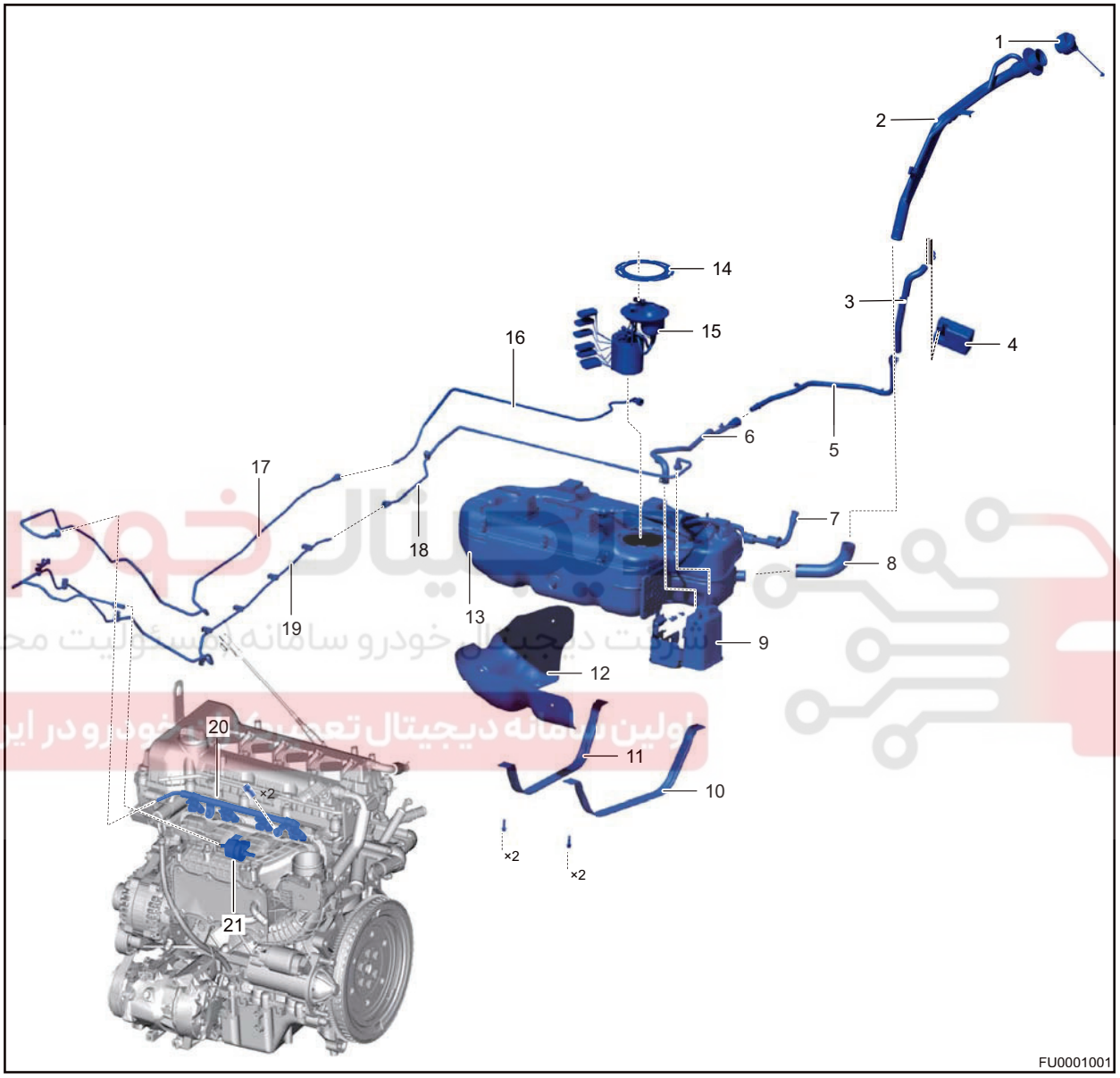
GENERAL INFORMATION

Overview

Description



1 - Fuel Tank Cap Assembly	2 - Filler Tube Assembly
3 - Activated Charcoal Canister Breather Pipe III	4 - Activated Charcoal Canister Filter
5 - Activated Charcoal Canister Breather Pipe II	6 - Activated Charcoal Canister Breather Pipe
7 - Fuel Breather Hose	8 - Fuel Filler Hose
9 - Activated Charcoal Canister Assembly	10 - Fuel Tank Left Fixing Strap
11 - Fuel Tank Right Fixing Strap	12 - Fuel Tank Heat Insulator
13 - Fuel Tank Assembly	14 - Fuel Pump Pressure Cap
15 - Electric Fuel Pump Assembly	16 - Inlet Pipel
17 - Inlet Pipe II	18 - Fuel Vapor Pipe II
19 - Fuel Vapor Pipe III	20 - Fuel Rail Injector Assembly
21 - Charcoal Canister Solenoid Valve	

Operation

- Fuel supply system consists of fuel tank, electric fuel pump assembly, delivery pipes, fuel rail and injectors, which is used for fuel storage, filtration, delivery and injection. The function of fuel supply system is to provide gasoline with sufficient pressure to fuel injectors by using electric fuel pump assembly, and the injector sprays a certain amount of gasoline which burnt mixed with gas to the top of intake valve in intake manifold in accordance with control signals from ECM.

Specifications

Torque Specifications

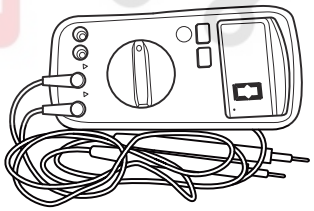
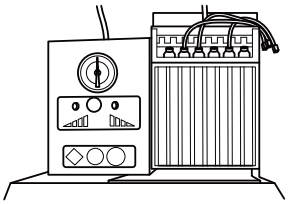
Description	Torque (N·m)
Fuel Pump Pressure Cap Tightening Torque	400
Filler Tube Assembly Fixing Bolt	7 + 1
Filler Tube End Bracket Fixing Bolt	7 ± 1
Activated Charcoal Canister Filter	7 ± 1
Fuel Tank Fixing Strap Fixing Bolt	23 ± 2
Fuel Rail Fixing Bolt	20 + 5
Worm Clamp	3 ± 0.5

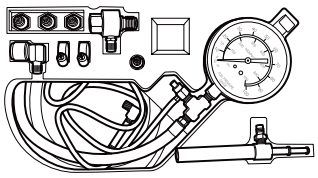
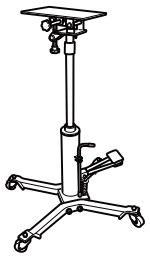
Fuel Pressure Specifications

SQRE4T15B	Pressure (kPa)
Fuel Rail Fuel Pressure - Key (ON)	400
Fuel Rail Fuel Pressure - Engine Idling	400
Fuel Rail Fuel Pressure - Key (OFF)	400 (pressure should not be less than 1 kPa within 48 hours)

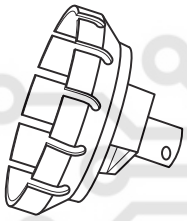
Tools

General Tools

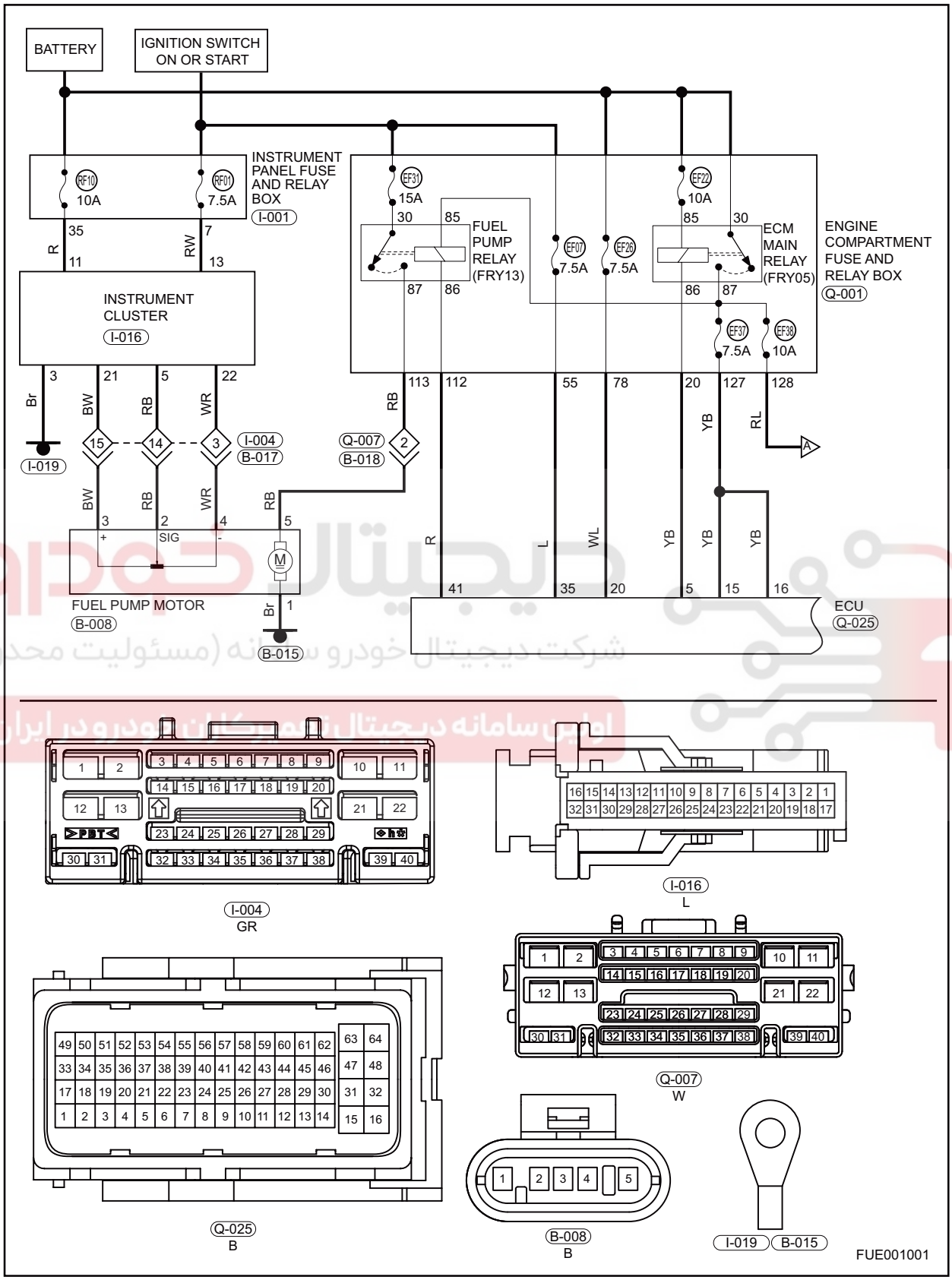
Digital Multimeter	 002
Fuel System Pressure Tester	 062

Injector Tester	 048
Transmission Carrier	 005

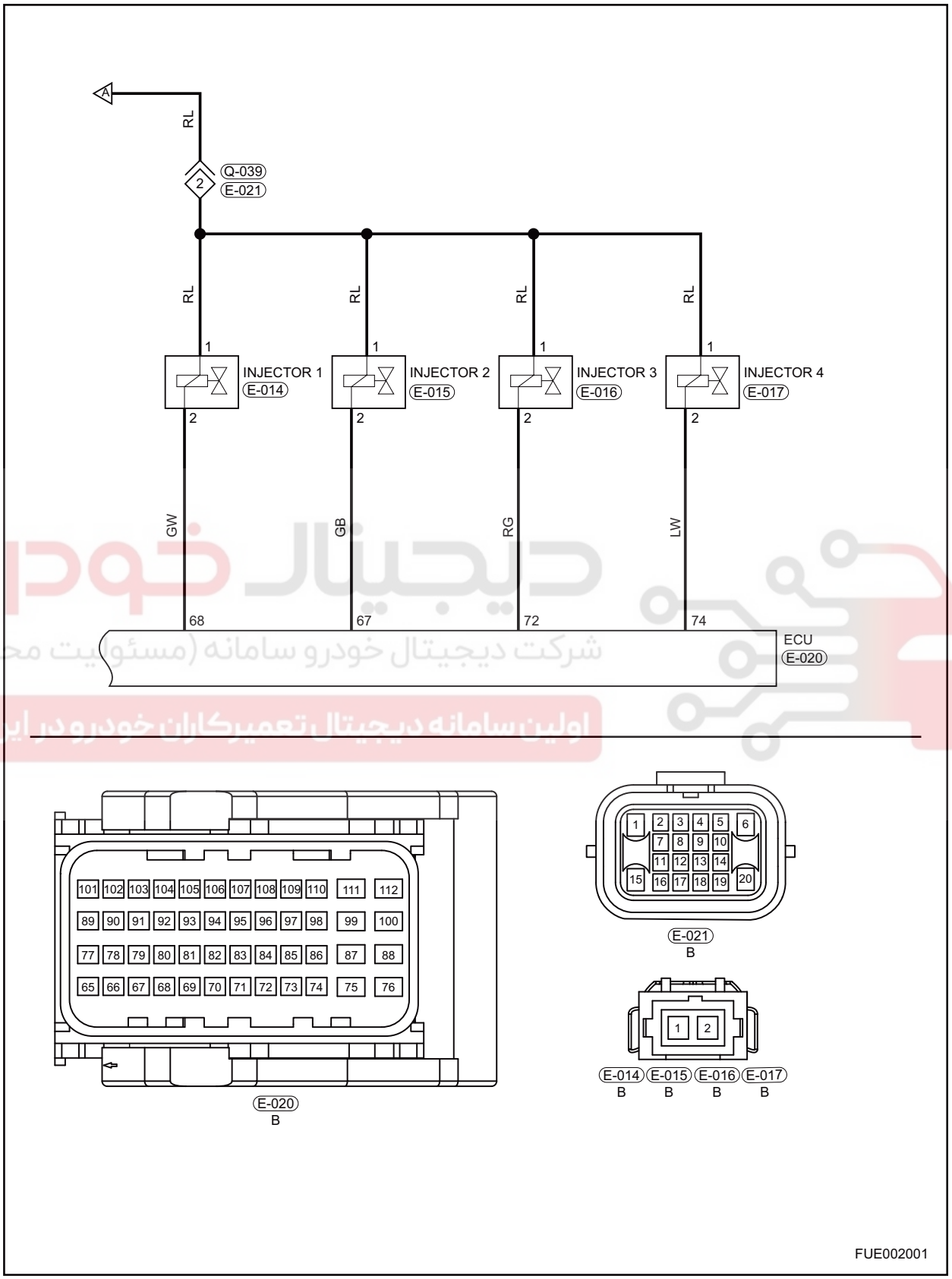
Special Tool

Fuel Pump Pressure Cap Remover	 004

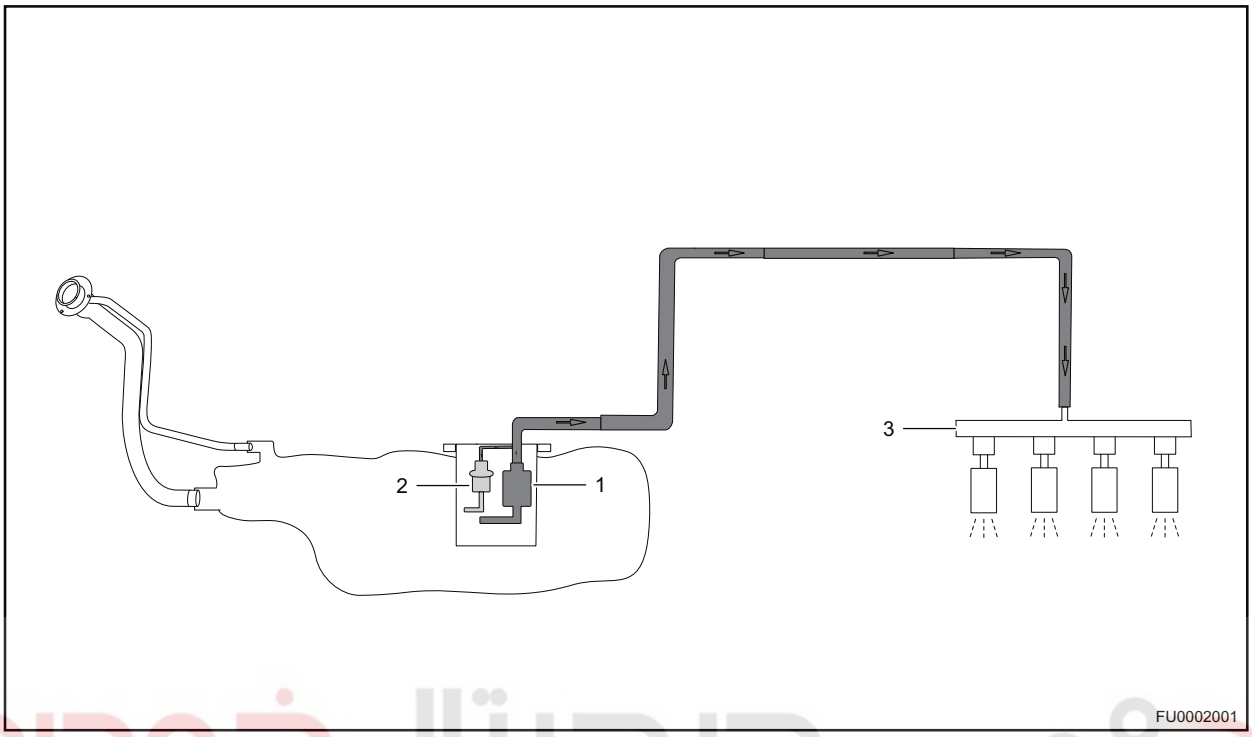
Exhaust System Diagram (Page 1 of 2)



Exhaust System Diagram (Page 2 of 2)



Fuel Supply System Line Connection Diagram



1 - Electric Fuel Pump Assembly	2 - Electric Fuel Pump Assembly Pressure Regulator
3 - Fuel Rail Injector Assembly	

When engine operates properly, the electric fuel pump assembly (1) sucks fuel from fuel tank. Some fuel enters the fuel rail (3) and is supplied to injectors, some fuel flows back to the electric fuel pump assembly pressure regulator (2) directly. When fuel supply system pressure is high, the diaphragm spring in the regulator is jacked up by pressure, then the valve opens and fuel flows out from regulator. When pressure reaches normal value, the regulator shuts off and fuel stops flowing out. Finally, the system pressure reaches a steady state.

DIAGNOSIS & TESTING

Diagnosis Content

Problem Symptoms Table

Hint:

Use symptoms table below to help determine cause of problem. Check each suspected area in sequence. Repair, replace or adjust faulty components as necessary.

Symptom	Suspected Area
Fuel pressure in fuel supply system is too low	Electric fuel pump assembly (strainer blocked or fuel pressure regulator damaged)
	Low fuel level
Fuel pressure in fuel supply system is too high	Fuel injector (clogged)
	Electric fuel pump assembly (fuel pressure regulator damaged)
Electric fuel pump assembly has loud noise or a delay in operating	Low fuel level
	Electric fuel pump assembly relay
	Electric fuel pump assembly
Fuel tank flat	Canister solenoid valve operates all the time
	Canister blocked
	Filter ineffective
	Fuel tank ineffective
Fuel injector is clogged or leaked	Fuel injector
	Poor fuel quality
	Excessive impurities in fuel tank
Fuel injector does not work	Fuel supply system line (broken)
	Fuel injector (short in coil)
	Electric fuel pump assembly (damaged)
	Wire harness

ON-VEHICLE SERVICE

Fuel System Pressure Release

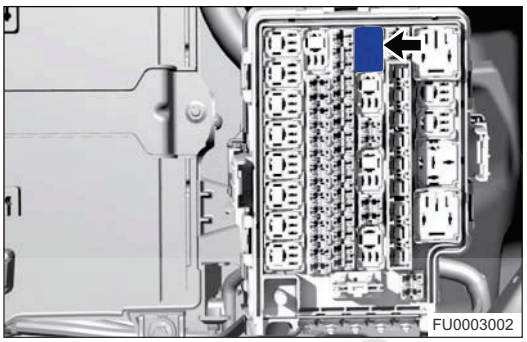
Operation Step

Warning:

- When engine is not operating, the fuel pressure in fuel supply system is still high. Before repairing or disconnecting the fuel line or fuel supply system components, it is necessary to release the fuel supply system pressure to prevent fuel from spraying out accidentally. Failure to follow these instructions may result in serious personal injury.

1. Perform the following procedures to release the fuel pressure in fuel supply system:

   (a) Recognize and remove the electric fuel pump assembly relay from engine compartment fuse and relay box.



   (b) Start and run the engine until it stalls.
   (c) Restart the engine until it does not run.
   (d) Turn ignition switch to OFF.
   (e) Disconnect the negative battery cable.
   (f) Insert the electric fuel pump relay into the original place.

Fuel Supply System Pressure Test

Fuel Pressure Specifications

SQRE4T15B	Pressure (kPa)
Fuel Rail Fuel Pressure - Key (ON)	When power is on, pressure of fuel supply system is kept at 400 kPa - key (ON). For the new vehicle, after it is added with a certain fuel, make sure that measured fuel pressure on fuel rail at 13 s can reach 90% or higher of rated pressure.
Fuel Rail Fuel Pressure - Engine Idling	Make sure that supply fuel under normal system pressure (at least 400 kpa).
Fuel Rail Fuel Pressure - Key (OFF)	Turn off oil pump after it runs for 5 minutes, test changes of pressure in oil outlet of oil pump within 48 hours, the pressure should be not less than 1 kPa; When system pressure is 80%, turn power and oil outlet off, the maximum pressure will not drop more than 10% in 1min.

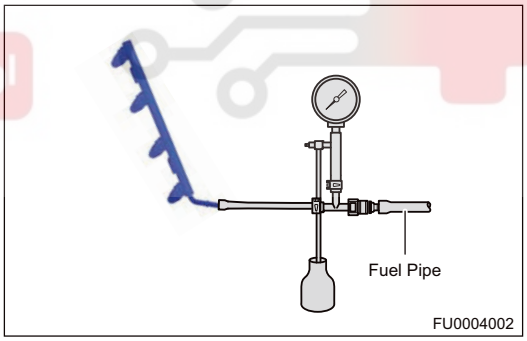
Warning:

- When operating the fuel supply system, work area should be in good ventilation and keep fire sources or open flames away from the work area, in which fire extinguisher should be equipped.
- Before operating the fuel supply system, please touch the vehicle body to discharge static electricity; failure to do so will cause a fire, even result in an explosion.
- Before removing and installing fuel pipes, release the fuel supply system pressure.

Caution:

- Make sure that battery voltage is not less than 12 V.
- There is sufficient fuel in fuel tank for test.
- Make sure that fuel supply system lines are securely connected, preventing the fuel supply system from leaking.

1. Detect the fuel system pressure.
2. Remove the engine trim cover.
3. Disconnect the inlet pipe II connector and connect the fuel supply system pressure tester between inlet pipe II and fuel rail.



4. Start engine and run it at idle, and then read the value on pressure tester.
   (a) Standard pressure at idle should be 400 kPa.
   (b) If measured pressure value is lower than 380 kPa or higher than 420 kPa, check vehicle fuel supply line for leakage or kink, injector for blockage, function of electric fuel pump for abnormality.
   Hint:
   Replace injector or electric fuel pump assembly if necessary.

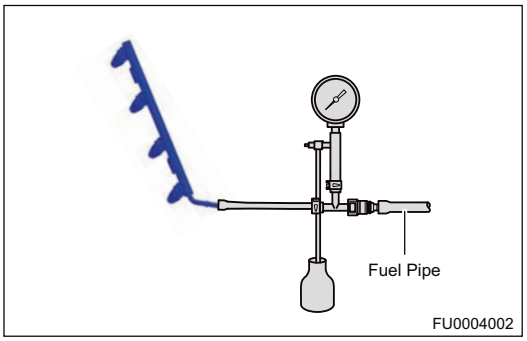
Fuel Flow Test

Caution:

- When fuel pressure is in normal during idling, the test of fuel flow can be performed.

1. Test method:

   (a) Disconnect the inlet pipe II connector and connect the fuel supply system pressure tester between inlet pipe II and fuel rail.



   (b) Start engine, increase engine speed (such as throttle fully opens), if the pressure of pressure gauge is lower than 0.1 Mpa (100 kPa) of system pressure, flow is insufficient.

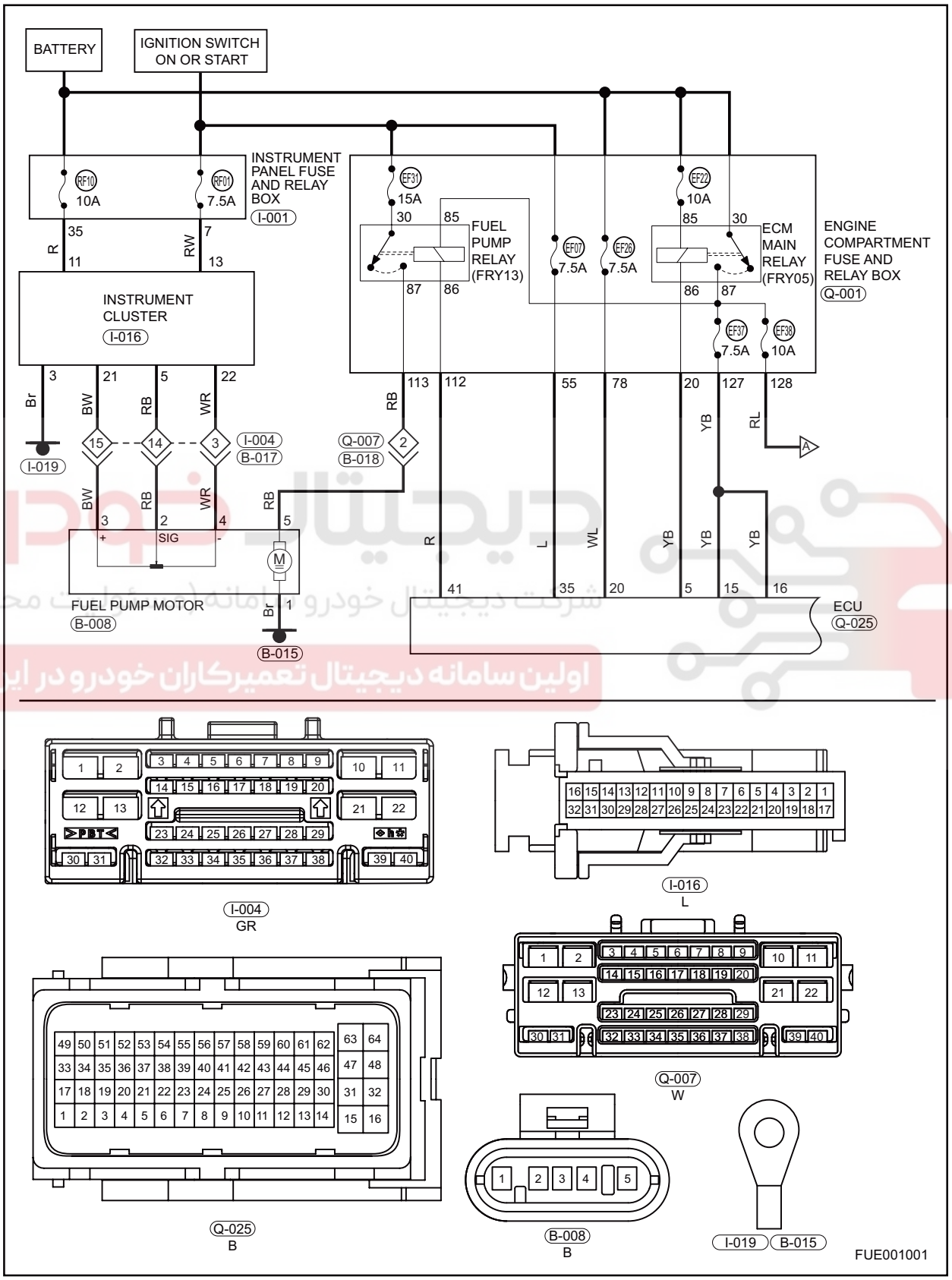
   (c) If flow is insufficient, line blockage or bend, fuel pump wear or mesh blockage may be the problem cause.

   Hint:

   - Replace the electric fuel pump first if necessary. If line is blocked or bent, check, repair or replace it and retest flow, if it is eligible, the problem is eliminated. If it is ineligible, replace fuel pump and wash impurities in fuel tank.

Electric Fuel Pump Assembly

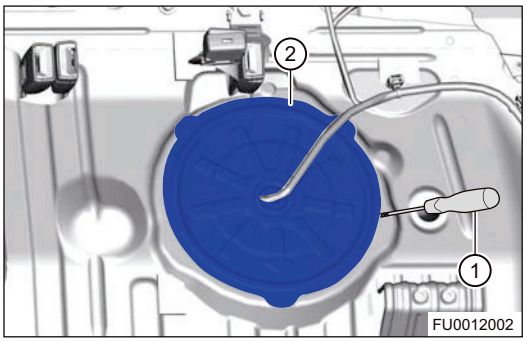
Electric Fuel Pump Circuit Diagram



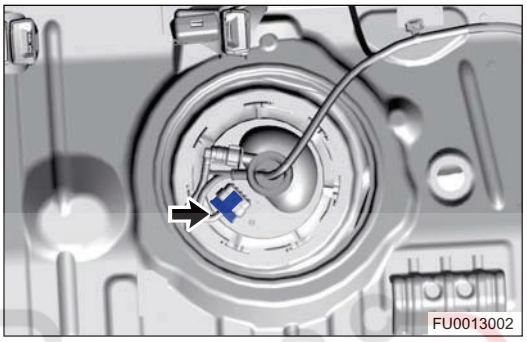
On-vehicle Inspection

1. Check the electric fuel pump fuel level sensor.

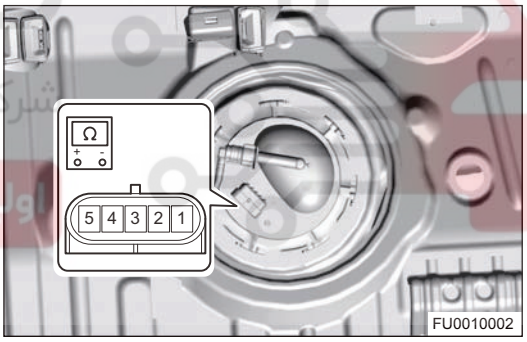
   (a) Using a screwdriver (1) wrapped with protective tape, pry off electric fuel pump assembly protective cap (2).



   (b) Disconnect the electric fuel pump assembly connector (arrow).



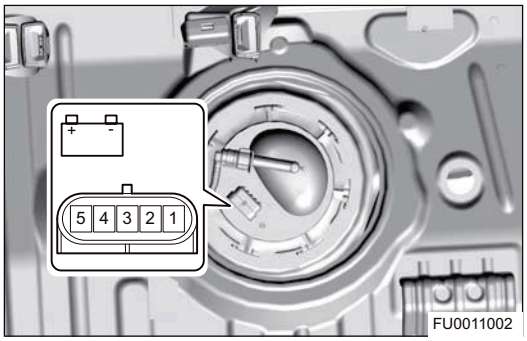
   (c) Using a digital multimeter, measure resistance of fuel level sensor according to remaining fuel in fuel tank.



Fuel Level Indication	Multimeter Connection	Specification (Ω)
E-stop	Terminal 2 - Terminal 3	325 ± 5
E	Terminal 2 - Terminal 3	310 ± 5
R	Terminal 2 - Terminal 3	280 ± 4
1/4	Terminal 2 - Terminal 3	250 ± 4
3/8	Terminal 2 - Terminal 3	220
1/2	Terminal 2 - Terminal 3	190 ± 3
5/8	Terminal 2 - Terminal 3	160
3/4	Terminal 2 - Terminal 3	130 ± 3
7/8	Terminal 2 - Terminal 3	96.67
F	Terminal 2 - Terminal 3	70 ± 2
F-stop	Terminal 2 - Terminal 3	55 ± 2

Hint:
If result is not as specified, replace electric fuel pump assembly.

2. Check the electric fuel pump assembly operation.
   (a) Using a flat tip screwdriver, pry off electric fuel pump assembly protective cap and disconnect electric fuel pump connector.
   (b) Apply battery voltage to terminals 1 and 5, and check if electric fuel pump operates within 10 seconds.



Battery Connection	Specifications
Battery positive (+) to Terminal 5 Battery negative (-) to Terminal 1	Fuel pump operates

Hint:
- These tests must be finished within 10 seconds to prevent the coils from being burnt.
- Leave the electric fuel pump assembly as far as possible from the battery.
- Always switch voltage on and off on the battery side, rather than the electric fuel pump assembly side.
- If the electric fuel pump assembly does not operate, replace it.

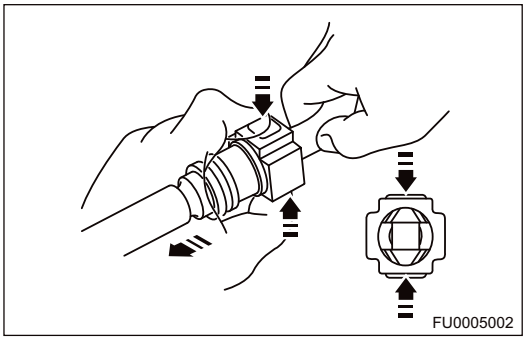
Removal

Warning/Caution/Hint

Warning:
- Before operating the fuel supply system, please touch the vehicle body to discharge static electricity; failure to do so will cause a fire, even result in an explosion.
- When operating the fuel supply system, work area should be in good ventilation and keep fire sources or open flames away from the work area, in which fire extinguisher should be equipped.
- After performing the procedures for fuel system pressure release, there still remains some fuel in fuel line. When disconnecting fuel line, cover the joint with a piece of cloth or equivalent to prevent fuel from spraying out.
- If fuel leakage occurs when operating the fuel supply system, please handle the leaked fuel in time.

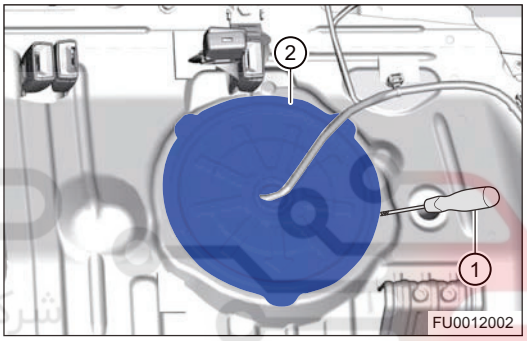
Caution:
- Be sure to wear necessary safety equipment to prevent accidents when repairing.
- Try to prevent body paint surface from being scratched during removal and installation.
- Operation staff should wear protective glasses and rubber gloves during requirement and avoid inhaling much fuel gas.
- Only use parts approved by Chery Automobile Co., Ltd. to replace the electric fuel pump assembly.
- As electric fuel pump assembly radiates through fuel, low fuel level in fuel tank will directly shorten the service life of electric fuel pump assembly.
- Keep electric fuel pump assembly and work area clean when replacing electric fuel pump assembly; otherwise the electric fuel pump assembly element will be clogged.
- DO NOT damage the disconnected fuel system line or connectors. Cover the line joints or connectors with plastic bags or equivalent, preventing foreign matter from entering.
- Keep fuel tank and line clean.

Hint:
Disconnection way for all fuel pipe coupling joints in following procedures is shown in the illustration.

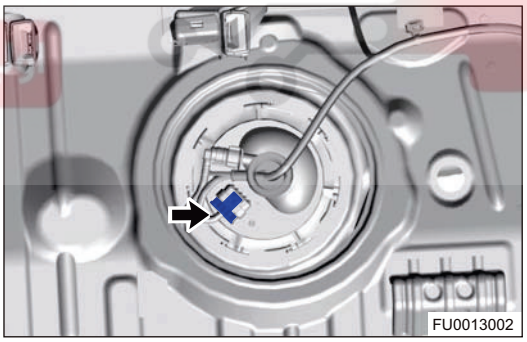


1. Release the fuel system pressure.
2. Turn off all electrical equipment and the ignition switch.
3. Disconnect the negative battery cable.
4. Open the fuel tank cap assembly and discharge the fuel vapor in fuel tank.
5. Remove the second row seat.
6. Remove the electric fuel pump assembly.

(a) Using a screwdriver (1) wrapped with protective tape, pry off electric fuel pump assembly protective cap (2).

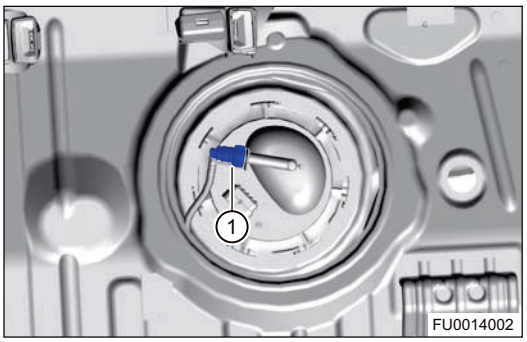


(b) Disconnect the electric fuel pump assembly connector (arrow).



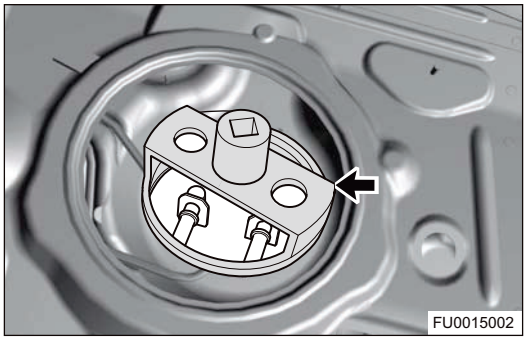
(c) Disconnect inlet pipe coupling joint (1) of electric fuel pump.

Caution:
- Before disconnecting the joints, remove all dirt from electric fuel pump assembly pressure cap.
- DO NOT forcefully bend or twist fuel line.



(d) Using special tool (fuel pump pressure cap remover) (arrow), remove pressure cap as shown in illustration.

Tightening torque
400 N·m



(e) Take out electric fuel pump assembly.

Caution:

- Operate carefully when taking the electric fuel pump assembly out of fuel tank, preventing damaging lines and floats.
- Cover the electric fuel pump assembly completely with a plastic bag or equivalent to prevent foreign matter from entering.
- Electric fuel pump assembly can be put into a container and taken out of the cabin, thus preventing fuel in the pump from dropping into the cabin.
- It is not allowed to perform running test for electric fuel pump assembly under dry state or in water. Otherwise service life will be reduced. In addition, do not inversely connect electric fuel pump assembly positive and negative poles.

(f) Dispose the fuel in the electric fuel pump assembly.

Installation

Warning/Caution/Hint

- DO NOT connect the power during installation. Work area should be in good ventilation and keep fire sources or open flames away.
- Replace fuel tank seal ring with a new one when installing electric fuel pump assembly, align it with installation position of fuel tank and do not run the electric fuel pump assembly with no fuel in fuel tank, preventing damaging electric fuel pump assembly.
- Before connecting the hose, check if there is any damage or foreign matter on the hose or joint.
- During installation, push in fuel pipe connector until a click sound is heard, then check that fuel pipe joint clip is on the collar of fuel pipe joint. After installing the pipe joint clip, check that fuel pipe joint cannot be pulled out. Be careful not to damage joint. If clip is damaged, replace it.
- Turn ignition switch to ON (without starting engine) to apply fuel pressure to fuel supply system, and then check connections for leakage.

1. Installation is in the reverse order of removal.

Caution:

- When installing electric fuel pump assembly into fuel tank, it is necessary to install float rod assembly into fuel tank carefully at first to avoid deformation as collision.

Filler Tube Assembly

Removal

Warning/Caution/Hint

Warning:

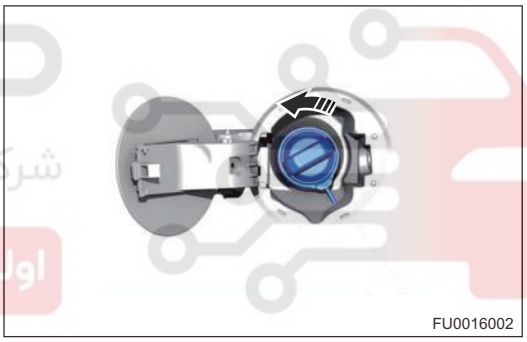
- Before operating the fuel supply system, please touch the vehicle body to discharge static electricity; failure to do so will cause a fire, even result in an explosion.
- When operating the fuel supply system, work area should be in good ventilation and keep fire sources or open flames away from the work area, in which fire extinguisher should be equipped.
- If fuel leakage occurs when operating the fuel supply system, please handle the leaked fuel in time.

Caution:

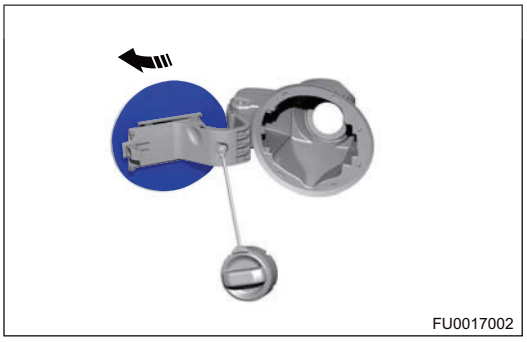
- Be sure to wear necessary safety equipment to prevent accidents when repairing.
- Try to prevent body paint surface from being scratched during removal and installation.

1. Turn off all electrical equipment and the ignition switch.
2. Disconnect the negative battery cable.
3. Remove the rear left tire assembly (See page 22-8).
4. Remove the rear left wheel house protector assembly (See page 48-32).
5. Remove the spare tire.
6. Remove the rear suspension.
7. Remove the filler tube assembly.

(a) Open the fuel filler door, rotate the fuel tank cap assembly in the direction of arrow as shown in the illustration.


FU0016002

(b) Remove the external plastic fuel tank cap plate in direction of arrow as shown in illustration.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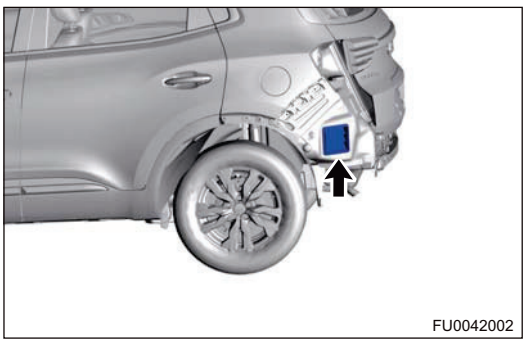
(c) Carefully pry off rear ventilation frame assembly, and remove it.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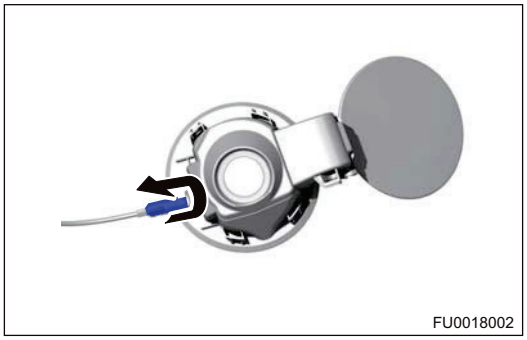
(d) Rotate and remove fuel tank cap cable lock mechanism in direction of arrow as shown in illustration.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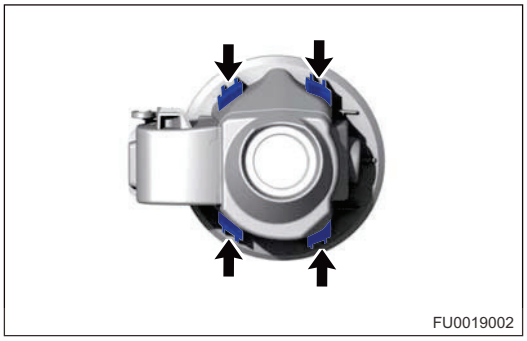
(e) Carefully pry off and remove fuel filler cap hinge assemblies (arrow).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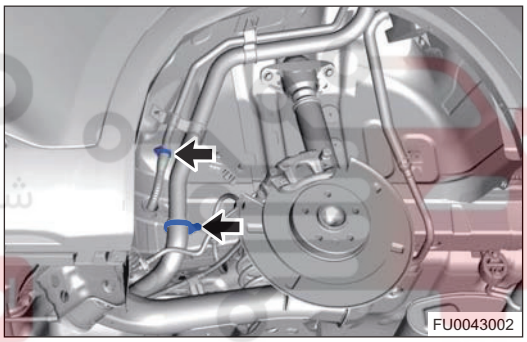
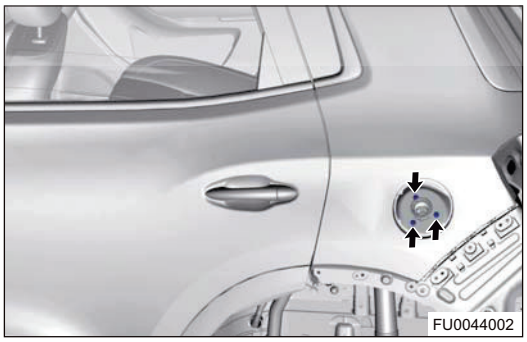
(f) Loosen worm clamps (arrow), disconnect the connection between filler tube assembly and fuel filler breather hose and fuel filler hose.

Tightening torque
3 ± 0.5 N·m


FU0043002

(g) Remove 3 filler tube assembly fixing bolts (arrow).

Tightening torque
7 ± 1 N·m


FU0044002

(h) Remove the filler tube assembly.
Caution:
- Cover the joints with plastic bags after disconnecting the fuel filler hose and fuel breather hose, in order to prevent foreign matter from entering the fuel tank and fuel from evaporating or leaking.

Installation

1. Installation is in the reverse order of removal.
Caution:
- When installing hose, make sure that hose is not twisted and kinked.
- Turning the fuel tank cap clockwise until a "click" is heard, indicating the cap has been tightened.

Fuel Tank

Removal

Warning/Caution/Hint

Warning:

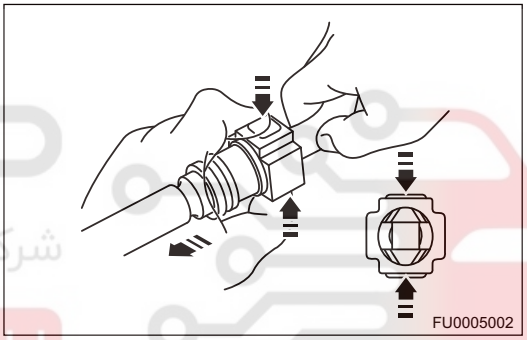
- Before operating the fuel supply system, please touch the vehicle body to discharge static electricity; failure to do so will cause a fire, even result in an explosion.
- When operating the fuel supply system, work area should be in good ventilation and keep fire sources or open flames away from the work area, in which fire extinguisher should be equipped.
- After performing the procedures for fuel system pressure release, there still remains some fuel in fuel line. When disconnecting fuel line, cover the joint with a piece of cloth or equivalent to prevent fuel from spraying out.
- If fuel leakage occurs when operating the fuel supply system, please handle the leaked fuel in time.

Caution:

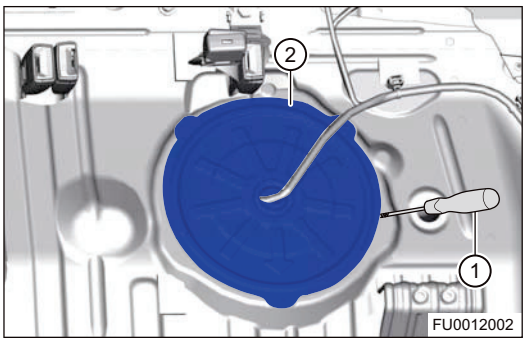
- DO NOT damage the disconnected fuel system line or connectors. Cover the line joints or connectors with plastic bags or equivalent, preventing foreign matter from entering.
- Be sure to wear necessary safety equipment to prevent accidents when repairing.
- Try to prevent body paint surface from being scratched during removal and installation.

Hint:

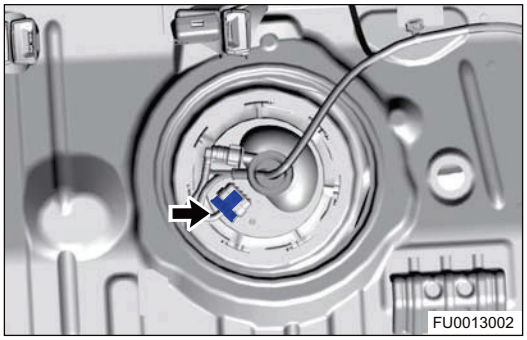
- Disconnection way for all fuel pipe coupling joints in following procedures is shown in the illustration.



1. Release the fuel system pressure.
2. Turn off all electrical equipment and the ignition switch.
3. Disconnect the negative battery cable.
4. Open fuel tank cap to discharge fuel vapor.
5. Disconnect the electric fuel pump assembly line and connector.
   (a) Remove the second row seat cushion.
   (b) Using a screwdriver (1) wrapped with protective tape, pry off electric fuel pump assembly protective cap (2).

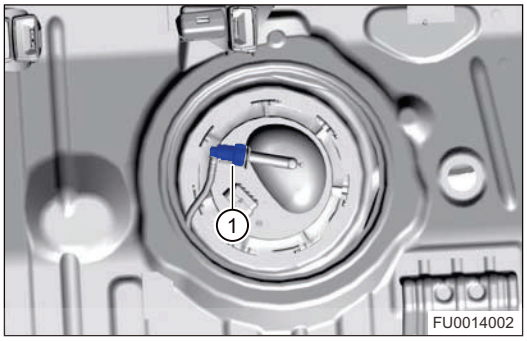


(c) Disconnect the electric fuel pump assembly connector (arrow).



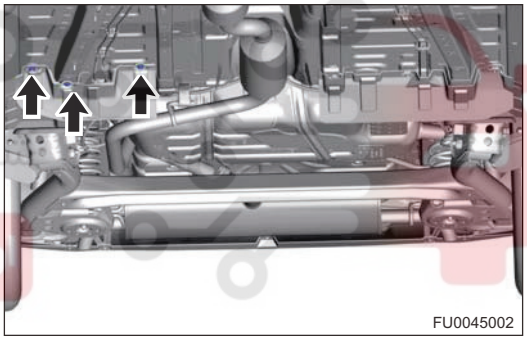
(d) Disconnect outlet pipe (1) of electric fuel pump.

Caution:
- Before disconnecting the joints, remove all dirt from electric fuel pump assembly pressure cap.
- DO NOT forcefully bend or twist line.



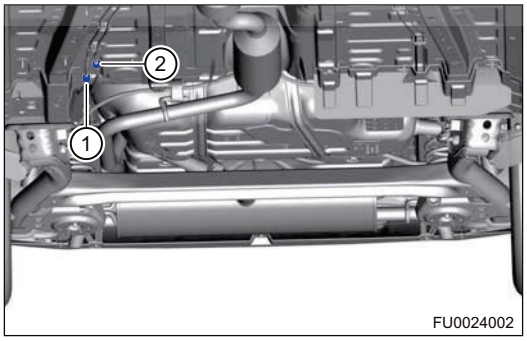
6. Remove the fuel tank assembly.

(a) Remove 3 fixing bolts (arrow) from right fuel tank spoiler.



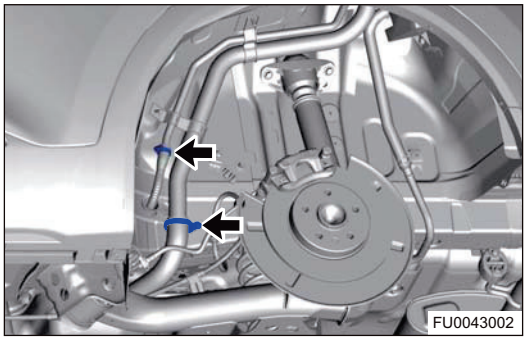
(b) Disconnect inlet pipe I joint (1) and fuel vapor pipe II (2).

Caution:
- Before disconnecting the joints, remove any dirt and foreign matter from the retainer. DO NOT forcefully bend or twist delivery pipes.

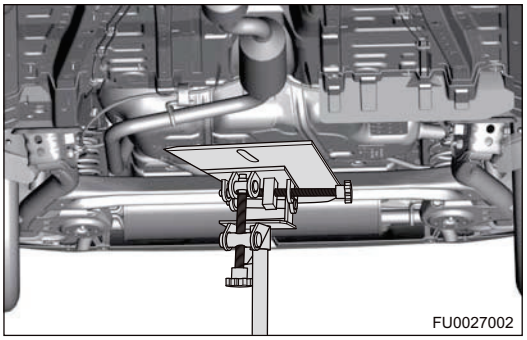


(c) Loosen worm clamps (arrow), disconnect the connection between filler tube assembly and fuel filler breather hose and fuel filler hose.

Tightening torque
3 ± 0.5 N·m

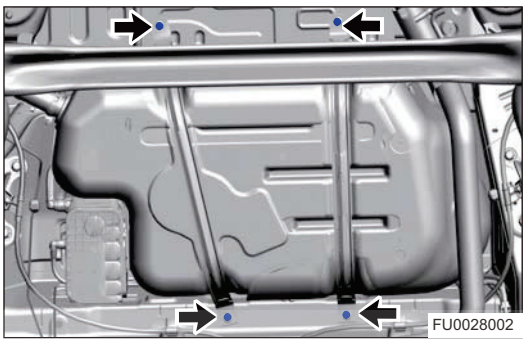


(d) Support fuel tank with a transmission carrier.


FU0027002

(e) Remove 4 coupling bolts (arrow) between fuel tank left and right fixing straps and body.

Tightening torque
23 ± 2 N·m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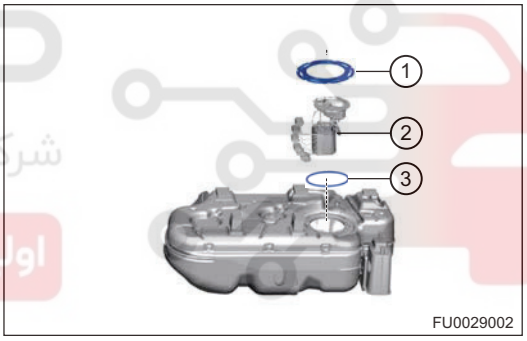
7. Slowly lower transmission carrier to remove fuel tank tank

(a) Remove fuel pump pressure cap (1), electric fuel pump assembly (2) and fuel tank seal ring (3) from fuel tank assembly.



FU0029002

Fuel Tank Accessories Description

1. Fuel Vapor Valve

   Function of fuel vapor valve:

   (a) When fuel vapor is produced in the fuel tank, the vapor will enter the charcoal canister through fuel vapor valve (1) by fuel vapor pipe I (2). When the vehicle body bumps or overturns, fuel vapor valve will automatically lock to prevent fuel overflow.

2. Fuel Breather Pipe

   Function of fuel breather pipe:

   (a) When filling fuel tank through fuel filler, the fuel vapor will get out of fuel tank through fuel breather pipe (3).

3. Fuel Tank Cushion

   (a) Pay attention to the installation positions of fuel tank cushions (arrow). Incorrect installation will damage the fuel tank or fuel lines due to friction between fuel tank and body.

Installation

Warning/Caution/Hint

Caution:

- Return fuel lines and vent line on fuel tank to their original positions, or the fuel lines will be damaged due to friction generated by vehicle body shock, causing fuel leak.
- Before connecting the hose, check if there is any damage or foreign matter on the hose or joint.
- During installation, push in fuel pipe connector until a click sound is heard, then check that fuel pipe joint clip is on the collar of fuel pipe joint. After installing the pipe joint clip, check that fuel pipe joint cannot be pulled out. Be careful not to damage joint. If clip is damaged, replace it.
- Turn ignition switch to ON (without starting engine) to apply fuel pressure to fuel system, and then check connections for leakage.

1. Installation is in the reverse order of removal.

Fuel Rail Injector Assembly

Removal

Warning/Caution/Hint

Warning:

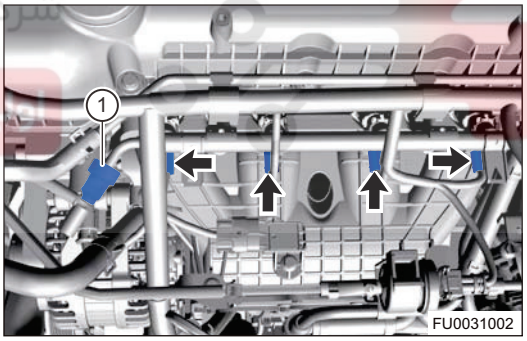
- Before operating the fuel supply system, please touch the vehicle body to discharge static electricity; failure to do so will cause a fire, even result in an explosion.
- When operating the fuel supply system, work area should be in good ventilation and keep fire sources or open flames away from the work area, in which fire extinguisher should be equipped.
- After performing the procedures for fuel system pressure release, there still remains some fuel in fuel line. When disconnecting fuel line, cover the joint with a piece of cloth or equivalent to prevent fuel from spraying out.
- If fuel leakage occurs when operating the fuel supply system, please handle the leaked fuel in time.

Caution:

- Be sure to wear necessary safety equipment to prevent accidents when repairing.
- Try to prevent body paint surface from being scratched during removal and installation.
- DO NOT damage the disconnected fuel system line or connectors. Cover the line joints or connectors with plastic bags or equivalent, preventing foreign matter from entering.
- Injector is a part of high accuracy, featuring good anti-clogging, anti-pollution and atomization, so be careful not to damage the injector during removal of fuel rail.

1. Release the fuel supply system pressure.
2. Turn off all electrical equipment and the ignition switch.
3. Disconnect the negative battery cable.
4. Remove the engine trim cover.
5. Remove the fuel rail injector assembly.

(a) Disconnect connection (1) between inlet pipe II and fuel rail injector.

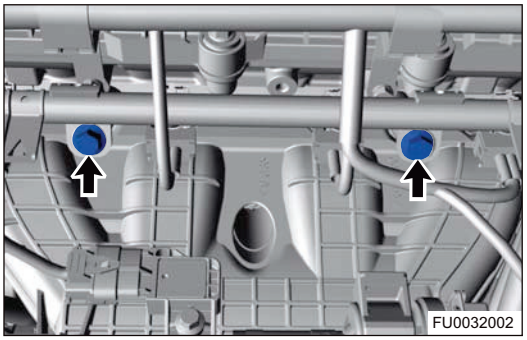


(b) Disconnect the injector connectors (arrow) of each cylinder.

(c) Remove 2 fixing bolts (arrow) from fuel rail injector.

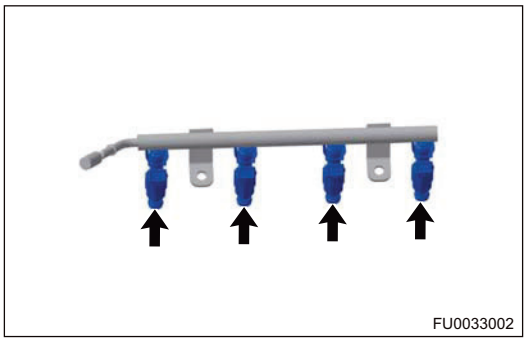
Tightening torque

20 + +5 N·m



(d) Remove the fuel rail injector assembly.

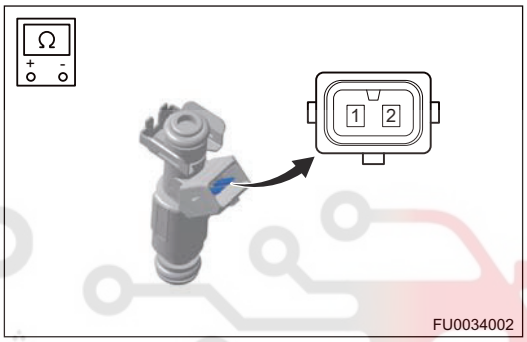
6. Separate the injector and fuel rail.
   (a) Remove injector fixing clamps and remove injectors (arrow) from fuel rail.



Inspection

1. Check the resistance of injector.
   (a) Disconnect the injector connector.
   (b) Measure resistance between 2 terminals (injector side) of injector with a digital multimeter.

Multimeter Connection	Measurement Temperature	Specification (Ω)
Terminal 1 - Terminal 2	20°C	12



2. Check leakage test and injection test of injector.
   (a) Remove injector and then install the injector to injector cleaning analyzer, adjust the pressure to operation pressure, and observe the injector for leakage, if so, sealing is poor.
   (b) If there is no cleaning analyzer, a free-unpick cleaning device also can be used, adjust pressure to 4 bar, and place a white paper under injector. Observe the injector for leakage.
   Caution:
   - When installing injector, grease will be applied to sealing ring to install injector easily, if the part is in high temperature for a long time, grease will melt, and adsorb around injector, so it may be wrong when judging injector for leakage. It is recommend to clean around injector to check injector for leakage.

   (c) If the color of one injector nozzle is different from the color of other injector nozzles, the injector may be leaked or have a poor atomization.
   (d) Fuel injection angle
      (1) Poor atomization: Fuel injected by injector is radial, and injection angle from injection nozzle is irregular.
      (2) Good atomization: Fuel injected from injector is fuel mist, and injection angle from injection nozzle is cone.

Installation

Warning/Caution/Hint

Caution:

- Install a new O-ring sealing on injector.
- Before installing the injector, apply clean grease or oil to the O-ring sealing surface for easy installation, preventing damage to the O-ring.
- When applying grease or oil, do not contaminate the injector internal and injection holes.
- It is not allowed to use any tool (hammer, etc.) to strike the injector when installing it.

1. Installation is in the reverse order of removal.