

## 2.3 Fuel System JL4G18-D

### 2.3.1 Specifications

#### 2.3.1.1 Fastener Tightening Specifications

Applications	Model	Specifications	
		Metric (Nm)	US English (lb-ft)
Fuel Tank Retaining Bolt	M10 × 1.25 × 30	38-46	28.2-34.0
Fuel Filter Mounting Bracket Retaining Bolt	M6 × 16	8-10	6.0-7.4
Fuel Pipe Retaining Bolts	M8 × 15	20-24	14.8-17.8
	M8 × 20	20-24	14.8-17.8
Fuel Rail Retaining Bolt	M6 × 20	8-10	6.0-7.4

دیجیتال خودرو

شرکت دیجیتال خودرو سامانه (مسئولیت محدود)

اولین سامانه دیجیتال تعمیرکاران خودرو در ایران



## 2.3.2 Description and Operation

### 2.3.2.1 Description and Operation

The fuel supply system provides a suitable amount of fuel to the engine in a variety of operating conditions. The fuel is sprayed into the engine through the fuel injectors. Fuel tank stores fuel. An electric fuel pump is installed in the fuel tank and it will pump fuel into the fuel rail assembly. Fuel pump provided fuel pressure exceeds the pressure needed by fuel injectors. Fuel pressure regulator is part of the fuel pump assembly, which keeps fuel supplied to the fuel injectors is under specified pressure. This vehicle fuel system has no fuel return system.

#### 1. Fuel Tank

Fuel tank is made from high-density polypropylene vinyl and other materials. The fuel tank is tightened by the two connected metal support brackets at the underbody, and it has a fuel vapor ventilation valve with roll-over protection function.

#### 2. Fuel Tank Filling Cap

##### Note

In the need for replacing the fuel tank filler cap, use a fuel tank filler cap with the same function as the original one. If the fuel tank filler cap is not correctly installed, it could cause serious fuel system faults.

The fuel tank filling tube filler cover is equipped with a screw thread structure, which allows air coming in once it is turned loose. It uses the structure of the ratchet in order to prevent over-tightening. Ventilation function means the fuel tank internal pressure can be released before remove the cap from the vehicle. Instructions are attached to the cap. The filler cap also integrates a security vacuum pressure limiting valve.

#### 3. Fuel Pump

Electric fuel pump is a modular fuel turbo pump located inside the fuel tank. Electric fuel pump is controlled by the engine control module (ECM) through the fuel pump relay. Electric fuel pump will start providing fuel 2s in advance to ensure that the fuel pressure achieve the requirements of the normal system operation. The fuel pump resistance range is 0.2-3.0  $\Omega$ . This model comes with electric fuel pump fuel storage in order to prevent the fuel level too low or provide fuel supply in harsh operating conditions.

#### 4. Fuel Pressure Regulator

Fuel pressure regulator is integrated in the fuel pump assembly. Fuel pressure regulator main function is to regulate

the fuel pipe fuel flow and to control the fuel injectors pressure. When the ignition switch is at ON position and the engine is shut down, the system fuel pressure should be about 400 kPa.

#### 5. Electric Fuel Pump Filter

As a coarse filter, the filter has the following features:

- Filters the pollutants.
- Improves the electric pump service life.

If the pump output pressure is found too low, clean or replace the filter.

#### 6. Fuel Filter Assembly

Fuel Filter Assembly is located in front of the rear suspension, fixed on the vehicle chassis. Filter consists of a paper filter. It can filter out the particles that may damage the fuel system. Fuel filter can withstand maximum fuel system pressure, temperature changes and fuel additive effect.

#### 7. Fuel Level Sensor

Fuel level sensor consists of a fuel level float, a wire arm harness assembly, engineering plastics, a variable resistance chip assembly and detachable nylon sliding chip. Variable resistance plastic film is connected to the retained to the fuel tank plastic bracket. The fork with a brush metal contact is connected to the detachable nylon sliding chip. According to the location, the sliding chip provides variable resistance to the instrument cluster circuit. The resistance range is 40-300  $\Omega$ . Circuit wiring harness leads from the variable resistance film and extends to and fuel pump harness connector.

#### 8. Fuel Rail

Fuel rail consists of the following:

- Fuel Delivery Pipes To Each Fuel Injector
- 4 Independent Fuel Injectors

Fuel rail is installed in the intake manifold, and provides fuel to each cylinder through the respective fuel injectors.

## 9. Fuel Injectors

Fuel injector is a solenoid valve device controlled by the engine control module. When the engine control module provides power supply to the fuel injector coil, normally closed ball valve opens, allowing fuel flow through the diffuser plate to fuel injector outlet. Diffuser plate has a hole, used to control fuel flow and form a double cone-shaped fine spray of fuel at the fuel injector outlet. The fuel is sprayed into the two intake valve channel from the fuel injectors, so that the fuel will be further atomized before entering the combustion chamber. If the fuel injectors have the following conditions, it will lead to various vehicle dynamic performance malfunction:

- If the fuel injector can not be opened.
- If the fuel injector is stuck at the opening position.
- If the fuel injector leaks.
- If the fuel injector coil resistance is too low. The normal resistance range is: 11.6-12.4  $\Omega$ .

## 10. Fuel Pipe O-ring

O-ring seals fuel system screw joints. Fuel System O-ring is made from a special material.

### Note

The fuel pipe O-ring is not a serviceable part.



اولین سامانه دیجیتال تعمیرکاران خودرو در ایران

### 2.3.3 System Working Principle

#### 2.3.3.1 System Working Principle

Intake manifold absolute pressure sensor senses and measures intake manifold vacuum. When the fuel demand is high, the intake manifold absolute pressure in a low-vacuum state, such as the throttle fully open. Engine control module uses this information to enrich the mixture, thereby increasing the fuel injector opening time and injecting the correct amount of fuel. When the engine decelerates, the intake manifold absolute pressure sensor detects increase in the vacuum degree, the engine control module requests to shorten the fuel injector opening time, reducing the amount of fuel injection according to the change.

#### 1. Startup Mode

When the ignition switch is turned on, the engine control module connects to the fuel pump relay 2 s. Then, the fuel pump fuel pressure is established. Engine control module also Check the engine coolant temperature sensor and throttle position sensor to determine the most appropriate Air-Fuel ratio to start the engine. Engine control module controls the fuel supply by changing the fuel injectors opening and closing time. This is achieved by controlling the fuel injectors with very short pulses.

#### 2. Acceleration Mode

Engine control module responds to throttle position and the rapid changes in airflow and provides additional fuel.

#### 3. Deceleration Mode

Engine control module responds to throttle position and gas flow rate changes and reduces the fuel amount. When the speed rapidly decreases, the engine control module can completely cut off fuel supply.

#### 4. Battery Voltage Calibration Mode

When the battery voltage is too low, the engine control module uses the following methods compensate for a weak ignition spark:

- Increase fuel injector pulse width.
- Increase idle speed.
- Increase the ignition duration.

#### 5. Stop Fuel Supply

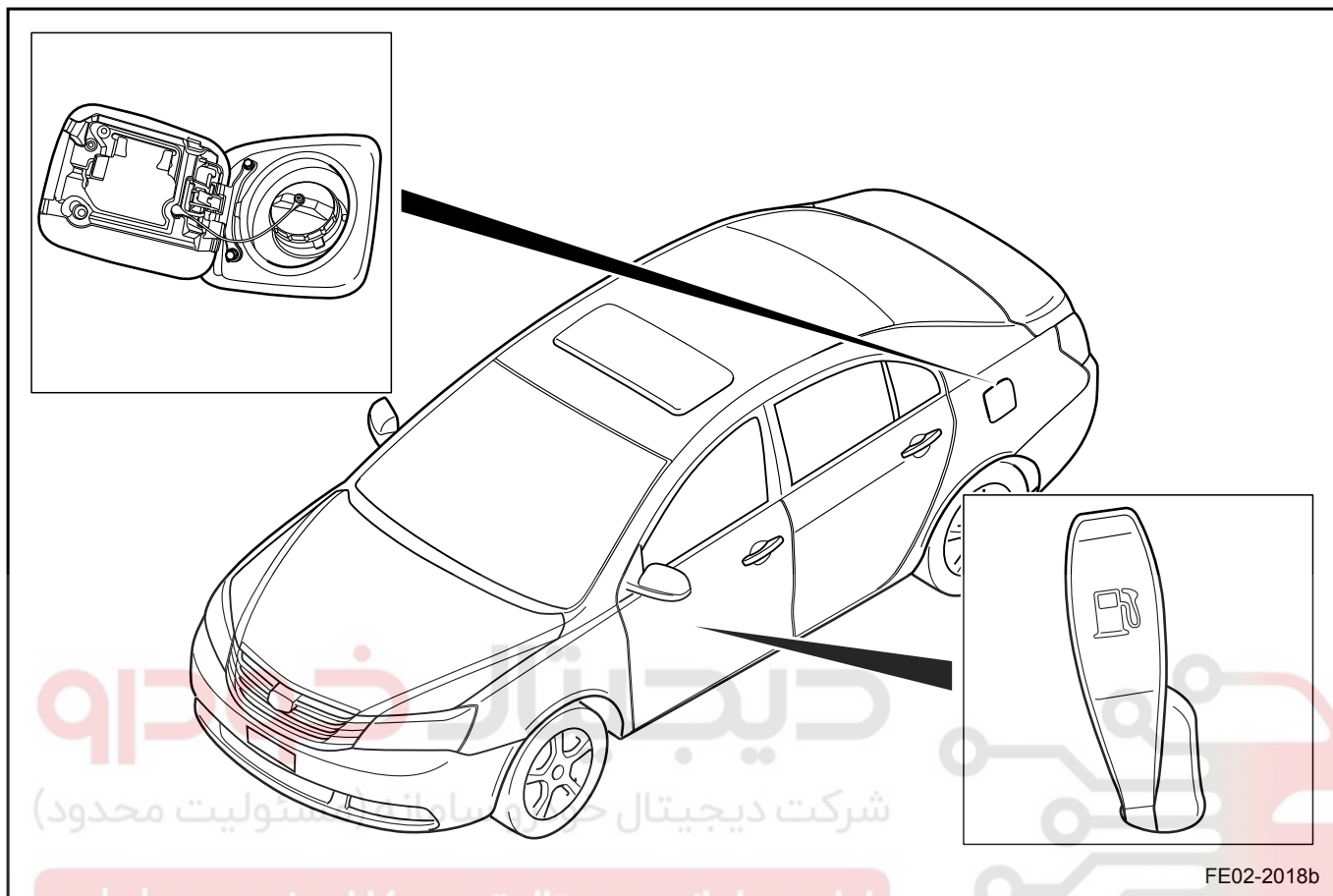
When the ignition switch is turned off, the fuel injector will not provide fuel. This prevents the continued combustion or engine

can not shut down. In addition, if the reference pulse is not received, there will be no fuel supply, in order to prevent fuel overflow.

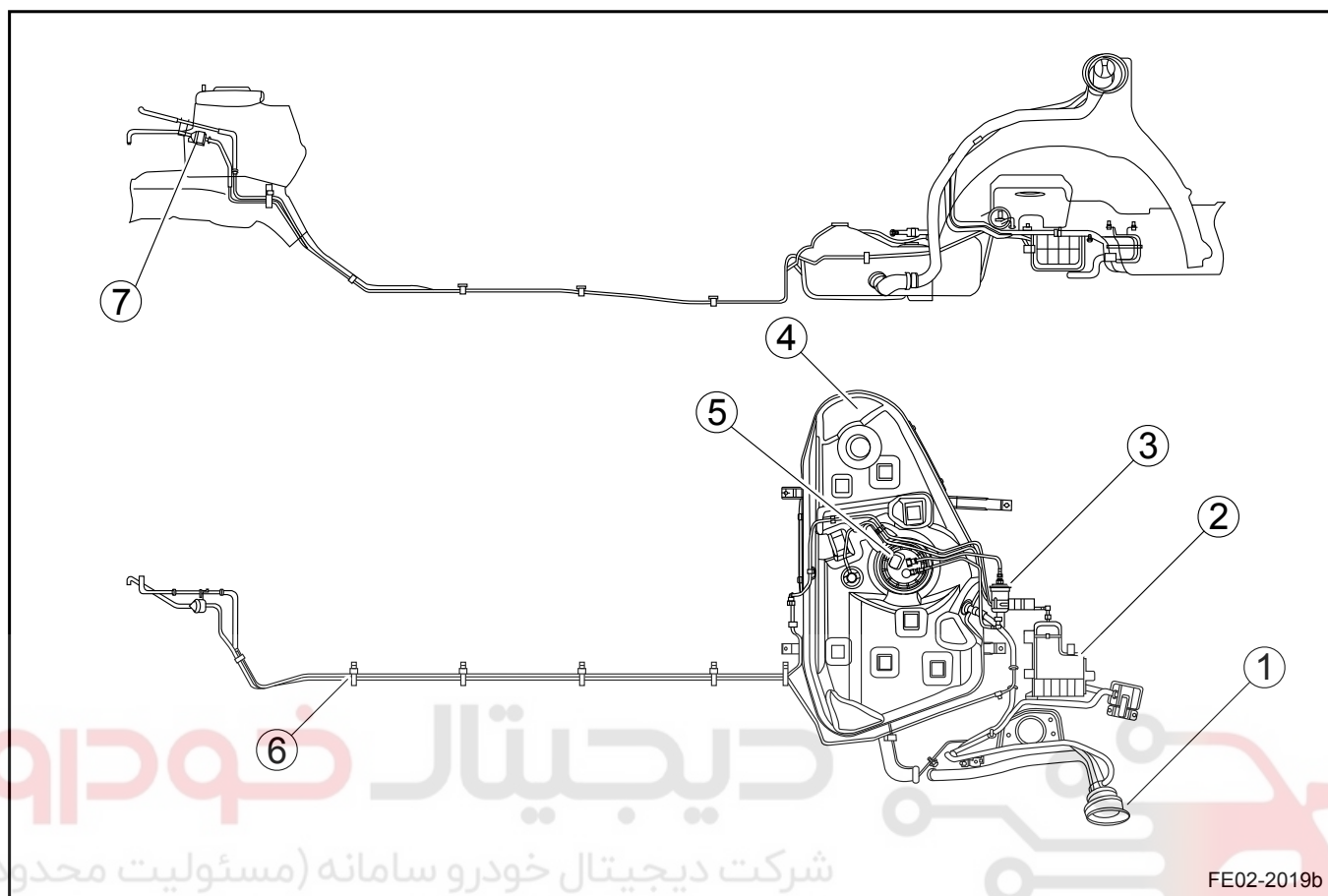


## 2.3.4 Component Locator

## 2.3.4.1 Fuel Filler



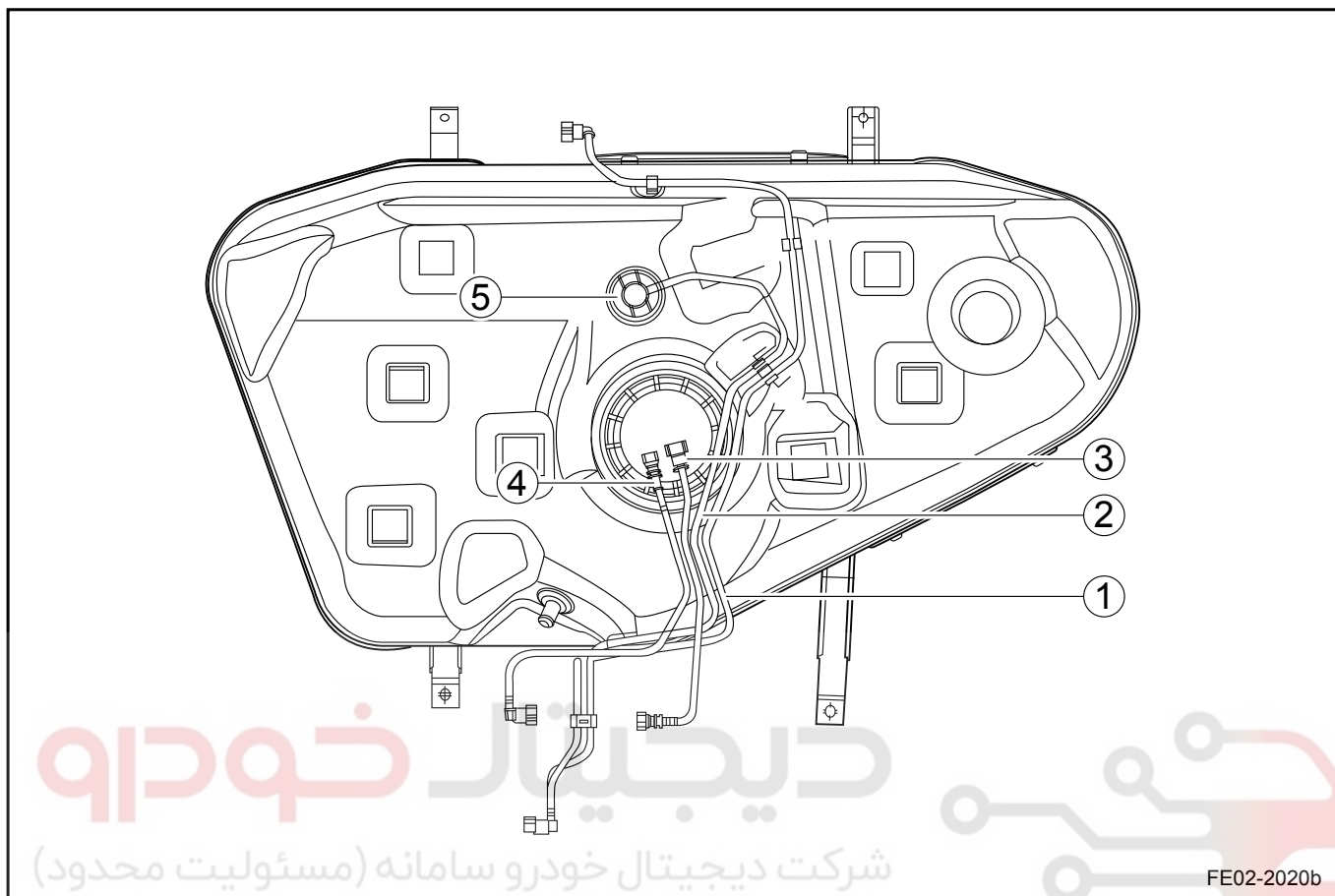
## 2.3.4.2 Fuel Supply System



## Legend

- |                                          |                                   |
|------------------------------------------|-----------------------------------|
| 1. Filling Tube                          | 6. Fuel Pipe and Evaporative Pipe |
| 2. Canister                              | 7. Canister Solenoid Valve        |
| 3. Filter                                |                                   |
| 4. Tank                                  |                                   |
| 5. Fuel Pump With a Fuel Sensor Assembly |                                   |

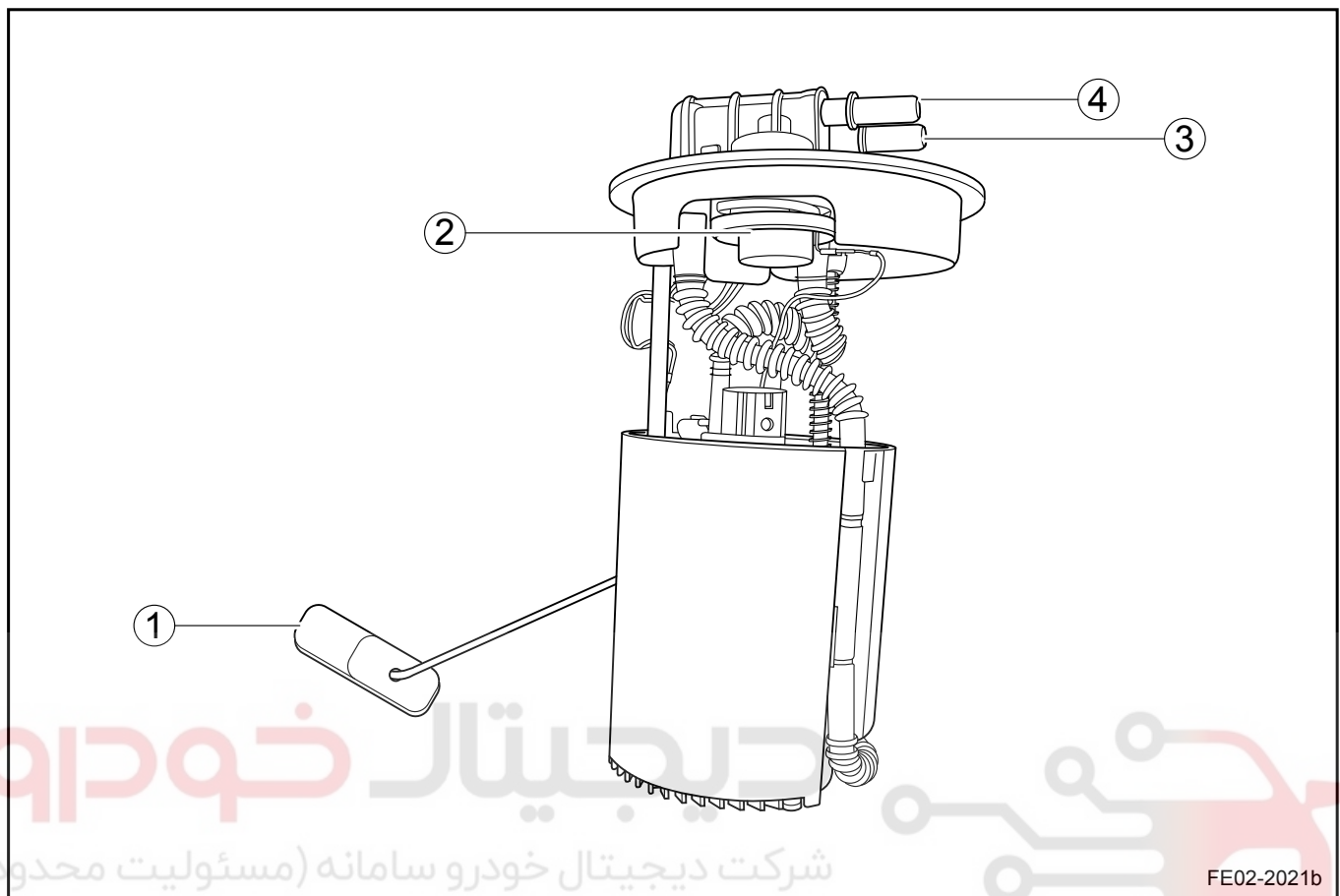
## 2.3.4.3 Fuel Tank Assembly



## Legend

- |                           |                                 |
|---------------------------|---------------------------------|
| 1. Fuel Vapor Vacuum Hose | 5. Fuel Vapor Ventilation Valve |
| 2. EVAP Hose              |                                 |
| 3. Fuel Pump Outlet Pipe  |                                 |
| 4. Fuel Pump Return Pipe  |                                 |

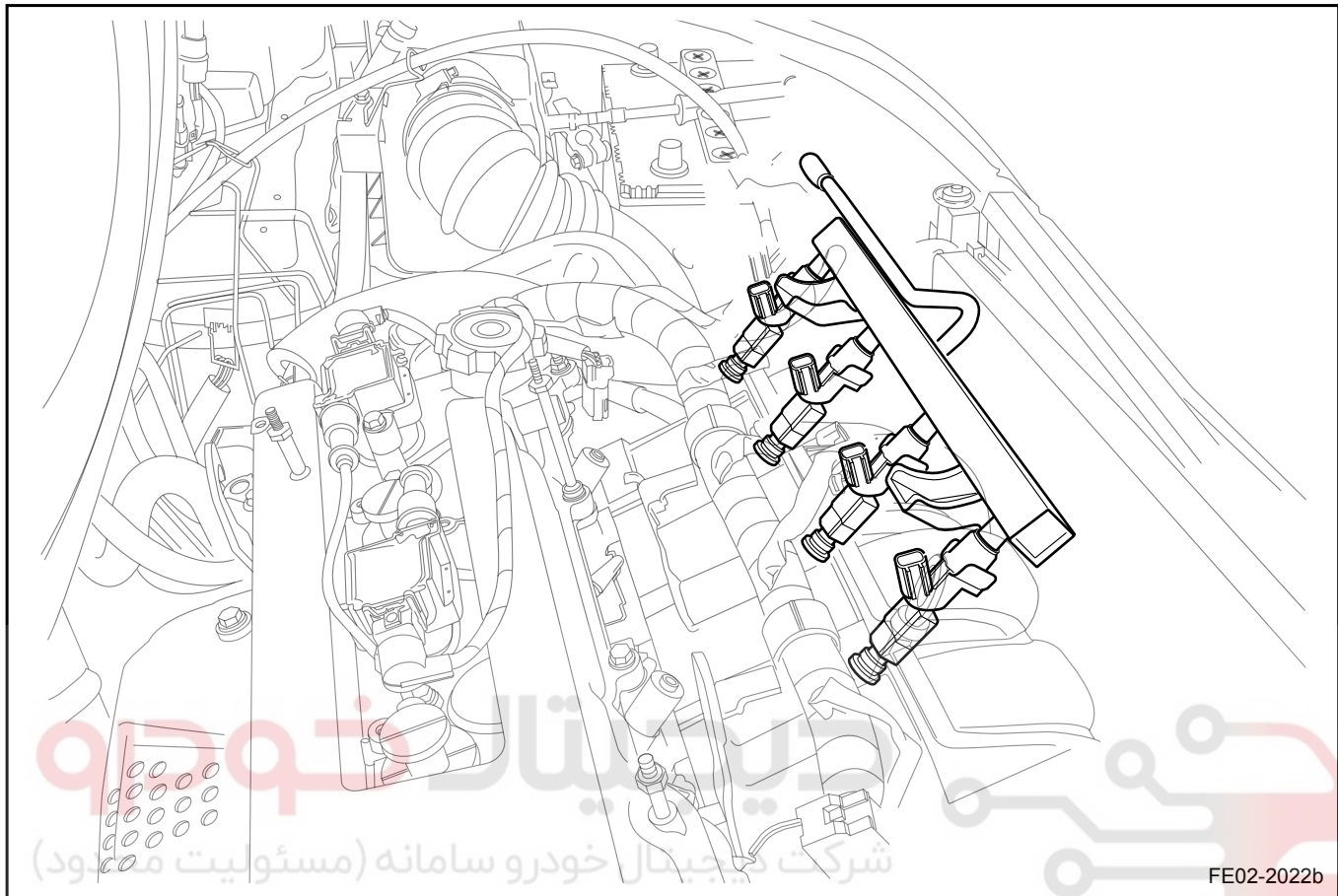
## 2.3.4.4 Fuel Pump Assembly



## Legend

- |                            |                          |
|----------------------------|--------------------------|
| 1. Fuel Level Sensor       | 4. Fuel Pump Return Port |
| 2. Fuel Pressure Regulator |                          |
| 3. Fuel Pump Outlet Port   |                          |

## 2.3.4.5 Fuel Injectors

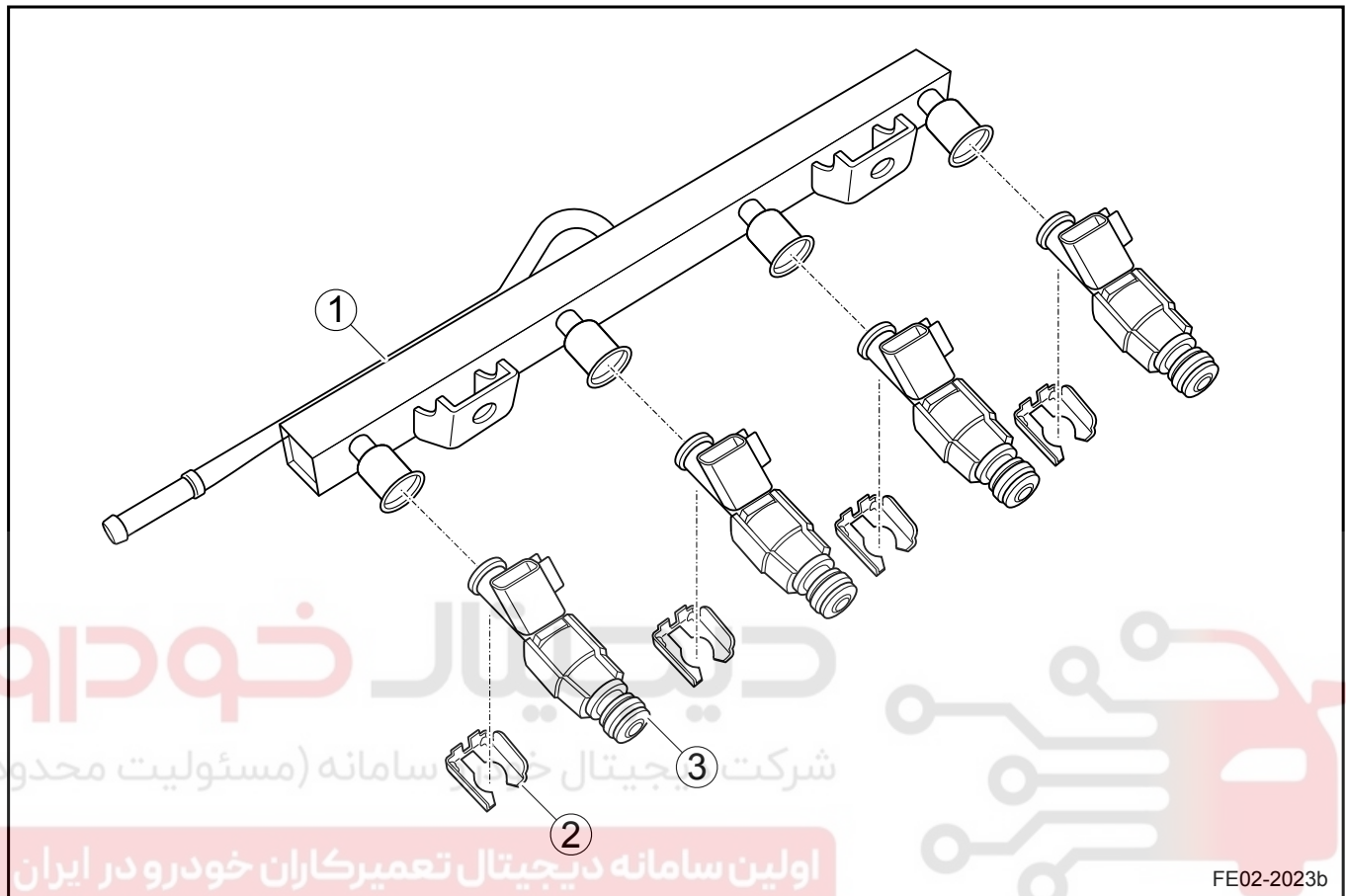


اولین سامانه دیجیتال تعمیرکاران خودرو در ایران

## 2.3.5 Disassemble View

## 2.3.5.1 Disassemble View

Oil Rail and Jet Assembly Disassemble View



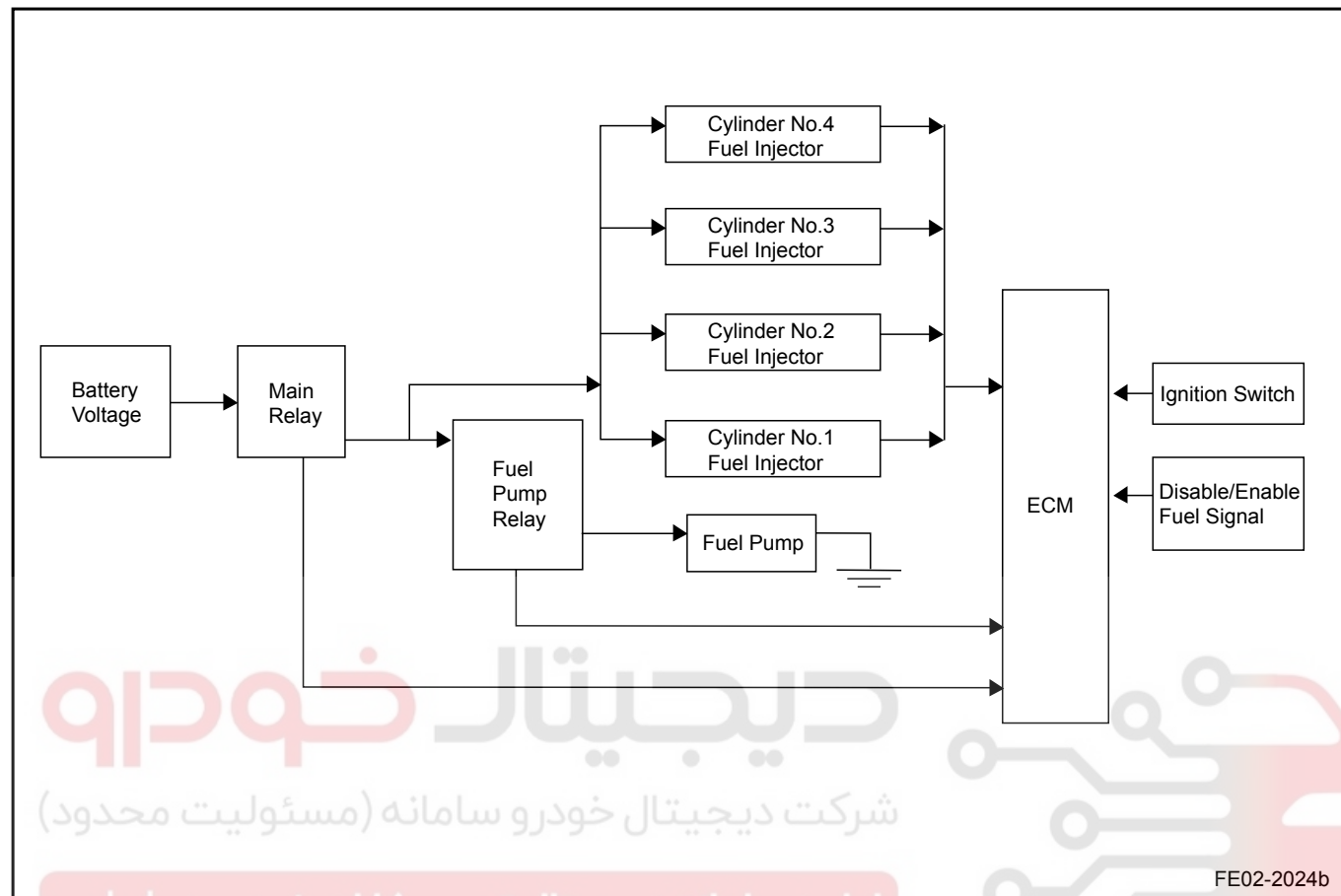
## Legend

- 1. Fuel Rail
- 2. Fuel Injectors

- 3. Spring Clip

## 2.3.6 Schematic

## 2.3.6.1 Schematic



## 2.3.7 Diagnostic Information and Procedures

### 2.3.7.1 Diagnostic Descriptions

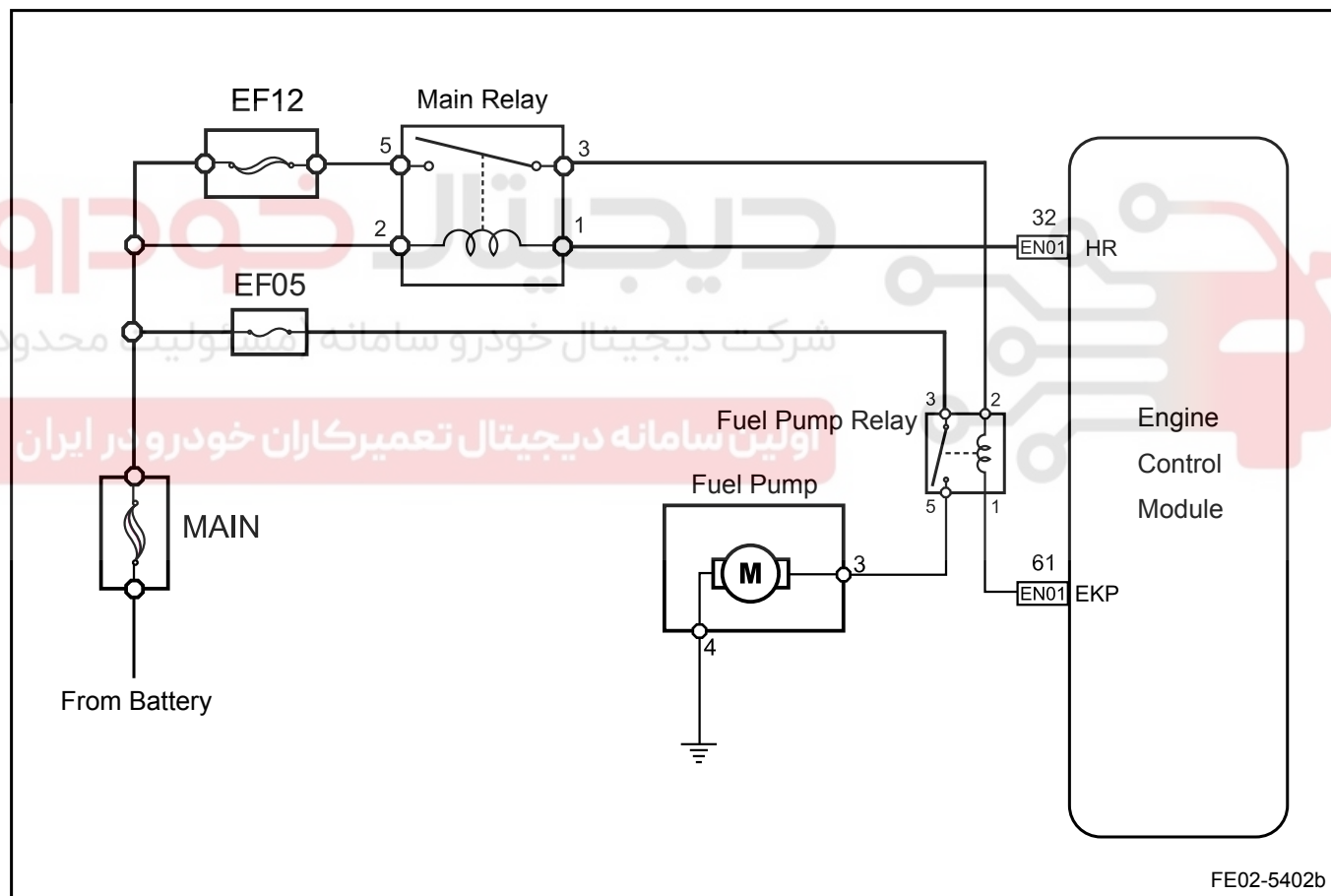
Refer to [2.3.2.1 Description and Operation](#) Get familiar with the system functions and operations before start system diagnostics, so that it will help to determine the correct diagnostic steps in the event of fault, more importantly, it will also help to determine whether the customer described situations are normal.

### 2.3.7.2 Visual Inspection

- Check installed aftermarket equipment that may affect the fuel system operation.
- Check system components that are easy to access to identify whether there is an obvious damage or external leakage.
- Check whether the recommended fuel is used and add sufficient fuel.

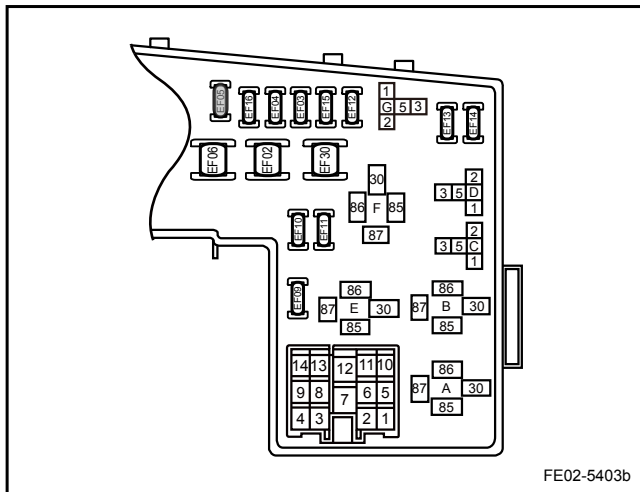
### 2.3.7.3 Fuel Pump Inoperative

Schematic:



Diagnostic Steps:

Step 1	Check fuel pump fuse EF05.
--------	----------------------------



Is the fuel pump fuse EF05 blown?

No

Go to step 3

Yes

Step 2 Repair fuel pump fuse EF05 circuit.

- (a) Check fuel pump fuse EF05 circuit.
- (b) Repair fuel pump power circuit short to ground fault.
- (c) Replace the fuse EF05.

Fuse Rating: 15 A

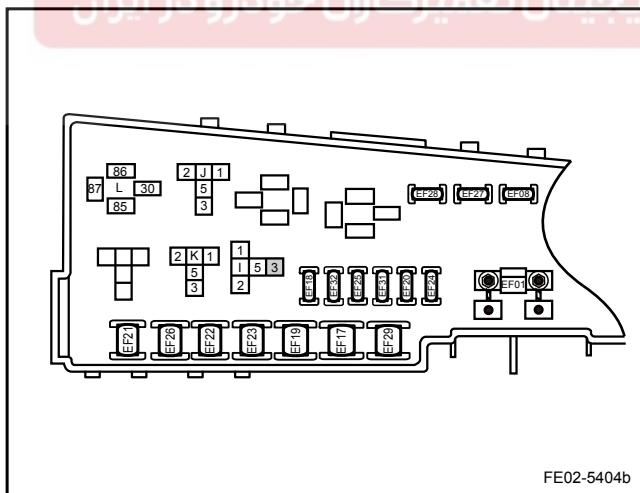
Is fuel pump working properly?

Yes

System normal

No

Step 3 Check fuel pump relay terminal 3 voltage.



- (a) Turn on the ignition switch.
- (b) At the same time, check the voltage of fuel pump relay terminal 3 with a multimeter.

Standard Voltage: 11-14 V

Is voltage the Standard Value?

Yes

Go to step 5

No

Step 4 Repair fuel pump relay terminal 3 and the fuel pump fuse EF05 circuit open fault.

- (a) Repair fuel pump relay terminal 3 and the fuel pump fuse EF05 open circuit fault.

Is fuel pump working properly?

Engine

Fuel System JL4G18-D

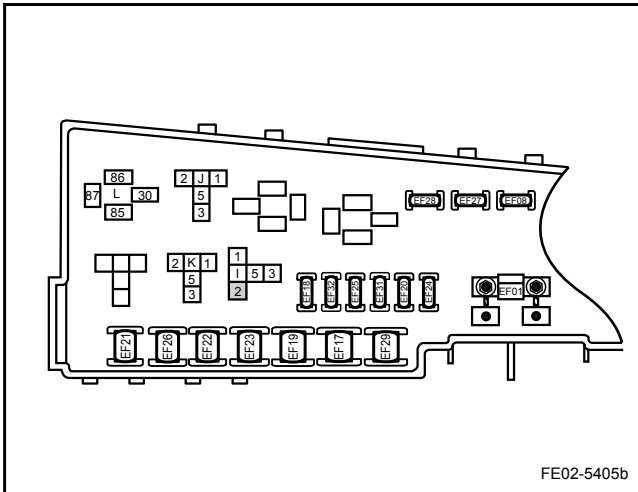
2-235

Yes

System normal

No

Step 5 Check fuel pump relay terminal 2 voltage.



(a) Check fuel pump relay terminal 2 voltage with a multimeter.

Standard Voltage: 11-14 V

Yes

Go to step 7

No

Step 6 Repair the main relay circuit fault.

(a) Repair the main relay circuit fault. Refer to [2.2.7.37 DTC P0560 P0562 P0563](#).

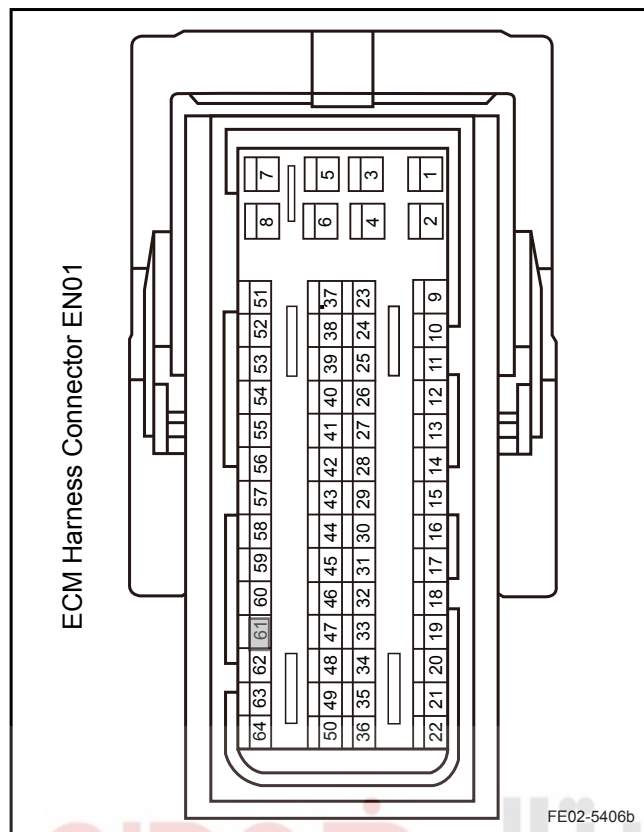
Is fuel pump working properly?

Yes

System normal

No

Step 7 Check continuity between ECM harness connector EN01 terminal 61 and ground.



- Turn on the ignition switch.
  - Connect a test lamp between ECM harness connector EN01 terminal 61 and the body ground circuit.
  - Use scan tool to carry out pump relay "Action Test".
- Is test lamp lit?

No

Go to step 9

Yes

Step 8 Replace ECM.

- Replace ECM. Refer to [2.2.8.8 Engine Control Module Replacement](#).

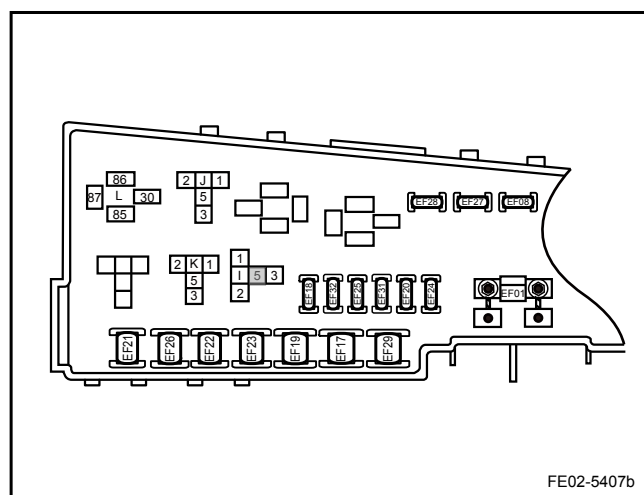
Is fuel pump working properly?

Yes

System normal

No

Step 9 Check the pump relay terminal 5 voltage.



- Check the pump relay terminal 5 voltage with a multimeter.  
Standard Voltage: 11-14 V

Standard Voltage?

Yes

Go to step 11

Engine

Fuel System JL4G18-D

2-237

No

Step 10 Replace the fuel pump relay.

(a) Replace the fuel pump relay.

Is fuel pump working properly?

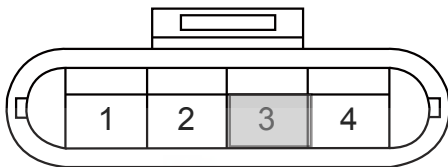
Yes

System normal

No

Step 11 Check the fuel pump wiring harness connector SO29 terminal 3 voltage.

Fuel Pump Harness Connector SO29



FE02-5408b

(a) Check the fuel pump wiring harness connector SO29 terminal 3 voltage with a multimeter.

Standard Voltage: 11-14 V

Is the voltage standard value?

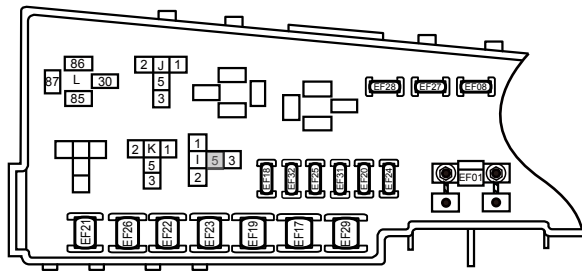
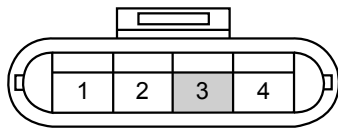
Yes

Go to step 13

No

Step 12 Repair the circuit between fuel pump wiring harness connector SO29 terminal 3 and the fuel pump relay terminals 5.

Fuel Pump Harness Connector SO29



FE02-5409b

- (a) Check circuit between fuel pump wiring harness connector SO29 terminal 3 and the fuel pump relay terminals 5.
- (b) Repair open circuit fault between fuel pump wiring harness connector SO29 terminal 3 and the fuel pump relay terminals 5.

Is fuel pump working properly?

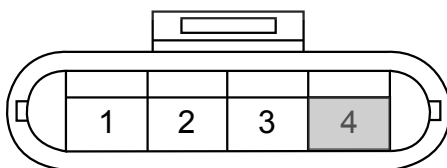
Yes

System normal

No

Step 13 Check the fuel pump wiring harness connector SO29 terminal 4 and the body ground circuit.

Fuel Pump Harness Connector SO29



FE02-5410b

- (a) Check resistance between fuel pump wiring harness connector SO29 terminal 4 and the body ground with a multimeter to confirm the ground circuit continuity.

Resistance Standard Value: Less than 1  $\Omega$ 

Is fuel pump ground circuit normal?

Yes

Go to step 15

No

Step 14 Repair fuel pump wiring harness connector SO29 terminal 4 and the body ground circuit.

- (a) Repair fuel pump wiring harness connector terminal 4 and the body SO29 ground circuit open fault.

Is fuel pump working properly?

Yes

System normal

Engine

Fuel System JL4G18-D

2-239

No

Step 15	Replace the fuel pump.
---------	------------------------

(a) Replace the fuel pump. Refer to [2.3.8.3 Fuel Pump Assembly Replacement](#).

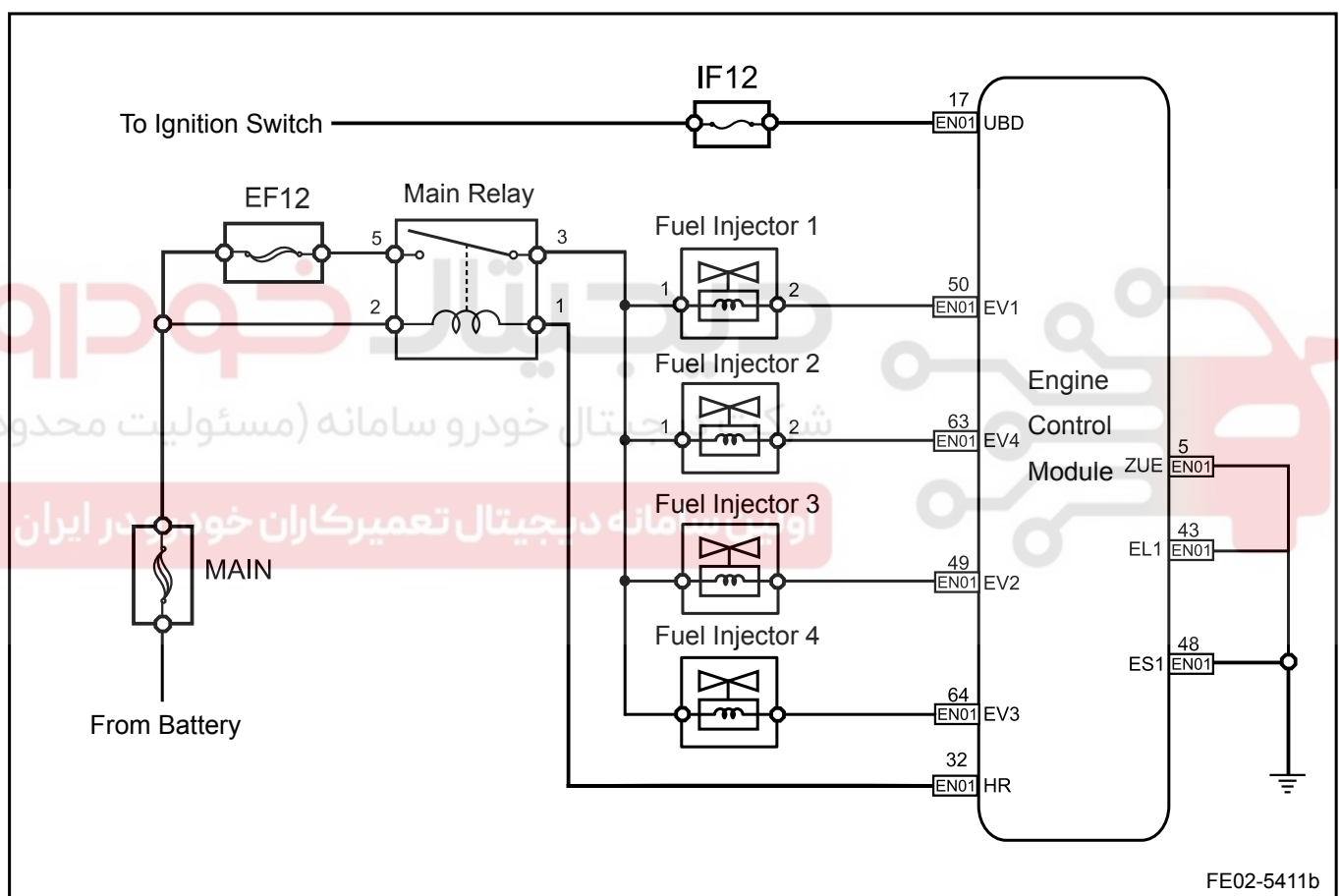
Confirm repair completed.

Next

Step 16	System normal.
---------	----------------

#### 2.3.7.4 All Fuel Injectors Inoperative

Schematic:



Diagnostic Steps:

Step 1	Check whether the engine anti-theft system is activated.
--------	----------------------------------------------------------

Does the engine warning lamp flash?

No

Go to step 3
--------------

Yes

Step 2 Repair the engine anti-theft system.

(a) Repair the engine anti-theft system. Refer to [2.5.7.12 Engine Anti-theft Warning Lamp Flashing, Vehicle Can Not Start.](#)

Is fuel injector working properly?

Yes

System normal

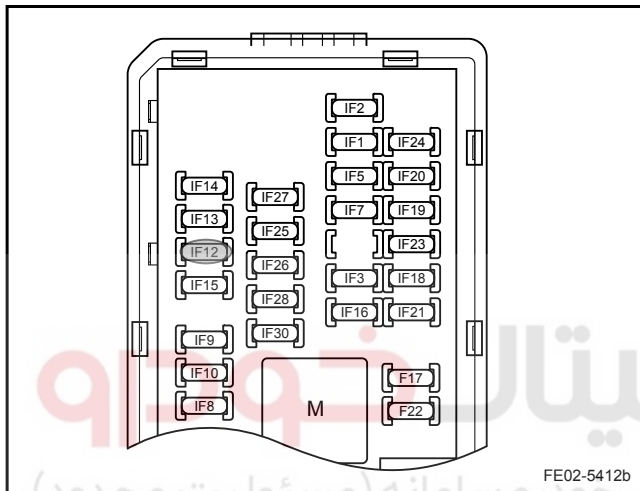
No

Step 3 Check ECM fuse.

Is ECM fuse IF12 blown?

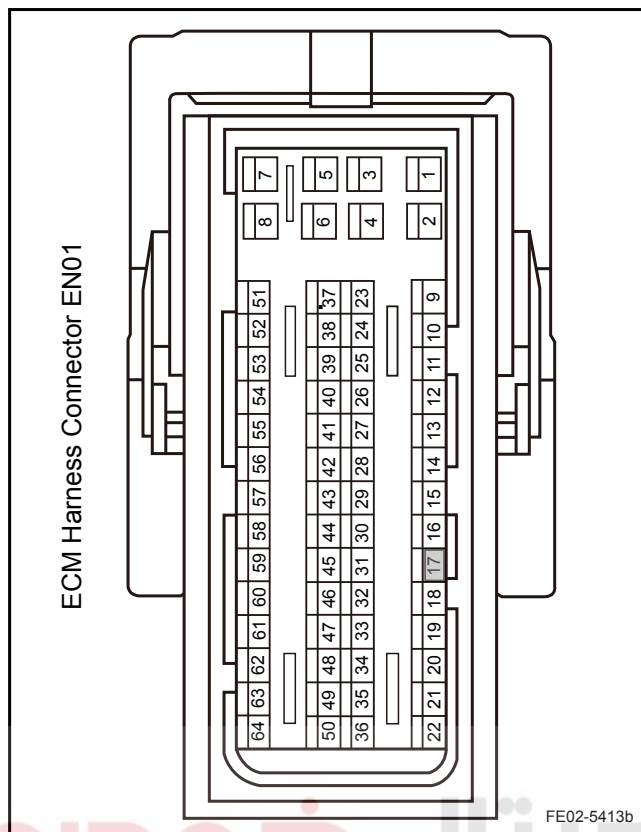
No

Go to step 6



Yes

Step 4 Repair ECM power supply circuit.



- (a) Repair ECM power supply short to body ground fault.  
(b) Replace fuse IF12.

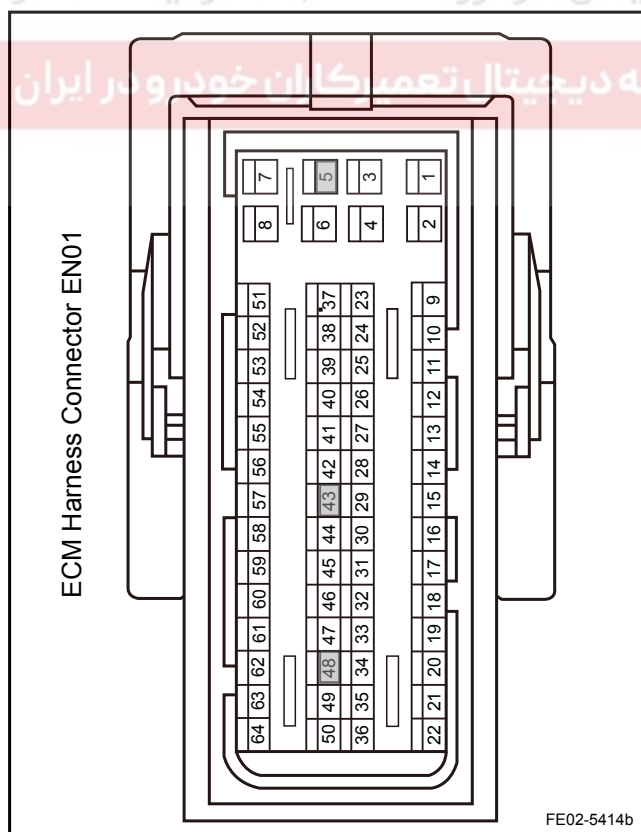
Is fuel injector working properly?

Yes

System normal

No

Step 5 Inspect and repair ECM ground circuit.



- (a) Check ECM ground circuit.  
(b) Repair ECM EN01 terminals 5,43,48 to the body open circuit fault.

Is fuel injector working properly?

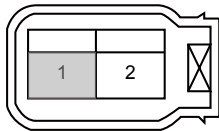
Yes

System normal

No

Step 6 Check the fuel injector wiring harness connector terminal 1 voltage.

Cylinder No.1 Fuel Injector Harness Connector EN11



FE02-5415b

- (a) Turn on point switch.
- (b) Measure fuel injectors wiring harness connector terminal 1 voltage with a multimeter .

Standard Voltage: 11-14 V

Is voltage the Standard Value?

Yes

Go to step 8

No

Step 7 Repair the main relay circuit.

- (a) Repair the main relay circuit. Refer to this section [2.2.7.37 DTC P0560 P0562 P0563](#).

Is fuel injector working properly?

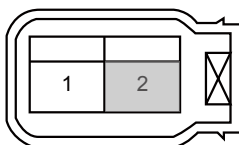
Yes

System normal

No

Step 8 Check the fuel injector wiring harness connector terminal 2 low voltage periodic waveform.

Cylinder No.1 Fuel Injector Harness Connector EN11



FE02-5416b

- (a) Turn on the ignition switch and try to start the engine.
- (b) At the same time, check the fuel injectors harness connector terminal 2 low-voltage periodic waveform with an oscilloscope.

Does it produce a low-voltage periodic waveform?

Yes

Go to step 10

No

Step 9 Replace ECM.

- (a) Replace ECM. Refer to [2.2.8.8 Engine Control Module Replacement](#).

Is fuel injector working properly?

Engine

Fuel System JL4G18-D

2-243

Yes

System normal

No

Step 10	Replace the fuel injector.
---------	----------------------------

- (a) Replace the fuel injector. Refer to [2.2.8.2 Fuel Injector Replacement](#).

Confirm repair completed.

Next

Step 11	System normal.
---------	----------------

### 2.3.7.5 Fuel Gage Inaccurate

Refer to [11.7.6.6 DTC U1303 U1304](#).

### 2.3.7.6 Surge diagnostic

Fault Definition: When the accelerator pedal position remains unchanged, the engine power changes causing speed increase or decrease.

#### Note

Prior to this diagnostic, make sure the engine control system has no DTC code.

Step 1	Initial Inspection
--------	--------------------

- (a) Check vacuum hoses, whether there is cracking, kinks and so on.
- (b) Check engine ECM ground whether there is oxidation, loose, incorrect location and so on.
- (c) Check whether sensor wiring harness connector is correctly connected, and the existence of loose, poor connection and so on.

Next

Step 2	Check whether the intake air pressure sensor is normal?
--------	---------------------------------------------------------

Refer to the "Control System" in the [2.2.7.17 DTC P0105 P0106 P0107 P0108](#).

No

Repair the faulty part.

Yes

Step 3	Is the engine coolant temperature sensor working properly?
--------	------------------------------------------------------------

Refer to the "Control System" in the [2.2.7.19 DTC P0117 P0118](#).

No

Repair the faulty part.

Yes

Step 4 Check the fuel pressure, is it normal?

Refer to [2.3.7.7 Fuel Pressure Testing Procedure](#).

No

Check whether the pipeline is blocked, if necessary, replace the failed component.

Yes

Step 5 Use the scan tool "Fuel Injector Cleaning and Testing Machine" function, test the performance of the cylinder fuel injector. Check whether the fuel injectors are normal?

No

Replace damaged fuel injectors.

Yes

is

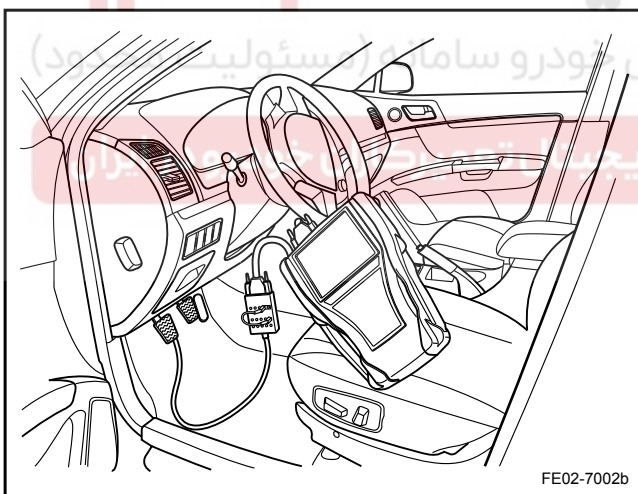
Step 6 Check whether fuel quality is normal, is the fuel contaminated?

Yes

Replace with good quality fuel.

No

Step 7 Connect scan tool, check the pre-catalytic oxygen sensor signal.



- Connect scan tool.
- Start engine and turn on the scan tool.
- Keep the engine speed at 2,500 rpm for more than 2 min to warm up the engine, until the engine coolant temperature reaches 80°C (176 °F).
- Select on the scan tool: Engine / Read Data Flow / Group 1 Oxygen Sensor Voltage 1 (Pre-Catalytic Oxygen Sensors).
- Observe the pre-catalytic oxygen sensor output voltage. The data flow should fluctuate within 0.1-0.8 V.
- If the voltage data is consistently below 0.45 V (mixture too lean), carry out the steps as following:
  - Spray proper amount of propane gas into the intake.
  - Observe whether there is a significant change in the pre-catalytic oxygen sensor voltage data, as the signal voltage will increase rapidly.
- If the voltage data is always higher than 0.45 V (mixture too rich), carry out the following steps:
  - Put gear into neutral.
  - Apply hand brake.
  - Press the accelerator pedal so the engine speed suddenly increases to 4,000 rpm and then quickly release the accelerator pedal.
  - Repeat the previous steps more than 3 times.

- Observe whether there is a significant change in the pre-catalytic oxygen sensor voltage data, as the signal voltage will increase rapidly.

During the above test, the oxygen sensor signal voltage should have a significant change.

Significant voltage change?

Signal Voltage No Response	A
Signal Voltage Remains High	B
Signal Voltage Remains Low	C
Signal Voltage Normal	D

A	Replace the pre-catalytic oxygen sensor.
B	Go to step 13
C	Go to step 14

D

Step 8	Check whether the spark plug is normal?
--------	-----------------------------------------

- (a) Refer to "Ignition System" in the [2.10.7.6 Spark Plug Diagnostic](#).

No	Replace with the correct type of spark plug.
----	----------------------------------------------

Yes

Step 9	Check whether the high-voltage resistance is normal?
--------	------------------------------------------------------

- (a) Check whether the high-voltage resistance connection is solid, not damaged and so on.

No	Repair the faulty part. If necessary, replace with a new high-voltage resistor.
----	---------------------------------------------------------------------------------

Yes

Step 10	Check whether the crankshaft position sensor signal tooth is correctly installed?
---------	-----------------------------------------------------------------------------------

- (a) Check whether the crankshaft position sensor signal tooth installation is solid. The signal tooth can not be missing, wear and tear and so on.

No	Diagnose the faulty part. If necessary, replace the faulty parts.
----	-------------------------------------------------------------------

Yes

Step 11	Check whether air-conditioning system is working correctly?
---------	-------------------------------------------------------------

- (a) Check the compression clutch engagement. Air-Conditioning system pressure can not be too high. Check whether the air-conditioning compressor is working properly. Refer to the

"Air-Conditioning System" in the [8.2.7 Diagnostic Information and Procedures](#).

No

Repair the faulty part.

Yes

Step 12 Check whether the exhaust system is normal?

(a) Inspect the exhaust system for blocking. Refer to the "Engine Exhaust System" in the [2.7.5.3 Exhaust System Blockage](#).

No

Repair the faulty part.

Yes

Go to step 15

Step 13 Check the cause for the mixture too rich.

- (a) Check whether the canister solenoid valve is normally turned on.
- (b) Check whether there is fuel injectors leakage.
- (c) Check whether the air filter is blocked.
- (d) Check whether there is intake manifold clogging or deformation.
- (e) Check whether the engine oil is contaminated by fuel.
- (f) Check whether the fuel pressure is too high.
- (g) Check whether the intake manifold absolute pressure sensor is normal.
- (h) Check whether the engine coolant temperature sensor is normal.

The existence of the above faults?

No

Go to step 15

Yes

Repair the faulty part.

Step 14 Check the cause for the mixture too lean.

- (a) Check whether there is a vacuum leak.
- (b) Check the existence of broken tubes.
- (c) Check whether the fuel injectors is blocked.
- (d) Check whether intake manifold absolute pressure sensor is abnormal.
- (e) Check whether the engine coolant temperature sensor is abnormal.
- (f) Check whether the fuel is contaminated.

The existence of the above faults?

Yes

Repair the faulty part.

No

Step 15 Road test the vehicle to confirm that the fault has been ruled out.

### 2.3.7.7 Fuel Pressure Testing Procedure

#### Warning!

Gasoline and gasoline vapor is highly flammable. In order to avoid fire or explosion, please select keep away from a fire. It is prohibited to use mobile phones during this procedure. Do not use open containers to store gasoline exhaust emissions. Before carrying out this procedure, please prepare a dry-chemical fire extinguisher.

#### Warning!

Wrap a cloth around the fuel pressure gage and fuel rail joints to absorb leaked fuel when you connect the fuel pressure gage to reduce the risk of fire and injury. Upon completion of testing, place the cloth into the designated containers. Clean pipe joints before removal.

#### Warning!

It is prohibited to pour or store fuel in an open container, otherwise it will cause a fire.

Step 1	Install fuel pressure gage in the fuel rail intake.
Next	
Step 2	Place the fuel pressure gage exhaust hose into a specified gasoline container.
Next	
Step 3	Open the valve on the fuel pressure gage to discharge the air from the gage.
Next	
Step 4	Turn the ignition switch to "ON" position.
Next	
Step 5	Use scan tool "Function Test" drive fuel pump fuel pump relay, until all the air expelled from pressure gage.
Next	
Step 6	Turn off the exhaust valve on the fuel pressure gage.
Next	
Step 7	Use scan tool to connect the fuel pump to check whether there is fuel leakage and the leakage location.
Next	
Step 8	When there is no leakage in the pipeline, start the engine and the fuel pressure should be 400 kPa (58.01 psi).
Next	
Step 9	Turn the ignition switch to "OFF" position. under normal circumstances the system should maintain residual pressure above 250 kPa (36.26 psi). If the fuel pressure continues to drop, check the fuel pump or fuel pressure regulator.

[Next](#)

Step 10 End.

# دیجیتال خودرو

شرکت دیجیتال خودرو سامانه (مسئولیت محدود)

اولین سامانه دیجیتال تعمیرکاران خودرو در ایران



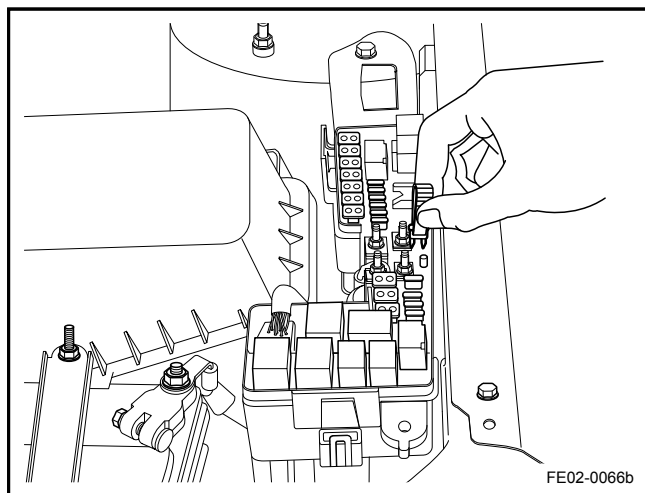
## 2.3.8 Removal and Installation

### 2.3.8.1 Fuel Pressure Release Procedure

1. Open the fuel tank cap.
2. Open the hood, pull out fuel pump fuse EF05 (15 A).
3. Start the engine until the engine stops running automatically.
4. Start the engine again, so that the crankshaft continues to rotate about 10 s.

#### Note

If you want to remove any fuel system components, wrap pipe joints with plastic bags to prevent fuel leakage and prevent the entry of foreign matter.



### 2.3.8.2 Fuel Filter Replacement

Removal Procedure:

#### Warning!

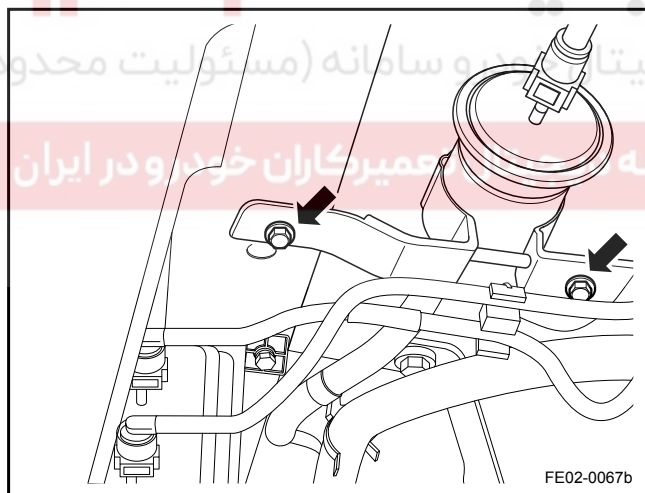
Refer to "Release Fuel Pressure Warning" in "Warnings and Notices".

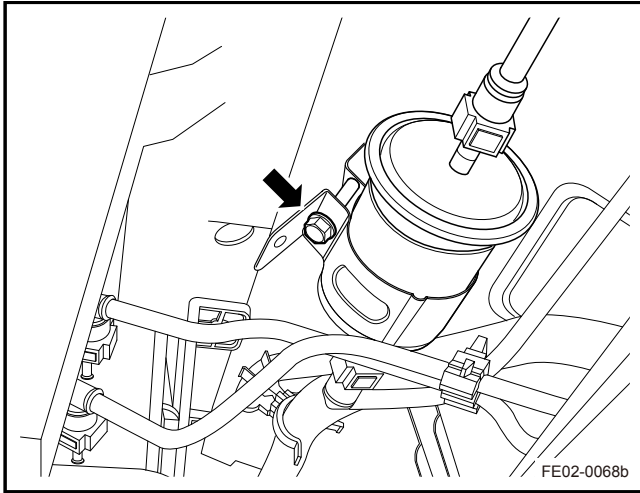
1. Release fuel system pressure. Refer to [2.3.8.1 Fuel Pressure Release Procedure](#).
2. Disconnect the battery negative cable. Refer to [2.11.8.1 Battery Disconnection](#).
3. Lift the vehicle.

#### Warning!

Refer to "Vehicle lifting Warning" in "Warnings and Notices".

4. Remove the fuel filter bracket bolts.

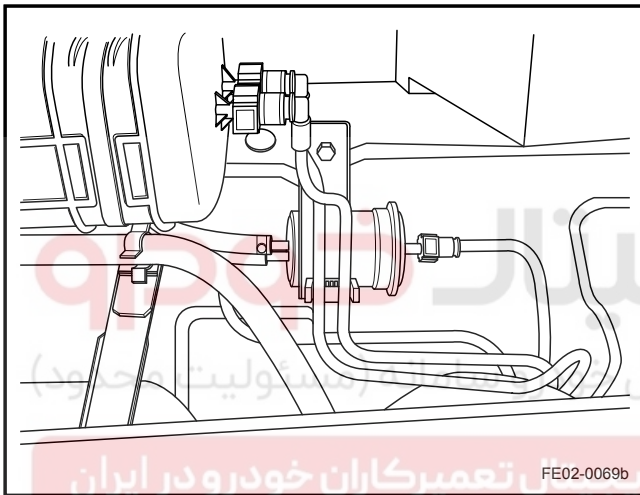




5. Loosen filter retaining bolts on the bracket.
6. Disconnect the fuel inlet and outlet pipes.

**Note**

If sand enters into the pipe joints, removal may become difficult. With a wood handle gently knock the filter housing to remove the sand, and then push the pipe toward the filter direction. Press the lock to Disconnect the pipe.

**Installation Procedure:**

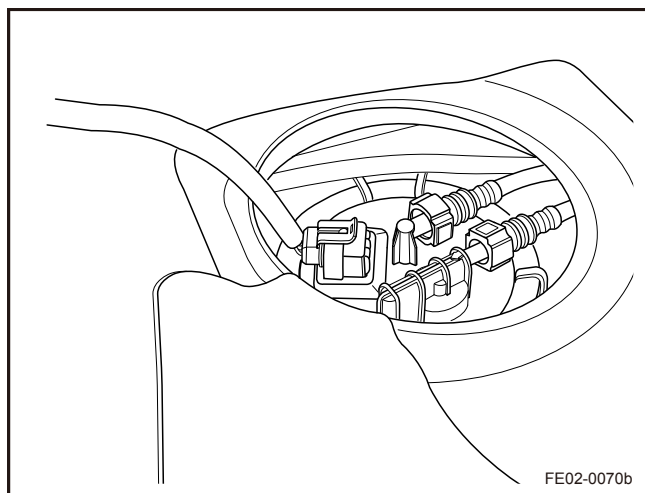
1. Install the fuel filter to the bracket and pay attention to the direction of the filter.
2. Connect the fuel inlet and outlet pipes.
3. Tighten the filter retaining bolts.
4. Install fuel filter bracket bolts.  
Torque: 9 Nm (Metric) 6.66 lb-ft (US English)
5. Connect the battery negative cable.

**2.3.8.3 Fuel Pump Assembly Replacement****Removal Procedure:****Warning!**

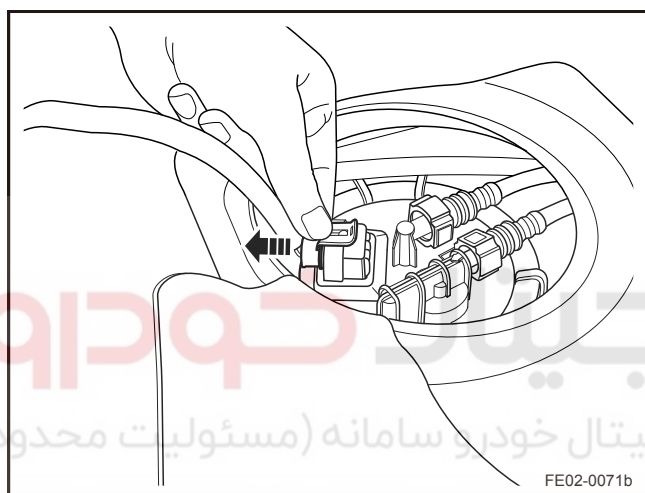
Refer to "Release Fuel Pressure Warning" in "Warnings and Notices".

**Warning!**

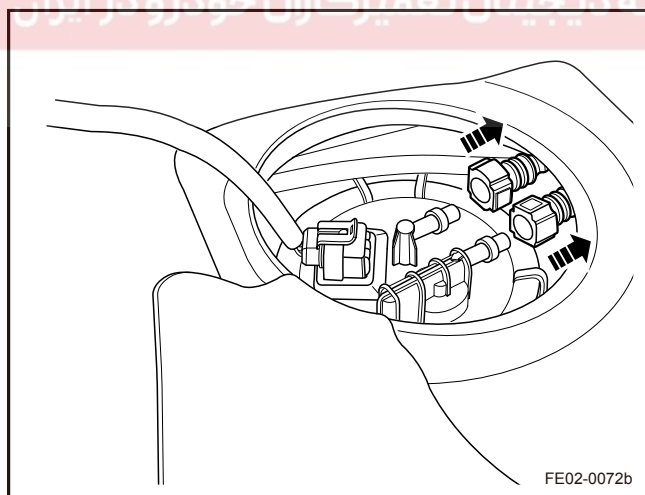
Refer to "Battery Disconnection Warning" in "Warnings and Notices".



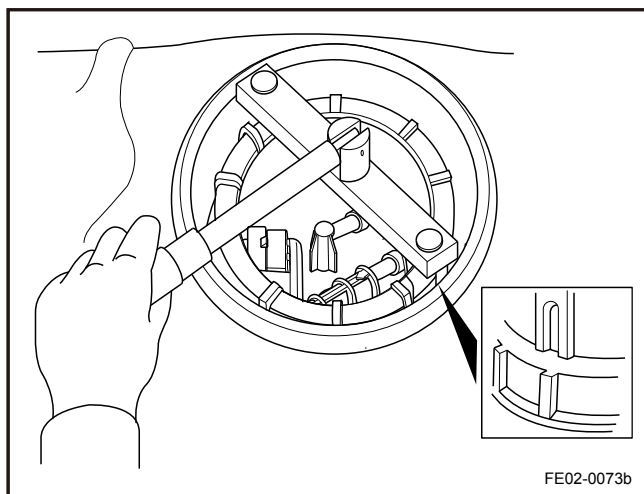
1. Release fuel pressure. Refer to [2.3.8.1 Fuel Pressure Release Procedure](#).
2. Disconnect the battery negative cable. Refer to [2.11.8.1 Battery Disconnection](#).
3. Remove the rear seat cushion. Refer to [12.7.3.4 Rear Seat Cushion Replacement](#).
4. Remove fuel pump inspection cover.



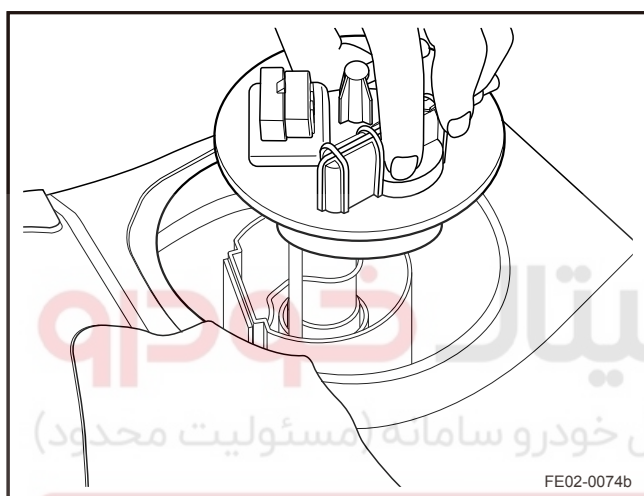
5. Disconnect fuel pump harness connector.



6. Disconnect the fuel pump inlet and outlet pipes.



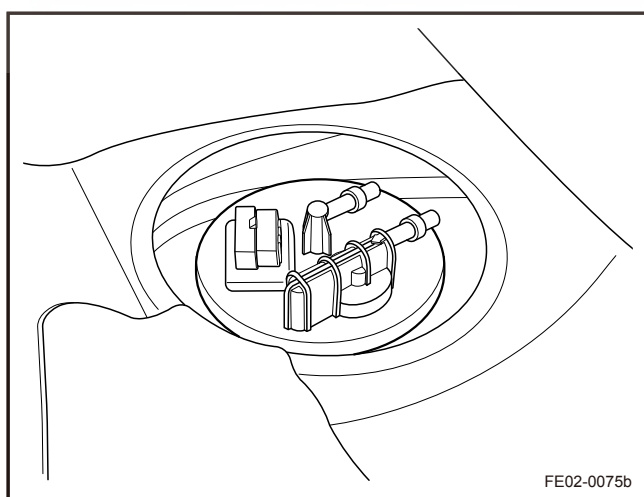
7. Unscrew counter-clockwise and remove the fuel pump lock ring.



8. Remove fuel pump assembly.

#### Note

Pay attention to not to drop gasoline on the floor and the interior, otherwise it will corrode sealant and the interior.

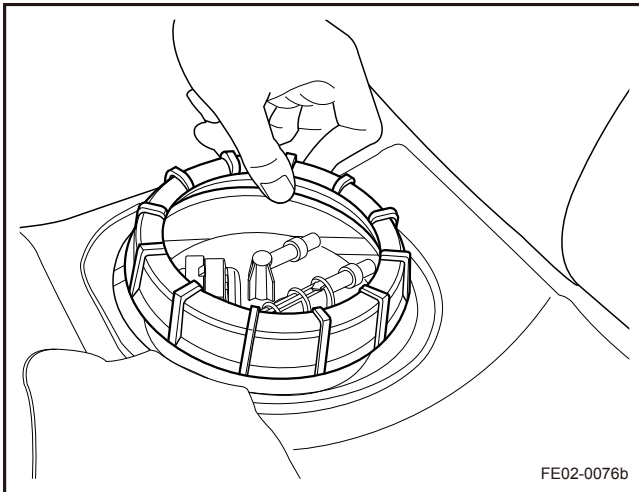


#### Installation Procedure:

1. Clean fuel pump seals and tank mating surface.
2. Install new fuel pump seals.
3. Install fuel pump assembly.

#### Note

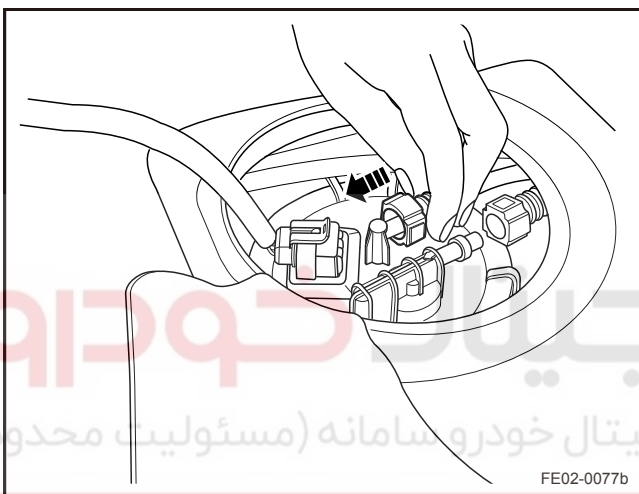
During installation, make ensure the outlet pipe and return pipe face the rear of the vehicle body, otherwise the pipes can not be installed.



4. Install fuel pump clockwise to tighten fuel pump lock ring.

**Note**

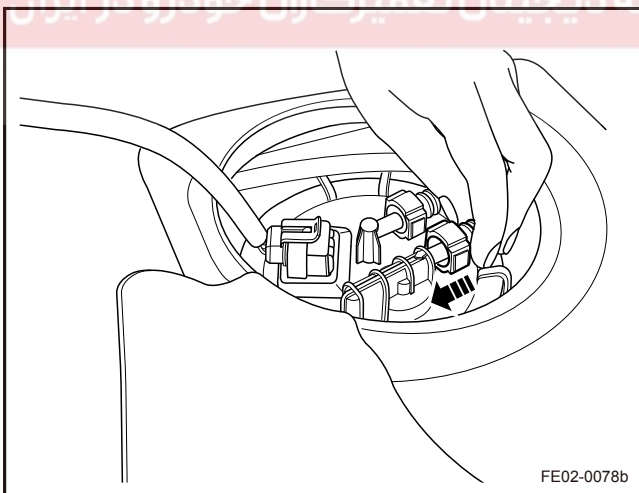
During installation, make ensure the outlet pipe and return pipe face the rear of the vehicle body.



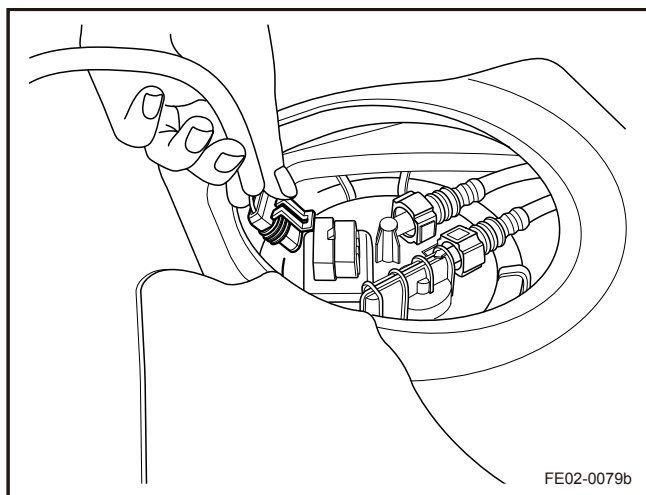
5. Connect the fuel pump outlet pipe.

**Warning!**

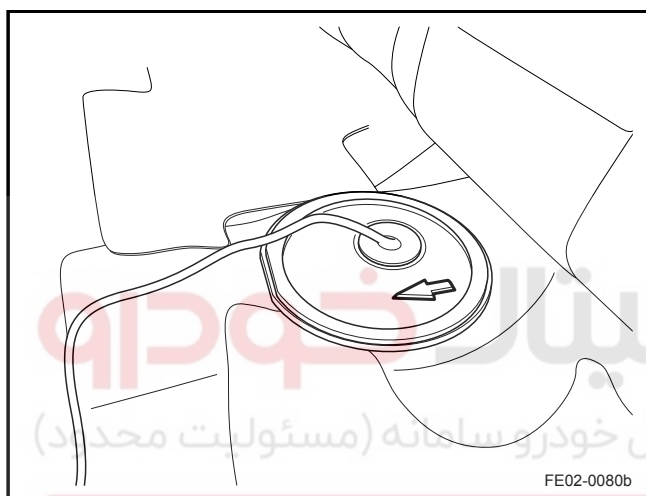
Refer to "Fuel Pipe Joints Warning" in "Warnings and Notices".



6. Connect the fuel pump return pipe.



7. Connect the fuel pump wiring harness connector.



8. Install fuel pump inspection cover, note that the arrow is pointing to the vehicle body front.
9. Install the rear seat.
10. Connect the battery negative cable.

#### 2.3.8.4 Fuel Level Sensor Replacement

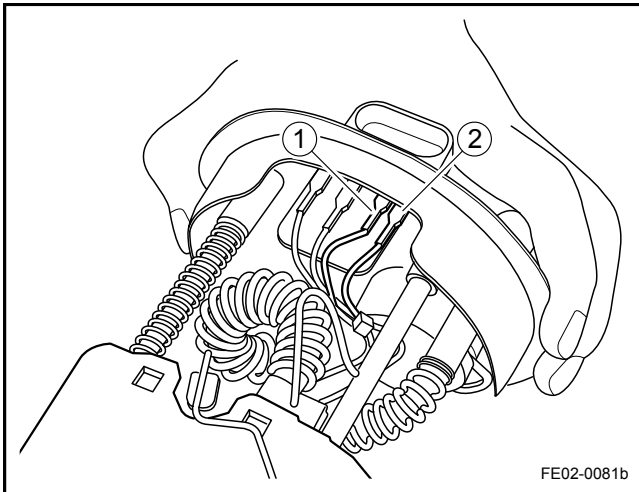
Removal Procedure:

**Warning!**

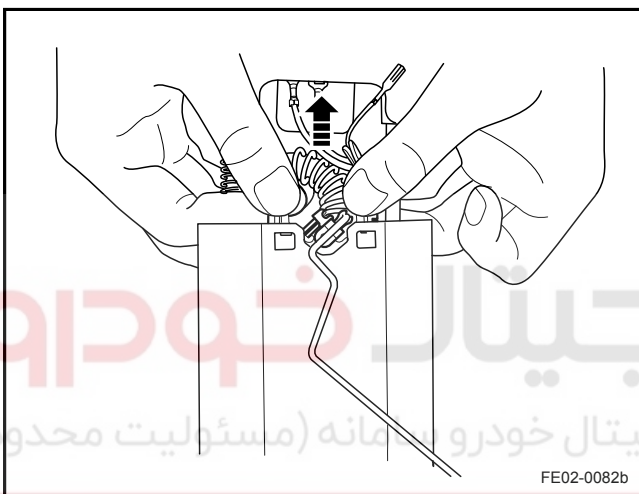
Refer to "Release Fuel Pressure Warning" in "Warnings and Notices".

**Warning!**

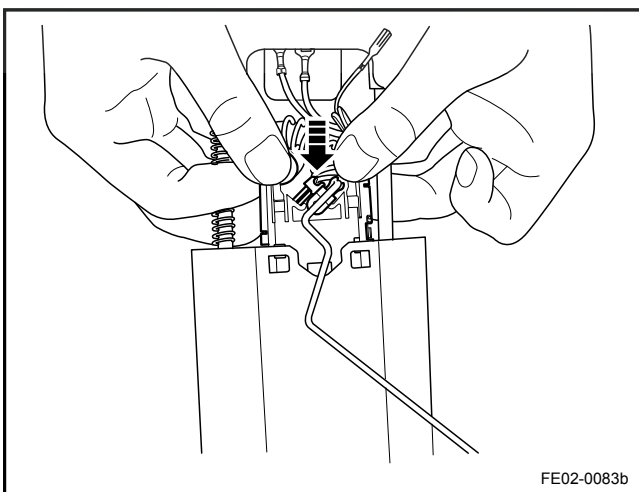
Refer to "Battery Disconnection Warning" in "Warnings and Notices".



1. Release fuel system pressure. Refer to [2.3.8.1 Fuel Pressure Release Procedure](#).
2. Disconnect the battery negative cable. Refer to [2.11.8.1 Battery Disconnection](#).
3. Remove the rear seat cushion. Refer to [12.7.3.4 Rear Seat Cushion Replacement](#).
4. Remove fuel pump assembly. Refer to [2.3.8.3 Fuel Pump Assembly Replacement](#).
5. Disconnect the fuel level sensor wires (1) and (2).

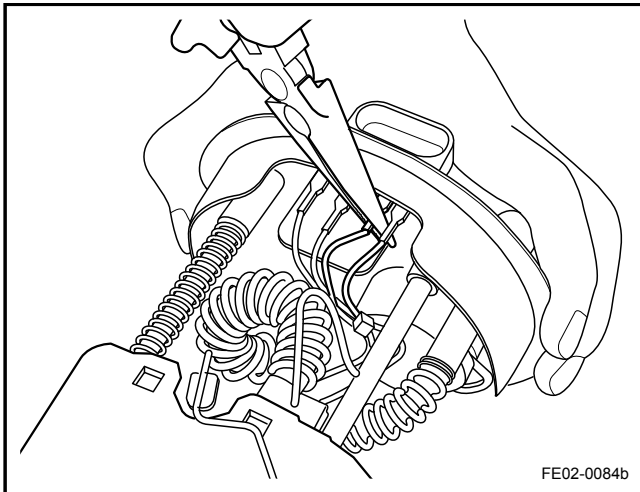


6. Disconnect the fuel level sensor wiring harness cable tie.
7. Hold the fuel level sensor buckle upward and remove the fuel level sensor.

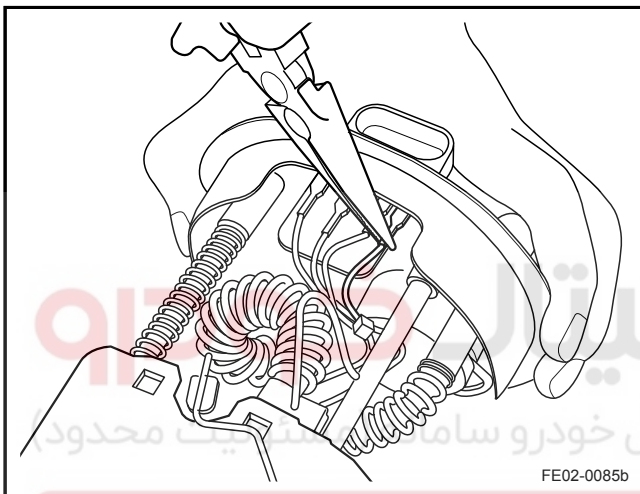


#### Installation Procedure:

1. Install the fuel level sensor to the fuel pump assembly.



2. Connect the black wires to the fuel level sensor.



3. Connect the black wires to the fuel level sensor.
4. Fix the fuel gage wiring harness with a cable tie.
5. Install the fuel pump.
6. Install the rear seat cushion.
7. Connect the battery negative cable.