

ENGINE

Fuel System [2GR-FE] - Sienna

FUEL SYSTEM

PRECAUTION

PRECAUTION

1. PRECAUTION

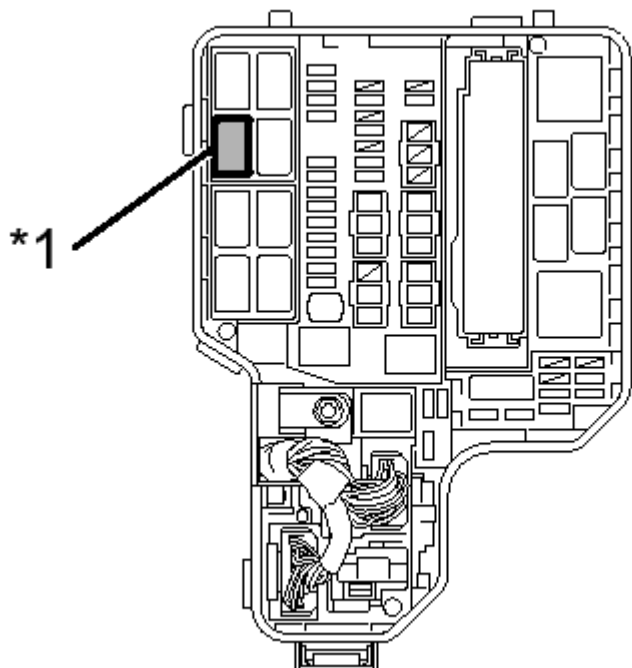
- a. Before working on the fuel system, disconnect the cable from the negative battery terminal.
- b. Do not work on the fuel system near any open flames. Never smoke when working on this system.
- c. Keep rubber and leather parts away from gasoline.

2. DISCHARGE FUEL SYSTEM PRESSURE

WARNING:

- Perform the following procedure to prevent fuel from spilling out before removing any fuel system parts.
- Even after discharging the fuel pressure, when disconnecting a fuel line, cover it with a piece of cloth to prevent fuel from spraying or coming out.

- a. Remove the circuit opening relay from the engine room relay block.



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Fig. 1: Identifying Circuit Opening Relay In Engine Room Relay Block

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

TEXT IN ILLUSTRATION

	Circuit
*1	Opening Relay

- b. Start the engine.
- c. After the engine stops naturally, turn the ignition switch off.

HINT:

DTC P0171 (system too lean (Bank 1)) or DTC P0174 (system too lean (Bank 2)) may be set.

- d. Crank the engine again and make sure that the engine does not start.
- e. Remove the fuel tank cap and discharge the pressure from the fuel tank.
- f. Install the circuit opening relay.

3. INJECTOR

- a. Observe the following precautions when removing and installing the fuel injector.

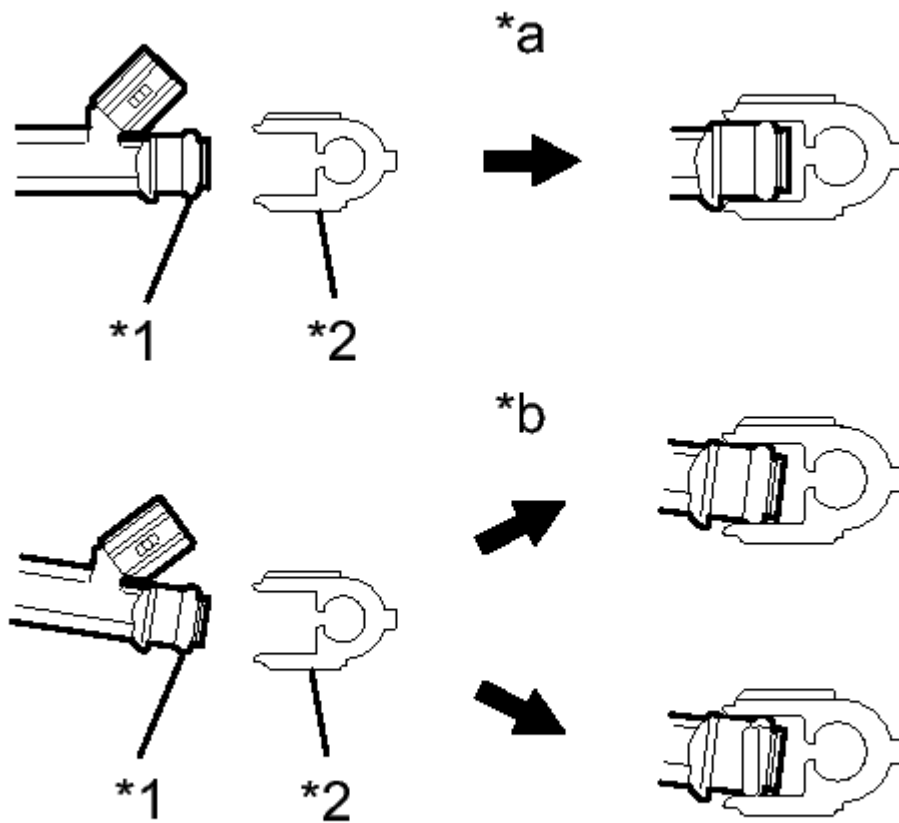
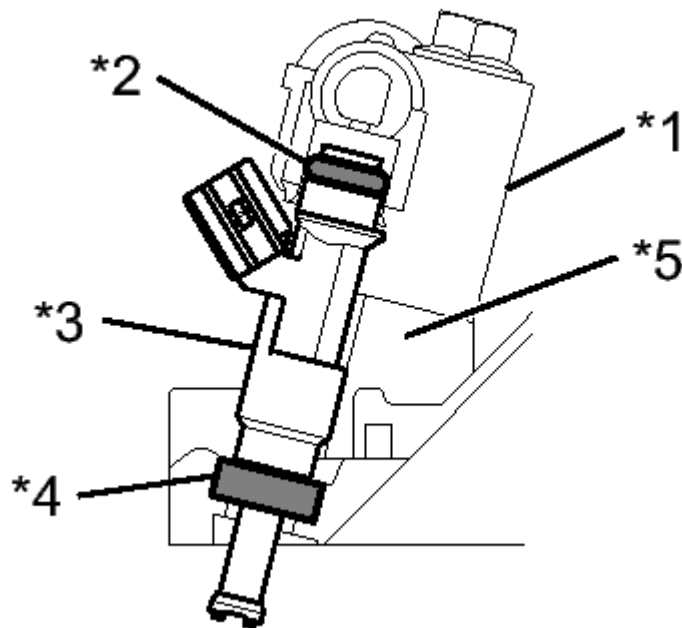


Fig. 2: Precautions - Removing/Installing Fuel Injectors
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

TEXT IN ILLUSTRATION

*1	O-Ring
*2	Delivery Pipe
*a	Correct
*b	Incorrect

- Do not reuse the O-ring and insulator.
 - When placing a new O-ring onto the injector, do not damage the O-ring.
 - Coat the new O-ring with spindle oil or gasoline before installing it. Do not use engine oil, gear oil or brake oil.
- b. Install the injector into the delivery pipe and lower intake manifold as shown in the illustration.



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Fig. 3: Identifying Injector Components

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

TEXT IN ILLUSTRATION

*1	Delivery Pipe
*2	O-Ring
*3	Injector
*4	Insulator
*5	Intake Manifold

NOTE: Before installing the injector, apply spindle oil or gasoline on any place where delivery pipe or lower intake manifold contacts the O-ring of the injector.

4. FUEL SYSTEM

- a. When disconnecting the high pressure fuel line, a large amount of gasoline will spill out, so observe these procedures.
 1. Discharge the fuel system pressure.
 2. Remove the charcoal canister protector. Refer to **REMOVAL - Step 1**.
 3. Disconnect the fuel tank main tube. Refer to **REMOVAL - Step 3**.
 4. Drain the fuel remaining inside the fuel tank main tube.
 5. Protect the contact surface by covering it with a plastic bag.

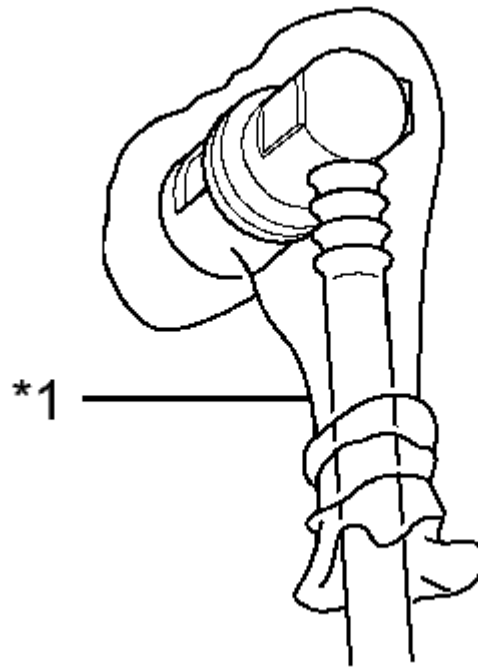


Fig. 4: Identifying High Pressure Fuel Line And Plastic Bag
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

TEXT IN ILLUSTRATION

*1	Plastic Bag
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NOTE: **Do not damage the pipe or fuel tube connector, and prevent entry of foreign objects.**

6. Put a container under the connection.
- b. Observe the following precautions when disconnecting the fuel tube connector.
 1. EFI fuel pipe clamp type A:

Remove the EFI fuel pipe clamp from the tube connector.

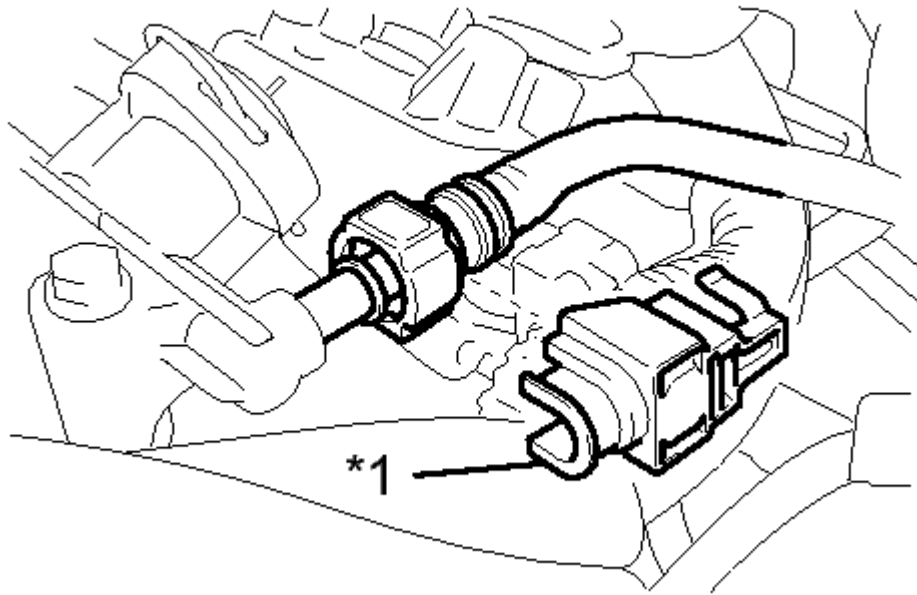


Fig. 5: Identifying EFI Fuel Pipe Clamp
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

TEXT IN ILLUSTRATION

*1	EFI Fuel Pipe Clamp
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2. EFI fuel pipe clamp type B:

Disengage the claw and remove the EFI fuel pipe clamp from the tube connector.

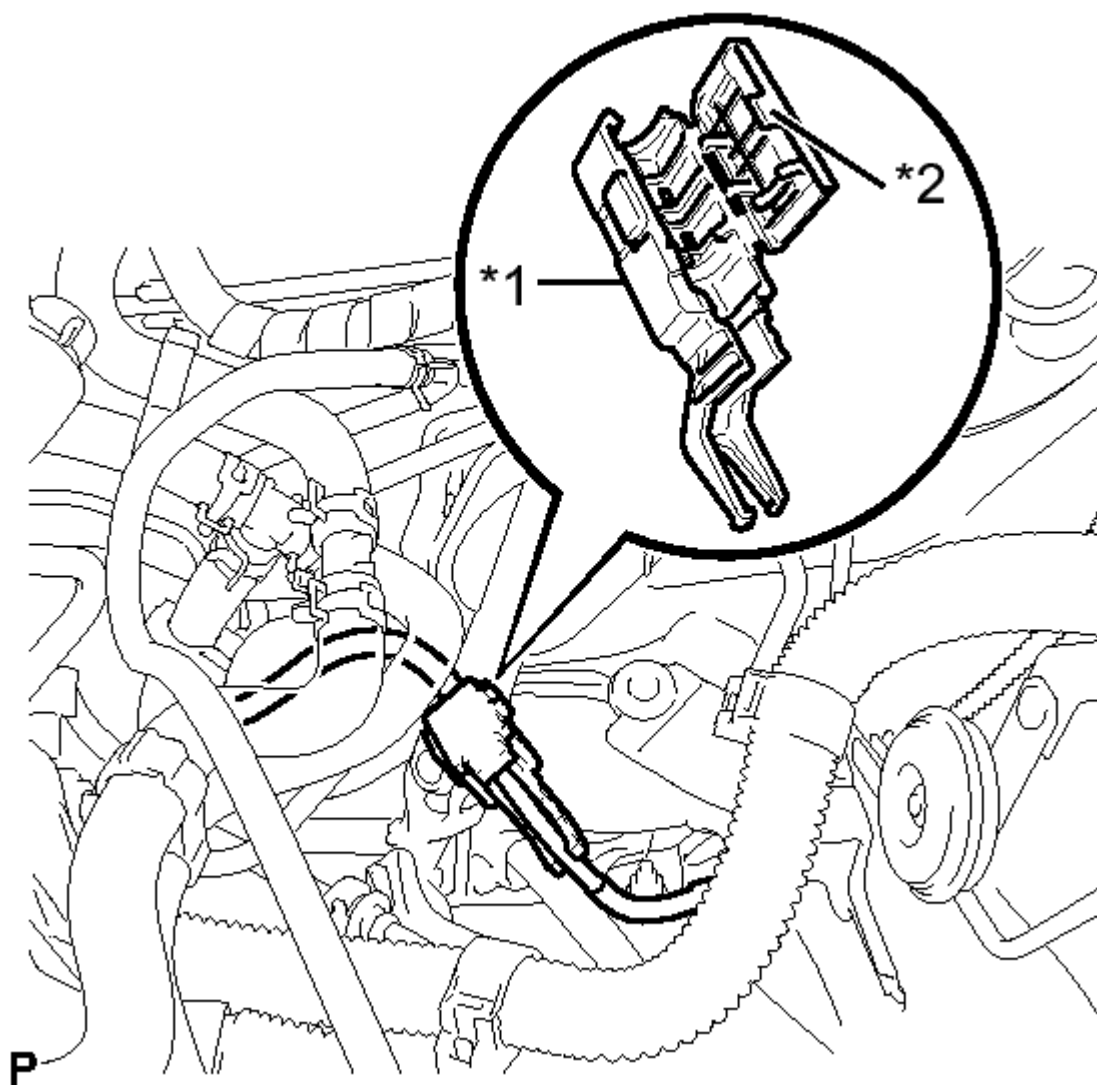


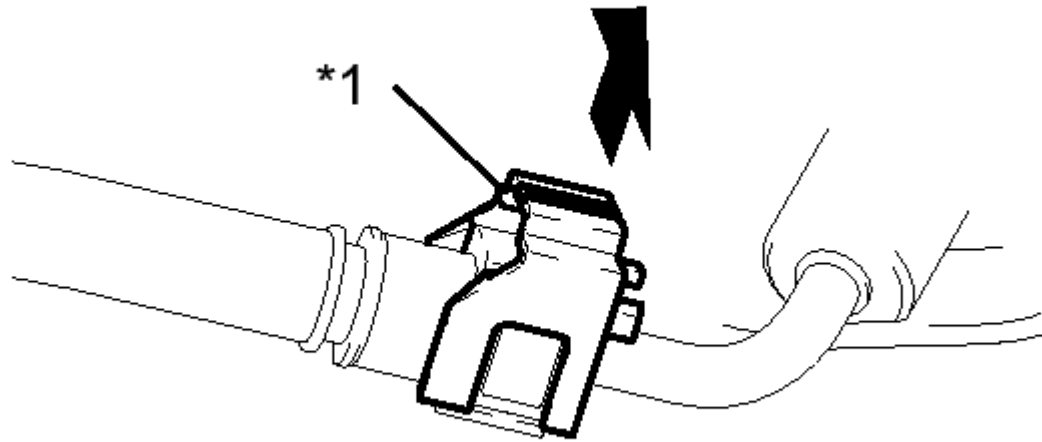
Fig. 6: Identifying Fuel Pipe Clamp (Type B)
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

TEXT IN ILLUSTRATION

	EFI
*1	Fuel Pipe Clamp
*2	Claw

3. Fuel tube connector cover type:

Disengage the lock claw by lifting up the cover as shown in the illustration.



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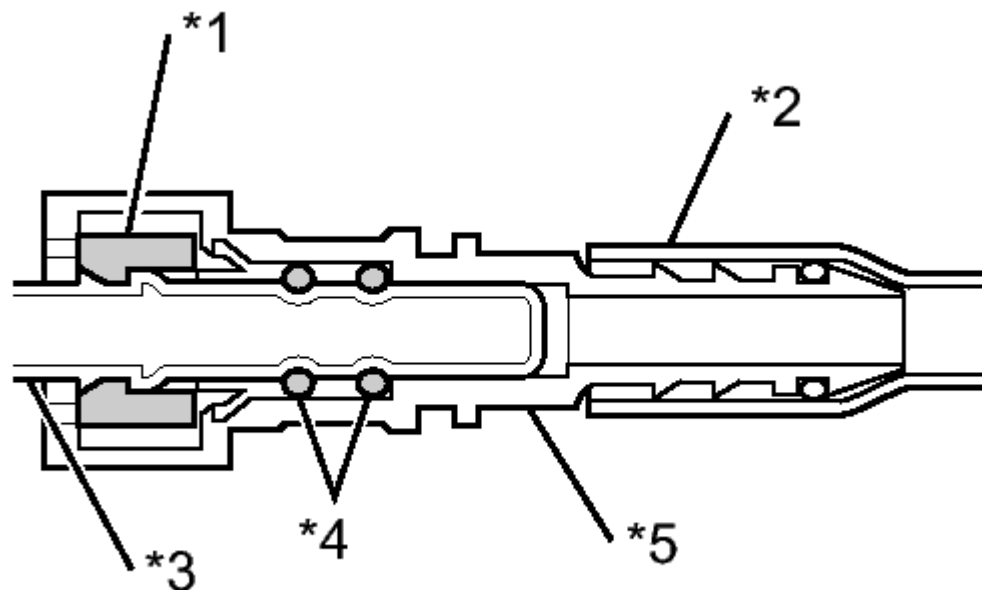
Fig. 7: Identifying Lock Claw

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

TEXT IN ILLUSTRATION

	Fuel Tube
*1	Connector Cover
·	Up

4. Check for dirt or other foreign matter on the parts to be disconnected and clean them if necessary.



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Fig. 8: Identifying Retainer, Nylon Tube, Pipe, O-Rings And Fuel Tube Connector
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

TEXT IN ILLUSTRATION

*1	Retainer
*2	Nylon Tube
*3	Pipe
*4	O-Ring
*5	Fuel Tube Connector

5. Pinch the retainer of the fuel tube connector, and then pull out the fuel tube connector to disconnect the fuel tube from the fuel pipe.

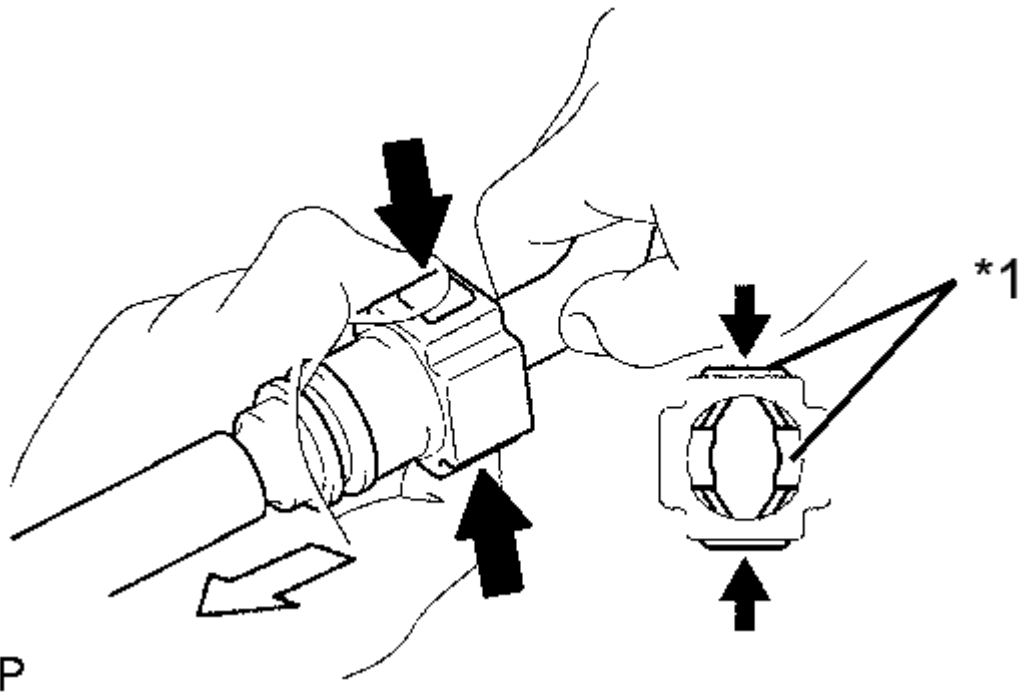


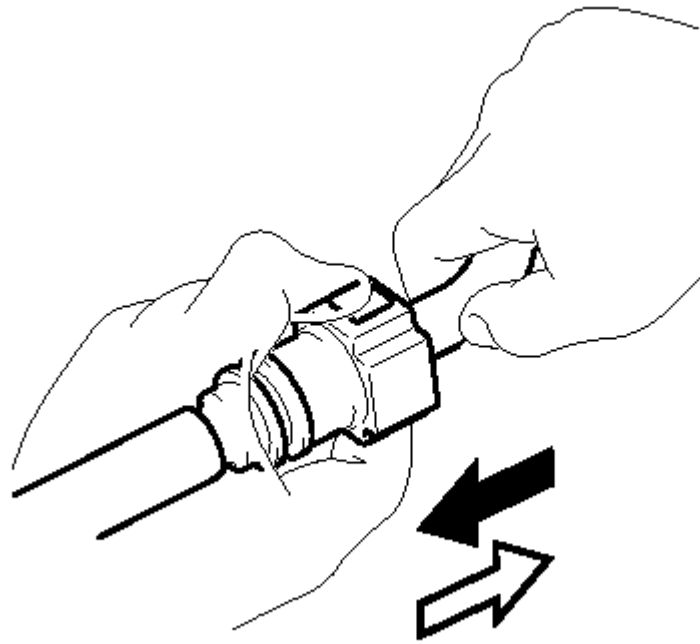
Fig. 9: Identifying Fuel Tube Connector And Retainer
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

TEXT IN ILLUSTRATION

*1	Retainer
·	Pinch
·	Pull Out

NOTE: **Do not use any tools.**

6. If the connector and pipe are stuck, pinch the retainer with your hand, and then push and pull the connector to disconnect them.



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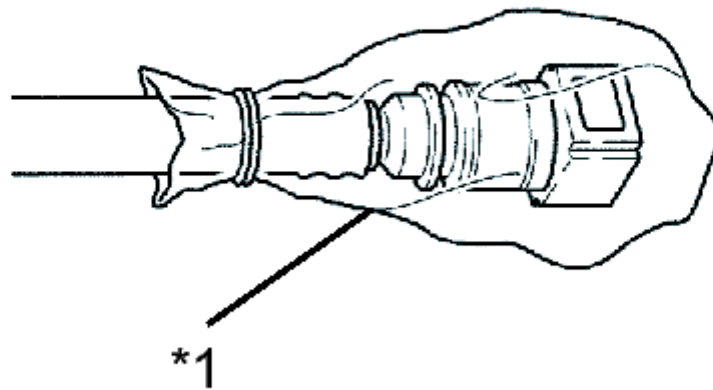
Fig. 10: Identifying Connector, Pipe And Retainer
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

TEXT IN ILLUSTRATION



NOTE: Do not use any tools.

7. Check the sealing surfaces of the disconnected parts, and clean them if necessary.
8. Protect the contact surface by covering it with a plastic bag.



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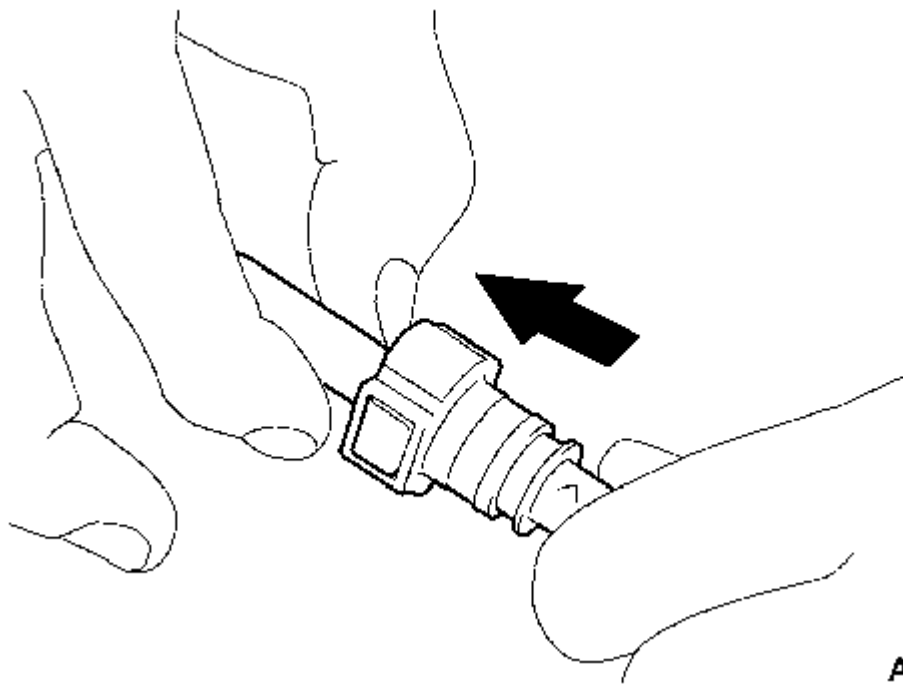
Fig. 11: Identifying Connector And Plastic Bag
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

TEXT IN ILLUSTRATION

*1	Plastic Bag
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NOTE: Do not damage the pipe or fuel tube connector, and prevent entry of foreign objects.

- c. Observe the following precautions when connecting the fuel tube connectors.



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Fig. 12: Precautions - Installing/Removing Fuel Tube Connectors
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

TEXT IN ILLUSTRATION

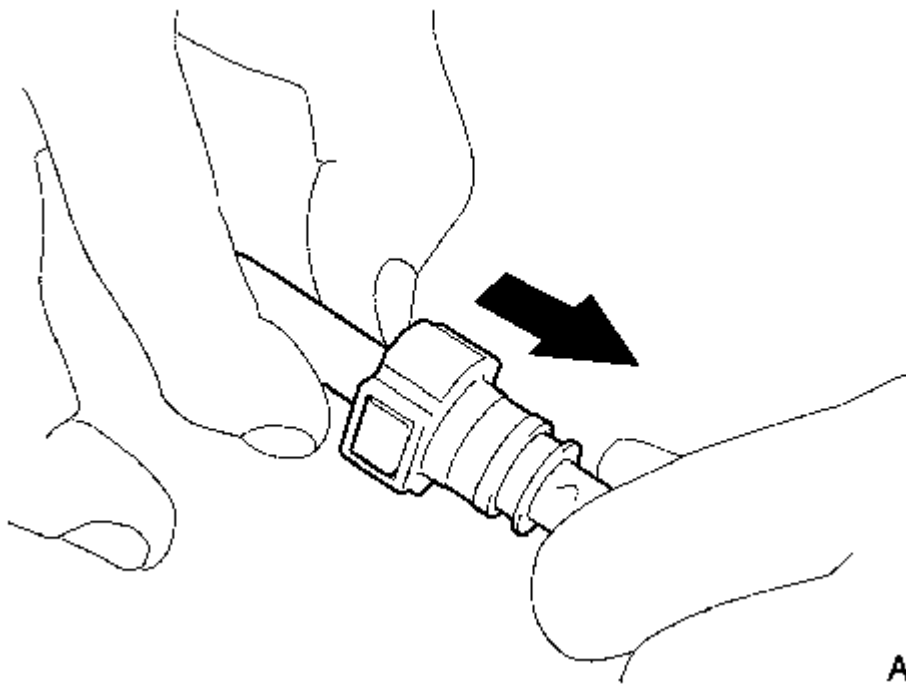
Push

1. Check that there are no scratches or foreign objects on the connecting part.
2. Line up the pipe and connector and push them together until a "click" sound is heard.

HINT:

If the pipe is difficult to push into the connector, apply a small amount of clean engine oil to the tip of the pipe and reinsert it.

3. After connecting the pipes, check that the pipe and connector are securely connected by pulling on them.



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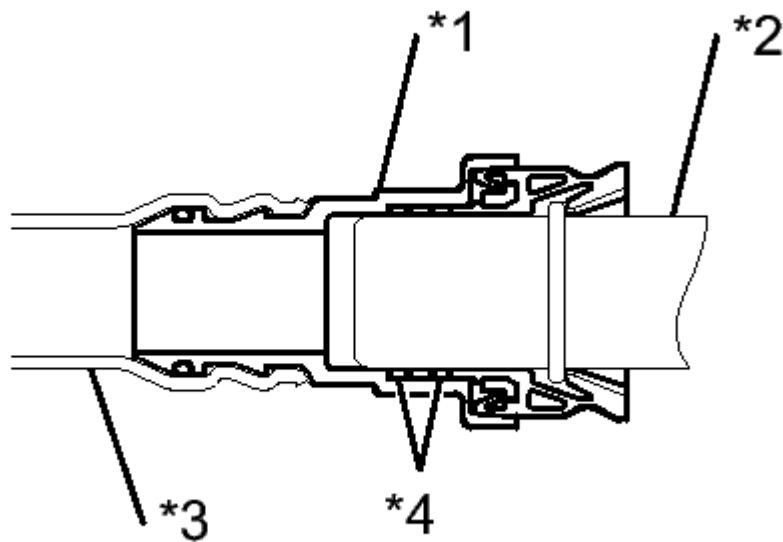
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Fig. 13: Securing Connector & Pipe
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

TEXT IN ILLUSTRATION

Pull

4. Fuel tube connector cover type:
Engage the lock claws to the connector by pushing down on the cover.
 5. EFI fuel pipe clamp type A:
Install the EFI fuel pipe clamp to the tube connector.
 6. EFI fuel pipe clamp type B:
Engage the claw and install the EFI fuel pipe clamp to the tube connector.
 7. Inspect for fuel leaks.
- d. Observe these precautions when disconnecting the charcoal canister outlet tube connector:



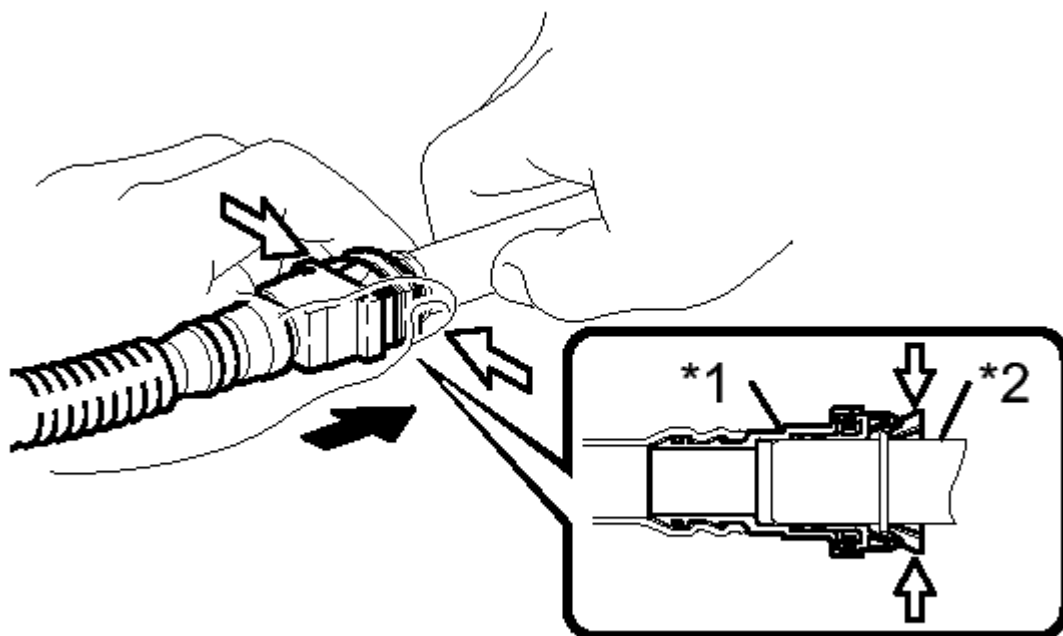
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Fig. 14: Identifying Fuel Tank Breather Tube Connector, Pipe, Nylon Tube And O-Ring
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

TEXT IN ILLUSTRATION

*1	Fuel Tank Breather Tube Connector
*2	Pipe
*3	Nylon Tube
*4	O-Ring

1. Check for dirt or other foreign matter on the parts to be disconnected and clean them if necessary.
2. Pinch the retainer and pull out the fuel tank breather tube connector with the fuel tank breather tube connector pushed to the pipe side to disconnect the fuel tank breather tube from the pipe.



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Fig. 15: Identifying Fuel Tube Connectors (Quick Type C)

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

TEXT IN ILLUSTRATION

*1	Fuel Tank Breather Tube Connector
*2	Pipe
·	Push
·	Pinch

NOTE: Do not use any tools.

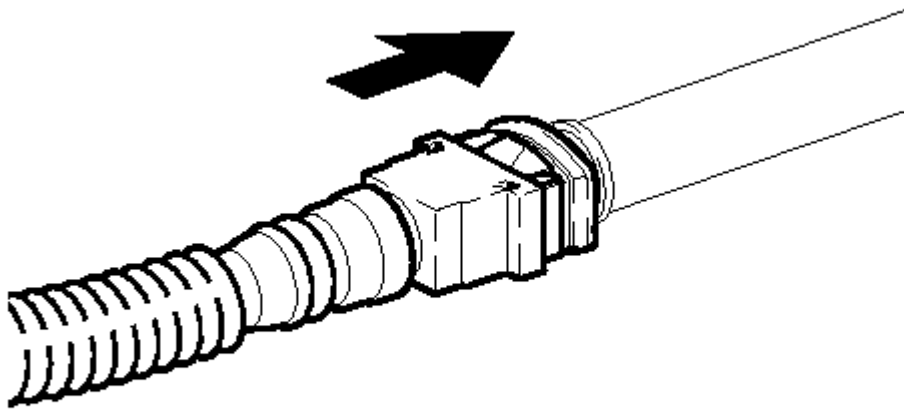
3. If the connector and pipe are stuck, pinch the retainer with your hand, and then push and pull the connector to disconnect them.

NOTE: Do not use any tools.

4. Check the sealing surfaces of the disconnected parts, and clean them if necessary.
5. Protect the contact surface by covering it with a plastic bag.

NOTE: Do not damage the pipe or fuel tube connector, and prevent entry of foreign objects.

- e. Observe these precautions when connecting the charcoal canister outlet tube connector:



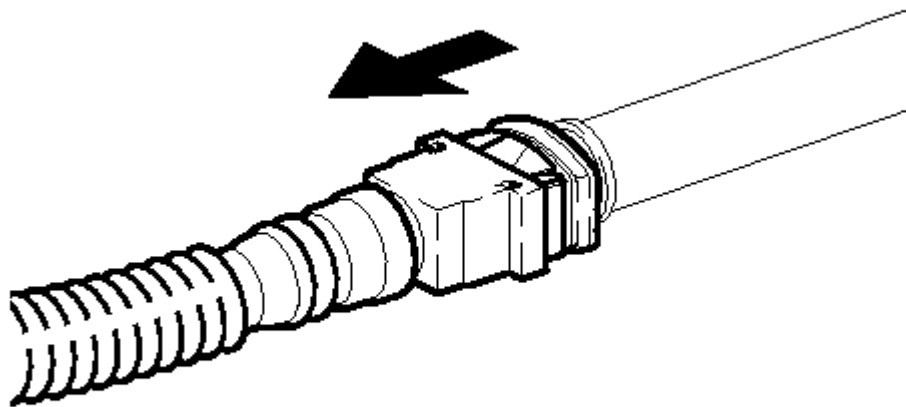
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Fig. 16: Identifying Fuel Tank Breather Tube Connector
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

TEXT IN ILLUSTRATION

Push

1. Check that there are no scratches or foreign objects on the connecting part.
2. Align the fuel tank breather tube connector with the pipe, then push in the fuel tank breather tube connector until the retainer makes a "click" sound to install the fuel tank breather tube to the pipe.
3. After connecting the pipes, check that the pipe and connector are securely connected by pulling on them.



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Fig. 17: Identifying Fuel Tank Breather Tube Connector
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

TEXT IN ILLUSTRATION

Pull

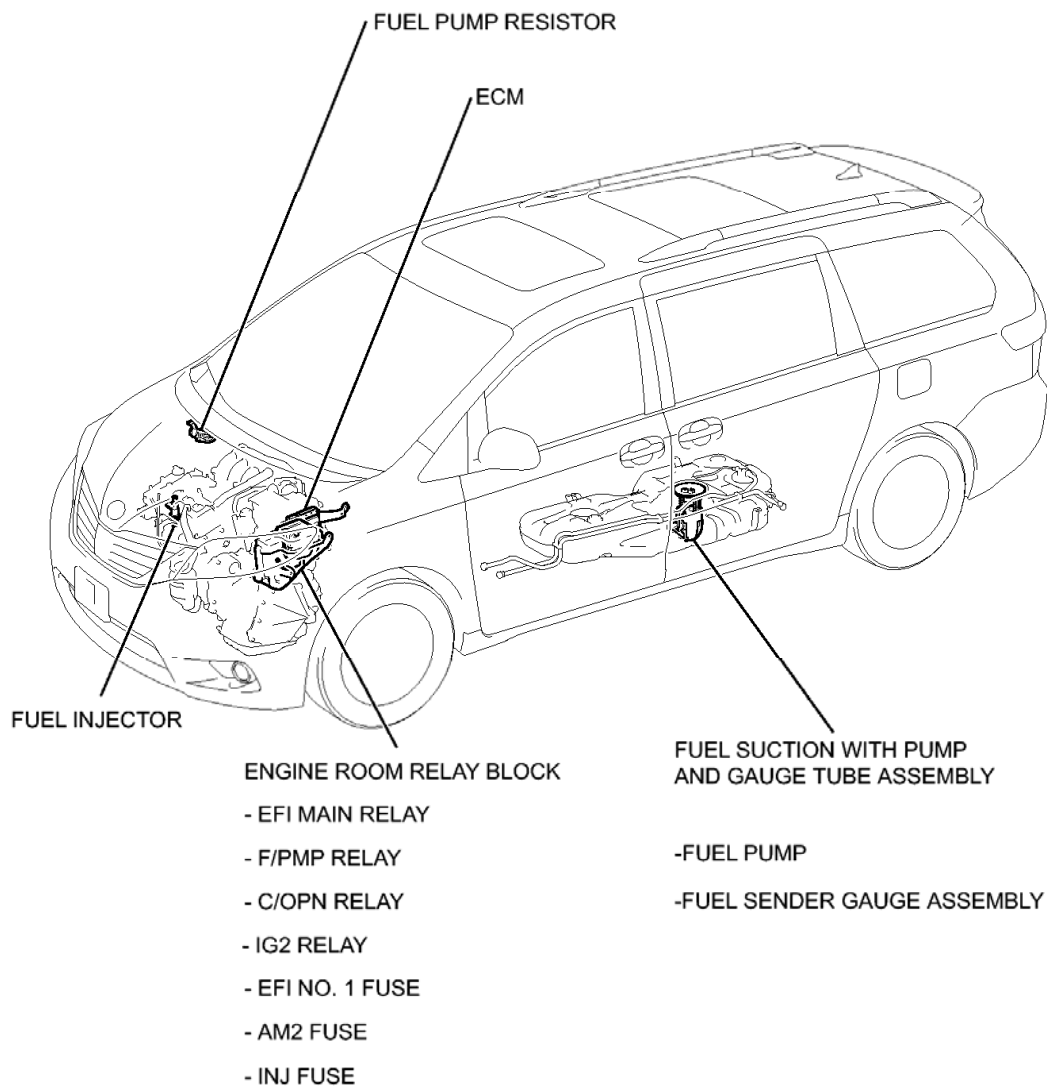
4. Inspect for fuel leak.

5. INSPECT FOR FUEL LEAK

- a. Check that there is no fuel leakage after performing maintenance anywhere on the fuel system. See step 1.

PARTS LOCATION

ILLUSTRATION



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Fig. 18: Fuel System Components Location
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

SYSTEM DIAGRAM

SYSTEM DIAGRAM

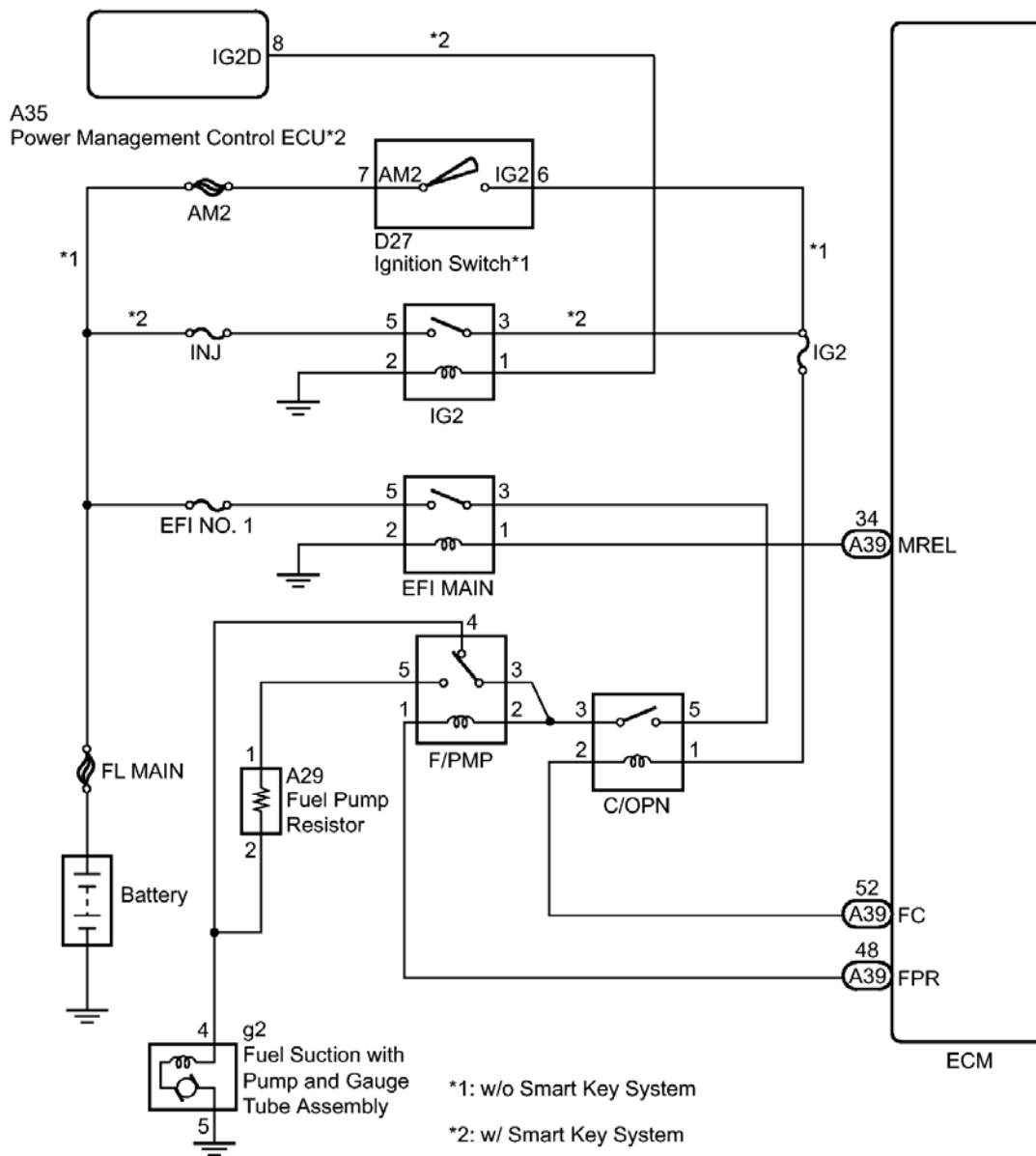


Fig. 19: Fuel System Diagram (1 Of 2)

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

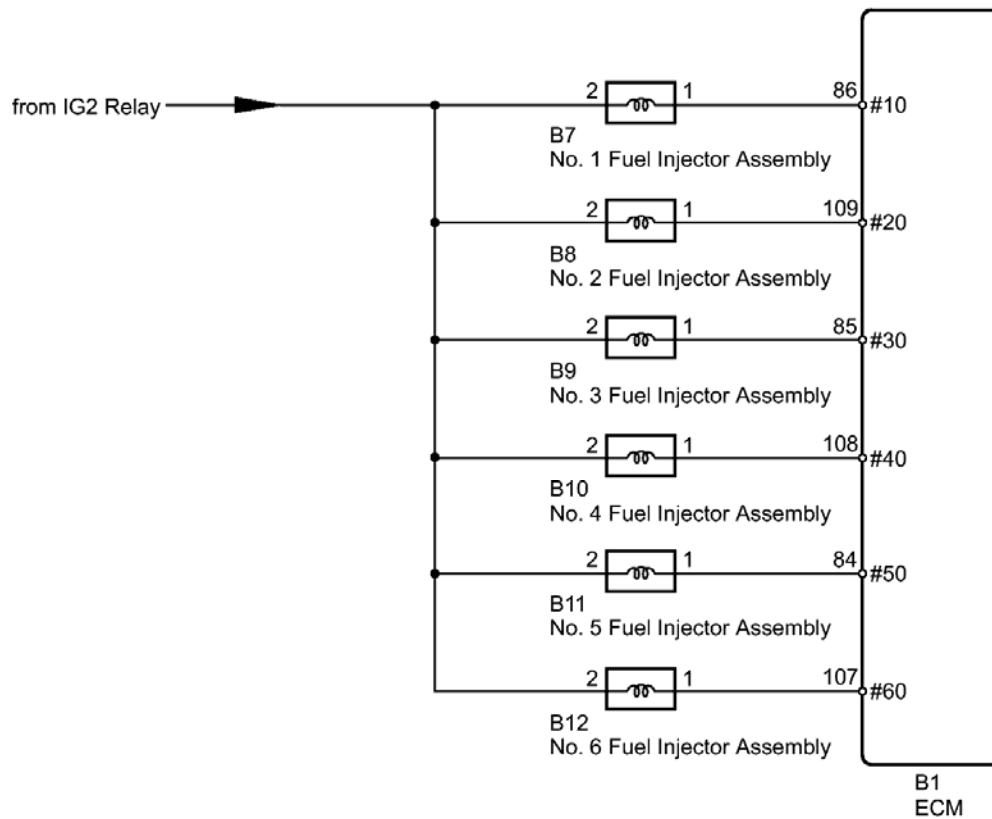


Fig. 20: Fuel System Diagram (2 Of 2)

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

ON-VEHICLE INSPECTION

ON-VEHICLE INSPECTION

1. CHECK FOR FUEL PUMP OPERATION AND INSPECT FOR FUEL LEAK

- a. Check fuel pump operation.
 1. Connect the Techstream to the DLC3.
 2. Turn the ignition switch to ON and turn the Techstream on.

NOTE: Do not start the engine.

3. Enter the following menus: Powertrain / Engine / Active Test / Control the Fuel Pump / Speed / ON.

4. Check for pressure in the fuel inlet tube from the fuel line. Check that the sound of fuel flowing from the fuel tank can be heard. If no sound can be heard, check the integration relay, fuel pump, ECM and wiring connectors.
- b. Inspect for fuel leaks.
 1. Check that there are no fuel leaks from the fuel system after doing any maintenance or repairs. If there is a fuel leak, repair or replace parts as necessary.
- c. Turn the ignition switch off.
- d. Disconnect the Techstream from the DLC3.

2. CHECK FUEL PRESSURE

- a. Discharge the fuel system pressure. Refer to **PRECAUTION**.
- b. Check the battery voltage.
 1. Measure the voltage according to the value(s) in the table below.

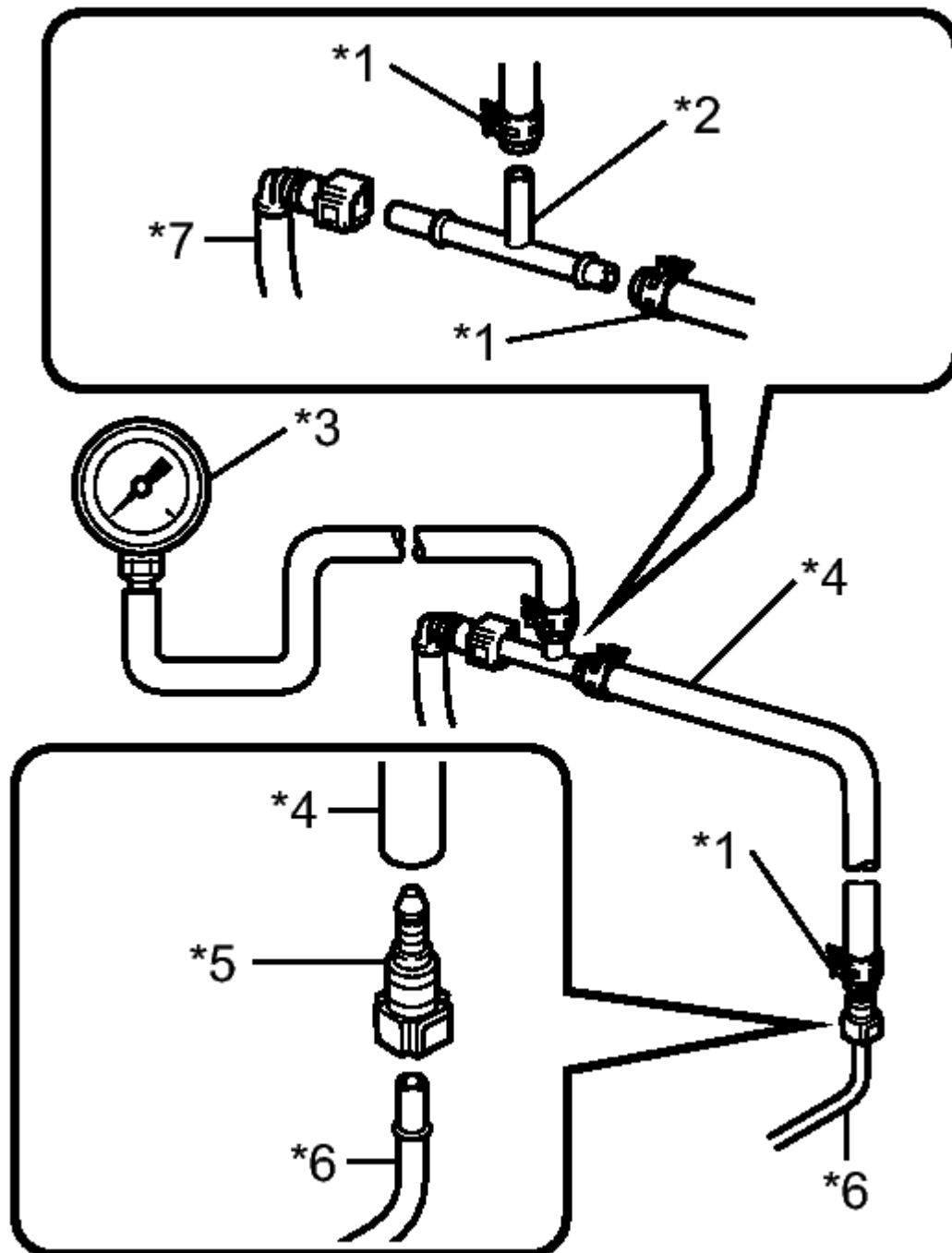
Standard Voltage

Tester Connection	Switch Condition	Specified Condition
Positive (+) terminal - Negative (-) terminal	Ignition switch off	11 to 14 V

- c. Disconnect the cable from the negative (-) battery terminal.

NOTE: When disconnecting the cable, some systems need to be initialized after the cable is reconnected. Refer to **INITIALIZATION** .

- d. Disconnect the fuel hose from the fuel main tube. Refer to **PRECAUTION**.
- e. Install SST (pressure gauge) using SST and a fuel tube connector as shown in the illustration.



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Fig. 21: Identify SST & Fuel Tube Connector
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

TEXT IN ILLUSTRATION

*1	SST (Clip)
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*2	SST (T-joint)
*3	SST (Gauge)
*4	SST (Hose)
*5	SST (Tube Connector)
*6	Fuel Tube
*7	Fuel Hose

- **SST: 09268-31013**

09268-41500

90467-13001

95336-08070

- **SST: 09268-45014**

09268-41200

09268-41220

09268-41250

- Wipe up any gasoline.
- Connect the cable to the negative (-) battery terminal.

NOTE: When disconnecting the cable, some systems need to be initialized after the cable is reconnected. Refer to INITIALIZATION .

- Connect the Techstream to the DLC3.
- Enter the following menus: Powertrain / Engine / Active Test / Control the Fuel Pump / Speed.
- Measure the fuel pressure.

Standard fuel pressure

304 to 343 kPa (3.1 to 3.5 kgf/cm² , 44 to 50 psi)

- If the fuel pressure is greater than the standard value, replace the fuel suction with pump and gauge tube assembly.
 - If the fuel pressure is less than the standard value, check the fuel hoses and connections, fuel suction with pump and gauge tube assembly.
- Disconnect the Techstream from the DLC3.
 - Start the engine.
 - Measure the fuel pressure at idle.

Standard fuel pressure

304 to 343 kPa (3.1 to 3.5 kgf/cm² , 44 to 50 psi)

- n. Stop the engine.
- o. Check that the fuel pressure remains as specified for 5 minutes after the engine stops.

Standard fuel pressure

147 kPa (1.5 kgf/cm² , 21 psi) or more

If the fuel pressure is not as specified, check the fuel suction with pump and gauge tube assembly, and/or fuel injectors.

- p. After checking the fuel pressure, disconnect the cable from the negative (-) battery terminal and carefully remove SST to prevent gasoline from spraying.

NOTE: **When disconnecting the cable, some systems need to be initialized after the cable is reconnected. Refer to INITIALIZATION .**

- q. Connect the fuel hose to the fuel main tube. Refer to **PRECAUTION**.
- r. Inspect for fuel leaks (Step 1).
 - 1. Check that there are no fuel leaks from the fuel system after doing any maintenance or repairs. If there is a fuel leak, repair or replace parts as necessary.