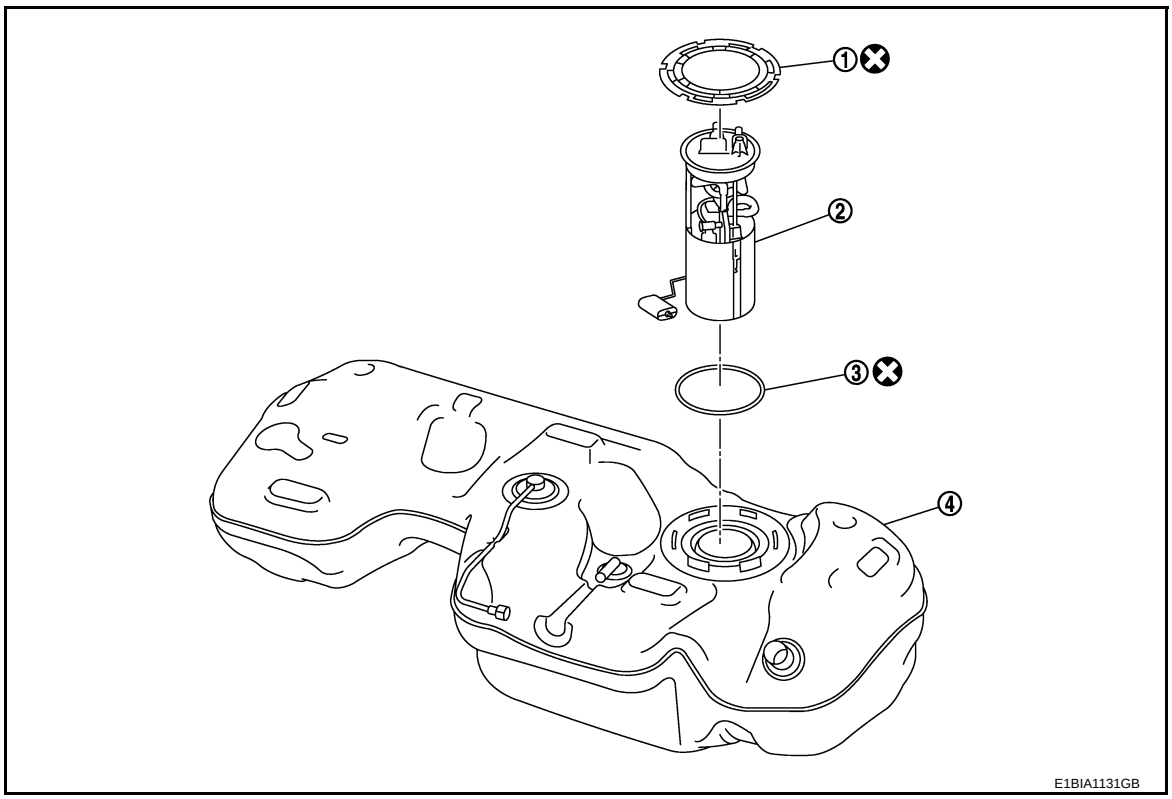
REMOVAL AND INSTALLATION

FUEL LEVEL SENSOR UNIT

2WD

2WD : Exploded View

INFOID:0000000010430539



1. Lock ring
2. Fuel level sensor unit, fuel filter and fuel pump assembly
3. O-ring
4. Fuel tank

Refer to GI-4, "Components" for symbol marks in the figure.

2WD : Removal and Installation

INFOID:0000000010763739

WARNING:
Read “General Precautions” when working on the fuel system. Refer to FL-30, "General Precautions".

REMOVAL

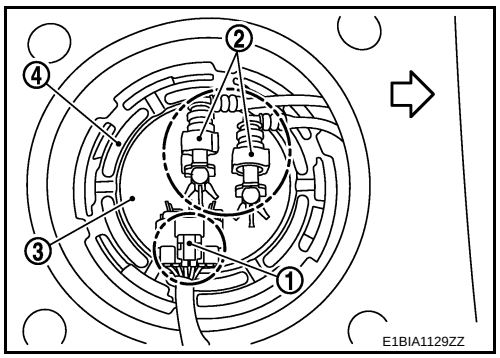
1. Release the fuel pressure from the fuel lines. Refer to ECK-153, "Work Procedure".
2. Check fuel level on a level ground. If the fuel level is at 1/2 or higher, drain enough fuel so that the level on the fuel gauge is at half or below.
   - This is to prevent overflow of fuel from the tank when the fuel level sensor unit, fuel filter and fuel pump assembly is removed

   Guideline : Draw approximately 27 liters (6 Imp gal) from a full-tank condition.

   - In the event of malfunction in fuel pump, insert a hose measuring less than 20mm (0.79 in) in diameter into fuel filler tube through fuel filler opening to draw fuel from filler tube.
   - Disconnect fuel filler hose from fuel filler tube. Refer to FL-10, "Exploded View".
   - Insert hose into fuel tank through fuel filler hose to draw fuel from fuel tank.
3. Disconnect batterie cable from negative terminal.

4. Open fuel filler lid and filler cap to release the pressure inside fuel tank.
5. Remove rear seat. Refer to SE-35, "Removal and Installation".
6. Remove inspection hole cover.
7. Disconnect harness connector and fuel feed tube.

NOTE:
Make sure that identification between the feed line and return line is made to enable correct assembly during installation.

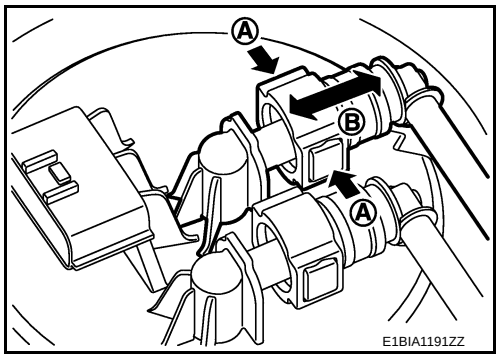


1 : Harness connector
2 : Quick connector
3 : Fuel level sensor unit, fuel filter and fuel pump assembly
4 : Lock ring
⇦ : Vehicle front

- Remove quick connector in the following procedures.

- **NOTE:**
  - The figure show the process of quick connector disconnection. Parts arround quick connector could have a different shape compare to the figure.

- Hold the sides of quick connector, press tabs and pull out fuel feed tube.

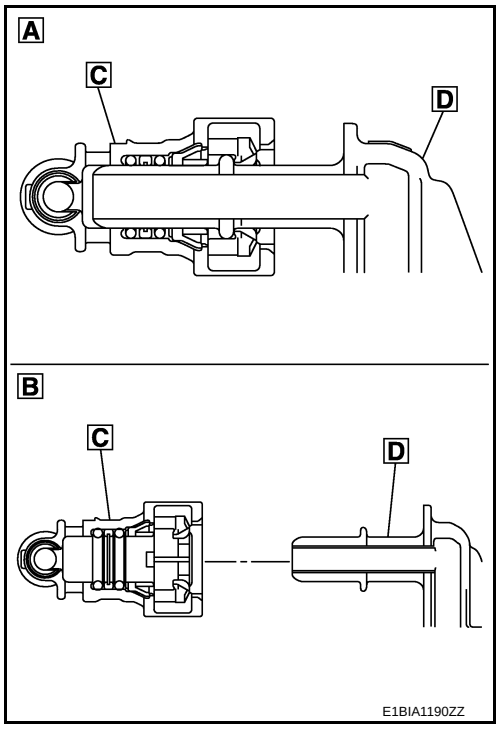


A : Push in tabs
B : Pull

- If quick connector sticks to tube of main fuel level sensor unit, push and pull quick connectors several times until they start to move. Then disconnect them by pulling.

CAUTION:

- **Quick connector can be disconnected when the tabs are depressed completely. Never twist it more than necessary.**

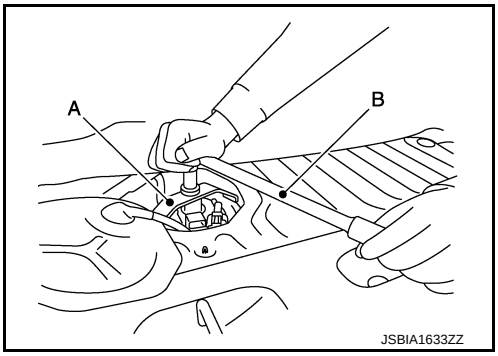


A : Connection (cross-section)
B : Disconnection (cross-section)
C : Quick connector
D : Hard tube

- **Never use any tools to disconnected quick connector.**
- **Keep resin tube away from heat. Be especially careful when welding near the resin tube.**
- **Prevent acid liquid such as battery electrolyte, etc. from getting on resin tube.**
- **Never bend or twist resin tube during installation and disconnection.**
- **Never insert plug, preventing damage to O–ring in quick connector.**
- **To keep the connecting portion clean and to avoid damage and foreign materials, cover them completely with plastic bags or something similar.**

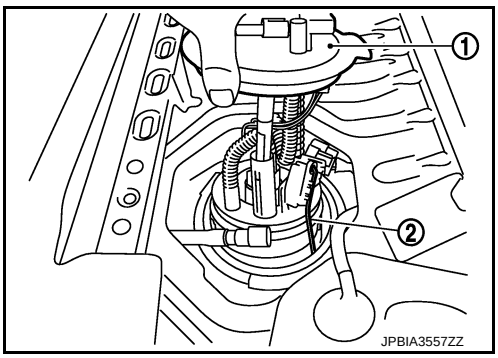
8. Use lock ring wrench [SST: KV101207S0] (A) to remove lock ring.

CAUTION:
- **To prevent lock ring wrench from being detached, securely hold down spinner handle (B) by hand.**
- **To reduce impact caused by removal operation, use long spinner handle [handle length: 60 cm (23.62 in) or more] and slowly turn it counterclockwise.**



9. Remove fuel level sensor unit, fuel filter and fuel pump assembly (1).

CAUTION:
- **Never bend float arm (2) during removal.**
- **Never pollute the residual fuel inside of the tank. Draw out avoiding inclination by supporting with a cloth.**
- **Never cause impacts such by dropping when handling components.**



INSTALLATION

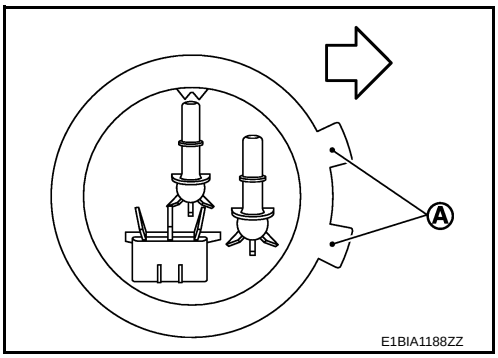
Note to the following, and install in the reverse order of removal.

Fuel Level Sensor Unit

1. Install new O-ring to fuel tank without any twist.
2. Install the fuel gauge on the fuel tank with the fuel gauge top surface (A) faced the front of the vehicle.

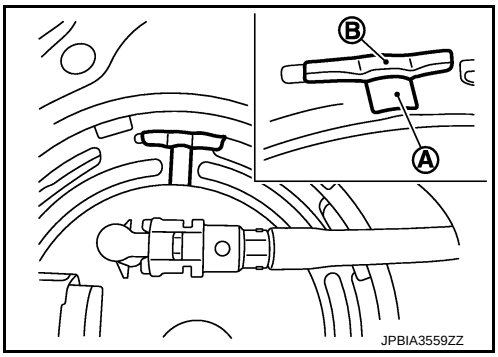
⇦ : Vehicle front

CAUTION:
- **Never allow O-ring to drop.**
- **Never bend float arm during installing.**



3. Install lock ring for fuel level sensor unit, fuel filter and fuel pump assembly with lock ring wrench [SST: KV101207S0] by turning clockwise.

CAUTION:
- **Install lock ring horizontally.**
- **Turn the lock ring (A) until it is engaged in the fuel tank side (B) as shown in the figure.**

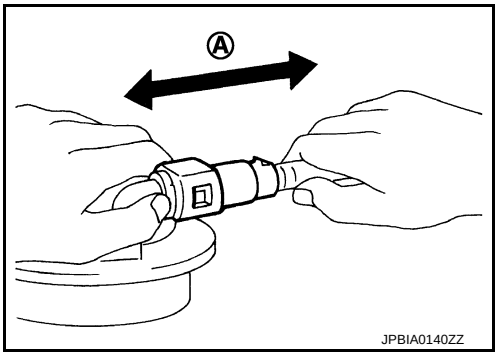


Quick Connector

- Connect quick connector as follows:

1. Check the connection for damage or any foreign materials.

2. Align the connector with the tube, then insert the connector straight into the tube until a “click” sound is heard.
3. After connecting, check that the connection is secured with following procedures.
   - Visually confirm that the two tabs are connected to the connector.
   - Pull (A) the tube and the connector to check that they are securely connected.



4. Reattach harness connector.

2WD : Inspection

INFOID:0000000010430541

INSPECTION AFTER INSTALLATION

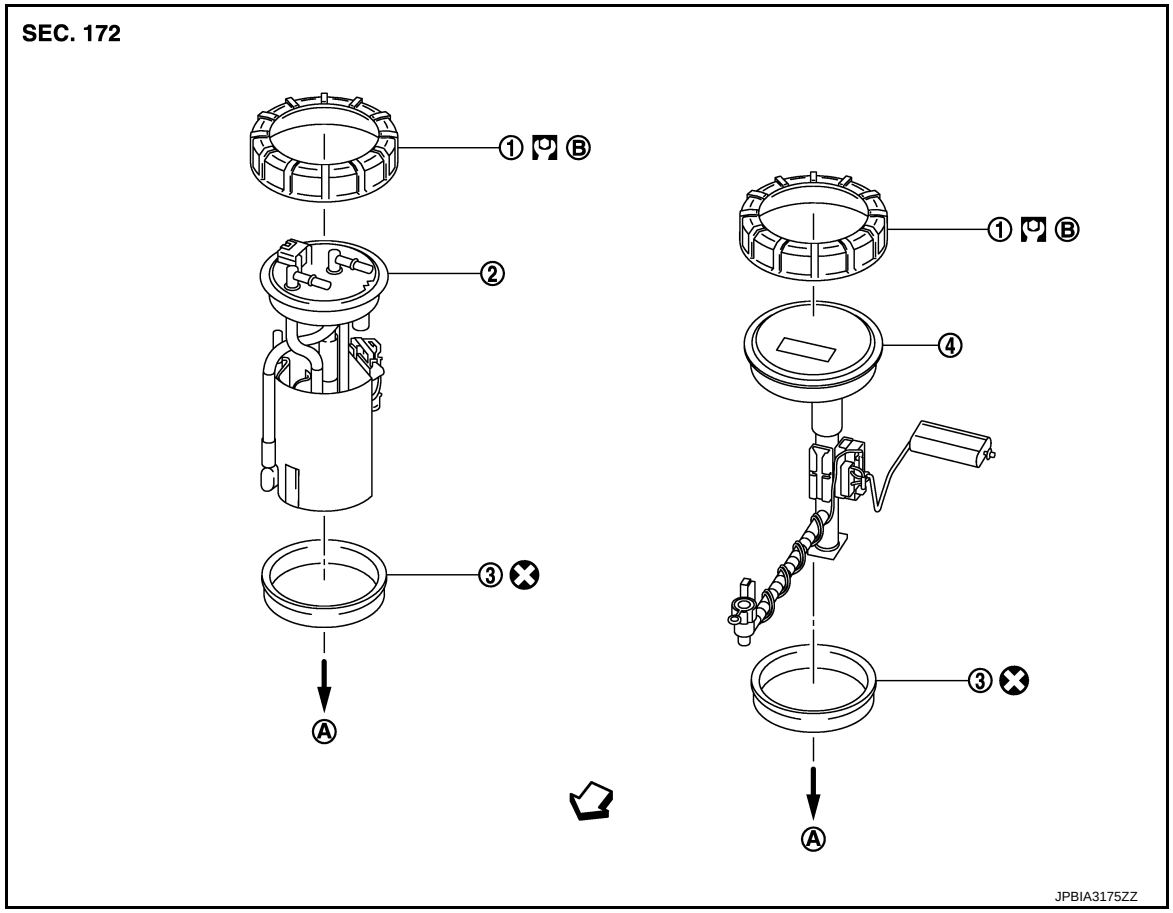
Use the following procedure to check for fuel leaks.

1. Turn ignition switch “ON” (with engine stopped), then check connections for leaks by applying fuel pressure to fuel piping.
2. Start engine and let it idle and make sure there are no fuel leaks at the fuel system connections.

4WD

4WD : Exploded View

INFOID:0000000010430557



1. Lock ring
2. Fuel level sensor unit
3. O-ring
4. Sub fuel level sensor unit

A. To fuel tank

B. Tightening must be done following the Installation procedure. Refer to FL-52, "4WD : Removal and Installation".

⇦ : Vehicle front

Refer to GI-4, "Components" for symbol marks in the figure.

CAUTION:

Never remove or disassemble parts unless instructed as shown in the figure.

4WD : Removal and Installation

INFOID:0000000010430556

REMOVAL

Fuel Level Sensor Unit

WARNING:

Be sure to read “General Precautions” before working on the fuel system. Refer to FL-43, "General Precautions".

1. Release the fuel pressure from the fuel lines. Refer to ECK-153, "Work Procedure".
2. Check fuel level on a level ground. If the fuel level is at 1/2 or higher, drain enough fuel so that the level on the fuel gauge is at half or below.
   - This is to prevent overflow of fuel from the tank when the fuel level sensor unit, fuel filter and fuel pump assembly is removed

     Guideline : Draw approximately 32 liters (7 Imp gal) from a full-tank condition.

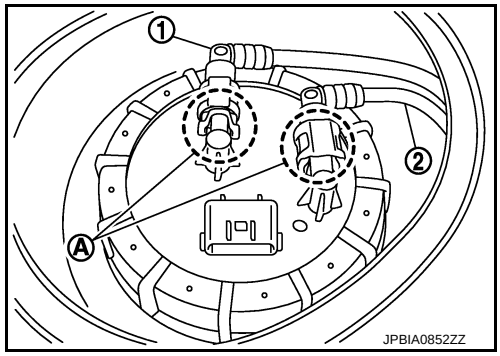
   - In the event of malfunction in fuel pump, insert a hose measuring less than 20mm (0.79 in) in diameter into fuel filler tube through fuel filler opening to draw fuel from filler tube.
   - Disconnect fuel filler hose from fuel filler tube. Refer to FL-10, "Exploded View".
   - Insert hose into fuel tank through fuel filler hose to draw fuel from fuel tank.
3. Disconnect batterie cable from negative terminal.
4. Open fuel filler lid and filler cap to release the pressure inside fuel tank.
5. Remove rear seat. Refer to SE-35, "Removal and Installation".
6. Remove inspection hole cover.
   - Using a screwdriver, remove it by turning clips clockwise by 90 degrees.
7. Disconnect harness connector and quick connectors (A).

   NOTE:

   Make sure that identification between the feed line and return line is made to enable correct assembly during installation.

   1 : Fuel tube (return side)

   2 : Fuel tube (feed side)

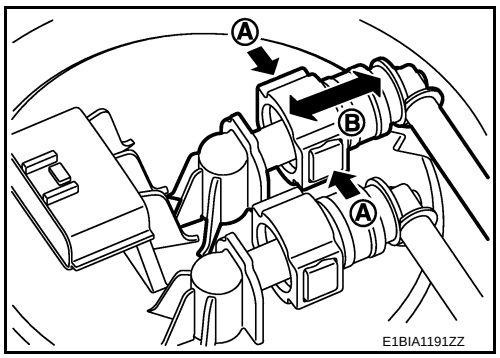


   - Remove quick connector in the following procedures.
   - **NOTE:**
     - The figure show the process of quick connector disconnection. Parts arround quick connector could have a different shape compare to the figure.

- Hold the sides of quick connector, press tabs and pull out fuel feed tube.

A : Push in tabs
B : Pull

- If quick connector sticks to tube of main fuel level sensor unit, push and pull quick connectors several times until they start to move. Then disconnect them by pulling.

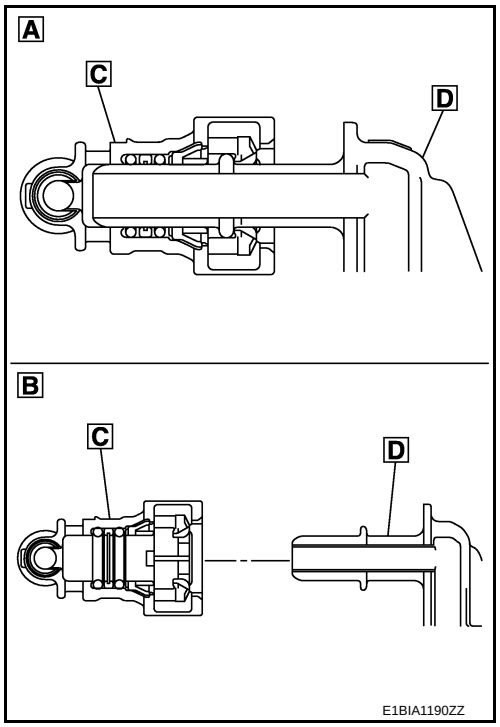


CAUTION:

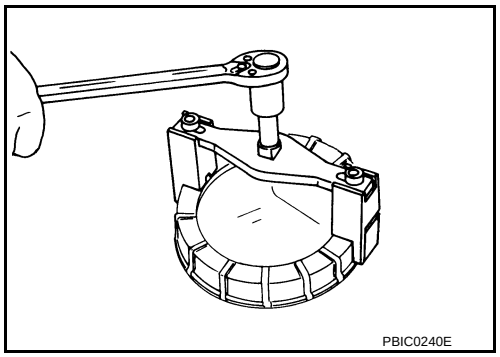
- **Quick connector can be disconnected when the tabs are depressed completely. Never twist it more than necessary.**

A : Connection (cross-section)
B : Disconnection (cross-section)
C : Quick connector
D : Hard tube

- **Never use any tools to disconnected quick connector.**
- **Keep resin tube away from heat. Be especially careful when welding near the resin tube.**
- **Prevent acid liquid such as battery electrolyte, etc. from getting on resin tube.**
- **Never bend or twist resin tube during installation and disconnection.**
- **Never insert plug, preventing damage to O–ring in quick connector.**
- **To keep the connecting portion clean and to avoid damage and foreign materials, cover them completely with plastic bags or something similar.**



8. Using lock ring wrench [SST: KV99104700], remove lock ring.
NOTE:
For reference when installing, put a matching mark on lock ring, fuel level sensor unit and fuel tank.



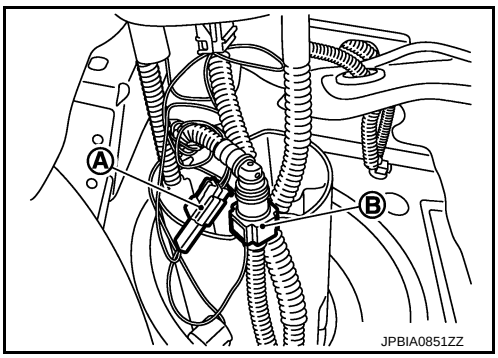
9. Raise fuel level sensor unit.
CAUTION:
- **Never bend float arm during removal.**
- **Never pollute the residual fuel inside of the tank. Draw out avoiding inclination by supporting with a cloth.**
- **Never cause impacts such by dropping when handling components.**

10. Separate fuel tube as per the following steps to remove fuel level sensor unit.

- Pinch quick connector (B) square-part with your fingers, and pull out the quick connector by hand.
- If quick connector and tube on sender unit are stuck, push several times until they move, and pull out.

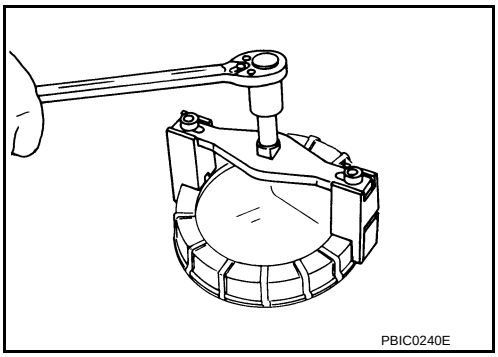
NOTE:
When separating the fuel tube, tie a diesel-resistance rope to the tip of the fuel tube and leave the rope on the fuel tank side to easily pull the fuel tube for installation.

- Disconnect harness connector (A).



Sub Fuel Level Sensor Assembly

1. Remove fuel level sensor unit, fuel filter and fuel pump assembly.
2. Use lock ring wrench [SST: KV99104700] to remove lock ring.

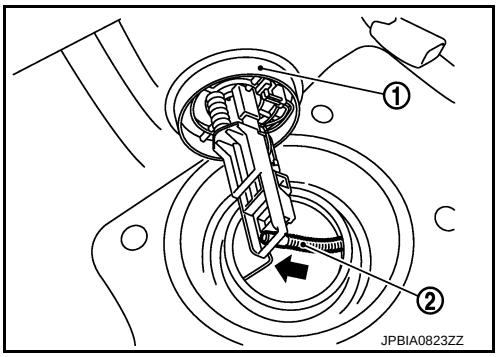


3. Remove sub fuel level sensor assembly (1).

CAUTION:

- **Never disassemble a fuel tube (2) from sub fuel sensor assembly.**
- **Never bend float arm during removal.**
- **Never pollute the residual fuel inside of the tank. Draw out avoiding inclination by supporting with a cloth.**
- **Never cause impacts such by dropping when handling components.**

NOTE:
Tie a gasoline-resistance rope to a tip of the tube. Draw and leave the rope to the fuel tank side so that the rope can be the guide for installation.



INSTALLATION

Note the following, and install in the reverse order of removal.

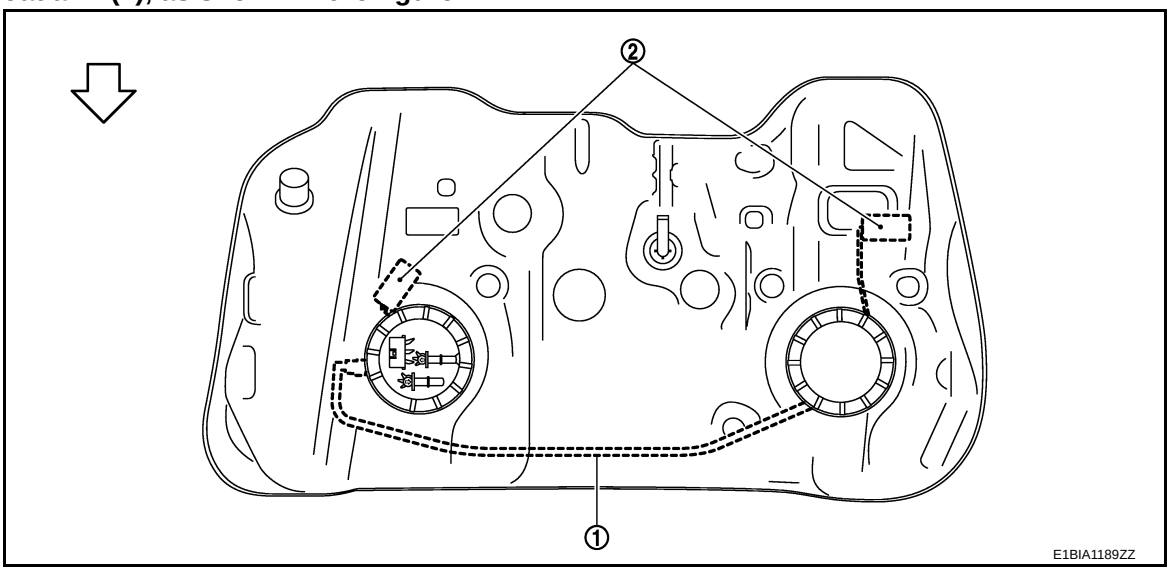
Sub Fuel Level Sensor Assembly

1. Install O-ring to fuel tank without any twist.
2. Using the rope left on the fuel tank side at removal, run the fuel tube inside the fuel tank to install the sub fuel level sensor assembly to the fuel tank.

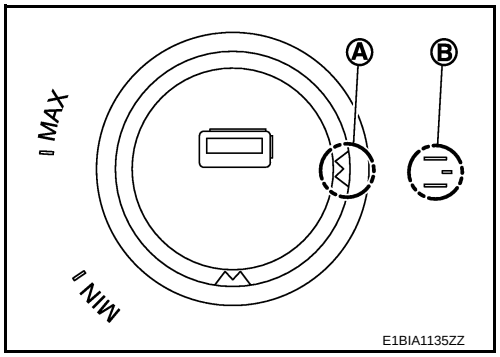
CAUTION:

- **Never bend float arm during installation.**

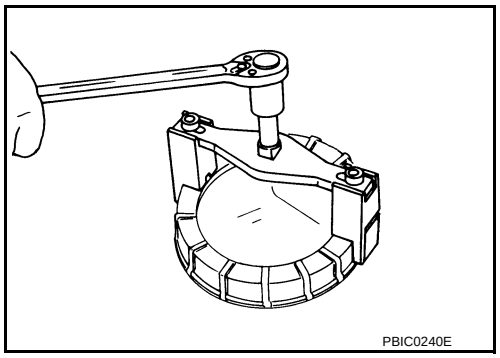
- **To install, fuel tube (1) must run to the front (⇦) of the vehicle to avoid the interference with the float arm (2), as shown in the figure.**



3. Install sub fuel level sensor assembly with its matching mark (A) aligned with fuel tank matching mark (B) as shown in the figure.

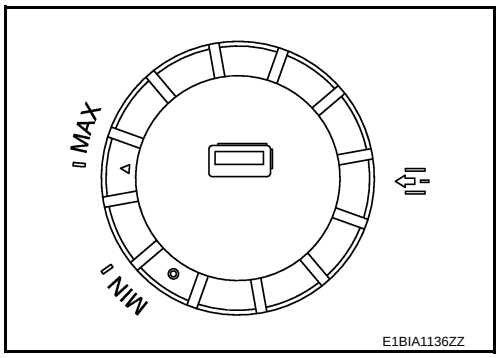


4. Use lock ring wrench [SST: 99104700] to install lock ring as per the following steps.



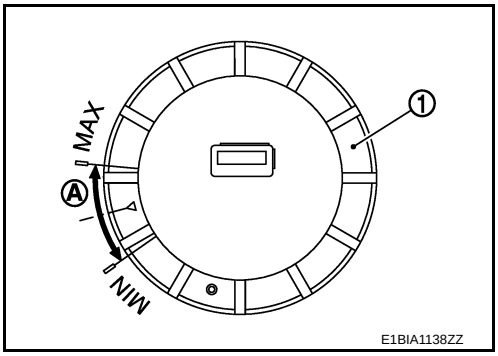
a. Align the "△" mark located on the rim of the lock ring (1) with the "MAX" position of the fuel tank. Press the locking ring horizontally to prevent the lock ring from tilting.
NOTE:
- Figure shows fuel level sensor unit, fuel filter and fuel pump assembly side of fuel tank.
- For sub fuel level sensor assembly matching mark is located on the fuel tank of the vehicle front side.

b. After aligning the "△" mark with "MAX" turn the lock ring counterclockwise until the lock ring thread engages with the tank.
Turn the lock ring roughly 540° until the "△" mark is between "MIN" and "MAX" position.



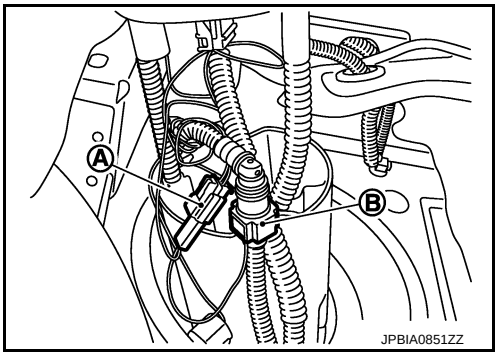
Tightening angle : Approximately 540°

c. Check that the "△" mark of the lock ring (1) is between MIN and MAX [i.e. within (A)].
NOTE:
- Figure shows fuel level sensor unit, fuel filter and fuel pump assembly side of fuel tank.
- For sub fuel level sensor assembly matching mark is located on the fuel tank of the vehicle front side.

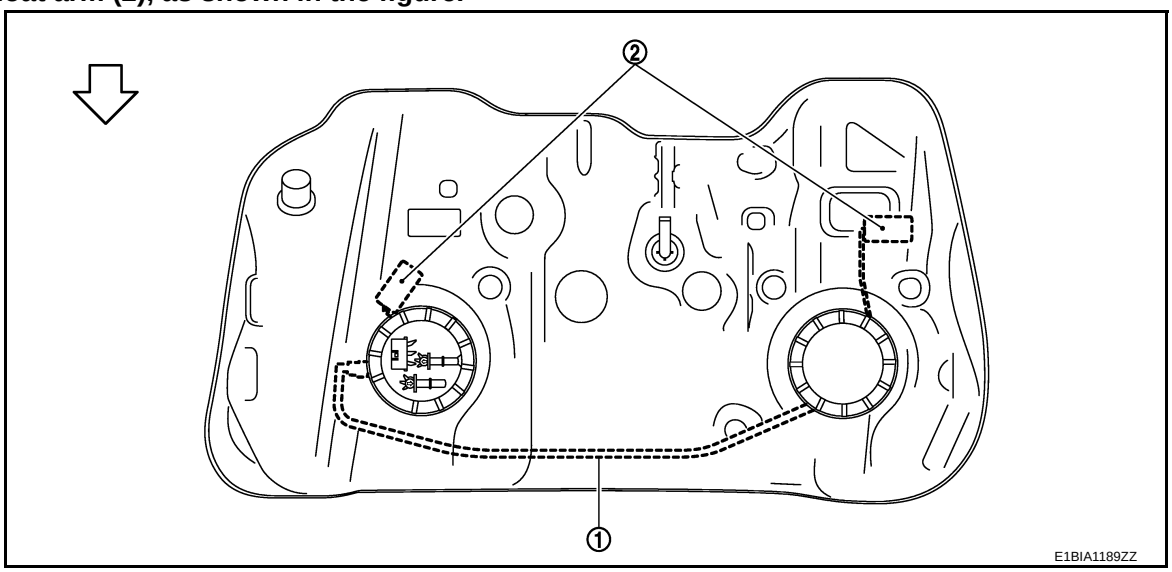


Fuel Level Sensor Unit

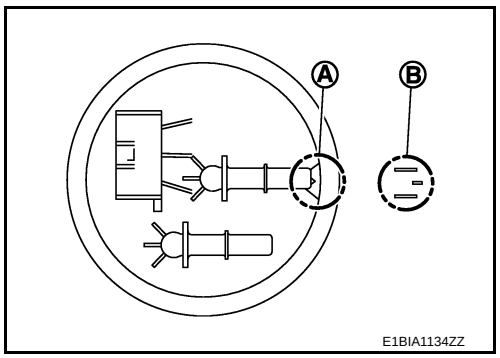
1. Temporarily install the O-ring to the fuel level sensor unit.
2. Connect the fuel tube as per the following steps.
   - Insert the quick connector (B) straight to the fuel level sensor unit.
   - Judge a good fit from connecting sound and tactile feedback.
   - Pull the fuel tube by hand to check a secure fit.
3. Connect harness connector (A).



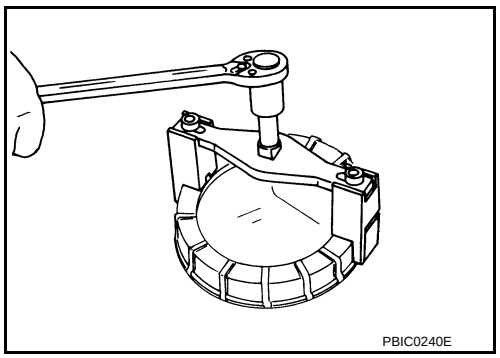
4. Insert the fuel level sensor unit to the fuel tank, and then install the temporarily installed O-ring (Step 1) to the opening of the fuel tank.
CAUTION:
- **Never bend float arm during installation.**
- **To install, fuel tube (1) must run to the front (⇦) of the vehicle to avoid the interference with the float arm (2), as shown in the figure.**



5. Install fuel level sensor unit with its matching mark (A) aligned with fuel tank matching mark (B) as shown in the figure.



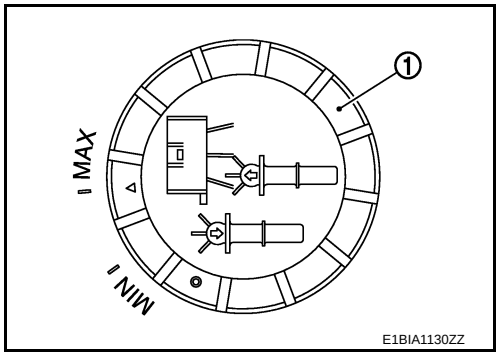
6. Use lock ring wrench [SST: KV99104700] to install lock ring as per the following steps.



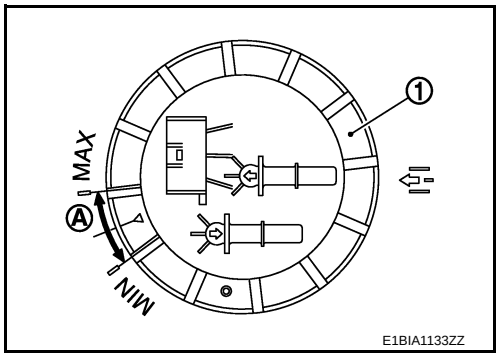
a. Align the "△" mark located on the rim of the lock ring (1) with the "MAX" position of the fuel tank. Press the locking ring horizontally to prevent the lock ring from tilting.

b. After aligning the "△" mark with "MAX" turn the lock ring counterclockwise until the lock ring thread engages with the tank.
Turn the lock ring roughly 540° until the "△" mark is between "MIN" and "MAX" position.

Tightening angle : Approximately 540°



c. Check that the "△" mark of the lock ring (1) is between MIN and MAX [i.e. within (A)].



7. Connect quick connector of fuel feed tube as per following procedures.

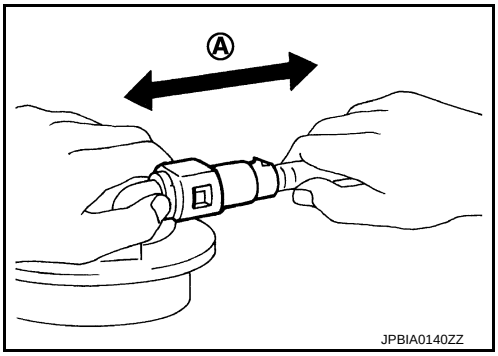
a. Check the connection for damage or any foreign materials.

b. Align the connector with the tube, then insert the connector straight into the tube until a "click" sound is heard.

c. After connecting, check that the connection is secured with following procedures.
- Visually confirm that the two tabs are connected to the connector.

- Pull (A) the tube and the connector to check that they are securely connected.

8. Connect harness connector.



Inspection Hole Cover

- Before installing inspection hole cover, check that the connecting part has no fuel leakage.

1. Install inspection hole covers with the front mark (arrow) facing front of vehicle.
2. Lock clips by turning counterclockwise.

INSPECTION AFTER INSTALLATION

Check that there is no fuel leakage at connections in the following steps.

- Start engine and rev it up and check that there is no fuel leakage at connections.

4WD : Inspection

INFOID:0000000010430544

INSPECTION AFTER INSTALLATION

Use the following procedure to check for fuel leaks.

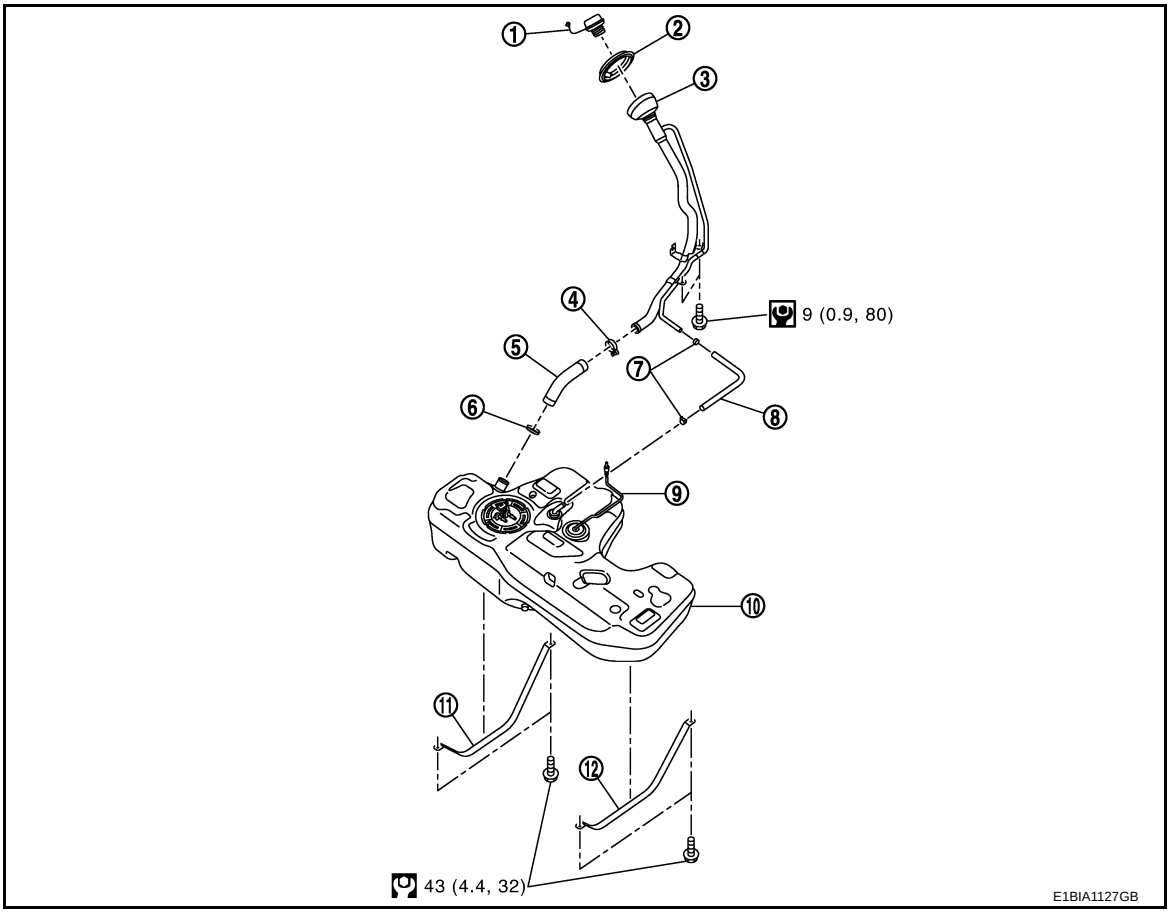
1. Turn ignition switch “ON” (with engine stopped), then check connections for leaks by applying fuel pressure to fuel piping.
2. Start engine and let it idle and make sure there are no fuel leaks at the fuel system connections.

FUEL TANK

2WD

2WD : Exploded View

INFOID:0000000010430545



1. Fuel filler cap	2. Grommet	3. Fuel filler tube
4. Clamp	5. Fuel filler hose	6. Clamp
7. Clamp	8. Vent hose	9. Evap hose
10. Fuel tank	11. Fuel tank band (RH)	12. Fuel tank band (LH)

Refer toGI-4, "Components" for symbol marks in the figure.

2WD : Removal and Installation

INFOID:0000000010763740

REMOVAL

WARNING:

Be sure to read “General Precautions” when working on the fuel system. Refer to FL-30, "General Precautions".

1. Perform the steps 1 to 7 of “REMOVAL” in “ FUEL LEVEL SENSOR UNIT, FUEL FILTER AND FUEL PUMP ASSEMBLY”. Refer to FL-6, "Removal and Installation".
2. Drain fuel from fuel tank if necessary. Refer to FL-6, "Removal and Installation".
   CAUTION:
   - **Fuel tank will become unstable whilst removing. Fuel should be drained from tank prior to removal to reduce this effect.**
   - **Situate vehicle on a flat and solid surface.**
3. Remove main muffler. Refer to EX-6, "Exploded View".
4. Remove vent hose from filler tube.

5. Remove fuel filler hose from fuel tank.

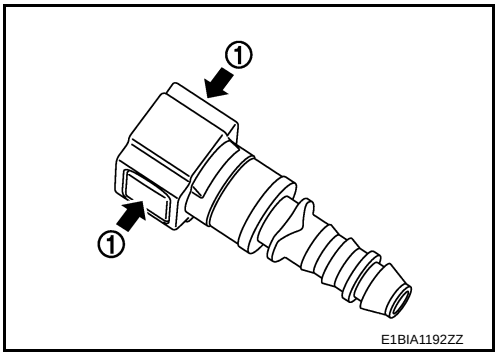
CAUTION:

- **Do not remove fuel filler hose from fuel filler tube to prevent interference with suspension when installing.**
- **If removal of fuel filler hose from fuel filler tube is necessary use mating marks to ensure correct orientation.**

6. Disconnect EVAP hose.
   - Remove quick connector in the following procedures.
   - Hold the sides of quick connector, press tabs and disconnect EVAP hose.
   - If quick connector sticks to tube, push and pull quick connectors several times until they start to move. Then disconnect them by pulling.

CAUTION:

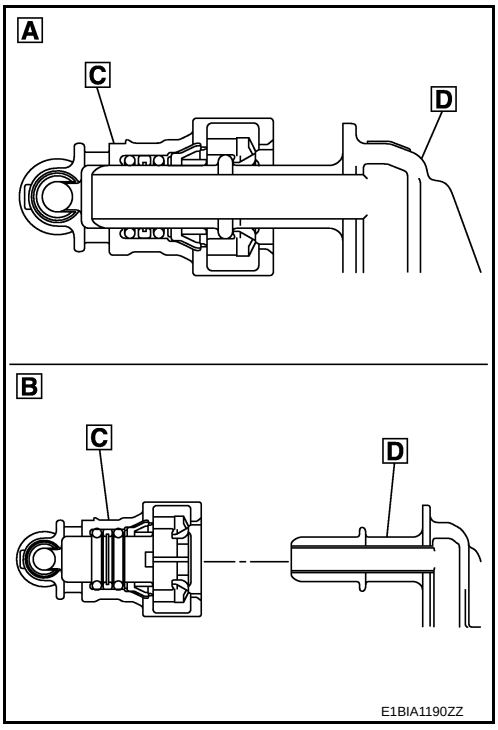
- **Quick connector can be disconnected when the tabs (1) are depressed completely. Never twist it more than necessary.**



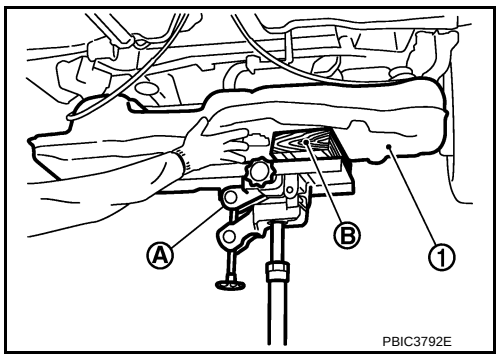
- **Never use any tools to disconnected quick connector.**

A : Connection (cross-section)
B : Disconnection (cross-section)
C : Quick connector
D : Hard tube

- **Keep resin tube away from heat. Be especially careful when welding near the resin tube.**
- **Prevent acid liquid such as battery electrolyte, etc. from getting on resin tube.**
- **Never bend or twist resin tube during installation and disconnection.**
- **Never insert plug, preventing damage to O–ring in quick connector.**
- **To keep the connecting portion clean and to avoid damage and foreign materials, cover them completely with plastic bags or something similar.**



7. Support center of fuel tank (1) with transmission jack (A) and piece of wood (B).
   CAUTION:
   - **Make sure the tank bottom surface is supported well enough to prevent an unstable condition when lowering the tank.**
   - **Make sure to hold it securely as tank surface may not be flat.**



8. Remove fuel tank band (RH and LH).
9. Lower transmission jack carefully to remove fuel tank while holding it by hand.
   CAUTION:
   Make sure to avoid any interference with surrounding component that may cause damage.

INSTALLATION

Note the following, and install in the reverse order of removal.

CAUTION:

- **Make sure hose clamps and hoses clips are not secured on top of the filler tube bulges.**
- **Make sure all quick connectors and their mating part are free of foreign matter, check for damage.**
- **Ensure the tank bands are correctly assembled as per their identification marks "L" and "R".**
- **Make sure that the torques of the mounting bolts are correct as per exploded view. Refer to FL-59, "2WD : Exploded View".**
- **Make sure that when installing the connectors, the confirmation click sound is heard. Pull back on the connector to ensure proper engagement.**

Fuel Filler Hose

- Insert fuel filler hose to the length below.

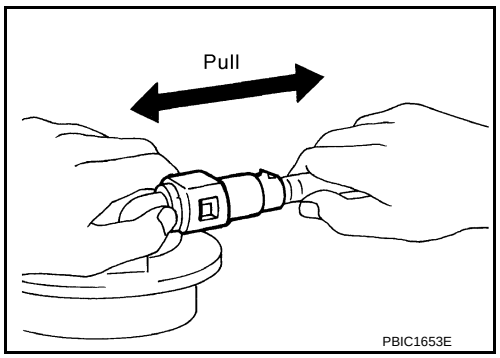
: 35 mm (1.38 in)

- Be sure hose clamp is not placed on swelled area of fuel filler tube.
- Tighten fuel filler hose clamp so that the remaining length of screw thread becomes to the following.

Fuel filler tube side : 7 - 11 mm (0.28 - 0.43 in)
Fuel tank side : 5 - 9 mm (0.20 - 0.35 in)

EVAP Hose

1. Check connections for damage or foreign material.
2. Align the matching side connection part with the center of shaft, and insert connector straight until it clicks.
3. After connecting, pull out quick connector and centralized under-floor piping by hand. Make sure connections are secure.



2WD : Inspection

INFOID:0000000010430547

INSPECTION AFTER INSTALLATION

Make sure there is no fuel leakage at connections in the following procedure.

- Start engine, rev it up and make sure there is no fuel leakage at connections.

4WD

4WD : Exploded View

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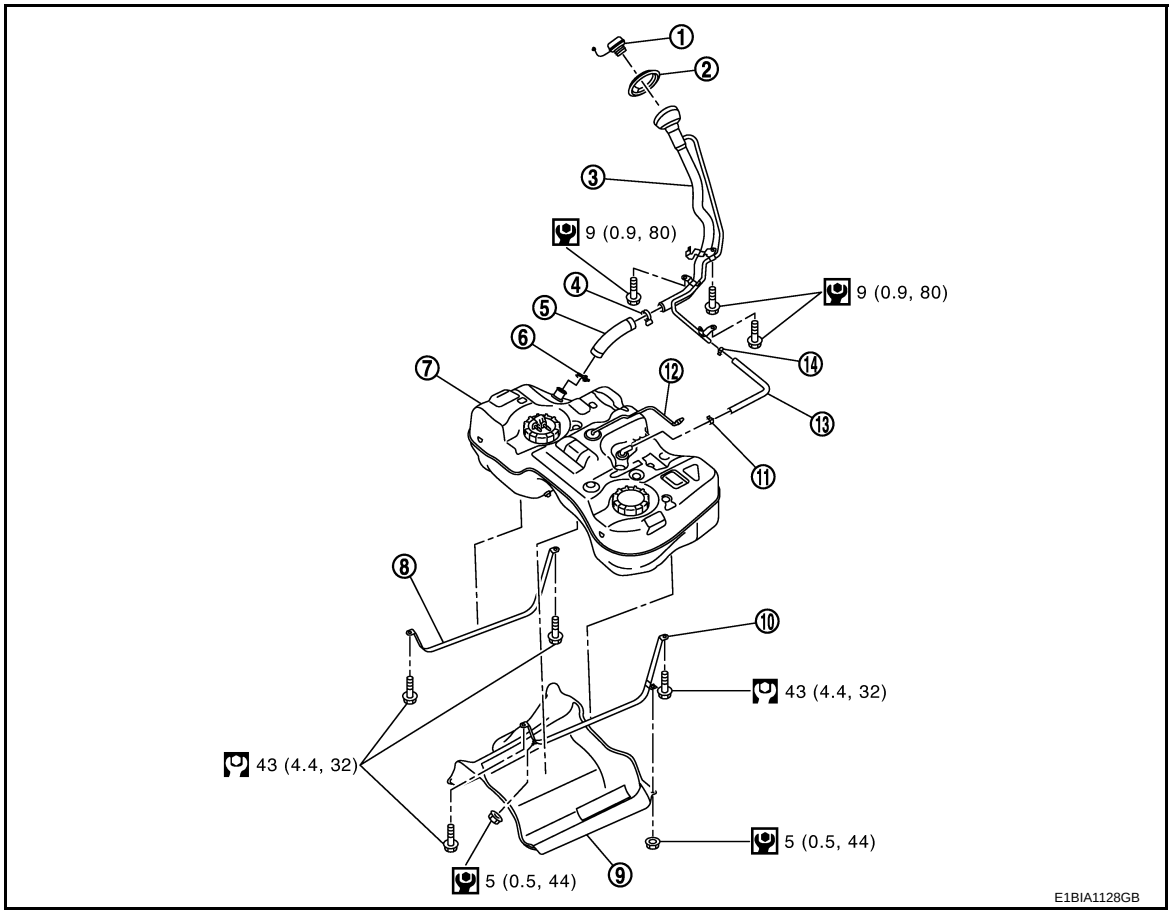


1. Fuel filler cap	2. Grommet	3. Fuel filler tube
4. Clamp	5. Fuel filler hose	6. Clamp
7. Fuel tank	8. Fuel tank band (RH)	9. Protector
10. Fuel tank band (LH)	11. Clamp	12. EVAP hose
13. Vent hose	14. Clamp	

Refer to GI-4, "Components" for symbol marks in the figure.

4WD : Removal and Installation

INFOID:0000000010430549

REMOVAL

WARNING:

Be sure to read “General Precautions” when working on the fuel system. Refer to FL-43, "General Precautions".

1. Perform the steps 1 to 7 of “REMOVAL” in “ FUEL LEVEL SENSOR UNIT, FUEL FILTER AND FUEL PUMP ASSEMBLY”. Refer to FL-6, "Removal and Installation".
2. Drain fuel from fuel tank if necessary. Refer to FL-6, "Removal and Installation".
   CAUTION:
   - **Fuel tank will become unstable whilst removing. Fuel should be drained from tank prior to removal to reduce this effect.**
   - **Situate vehicle on a flat and solid surface.**
3. Remove main muffler. Refer to EX-6, "Exploded View".
4. Remove propeller shaft. Refer to DLN-186, "Removal and Installation"
5. Remove protector from fuel tank.
6. Remove vent hose from filler tube.

7. Remove fuel filler hose from fuel tank.

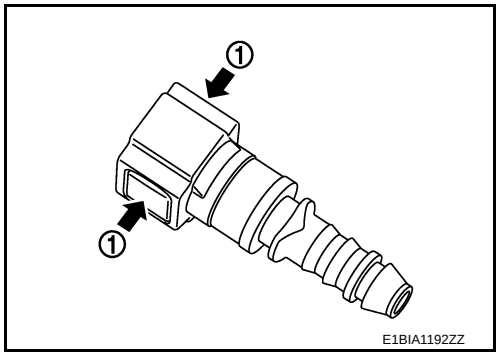
CAUTION:

- **Do not remove fuel filler hose from fuel filler tube to prevent interference with suspension when installing.**
- **If removal of fuel filler hose from fuel filler tube is necessary use mating marks to ensure correct orientation.**

8. Disconnect EVAP hose.
   - Remove quick connector in the following procedures.
   - Hold the sides of quick connector, press tabs and disconnect EVAP hose.
   - If quick connector sticks to tube, push and pull quick connectors several times until they start to move. Then disconnect them by pulling.

CAUTION:

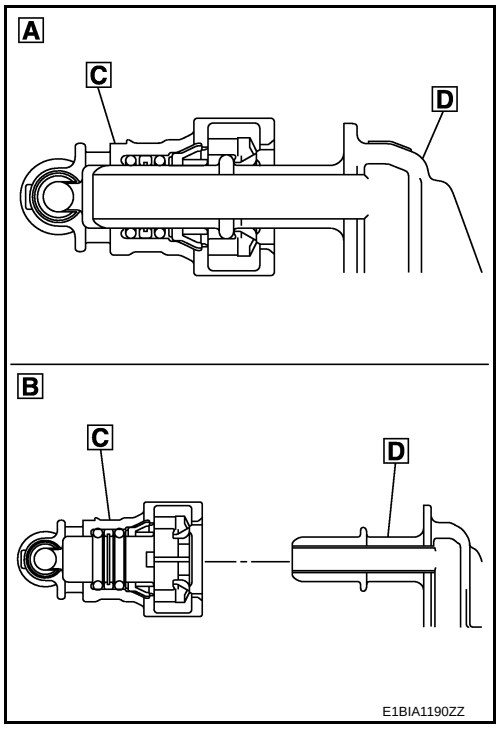
- **Quick connector can be disconnected when the tabs (1) are depressed completely. Never twist it more than necessary.**



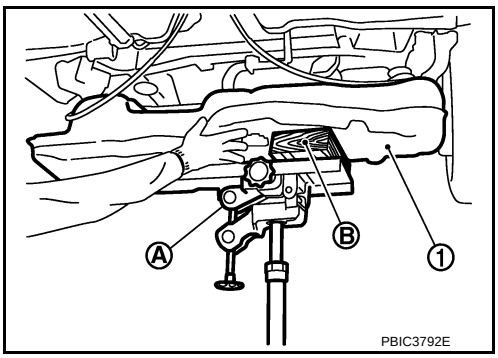
- **Never use any tools to disconnected quick connector.**

A : Connection (cross-section)
B : Disconnection (cross-section)
C : Quick connector
D : Hard tube

- **Keep resin tube away from heat. Be especially careful when welding near the resin tube.**
- **Prevent acid liquid such as battery electrolyte, etc. from getting on resin tube.**
- **Never bend or twist resin tube during installation and disconnection.**
- **Never insert plug, preventing damage to O–ring in quick connector.**
- **To keep the connecting portion clean and to avoid damage and foreign materials, cover them completely with plastic bags or something similar.**



9. Support center of fuel tank (1) with transmission jack (A) and piece of wood (B).
   CAUTION:
   - **Make sure the tank bottom surface is supported well enough to prevent an unstable condition when lowering the tank.**
   - **Make sure to hold it securely as tank surface may not be flat.**



10. Remove fuel tank band (RH and LH).
11. Lower transmission jack carefully to remove fuel tank while holding it by hand.
    CAUTION:
    Make sure to avoid any interference with surrounding component that may cause damage.

INSTALLATION

Note the following, and install in the reverse order of removal.

CAUTION:

- **Make sure hose clamps and hoses clips are not secured on top of the filler tube bulges.**
- **Make sure all quick connectors and their mating part are free of foreign matter, check for damage.**
- **Ensure the tank bands are correctly assembled as per their identification marks "L" and "R".**
- **Make sure that the torques of the mountin bolts are correct as pair exploded view. Refer to FL-62, "4WD : Exploded View".**
- **Make sure that when installing the connectors, the confirmation click sound is heard. Pull back on the connector to ensure proper engagement.**

Fuel Filler Hose

- Insert fuel filler hose to the length below.

: 35 mm (1.38 in)

- Be sure hose clamp is not placed on swelled area of fuel filler tube.
- Tighten fuel filler hose clamp so that the remaining length of screw thread becomes to the following.

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EVAP Hose

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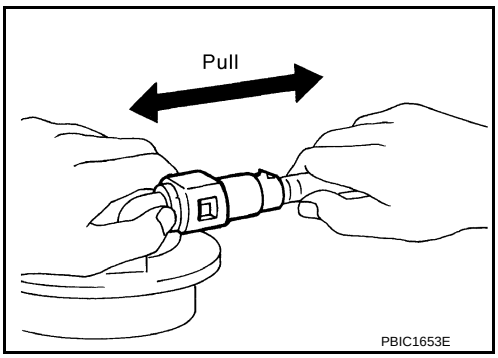

4WD : Inspection

INFOID:0000000010430550

INSPECTION AFTER INSTALLATION

Make sure there is no fuel leakage at connections in the following procedure.

- Start engine, rev it up and make sure there is no fuel leakage at connections.

SERVICE DATA AND SPECIFICATIONS (SDS)

SERVICE DATA AND SPECIFICATIONS (SDS)

Fuel Tank

INFOID:0000000010419032

Standard and Limit

Fuel tank capacity 2WD	Approx. 55 ℓ (12-1/8 Imp gal)
Fuel tank capacity 4WD	Approx. 65 ℓ (14-1/4 Imp gal)
Fuel recommendation	Refer to GI-35, "Fuel"