

SECTION **FL**
FUEL SYSTEM

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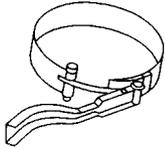
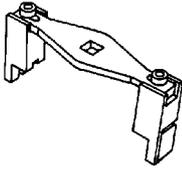
PREPARATION

PREPARATION

PFP:00002

Commercial Service Tools

EBS01E70

Tool name	Description
Fuel filter wrench  PBIC0519E	Removing fuel filter
Fuel tank lock ring wrench  ZZA0122D	Removing and installing fuel tank lock ring

FUEL SYSTEM

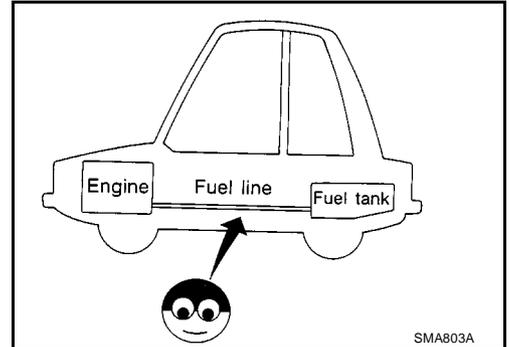
PFP:17503

Checking Fuel Lines

EBS01E71

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.



General Precautions

EBS01E72

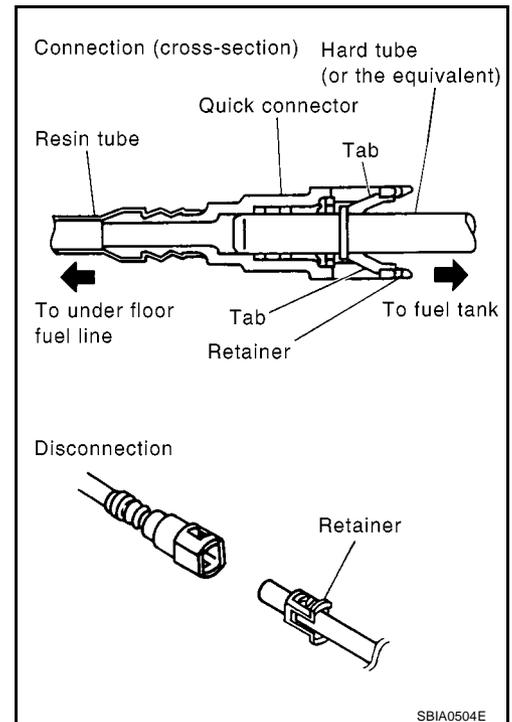
WARNING:

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

- Put a "CAUTION: INFLAMMABLE" sign in workshop.
- Be sure to work in a well-ventilated area and furnish workshop with a CO₂ fire extinguisher.
- Do not smoke while servicing fuel system. Keep open flames and spark away from work area.

CAUTION:

- Use diesel fuel required by the regulations for cetane number. Refer to [GI-6, "DIESEL ENGINE"](#).
- 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.
- Do not kink or twist tubes when they are being installed.
- Do not tighten hose clamps excessively to avoid damaging hoses.
- After connecting fuel tube quick connectors, make sure quick connectors are secure. Ensure that connector and resin tube do not contact any adjacent parts.
- After installing tubes, make sure there is no fuel leakage at connections in the following steps.
 - Start the engine and rev it up and check for fuel leaks at connections.



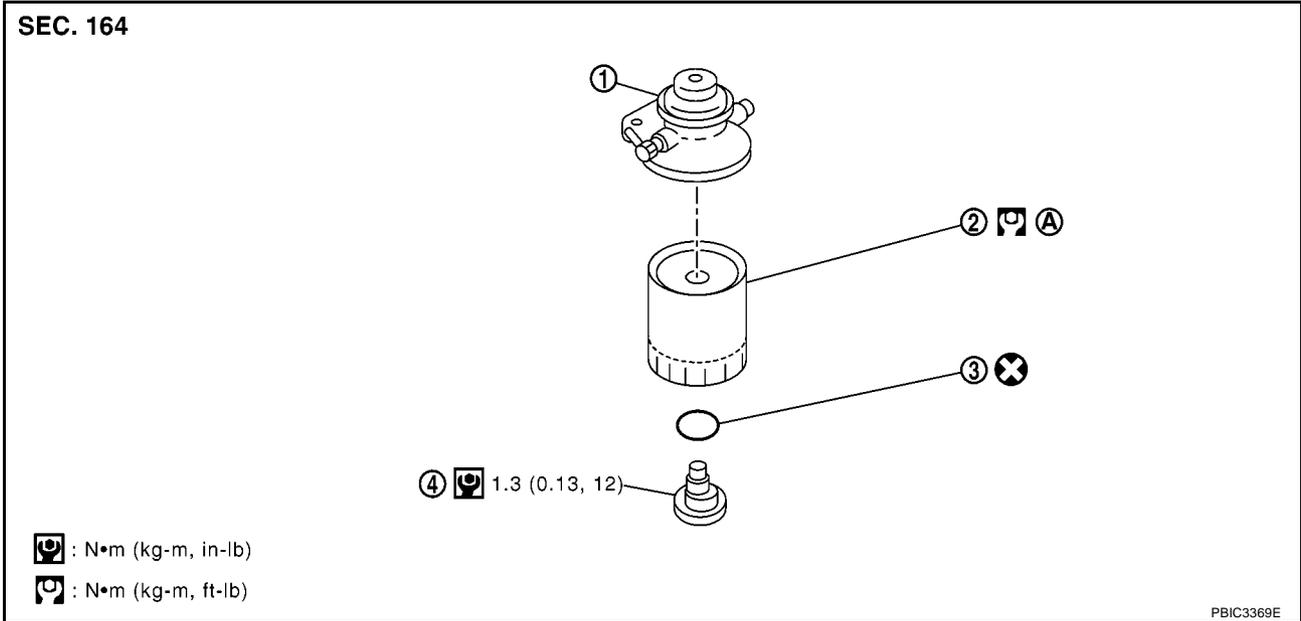
FUEL FILTER

PFP:16400

EBS01F6M

FUEL FILTER

Components



1. Fuel filter bracket
 2. Fuel filter
 3. O-ring
 4. Drain plug
- A. Refer to [FL-5](#).

- Refer to [GI-10, "Components"](#) for symbol marks in the figure.

Removal and Installation

REMOVAL

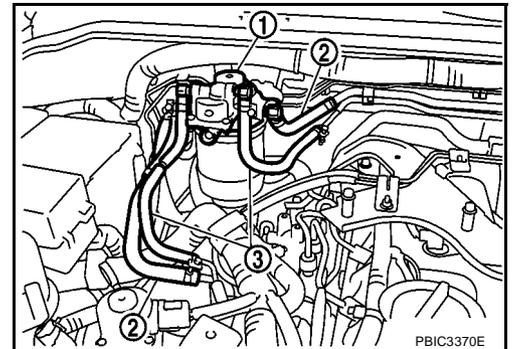
EBS01E73

1. Disconnect fuel hoses at fuel filter.

- 1 : Fuel filter
- 2 : Fuel hose (feed)
- 3 : Fuel hose (return)

CAUTION:

Plug the pipe to prevent fuel from draining.

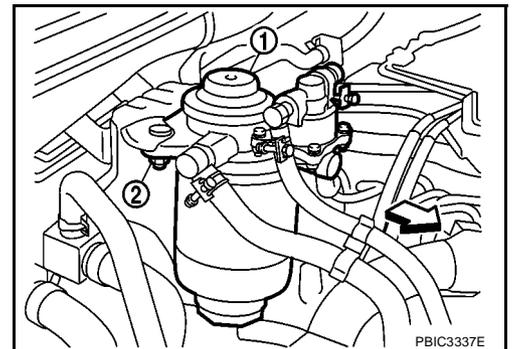


2. Loosen mounting nuts (2) and remove fuel filter (1).

: Vehicle front

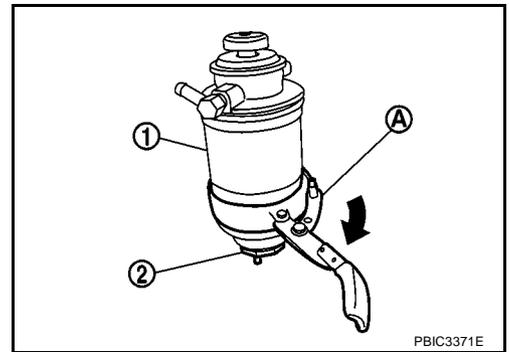
CAUTION:

Do not splash fuel during removal. If fuel is splashed, immediately wipe it off.



FUEL FILTER

- Using band-type fuel filter wrench (A) (commercial service tool), remove fuel filter (1).
- Turn fuel filter (1) upside down to drain fuel.
- Remove drain plug (2) from fuel filter.



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INSTALLATION

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

- Replace O-ring on drain plug with new one.
- Screw the fuel filter by hand until packing contacts sealing surface of fuel filter bracket. Then tighten it by turning approximately 2/3 turn.

Fuel filter (reference value)

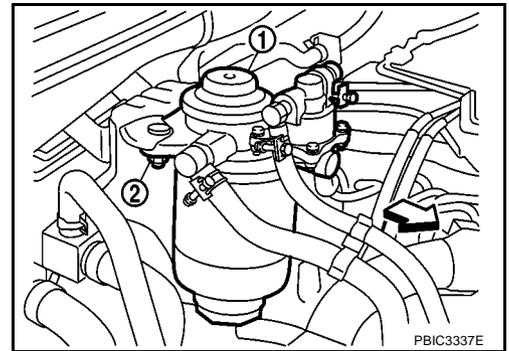
: 13.5 N·m (1.4 kg·m, 10 ft·lb)

- Install fuel filter (1), and tighten mounting nuts (2) to the specified torque.

↔ : Vehicle front

Fuel filter mounting nuts

: 13.5 N·m (1.4 kg·m, 10 ft·lb)



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- After installation, bleed air from fuel line. Refer to [FL-5, "Air Bleeding"](#).

INSPECTION AFTER INSTALLATION

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

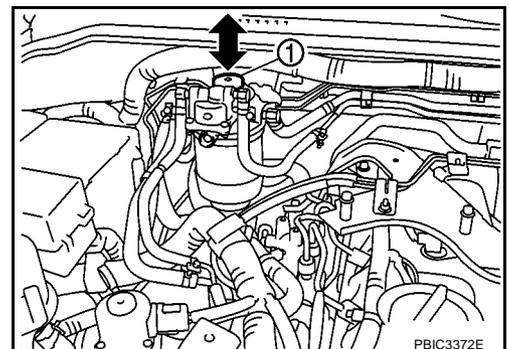
- Start the engine and rev it up and make sure there is no fuel leakage at connections.

Air Bleeding

EBS01E74

After fuel filter is replaced and after fuel system components are removed/installed, bleed air from fuel line as follows:

- Move priming pump (1) up and down to bleed air from fuel path. When air is bled, pumping of priming pump becomes heavy stop operation at that time.



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- Crank engine until it starts. Do not crank engine for more than 30 seconds.
- If engine does not start, stop cranking and repeat step 1 above.
- If engine does not operate smoothly after it has started, race it two or three times.

FUEL FILTER

- If air cannot be bled easily (pumping of priming pump does not become heavy), disconnect feed-side of hose between fuel filter and electronically controlled fuel pump. After that, operate priming pump and confirm that fuel comes out.

CAUTION:

Prepare a tray to collect fuel. Prevent fuel from adhering to rubber parts, especially the engine mounting insulator.

Draining Water from Fuel Filter

1. Prepare a tray (A) under the drain plug (1).
2. Loosen drain plug (1), and operate priming pump (2) 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.
3. Replace O-ring on drain plug with new one.
 4. After draining, close drain plug to specified torque.

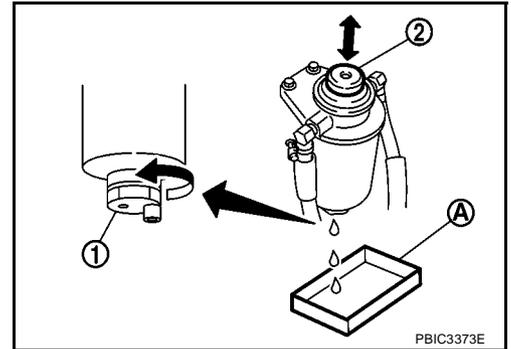
Drain plug

: 1.3 N·m (0.13 kg·m, 12 in·lb)

CAUTION:

If drain plug is tightened excessively, it may be damaged and fuel will leak.

5. Bleed air in fuel piping. Refer to [FL-5, "Air Bleeding"](#).
6. Start engine and make sure there is no fuel leakage.



FUEL COOLER

FUEL COOLER

PPF:17511

Components (4WD Models Only)

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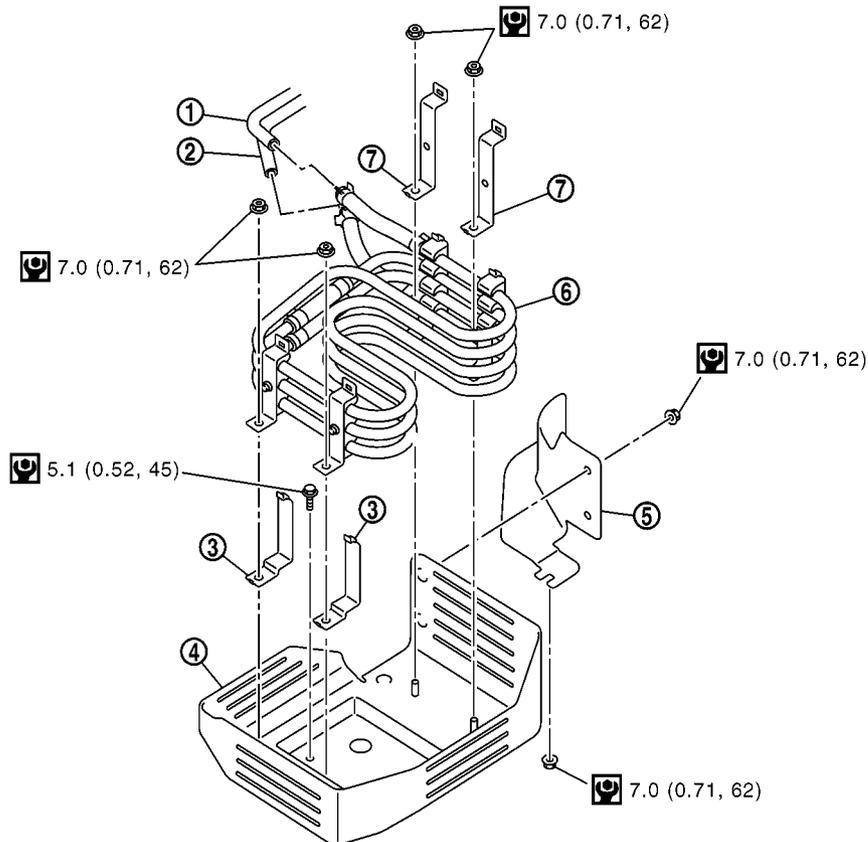
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SEC. 173



PBIC4059E

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|--------------------------------------|-----------------------------------|-------------------------|
| 1. Fuel tube (return) (to fuel tank) | 2. Fuel tube (return) (to engine) | 3. Bracket |
| 4. Protector (fuel cooler) | 5. Protector (fuel tube) | 6. Fuel cooler assembly |
| 7. Bracket | | |

Removal and Installation (4WD Models Only)

EBS01FEZ

REMOVAL

WARNING:

Be sure to read "General Precautions" when working on fuel system. Refer to [FL-3, "General Precautions"](#).

1. Remove protector (fuel tube).
2. Remove protector (fuel cooler) mounting bolts (3 pieces) then disconnect fuel tubes from fuel cooler assembly.

CAUTION:

- Plug fuel tubes and fuel cooler assembly to prevent fuel from draining.
- Do not splash fuel during removal. If fuel is splashed, immediately wipe it off.

3. Remove fuel cooler assembly from protector (fuel cooler)

CAUTION:

- Do not bend fuel tubes during removal.
- Avoid impacts such as falling when handling components.

FUEL COOLER

INSTALLATION

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

- Insert hose to the length below when there is no spool on the fuel tube and surely clamp fuel hoses.

Fuel hose : 25 mm (0.98 in)

- Be sure hose clamp is not positioned on swelled area of fuel tube.

INSPECTION AFTER INSTALLATION

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

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

FUEL TANK

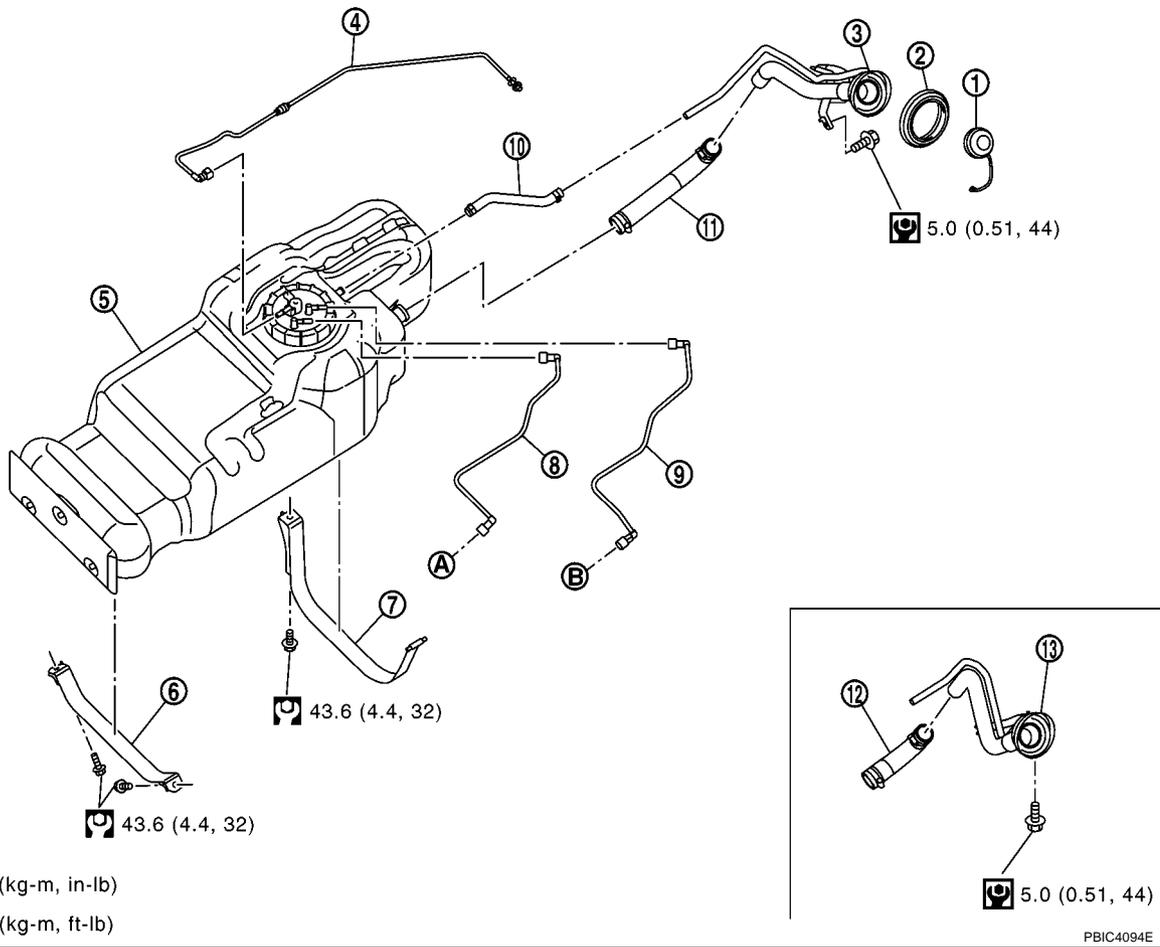
FUEL TANK Components

PFP:17202

EBS01F60

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SEC. 172



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|--|--|---|
| 1. Fuel filler cap | 2. Grommet | 3. Fuel filler tube (Double cab models) |
| 4. EVAP tube | 5. Fuel tank | 6. Fuel tank band |
| 7. Fuel tank band | 8. Fuel feed tube | 9. Fuel return tube |
| 10. Vent hose | 11. Fuel filler hose (Double cab models) | 12. Fuel filler hose (King cab models) |
| 13. Fuel filler tube (King cab models) | | |
- A. To fuel filter
 B. To fuel cooler (under floor) (4WD models)
 To fuel return tube (2WD models)

Removal and Installation REMOVAL

EBS01E77

WARNING:

Be sure to read "General Precautions" when working on fuel system. Refer to [FL-3, "General Precautions"](#).

1. Open fuel filler lid.
2. Open the fuel filler cap and release the pressure inside fuel tank.

FUEL TANK

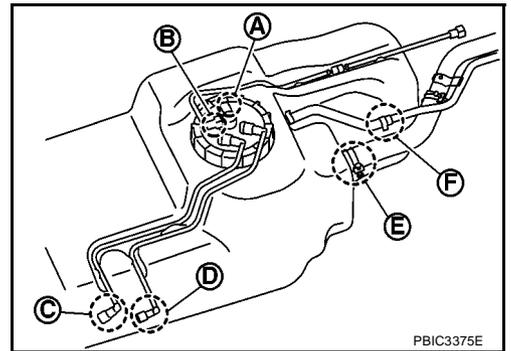
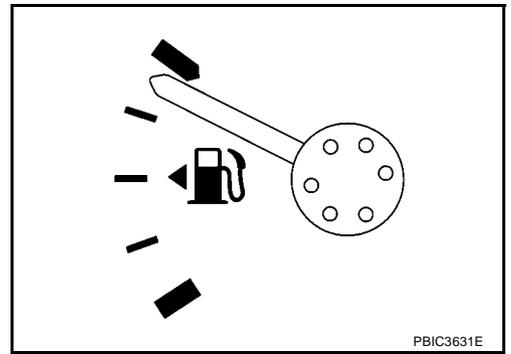
3. Check fuel level on level place. If fuel gauge indicates more than the level shown in figure (full or almost full), drain fuel from fuel tank until gauge indicates level as shown in the figure or below.

NOTE:

Because fuel will be spilled when removing fuel level sensor unit for the top of the fuel is above fuel level sensor unit installation surface.

- As a guide, fuel level becomes the position as shown in the figure or below when approximately 20 ℓ (4-3/8 Imp gal) of fuel are drained from fuel tank.
 - Refer to the following for draining fuel.
- a. Insert fuel tube of less than 15 mm (0.59 in) in diameter into fuel filler tube through fuel filler opening to draw fuel from fuel filler tube.
 - b. Disconnect fuel filler hose from fuel filler tube.
 - c. Insert fuel tube into fuel tank through fuel filler hose to draw fuel from fuel tank.
 4. Disconnect the battery cable from the negative terminal.
 5. Disconnect fuel feed tube (C) and fuel return tube (D).

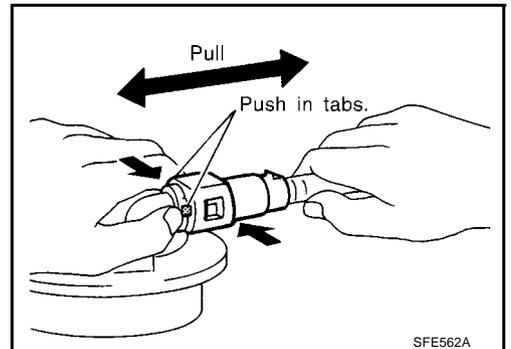
- A : Harness connector
- B : EVAP tube
- E : Fuel filler hose
- F : Vent hose



Disconnect quick connector of fuel feed tube and fuel return tube as follows.

NOTE:

- Hold the sides of the connector, push in tabs and pull out the tube.
- If the connector and the tube are stuck together, push and pull several times until they start to move. Then disconnect them by pulling.

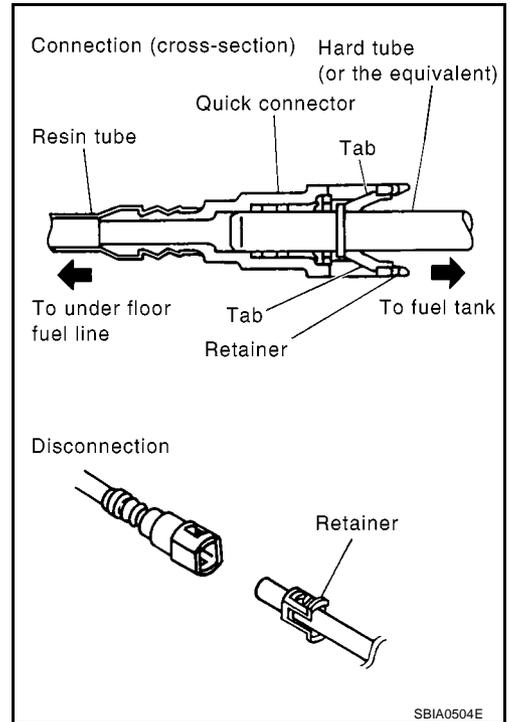


FUEL TANK

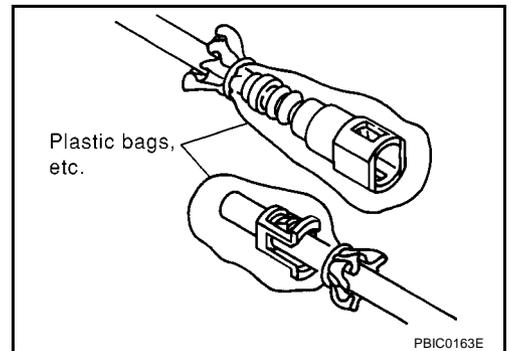
CAUTION:

- Quick connector can be disconnected when the tabs are completely depressed. Do not twist it more than necessary.
- Do not use any tools to disconnect 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.
- Do not bend or twist resin tube during installation and removal.
- Do not remove the remaining retainer on hard tube (or equivalent) except when resin tube or retainer is replaced.
- When resin tube or fuel level sensor unit is replaced, also replace retainer with a new one. Replace same color retainer as before replacing.

Retainer color : Green (Fuel feed tube)
: Gray (Fuel return tube)



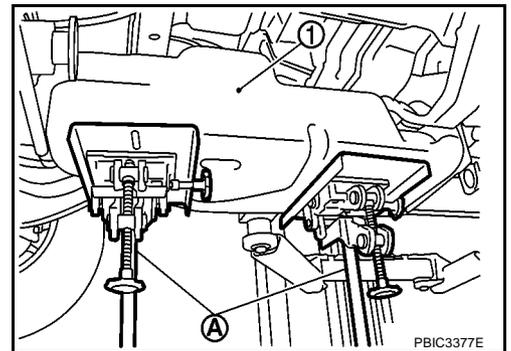
- To keep clean the connecting portion and to avoid damage and foreign materials, cover them completely with plastic bags or something similar.



6. Using a transmission jack (A), support the bottom of fuel tank (1).

CAUTION:

Support the position that fuel tank bands do not engage.

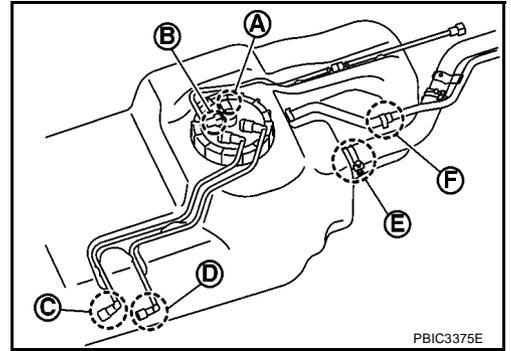


FUEL TANK

7. Remove fuel tank bands, and lower the transmission jack carefully until harness connector (A), EVAP tube (B), fuel filler hose (E) and vent hose (F) can be disconnected.

C : Fuel feed tube
D : Fuel return tube

8. Disconnect harness connector (A), EVAP tube (B), fuel filler hose (E) and vent hose (F).



9. Supporting with hands, lower transmission jack carefully, and remove fuel tank.

CAUTION:

- Pay attention not to fall fuel tank.
- Make sure that all connection points have been disconnected.
- Confirm there is no interference with vehicle.

10. Remove fuel filler tubes, fuel filler hoses and vent hoses if necessary.

INSTALLATION

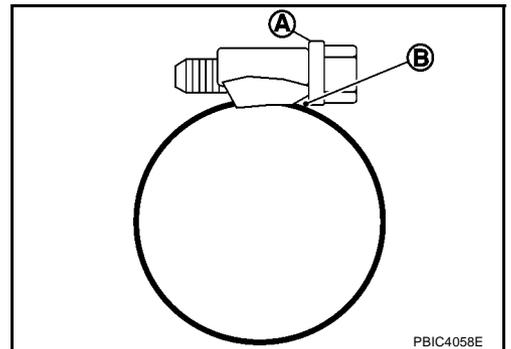
Note the following, and install in the reverse order of removal.

- Surely clamp fuel hoses and insert hose to the length below.

Fuel filler hose : 35 mm (1.38 in)

The other hose : 25 mm (0.98 in)

- Be sure hose clamp is not positioned on swelled area of fuel tube.
- Tighten fuel hose clamp so that the flange (A) of bolt head is on the paint mark (B) on the band.



- Fit mounting band pin to the vehicle side securely.
- Before fixing the fuel tank, temporarily install the fuel filler tube.

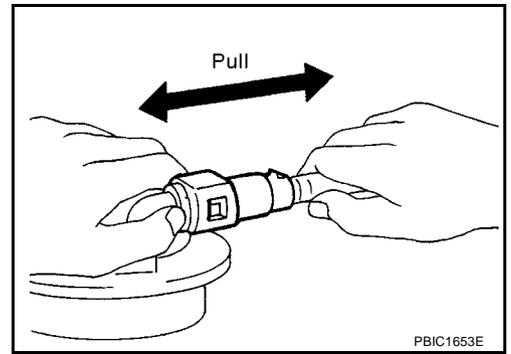
CAUTION:

Use genuine fuel filler tube mounting bolts or equivalent. Make sure to tighten them to the specified torque.

- Connect quick connector as follows.
 1. Check connection for damage and foreign materials.
 2. Align the connector with the tube, then insert connector straight into tube until a click is heard.
 3. After connecting, make sure that the connection is secure by following the steps below.
 - Visually confirm that the two tabs are connected to connector.

FUEL TANK

- Pull the tube and connector to make sure they are securely connected.



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INSPECTION AFTER INSTALLATION

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

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

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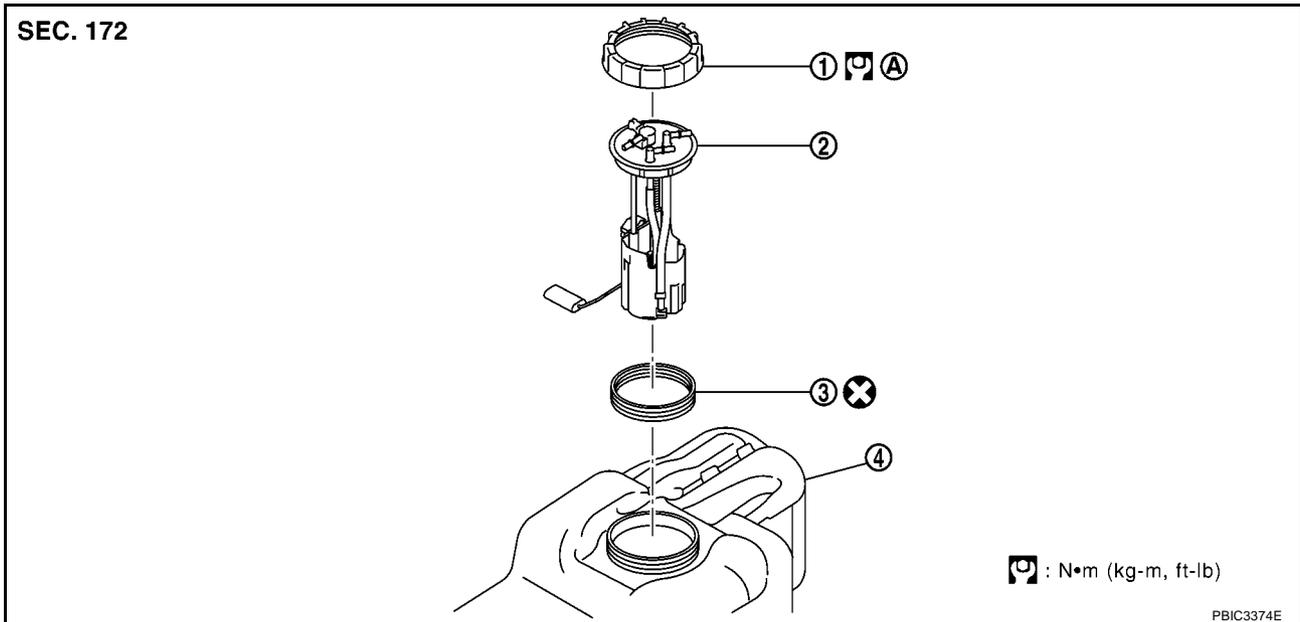
FUEL LEVEL SENSOR UNIT

FUEL LEVEL SENSOR UNIT

PFP:17042

Components

EBS01F6N



1. Lock ring
 2. Fuel level sensor unit
 3. Seal packing
 4. Fuel tank
- A. Refer to text.

- Refer to [GI-10, "Components"](#) for symbol marks in the figure.

Removal and Installation

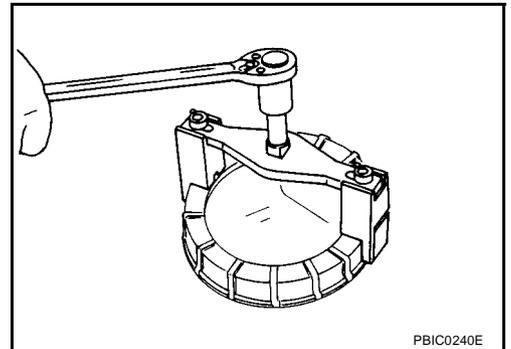
REMOVAL

EBS01E76

WARNING:

Be sure to read "General Precautions" when working on fuel system. Refer to [FL-3, "General Precautions"](#).

1. Remove fuel tank from the vehicle. Refer to [FL-9, "FUEL TANK"](#).
2. Using a fuel tank lock ring wrench (commercial service tool), remove the lock ring.



3. Remove fuel level sensor unit.

CAUTION:

- Do not bend the float arm during removal.
- Avoid impacts such as falling when handling components.

INSPECTION AFTER REMOVAL

Make sure fuel level sensor unit is free from foreign materials. If any are found, remove them.

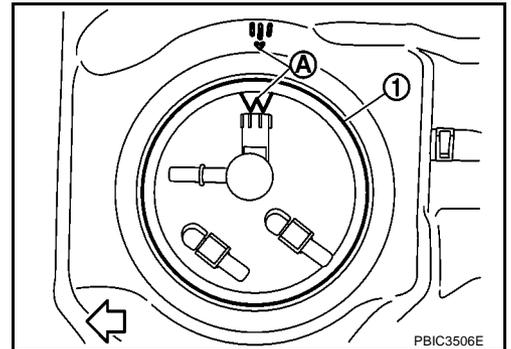
FUEL LEVEL SENSOR UNIT

INSTALLATION

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

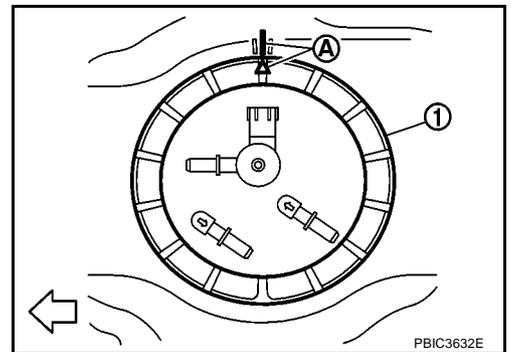
- Install fuel level sensor unit (1) with aligning mating marks (A) on fuel tank and fuel level sensor unit as shown in the figure.

← : Vehicle front



- Install lock ring (1), and tighten lock ring by hand. Then tighten lock ring with a fuel tank lock ring wrench (commercial service tool), aligning mating marks (A) on fuel tank and lock ring as shown in the figure.

← : Vehicle front



INSPECTION AFTER INSTALLATION

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

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

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SERVICE DATA AND SPECIFICATIONS (SDS)

SERVICE DATA AND SPECIFICATIONS (SDS)

PFP:00030

Standard and Limit

EBS01E78

Fuel tank capacity	Approx. 80 ℓ (17-5/8 Imp gal)
Fuel recommendation	Refer to GL-6 .