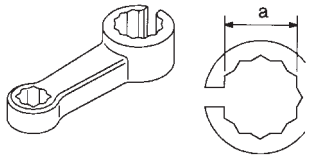
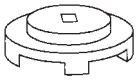
ACCELERATOR CONTROL, FUEL & EXHAUST SYSTEMS

SECTION FE

CONTENTS

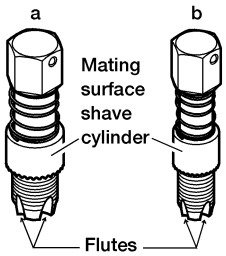
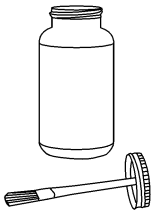
Special Service Tools

NLFE0029

Tool number Tool name	Description	
KV10114400 Heated oxygen sensor wrench	 NT636	Loosening or tightening front and rear heated oxygen sensors **a: 22 mm (0.87 in)**
KV999G0010 Fuel tank lock ring socket	 NT057	Removing and installing fuel tank lock ring

Commercial Service Tools

NLFE0030

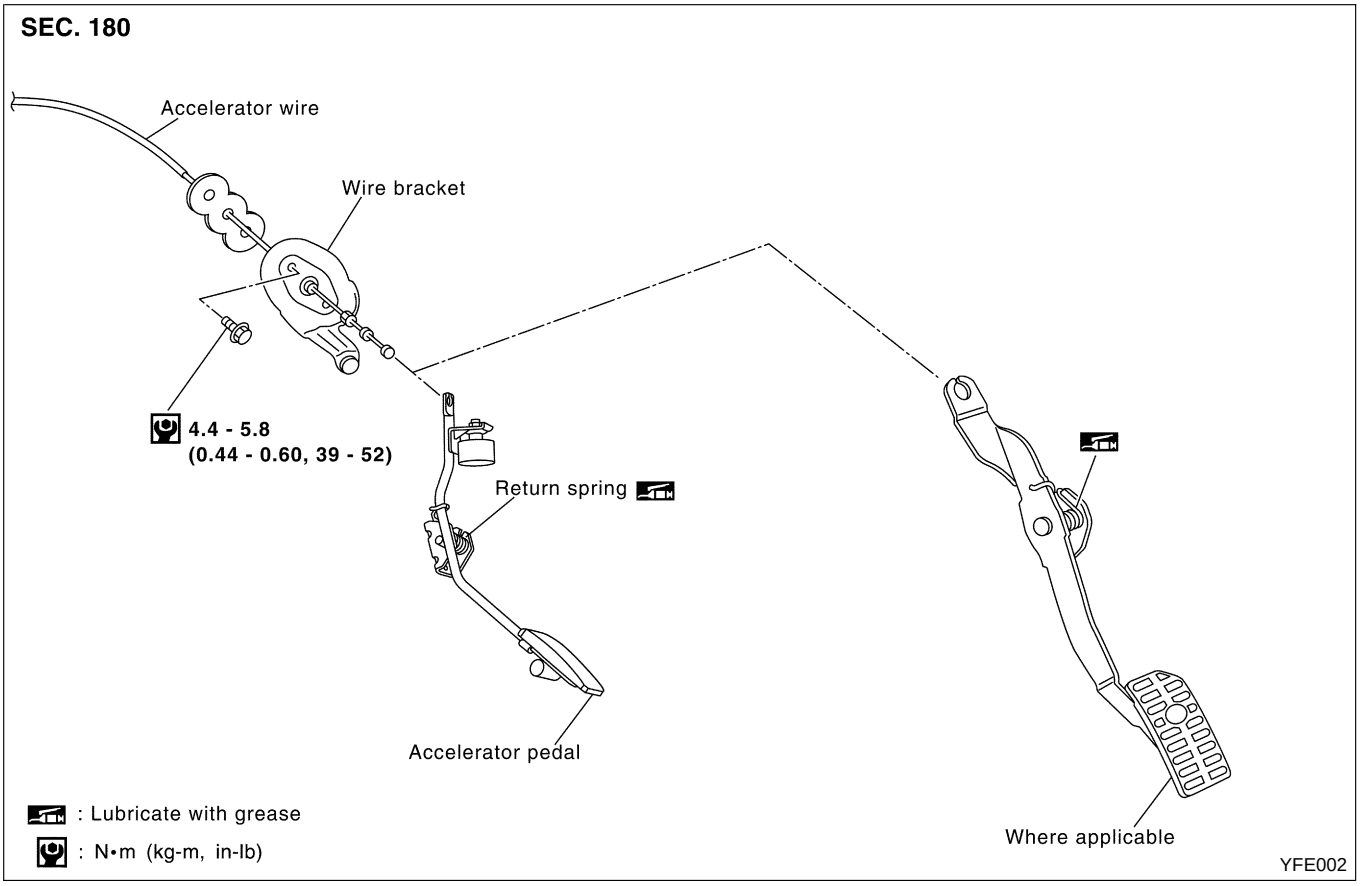
Tool number Tool name	Description	
Oxygen sensor thread cleaner	 AEM488	Reconditioning the exhaust system threads before installing a new oxygen sensor (Use with anti-seize lubricant shown below.) **a: 18 mm dia. with pitch 1.5 mm for zirconia oxygen sensor** **b: 12 mm dia. with pitch 1.25 mm for titania oxygen sensor**
Anti-seize lubricant (Permatex 133AR or equivalent meeting MIL specification MIL-A-907)	 AEM489	Lubricating oxygen sensor thread cleaning tool when reconditioning exhaust system threads

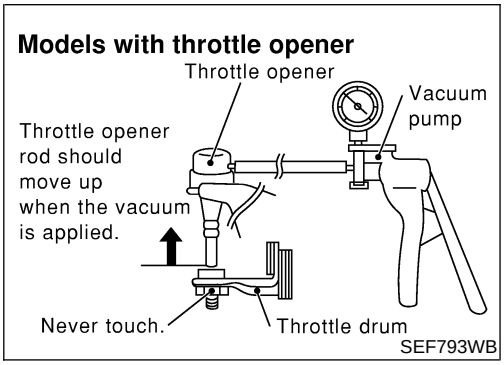
Removal and Installation

NLFE0002

CAUTION:

- **When removing accelerator wire, make a mark to indicate lock nut's initial position.**
- **Check that throttle valve opens fully when accelerator pedal is fully depressed. Also check that it returns to idle position when pedal is released.**
- **Check accelerator control parts for improper contact with any adjacent parts.**
- **When connecting accelerator wire, be careful not to twist or scratch wire.**





Adjusting Accelerator Wire

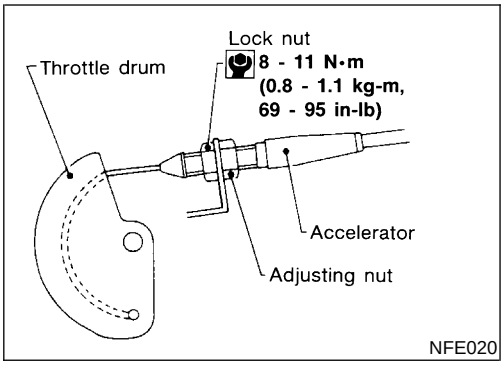
NLFE0003

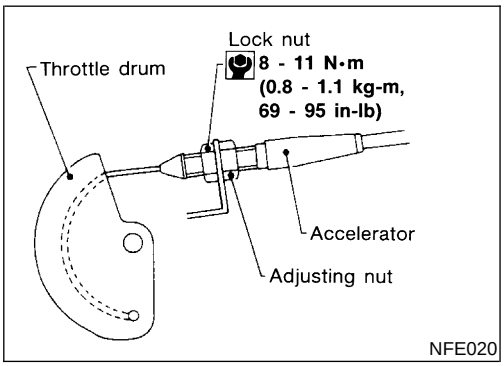
MODELS WITH THROTTLE OPENER

NLFE0003S01

1. Remove the vacuum hose connected to the throttle opener.
2. Connect suitable vacuum hose to vacuum pump as shown left.
3. Apply vacuum [more than −40.0 kPa (−40.0 bar, −300 mmHg, −11.81 inHg)] until the throttle drum becomes free from the rod of the throttle opener.
   Make sure that there is clearance between the throttle drum and rod.
   If NG, refer to EC-82 (QG), "Basic Inspection".
   If OK, go to following step.

Adjusting Accelerator Wire (Cont'd)



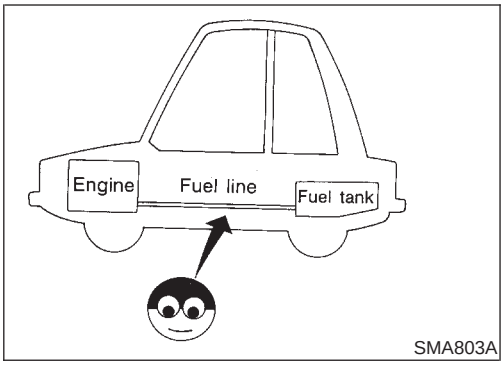


4. Loosen lock nut.
5. Tighten accelerator adjusting nut until throttle drum starts to move.
6. From that position, turn back adjusting nut 1.5 to 2 turns, and secure lock nut.
7. Release vacuum from the throttle opener.
8. Remove vacuum pump and vacuum hose from the throttle opener.
9. Reinstall the original vacuum hose to the throttle opener securely.

MODELS WITHOUT THROTTLE OPENER

NLFE0003S02

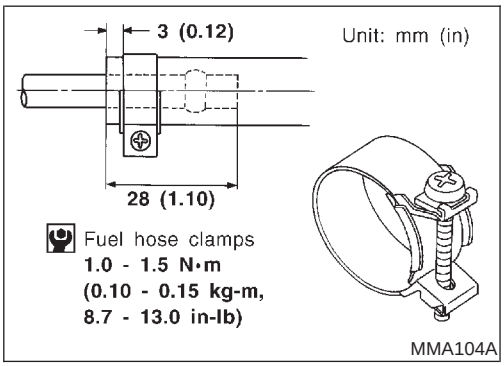
1. Loosen lock nut, and tighten adjusting nut until throttle drum starts to move.
2. From that position turn back adjusting nut 1.5 to 2 turns, and secure lock nut.



Checking Fuel Lines

NLFE0009

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



CAUTION:
Tighten high-pressure rubber hose clamp so that clamp end is 3 mm (0.12 in) from hose end.
Tightening torque specifications are the same for all rubber hose clamps.
Ensure that screw does not contact adjacent parts.

Removal and Installation

NLFE0004

WARNING:
When replacing fuel line parts, be sure to observe the following.
- **Put a "CAUTION: FLAMMABLE" sign in workshop.**
- **Be sure to furnish workshop with a CO_2 fire extinguisher.**
- **Do not smoke while servicing fuel system. Keep open flames and sparks away from work area.**

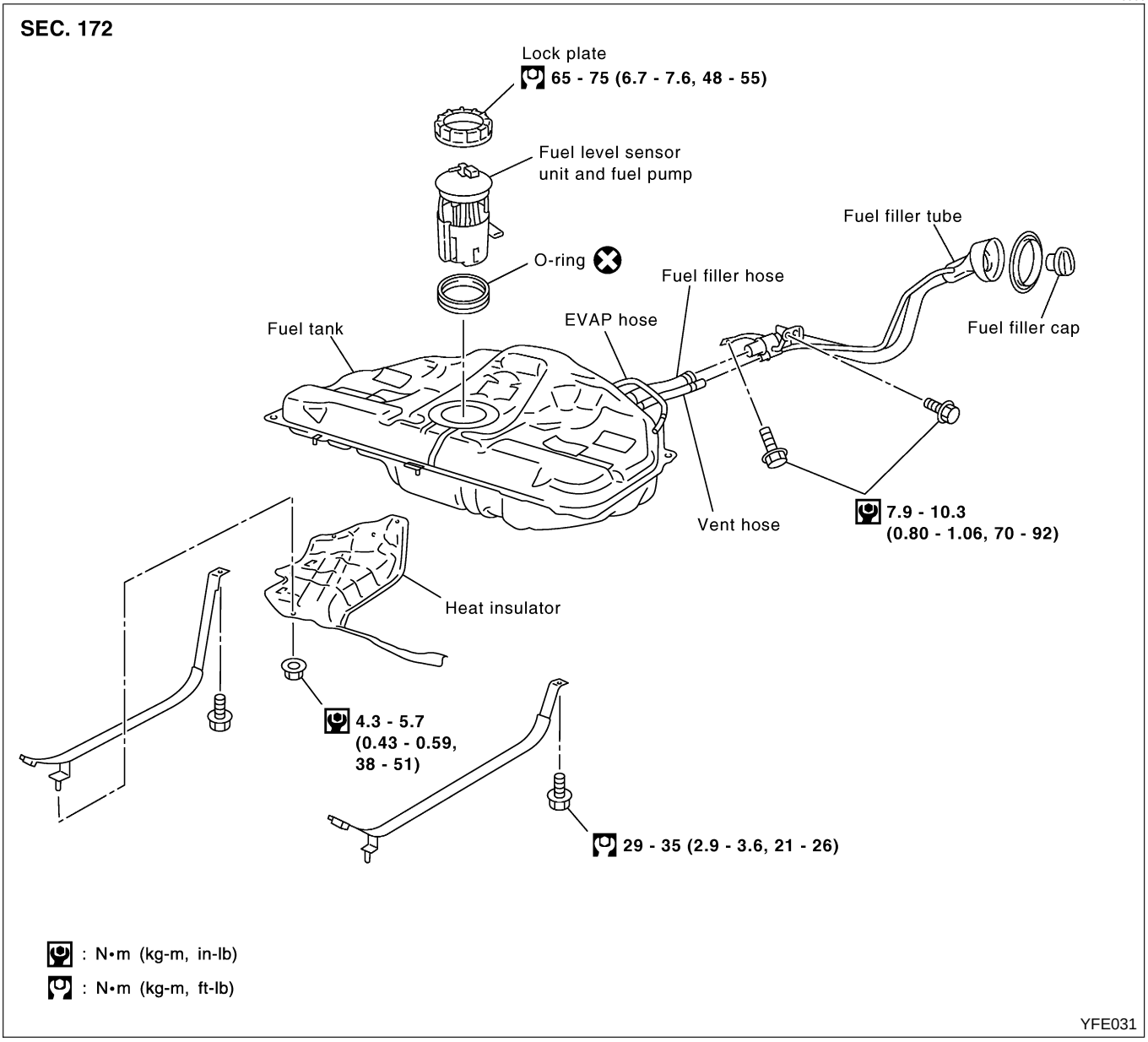
CAUTION:
- **Before removing fuel line parts, carry out the following procedures:**

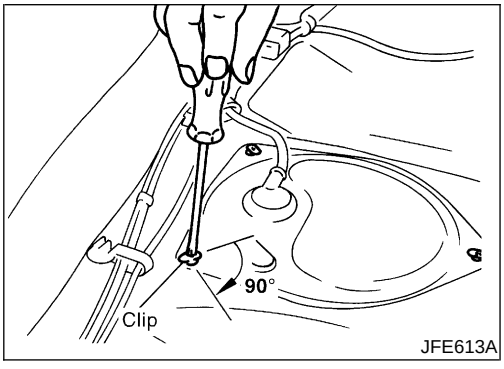
a) Put drained fuel in an explosion-proof container and put the lid on securely.
b) Release fuel pressure from fuel line. Refer to EC-47 (QG), "Fuel Pressure Release".
c) Disconnect battery ground cable.

- **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 installing tubes, run engine and check for fuel leaks at connections.**

Fuel Tank

NLFE0006

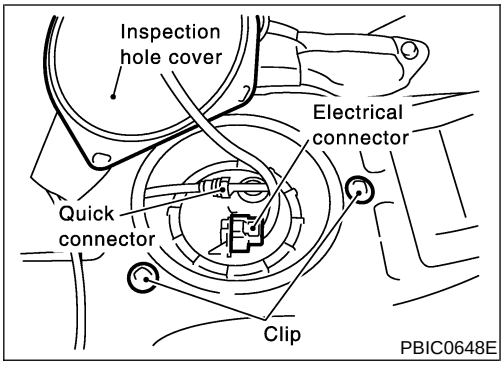




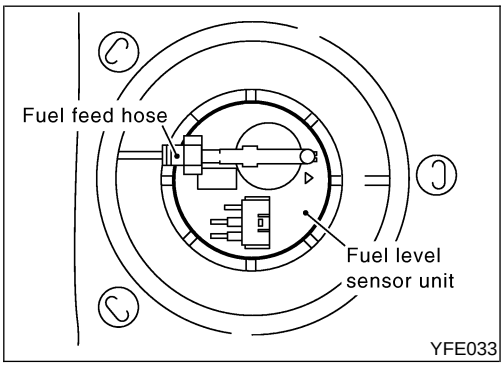
REMOVAL

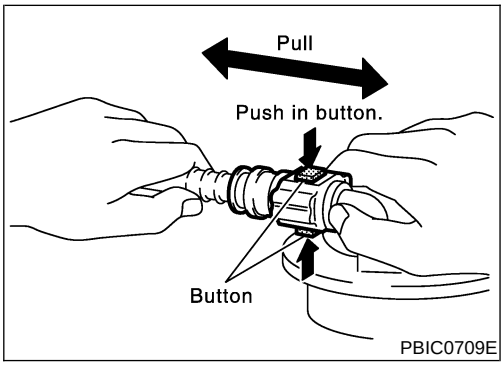
NLFE0006S01

1. Disconnect battery ground cable.
2. Open fuel filler lid and filler cap.
3. Drain fuel from fuel tank.
4. Remove rear seat cushion. Refer to BT-48, “Removal and Installation”.
5. Remove inspection hole cover under the rear seat.



6. Disconnect electrical connector.





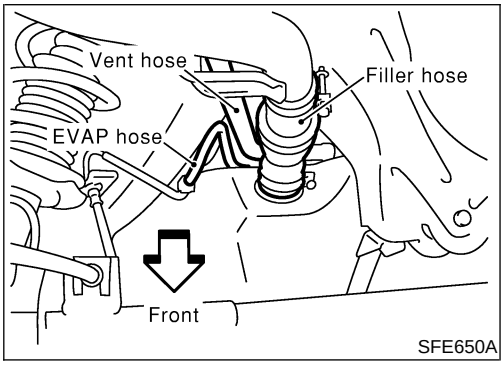
7. Remove the quick connector as follows.

NOTE:

- Hold the sides of the connector, push in tubs 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.

CAUTION:

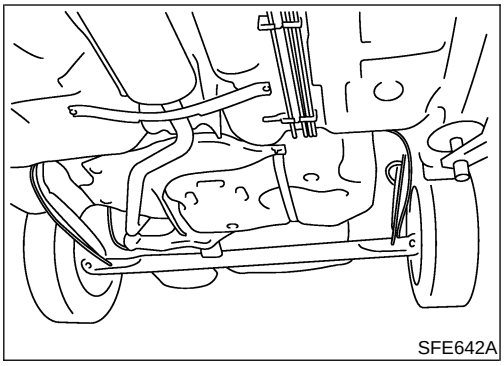
- **The tube can be removed when the button are completely depressed. Do not twist it more than necessary.**
- **Do not use any tools to remove the quick connector.**
- **Keep the resin tube away from heat. Be especially careful when welding near the tube.**
- **Prevent acid liquid such as battery electrolyte etc. from getting on the resin tube.**
- **Do not bend or twist the tube during installation and removal.**



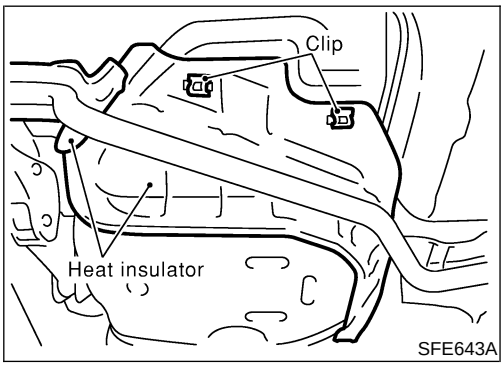
8. From rear left area of fuel tank, remove filler hose, vent hose, and EVAP hose.

CAUTION:

To prevent fuel from flowing out, install a blind cap immediately after the fuel hose is disconnected.

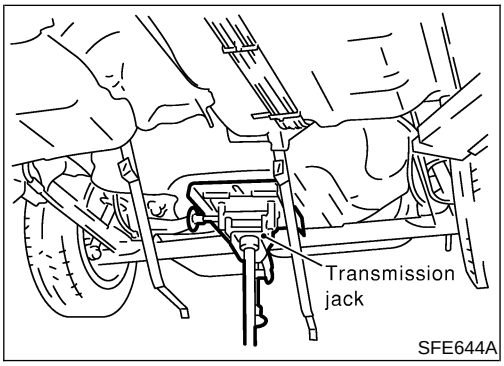

SFE642A

9. Remove exhaust center tube.



SFE643A

10. Remove heat insulators from fuel tank side.



SFE644A

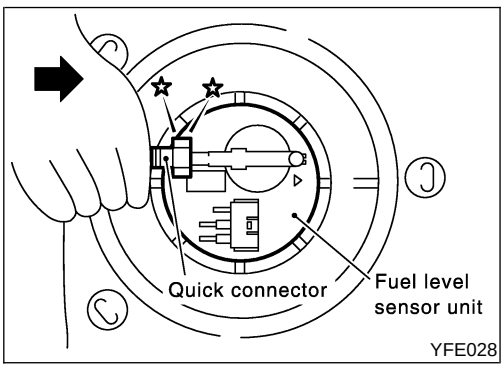
11. Set a suitable transmission jack under fuel tank.
12. Remove fuel tank mounting band bolts while supporting fuel tank.
13. Remove fuel tank.

INSTALLATION

NLFE0006S02

To install, reverse the removal procedure. Connect the quick connector as follows:

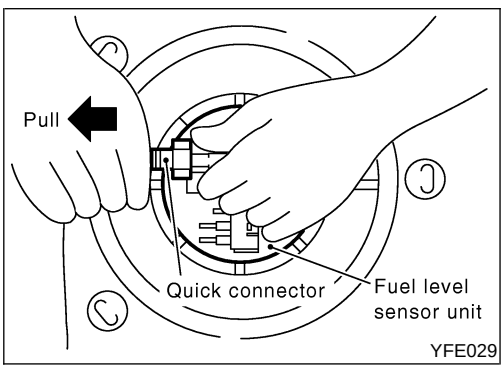
- Insert tube into the center of the connector until you hear a click.



YFE028

After connecting quick connector, make sure the connection is firmly made using the following method.

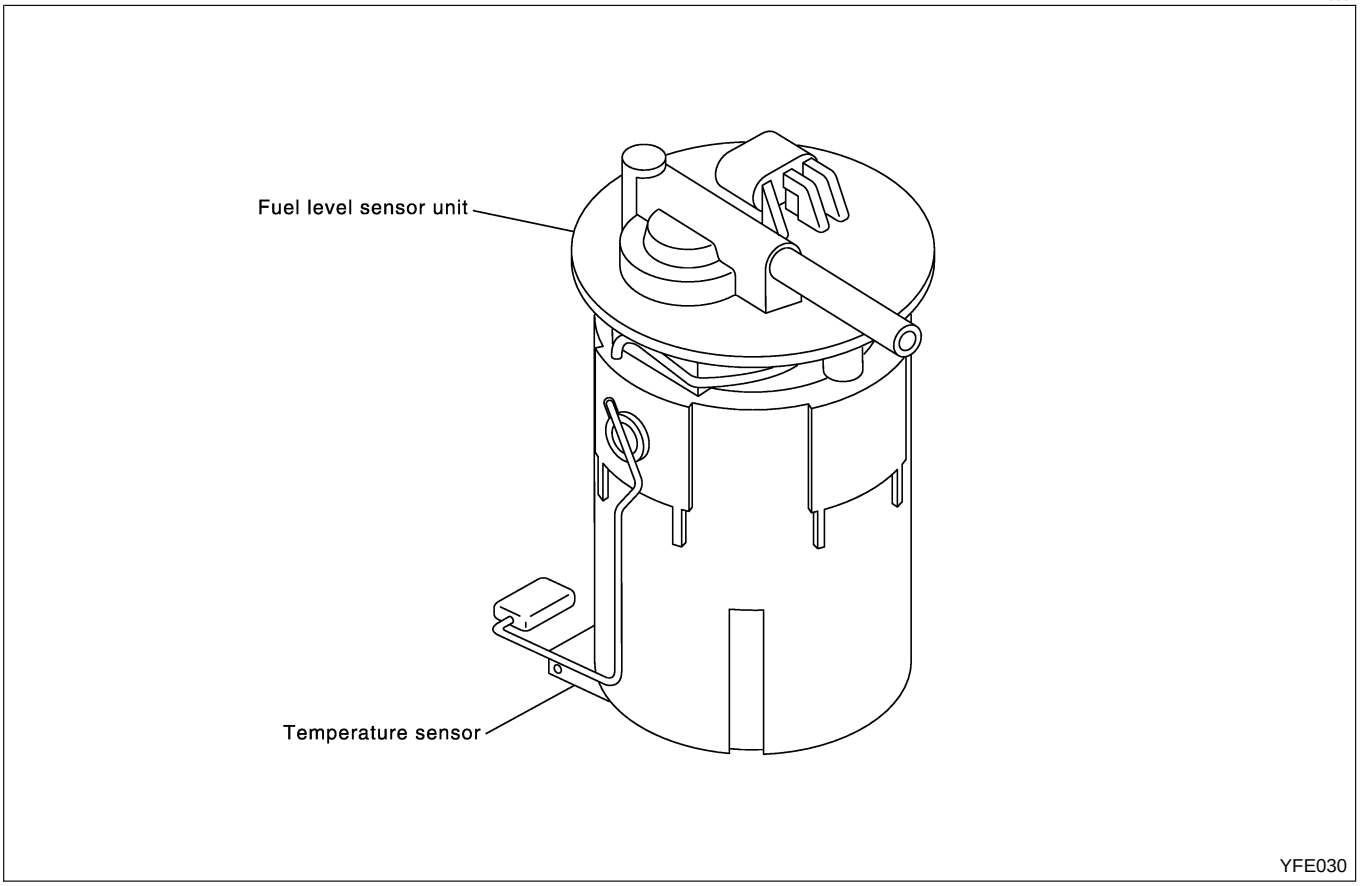
- Pull on the fuel tube and connector to make sure they are firmly connected.
- Start the engine, increase engine speed and verify that there are no leaks.

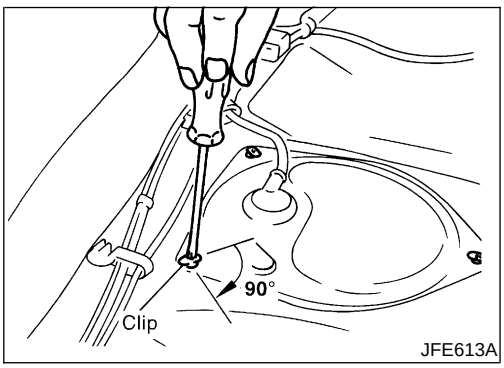


YFE029

Fuel Pump, Fuel Level Sensor Unit and Fuel Filter

NLFE0007

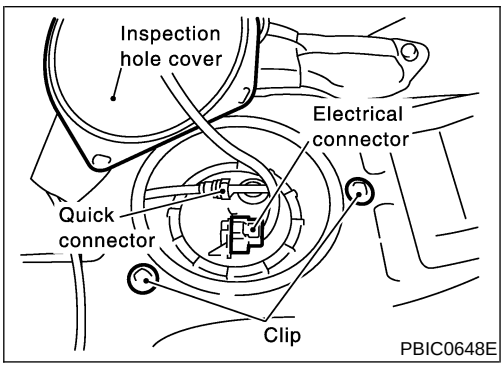




REMOVAL

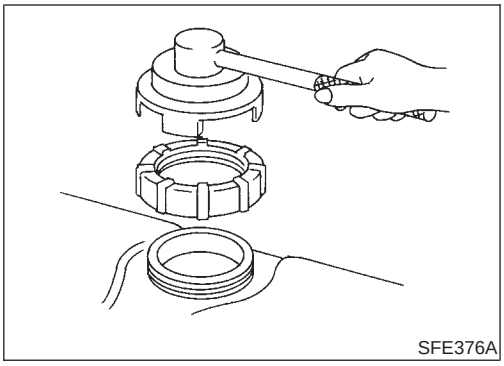
NLFE0007S01

1. Disconnect battery ground cable.
2. Open fuel filler lid and filler cap.
3. Remove rear seat cushion. Refer to BT-48, “Removal and Installation”.
4. Remove inspection hole cover under the rear seat.

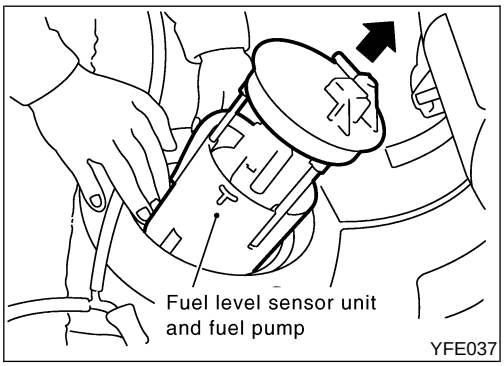


5. Disconnect electrical connector.
6. Disconnect the quick connectors.

- For disconnect of quick connectors, refer to step 7. of “Fuel Tank Removal”.


SFE376A

7. Remove lock ring using a lock ring socket (SST).



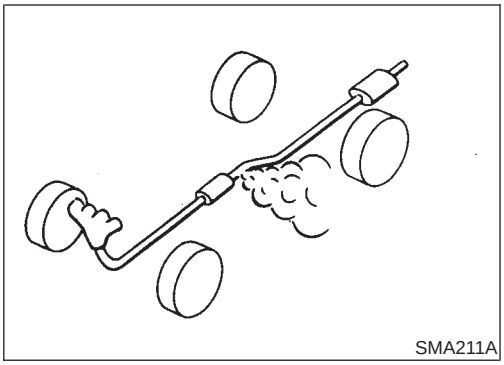
YFE037

8. Pull out the fuel level sensor unit and fuel pump.
- **Do not damage the arm of the fuel level sensor unit and fuel tank temperature sensor.**

INSTALLATION

NLFE0007S02

Installation is in reverse order of removal.


SMA211A

Checking Exhaust System

NLFE0010

Check exhaust pipes, muffler and mounting for improper attachment, leaks, cracks, damage, chafing or deterioration.

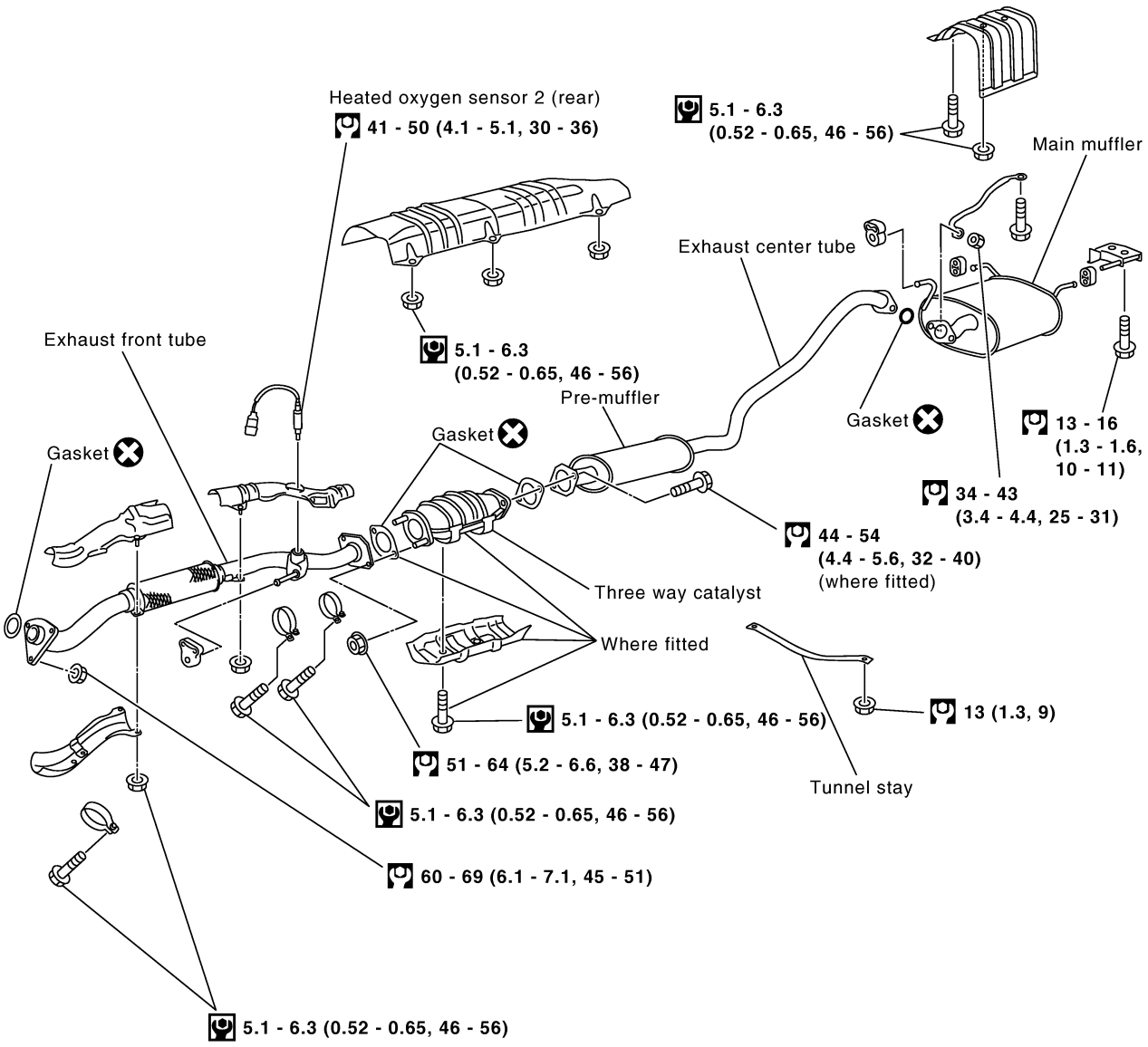
Removal and Installation

NLFE0005

CAUTION:

- **Always replace exhaust gaskets with new ones when reassembling.**
- **With engine running, check all tube connections for exhaust gas leaks, and entire system for unusual noises.**
- **Check to ensure that mounting brackets and mounting insulators are installed properly and free from undue stress. Improper installation could result in excessive noise or vibration.**
- **Discard any heated oxygen sensor which has been dropped from a height of more than 0.5 m (19.7 in) onto a hard surface such as a concrete floor; use a new one.**
- **Before installing a new oxygen sensor, clean exhaust system threads using oxygen sensor thread cleaner tool and apply anti-seize lubricant.**
- **Do not overtorque the oxygen sensor. Doing so may cause damage to the oxygen sensor, resulting in the MI coming on.**
- **Be sure to use genuine exhaust system parts which are designed especially for heat resistance, corrosion resistance, and shape.**
- **Perform the operation with the exhaust system fully cooled down because the system will be heated just after the engine stops.**
- **Be careful not to cut your hand on the insulator edge.**

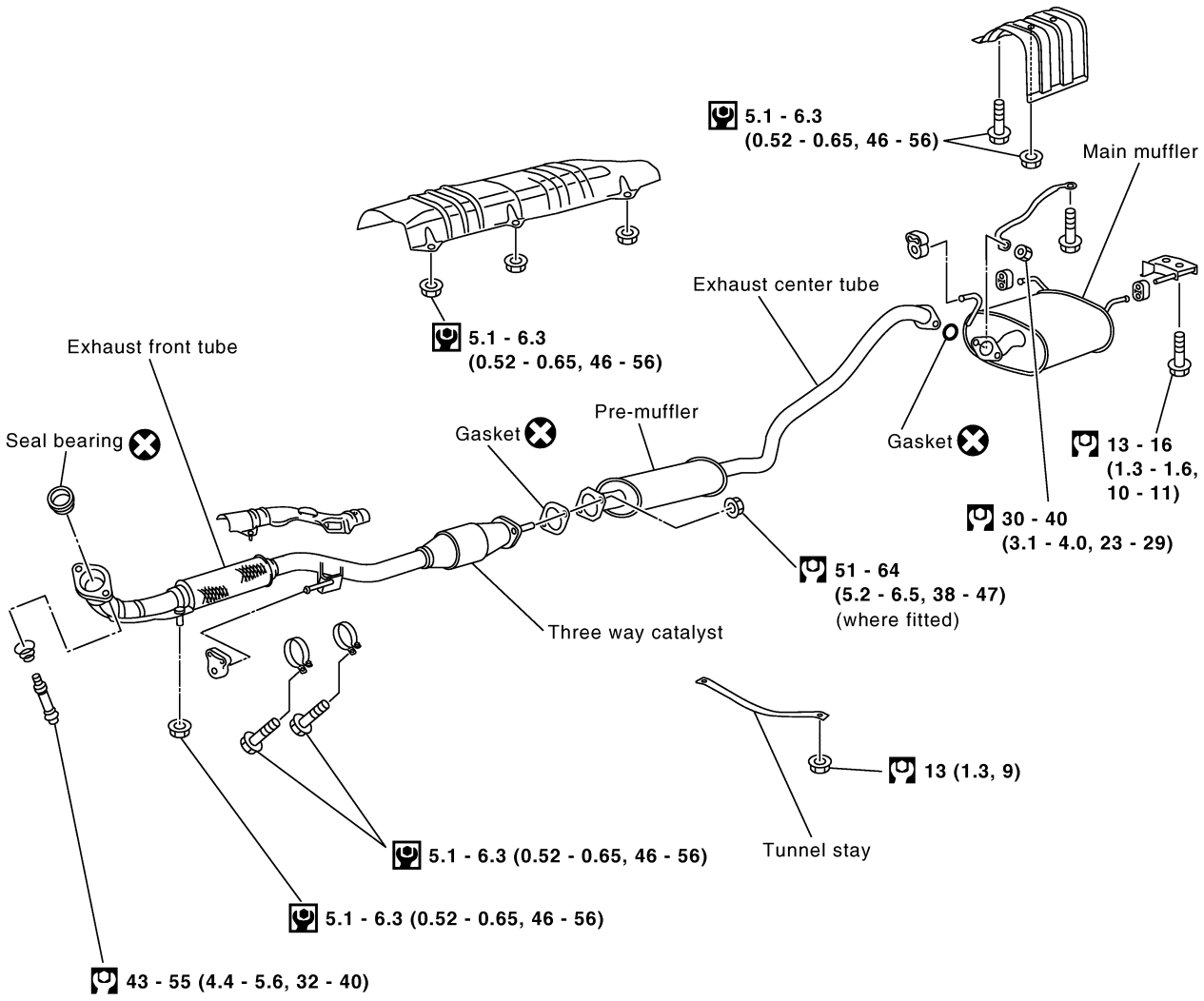
With three way catalyst
[Type A]



: N•m (kg-m, in-lb)
: N•m (kg-m, ft-lb)

YFE047

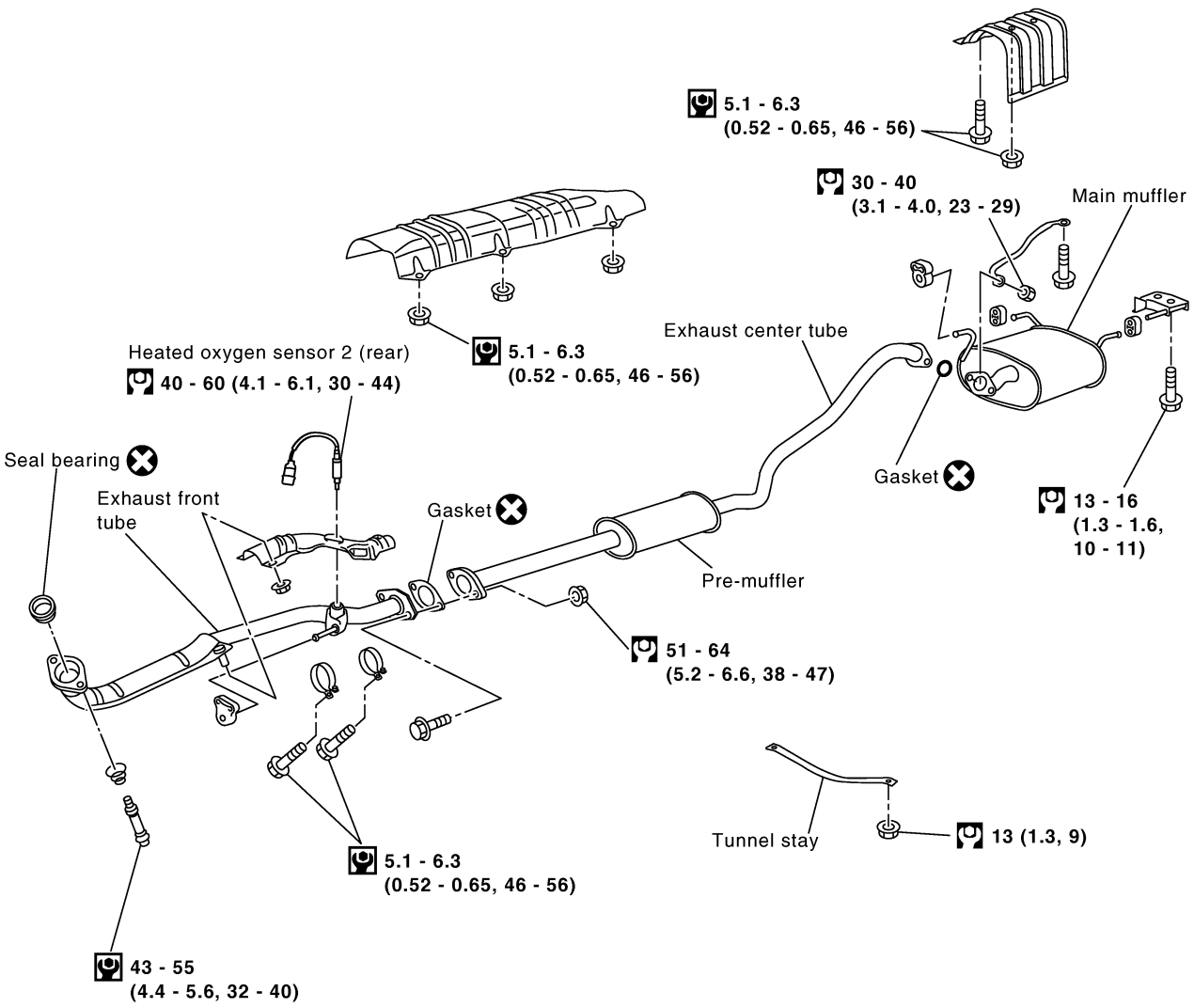
With three way catalyst
[Type B]



: N•m (kg-m, in-lb)
: N•m (kg-m, ft-lb)

YFE038

Without three way catalyst



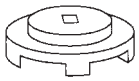
: N•m (kg-m, in-lb)

: N•m (kg-m, ft-lb)

YFE039

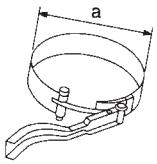
Special Service Tool

NLFE0031

Tool number Tool name	Description	
KV999G0010 Fuel tank lock ring socket	 NT057	Removing and installing fuel tank lock ring

Commercial Service Tool

NLFE0027

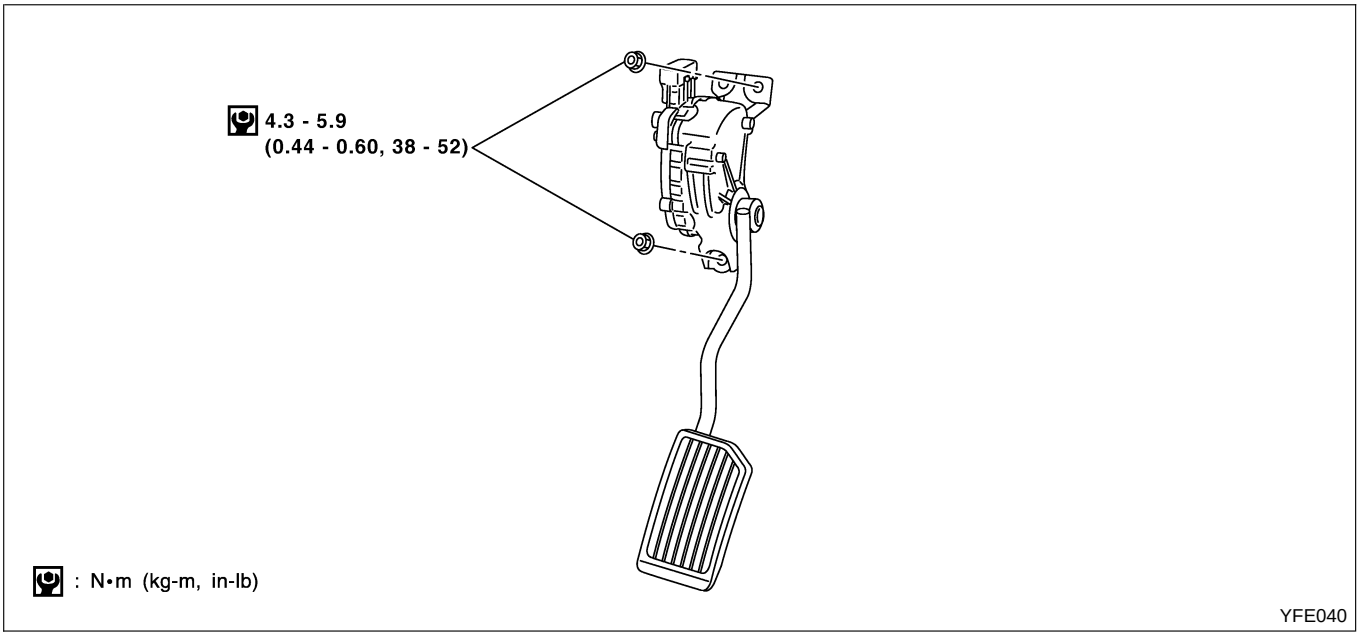
Tool name	Description	
Fuel filter wrench	 NT553	Removing fuel filter **a: Max. 100 mm (3.94 in) dia.**

Removal and Installation

NLFE0013

CAUTION:

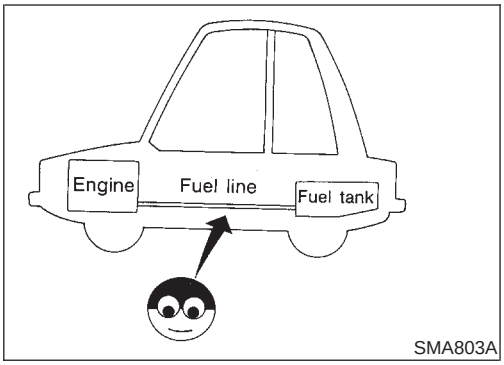
- **Do not disassemble the accelerator pedal assembly. Do not remove the sensors and the switches from the assembly.**
- **Avoid impact from dropping etc. during handling.**
- **Be careful to keep the assembly away from water.**



Inspection

NLFE0020

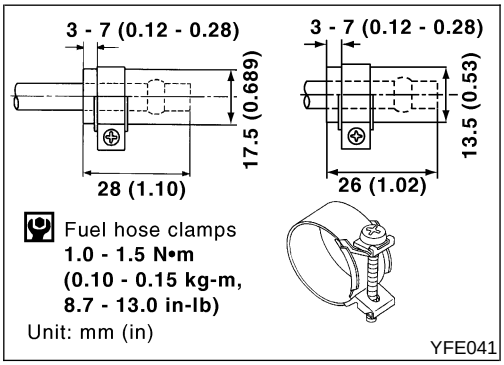
- Check that the accelerator pedal moves smoothly within the whole operation range.
- Check that the accelerator pedal securely returns to the original position.
- Check that the drum of the accelerator work unit can be fully opened.
- Refer to EC-971 or EC-1280, “Basic Inspection” for the inspection of the accelerator work unit and the accelerator pedal switch.



Checking Fuel Lines

NLFE0019

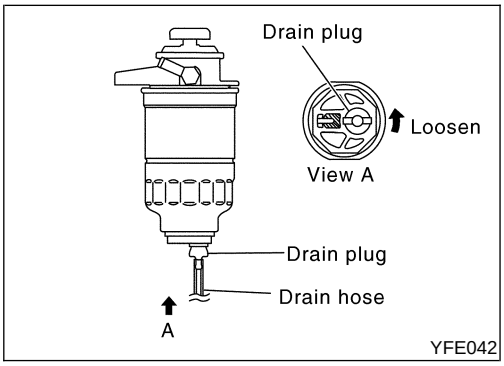
Inspect fuel lines and tank for improper attachment, leaks, cracks, damage, chafing and deterioration.
If necessary, repair or replace.



CAUTION:

Tighten high-pressure rubber hose clamp so that clamp end is 3 to 7 mm (0.12 to 0.28 in) from hose end.
Tightening torque specifications are the same for all rubber hose clamps.

Ensure that screw does not contact adjacent parts.



Water Draining from Fuel Filter

NLFE0028

DRAINING WATER

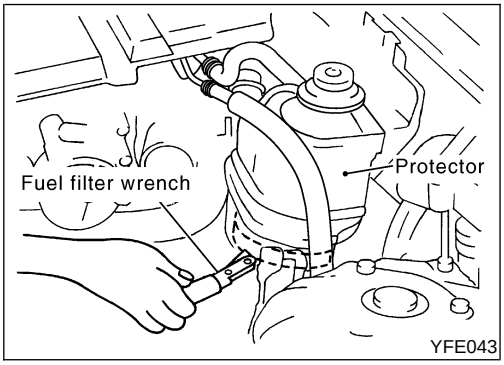
NLFE0028S01

Open drain plug at the bottom of fuel filter.

FUEL FILTER CHECK

NLFE0028S02

Check fuel filter for fuel leakage, damage and other abnormal sings.



Changing Fuel Filter

NLFE0021

REMOVAL

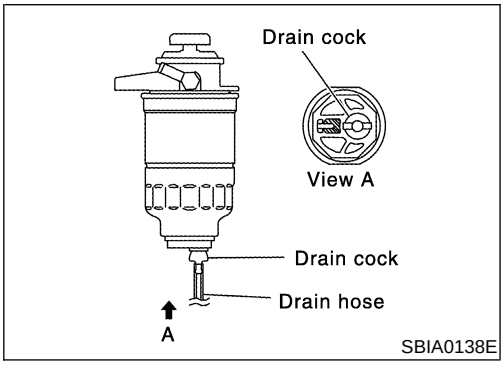
NLFE0021S01

1. Take out air duct and upper air cleaner case.
2. Remove fuel filter using a fuel filter wrench (commercial service tool).

CAUTION:

Do not spill the fuel during removal. If the fuel is spilt, immediately wipe it off. Be especially careful to prevent the fuel from adhering to the insulators of the engine mounts.

3. Remove drain plug from fuel filter.



INSTALLATION

NLFE0021S02

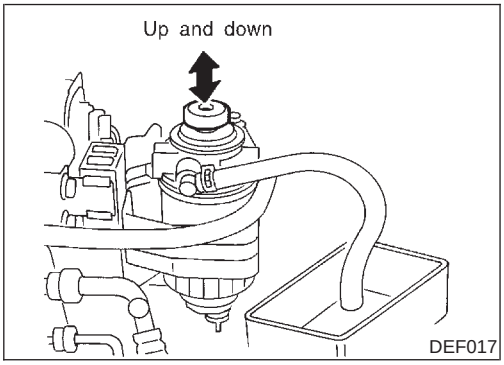
- Install in the reverse order of removal.
- Replace the O-ring of the drain plug with a new one.
- Tighten the fuel filter so that the sealing face contacts the packing, then retighten it manually by approximately 2/3 turn.
- After installation, operate the priming pump vertically to perform air bleeding.
  Refer to FE-18, “Bleeding Fuel Filter”.

Bleeding Fuel Filter

NLFE0023

1. After the repair, bleed air from the piping by pumping the priming pump up and down until it becomes heavy.
2. To start the engine, rotate the starter for a maximum of 30 seconds.
   To start the engine more quickly, crank the engine while pumping the priming pump (requires two workers).
3. If the engine does not start after rotating the starter for a maximum of 30 seconds, stop it once, and pump the priming pump again until it becomes heavy.
4. Rotate the starter again until the engine starts running.
5. After the engine starts, let it idle for at least 1 minute to stabilize the behavior.

- **When air is bled completely, the pumping of the priming pump suddenly becomes heavy. Stop the operation at that time.**
- **If it is difficult to bleed air by the pumping of the priming pump (the pumping of the priming pump does not become heavy), disconnect the fuel supply hose between the fuel filter and the injection pump. Then, perform the operation described above, and make sure that fuel comes out. (Use a pan, etc. so as not to spill fuel. Do not let fuel get on engine and other parts.) After that, connect the hose, then bleed air again.**
- **Start engine and let it idle for at least 1 minute after performing air bleeding.**



Checking Priming Pump

NLFE0024

Before checking priming pump, make sure that fuel filter is filled with fuel.

1. Disconnect fuel supply hose.

Place a suitable container beneath hose end.

2. Pump priming pump and check that the fuel overflows from the hose end. If not, replace priming pump.

Removal and Installation

=NLFE0015

WARNING:

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

- **Put a “CAUTION: FLAMMABLE” sign in workshop.**
- **Be sure to furnish workshop with a CO_2 fire extinguisher.**
- **Do not smoke while servicing fuel system. Keep open flames and sparks away from work area.**

CAUTION:

- **Before removing fuel line parts, carry out the following procedures:**

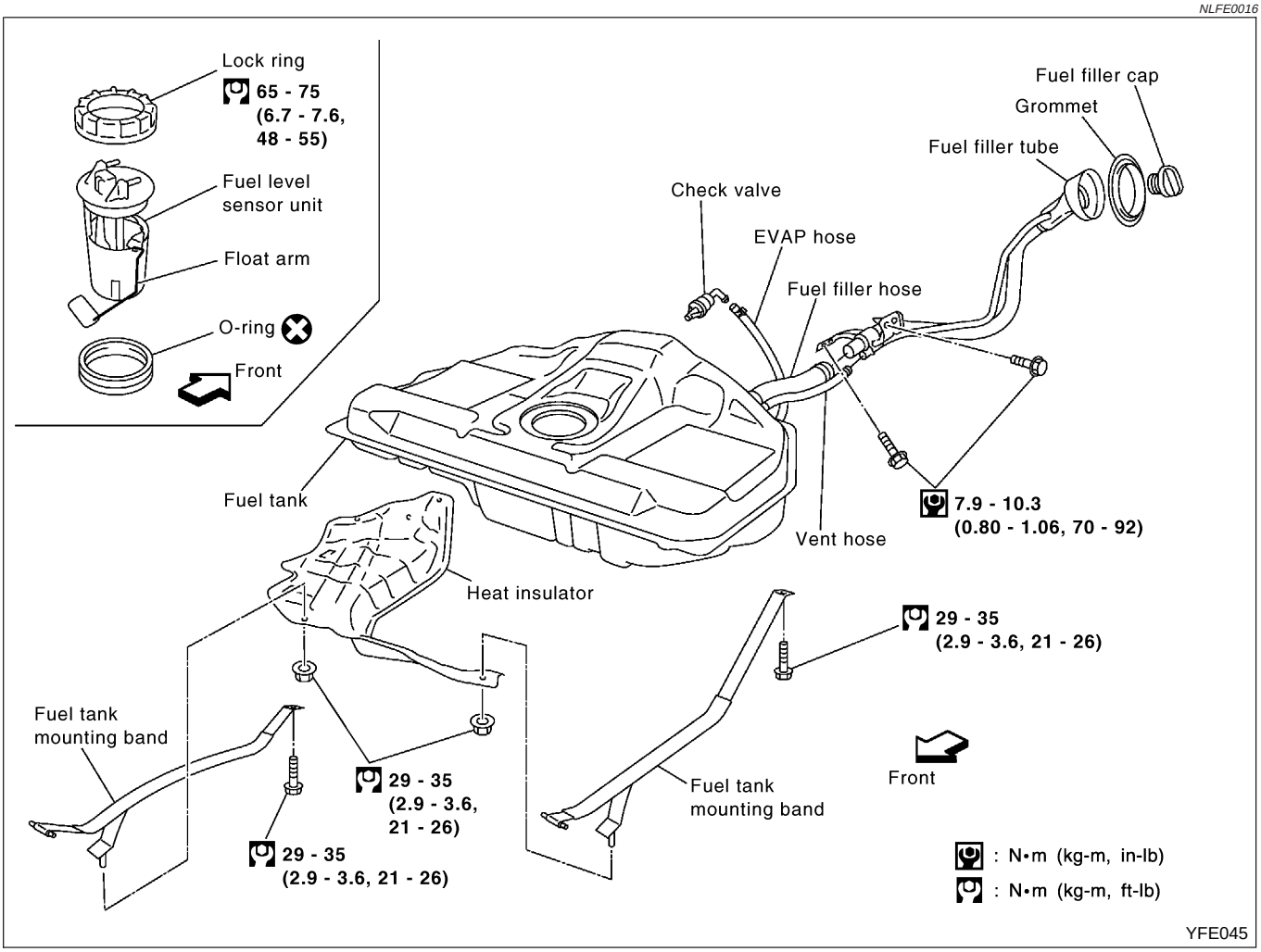
a) Put drained fuel in an explosion-proof container and put the lid on securely.

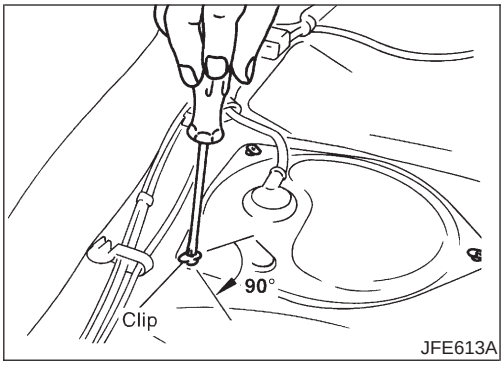
b) Disconnect battery ground cable.

- **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 installing tubes, run engine and check for fuel leaks at connections.**

Fuel Tank

NLFE0016



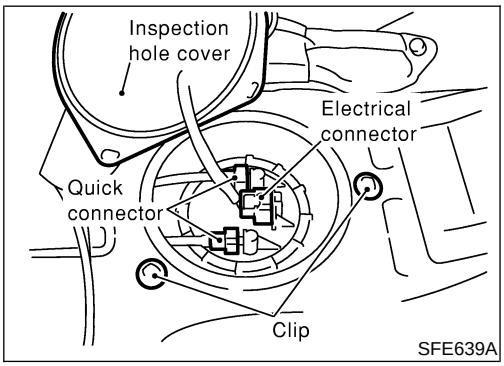


JFE613A

REMOVAL

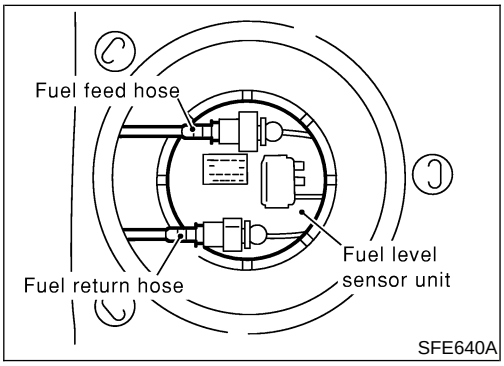
NLFE0016S01

1. Disconnect battery ground cable.
2. Open fuel filler lid and filler cap.
3. Drain fuel from fuel tank.
4. Remove rear seat cushion. Refer to BT-48, "Removal and Installation".
5. Remove inspection hole cover under the rear seat.



SFE639A

6. Disconnect electrical connector.



SFE640A

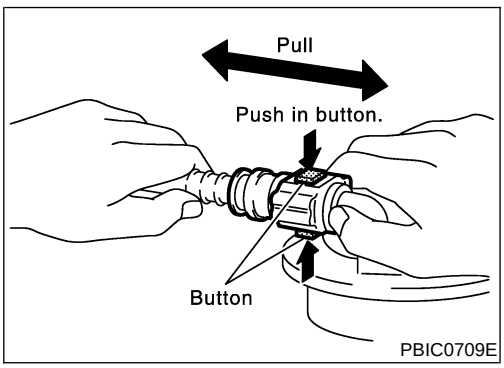
7. Remove the quick connector as follows.

NOTE:

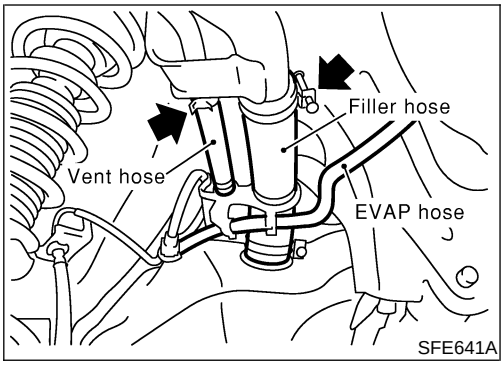
- Hold the sides of the connector, push in tubs and pull out the tube.
- If the connector and the tube are stuck together, push and pull several times until they start to move. Then disconnect them by pulling.

CAUTION:

- **The tube can be removed when the button are completely depressed. Do not twist it more than necessary.**
- **Do not use any tools to remove the quick connector.**
- **Keep the resin tube away from heat. Be especially careful when welding near the tube.**
- **Prevent acid liquid such as battery electrolyte etc. from getting on the resin tube.**
- **Do not bend or twist the tube during installation and removal.**

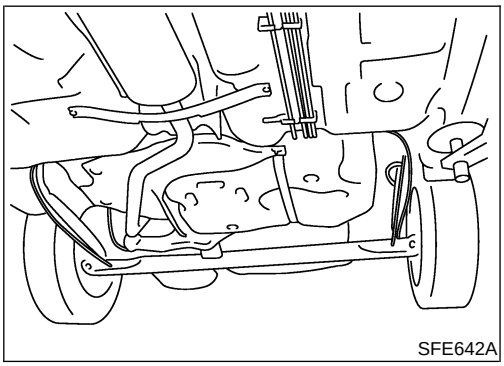


PBIC0709E

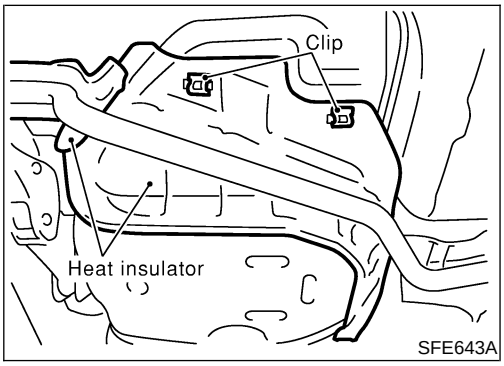


8. From rear left area of fuel tank, remove filler hose, vent hose, and EVAP hose.

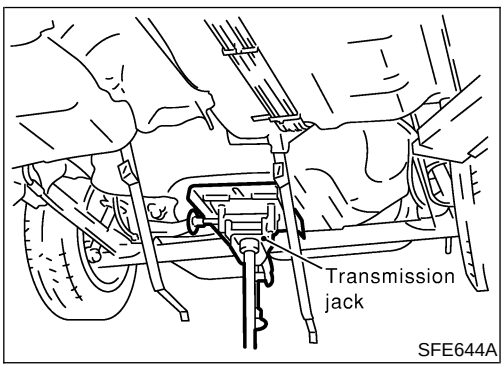
CAUTION:
To prevent fuel from flowing out, install a blind cap immediately after the fuel hose is disconnected.



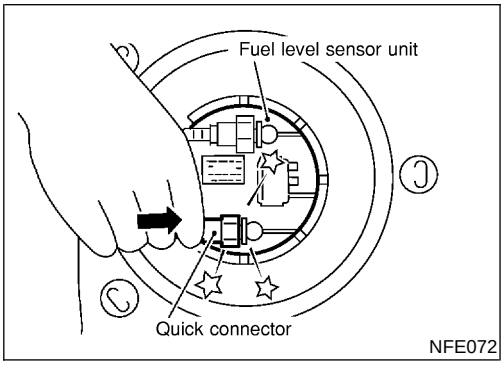
9. Remove exhaust center tube.



10. Remove heat insulators from fuel tank side.



11. Set a suitable transmission jack under fuel tank.
12. Remove fuel tank mounting band bolts while supporting fuel tank.
13. Remove fuel tank.

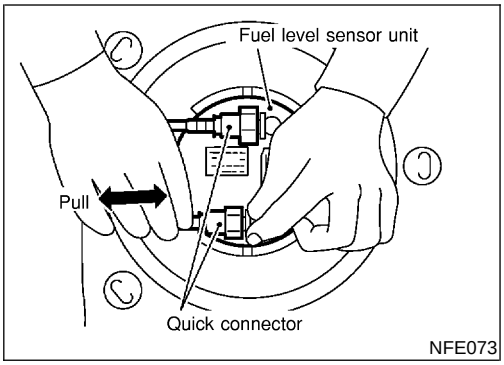


INSTALLATION

NLFE0016S02

To install, reverse the removal procedure. Connect the quick connector as follows:

- Insert tube into the center of the connector until you hear a click.

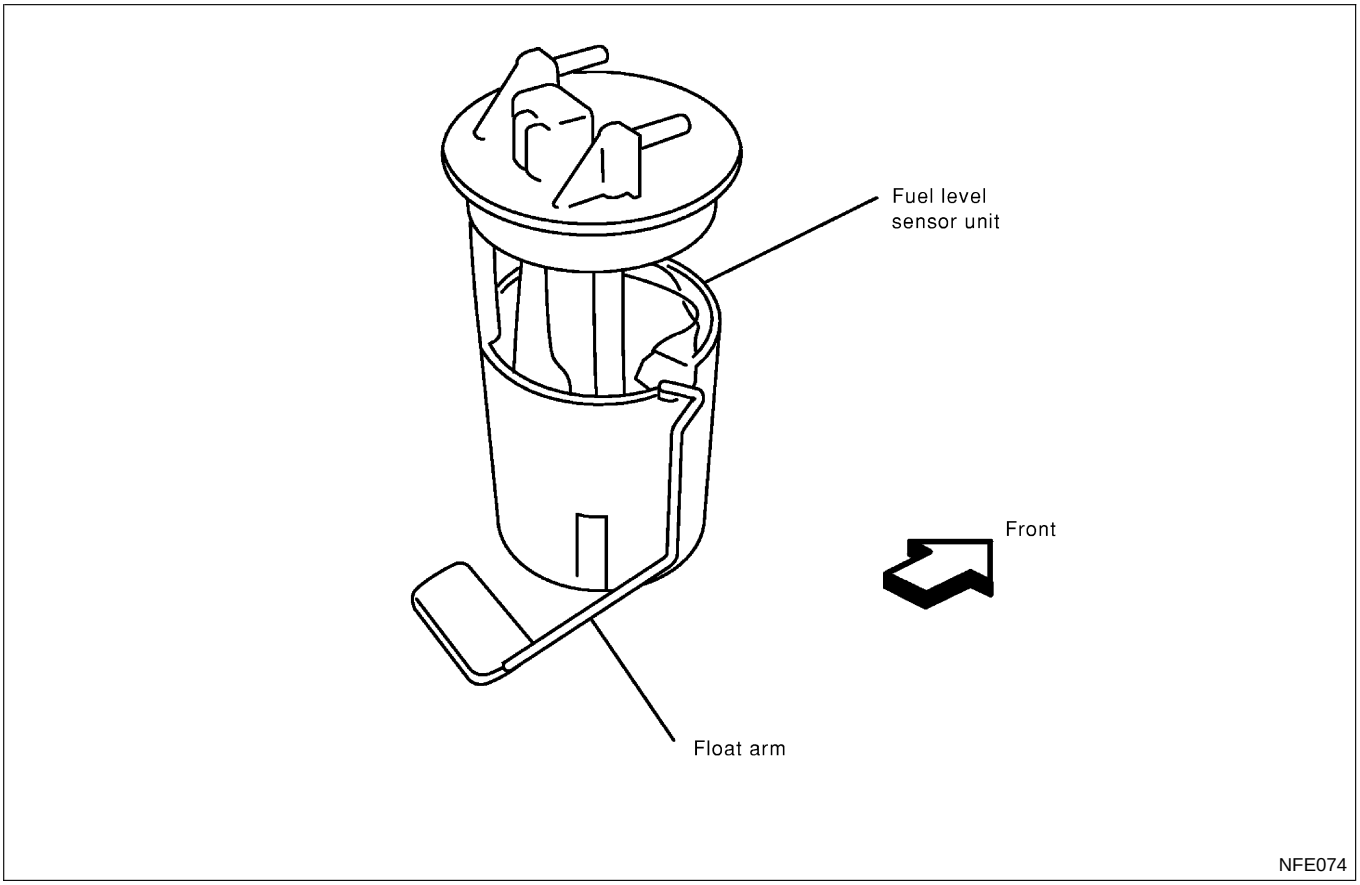


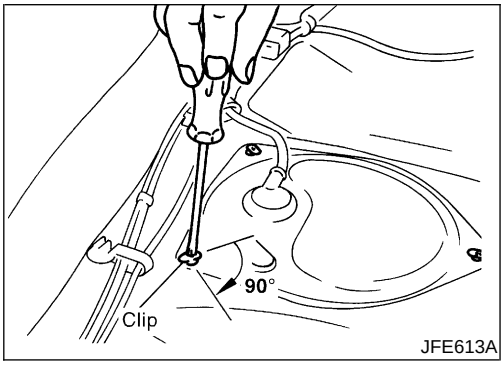
After connecting quick connector, make sure the connection is firmly made using the following method.

- Pull on the fuel tube and connector to make sure they are firmly connected.
- Start the engine, increase engine speed and verify that there are no leaks.

Fuel Level Sensor Unit

NLFE0032

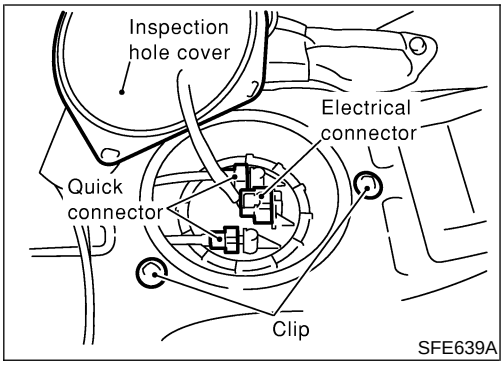




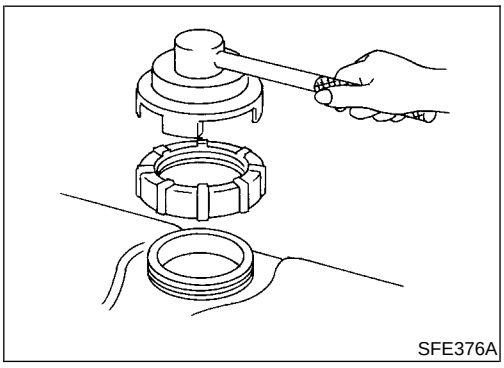
REMOVAL

NLFE0032S01

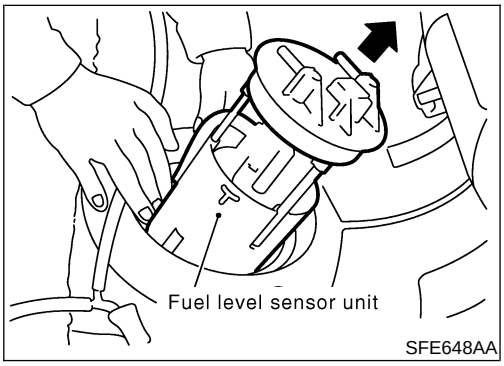
1. Disconnect battery ground cable.
2. Open fuel filler lid and filler cap.
3. Remove rear seat cushion. Refer to BT-48, "Removal and Installation".
4. Remove inspection hole cover under the rear seat.



5. Disconnect electrical connector.
6. Disconnect the quick connectors.
- For disconnect of quick connectors, refer to step 7. of "Fuel Tank Removal".



7. Remove lock ring using a lock ring socket (SST).

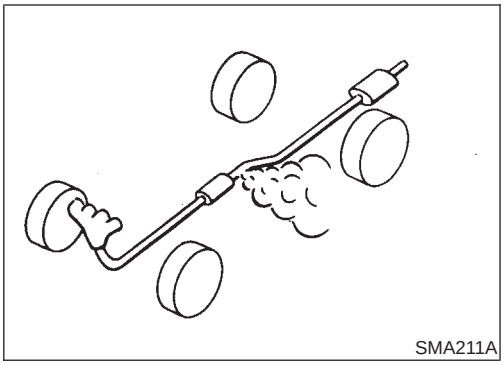


8. Pull out the fuel level sensor unit and fuel pump.
- **Do not damage the arm of the fuel level sensor unit.**

INSTALLATION

NLFE0032S02

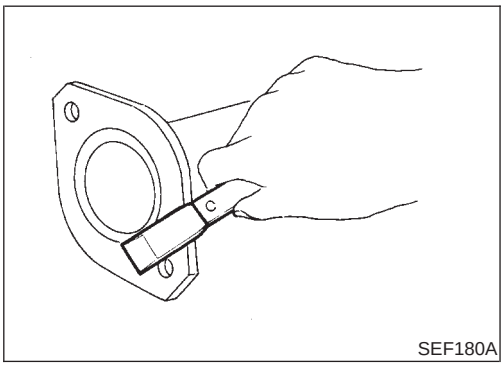
Installation is in reverse order of removal.


SMA211A

Checking Exhaust System

NLFE0022

Check exhaust pipes, muffler and mounting for improper attachment, leaks, cracks, damage, chafing or deterioration.



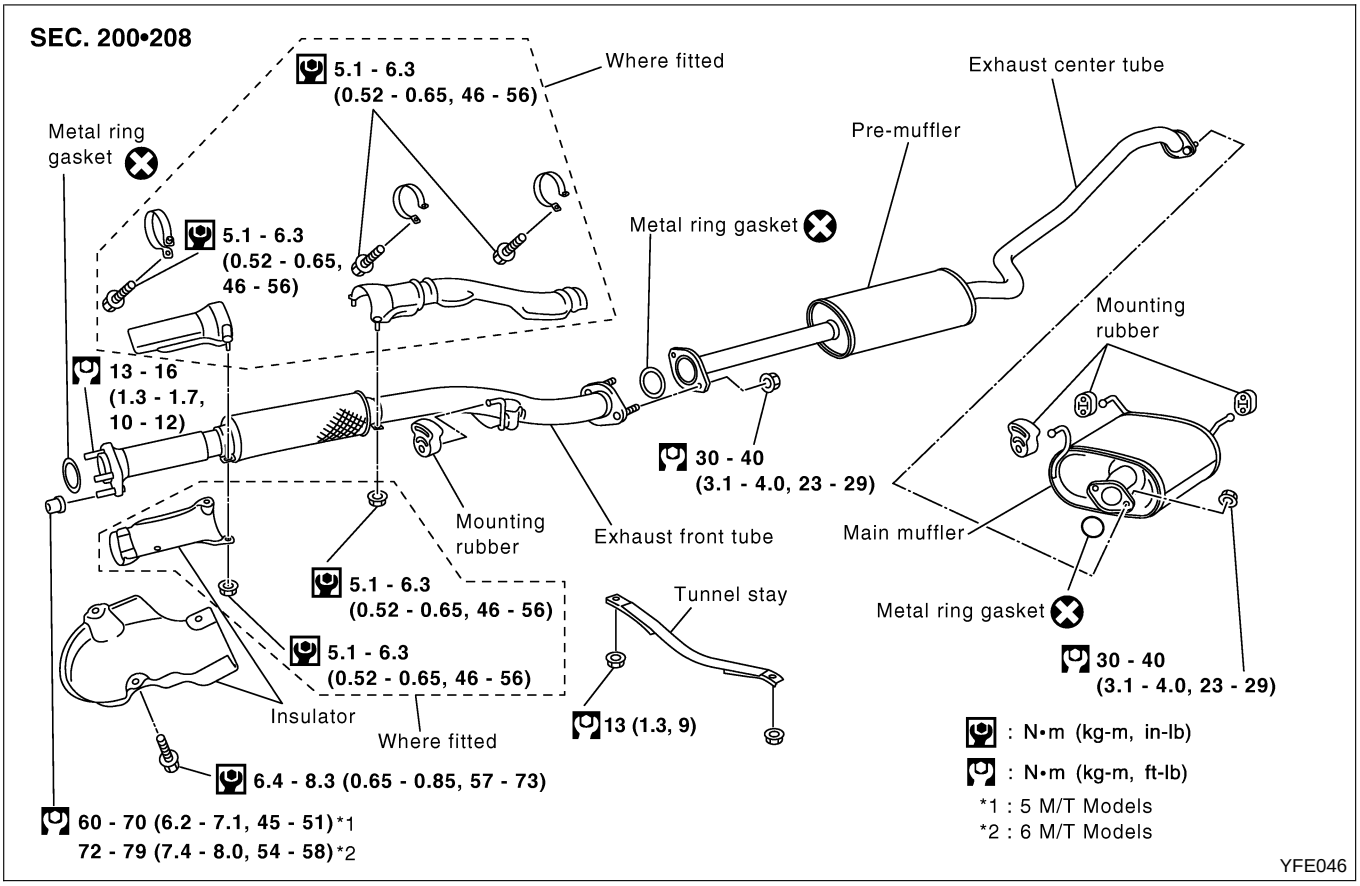
SEF180A

Removal and Installation

NLFE0018

CAUTION:

- **Always replace exhaust gaskets with new ones when reassembling. If gasket remains on flange surface, scrape off completely as shown at left.**
- **With engine running, check all tube connections for exhaust gas leaks, and entire system for unusual noises.**
- **Check to ensure that mounting brackets and mounting insulators are installed properly and free from undue stress. Improper installation could result in excessive noise or vibration.**
- **Be sure to use genuine exhaust system parts which are designed especially for heat resistance, corrosion resistance, and shape.**
- **Perform the operation with the exhaust system fully cooled down because the system will be heated just after the engine stops.**
- **Be careful not to cut your hand on the insulator edge.**


SEC. 200•208
5.1 - 6.3 (0.52 - 0.65, 46 - 56)
Where fitted
Exhaust center tube
Metal ring gasket
Pre-muffler
5.1 - 6.3 (0.52 - 0.65, 46 - 56)
Metal ring gasket
Mounting rubber
13 - 16 (1.3 - 1.7, 10 - 12)
30 - 40 (3.1 - 4.0, 23 - 29)
Mounting rubber
Exhaust front tube
Main muffler
5.1 - 6.3 (0.52 - 0.65, 46 - 56)
Tunnel stay
Metal ring gasket
5.1 - 6.3 (0.52 - 0.65, 46 - 56)
30 - 40 (3.1 - 4.0, 23 - 29)
Insulator
Where fitted
13 (1.3, 9)
: N•m (kg-m, in-lb)
: N•m (kg-m, ft-lb)
*1 : 5 M/T Models
*2 : 6 M/T Models
6.4 - 8.3 (0.65 - 0.85, 57 - 73)
60 - 70 (6.2 - 7.1, 45 - 51)*1
72 - 79 (7.4 - 8.0, 54 - 58)*2
YFE046

NOTES