

FUEL SYSTEM

01-14 FUEL SYSTEM

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FUEL SYSTEM OUTLINE

CHU011401006S01

Features

Improved serviceability	• Nylon tubes adopted for fuel hoses in the engine compartment and around the fuel tank, and quick release connectors adopted for joints
Reduction of evaporative gas	• Returnless fuel system adopted

Specification

Item		Specification
Injector	Type	Multiple hole design
	Type of fuel delivery	Top-feed
	Type of drive	Electronic
Pressure regulator control pressure	(kPa {kgf/cm ² , psi})	Approx. 390 {3.98, 56.6}
Fuel pump type		Electric
Fuel tank capacity	(L {US gal, Imp gal})	60 {15.9, 13.2}
Fuel type		Unleaded premium (unleaded high-octane) gasoline

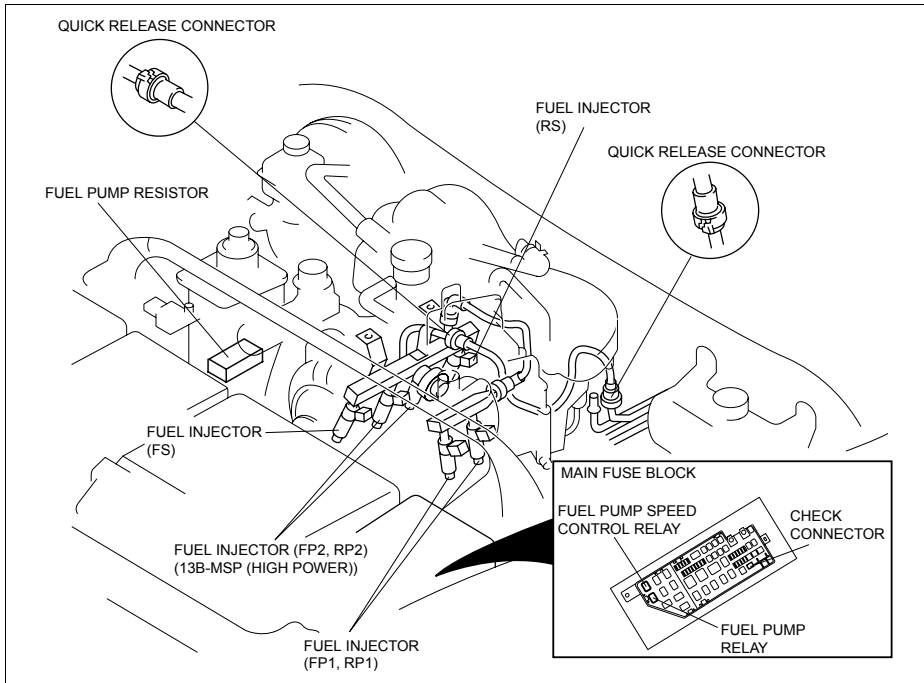
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FUEL SYSTEM STRUCTURAL VIEW

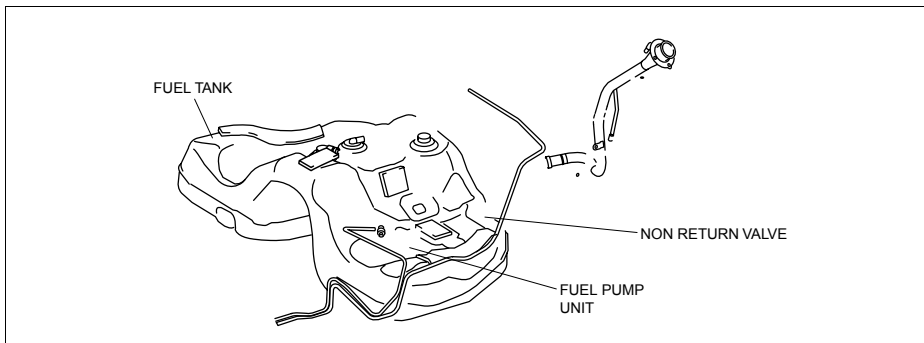
CHU011401006S02

Engine Room Side



CHU0114S001

Fuel Tank Side

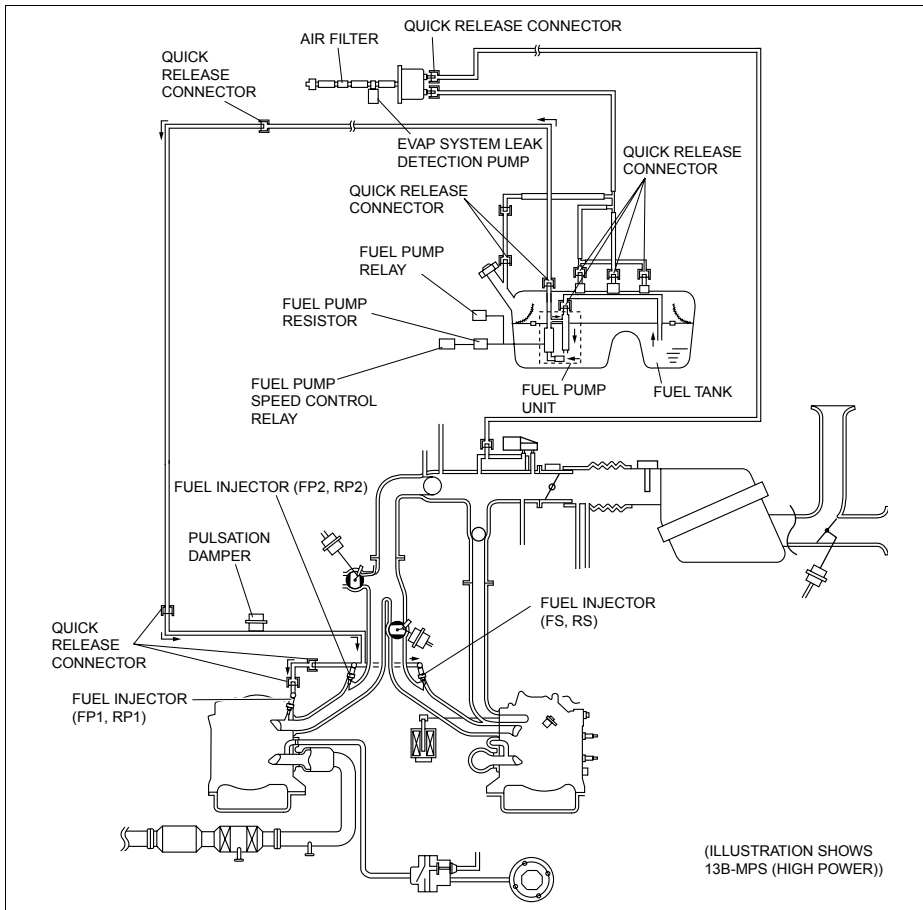


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FUEL SYSTEM**FUEL SYSTEM DIAGRAM**

CHU011401006S03



CHU0114S003

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FUEL TANK CONSTRUCTION

CHU011442110S01

- Fuel tank capacity is **60 L {15.9 US gal, 13.2 Imp gal}**.
- Includes two rollover valves, and the fuel shut-off valve that is press-fitted in the evaporative hose above the fuel tank. For the fuel shut-off valve and the rollover valves, refer to EMISSION SYSTEM. (See 01-16-10 FUEL SHUT-OFF VALVE FUNCTION, 01-16-11 FUEL SHUT-OFF VALVE CONSTRUCTION/OPERATION, 01-16-11 ROLLOVER VALVE FUNCTION, 01-16-12 ROLLOVER VALVE CONSTRUCTION/OPERATION.)
- Made of hard plastic for weight reduction.

NONRETURN VALVE FUNCTION

CHU011442270S01

- Prevents fuel from spouting out due to evaporative gas pressure in the fuel tank when removing the fuel-filler cap.

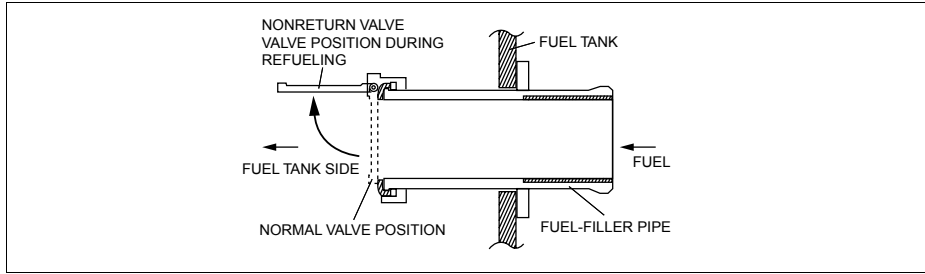
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NONRETURN VALVE CONSTRUCTION/OPERATION

CHU011442270S02

- A single valve type has been adopted.



CHU0114S014

- The nonreturn valve cannot be removed because it is fixed to the fuel-filler pipe in the fuel tank.
- Under normal conditions, this valve is closed as shown by the dotted line. When refueling, it opens to the position shown by the solid line due to the flow of fuel. When refueling is finished, the valve returns to the normal valve position due to spring force.

RETURNLESS FUEL SYSTEM OUTLINE

CHU011413350S01

Features

- The returnless fuel system reduces fuel evaporation in the fuel tank.
- The pressure regulator located in the fuel tank prevents fuel return from the engine compartment side, thereby maintaining a low fuel tank temperature. Due to this, formation of evaporative gas produced by a rise in fuel temperature is suppressed.
- The pressure regulator is built into the fuel pump unit in the fuel tank.

RETURNLESS FUEL SYSTEM OPERATION

CHU011413350S02

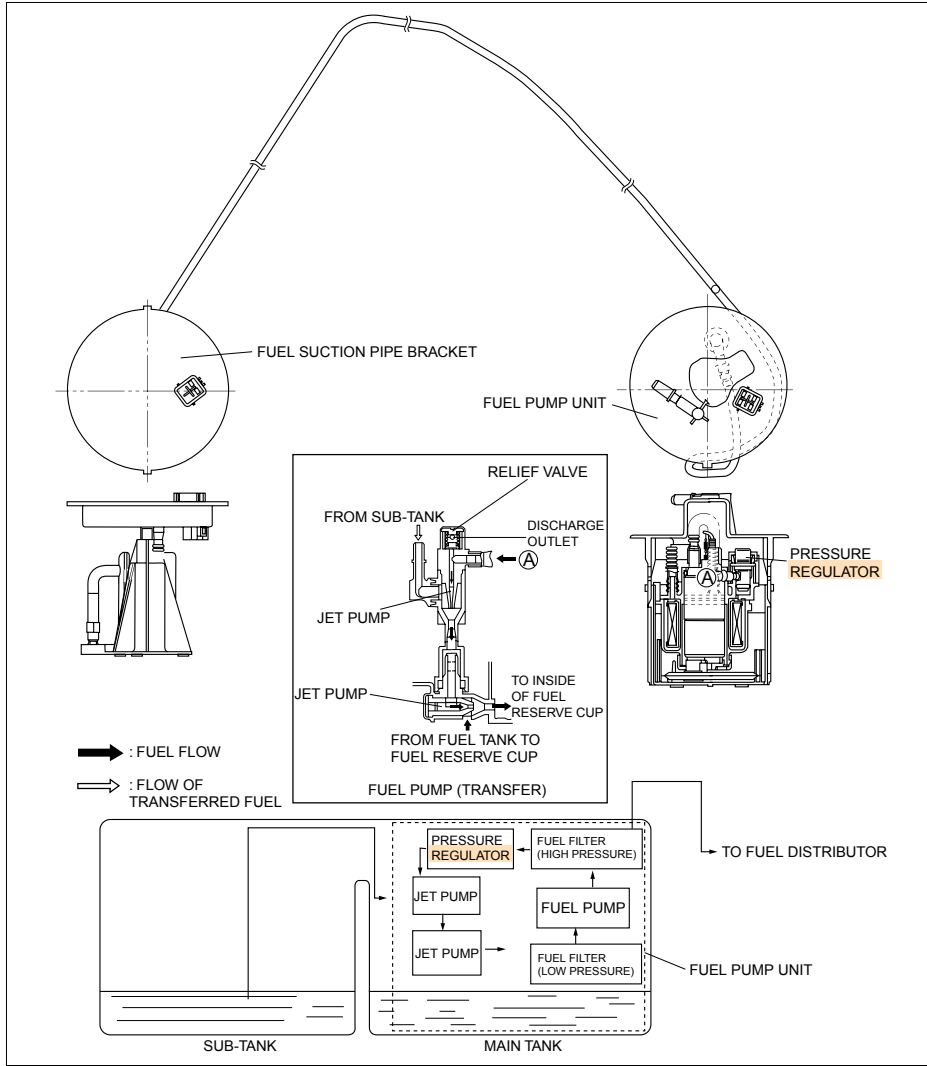
- Fuel in the fuel tank is pumped out through the fuel filter (low-pressure side) by the fuel pump, filtered by the fuel filter (high-pressure side), and then compressed to a specified pressure by the pressure regulator. The pressurized fuel passes through the pulsation damper and is sent to the fuel injector.
- The pressure regulator pressurizes fuel to **approx. 390 kPa {3.98 kgf/cm², 56.6 psi}**. If the pressure exceeds the **approx. 390 kPa {3.98 kgf/cm², 56.6 psi}**, the pressure regulator valve in the fuel pump unit opens to allow fuel to flow to the fuel tank.

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FUEL PUMP UNIT FUNCTION

CHU011413350S03

- The fuel pump suctions fuel from the fuel tank and pumps it to the fuel distributor.



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CHU0114S012

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FUEL PUMP UNIT CONSTRUCTION/OPERATION

CHU011413350S04

Fuel Pump Unit

- Mainly consists of a fuel filter (high-pressure), pressure regulator, fuel pump, fuel reserve cup, fuel filter (low-pressure), and fuel pump (transfer).
- A pressure regulator is built-in due to the adoption of a returnless fuel system.
- A hard-plastic fuel pump unit, with an integrated fuel filter (high-pressure) and fuel pump, has been adopted to simplify the fuel line.
- The fuel pump unit, located on top of the fuel tank, can be removed and installed through the service hole in the bottom of the rear seat.
- The fuel pump unit cannot be disassembled.
- Fuel in the fuel reserve cup is suctioned out through the fuel filter (low-pressure) by the fuel pump, and pumped to the fuel filter (high-pressure). Return fuel is sent back to the fuel reserve cup or the fuel tank through the jet pump.
- A venturi, located in the path of fuel returning from the pressure regulator, creates negative pressure that is used to transfer fuel from the reserve to the main tank.
- If return fuel pressure exceeds the specified value, the relief valve discharges return fuel into the fuel pump unit without passing it through the venturi. Due to this, return fuel pressure is maintained below the specified value.

Pressure Regulator

- Built into the fuel pump unit due to adoption of a returnless fuel system.
- Cannot be removed because it is integrated with the fuel pump unit.
- Mainly consists of a spring, release valve and diaphragm.
- Pressurizes fuel discharged by the fuel pump to **approx. 390 kPa {3.98 kgf/cm², 56.6 psi}** with the spring, diaphragm and release valve, and then pumps it to the fuel distributor.
- If fuel pressure exceeds **approx. 390 kPa {3.98 kgf/cm², 56.6 psi}**, the release valve opens to discharge unnecessary fuel pressure.

QUICK RELEASE CONNECTOR FUNCTION

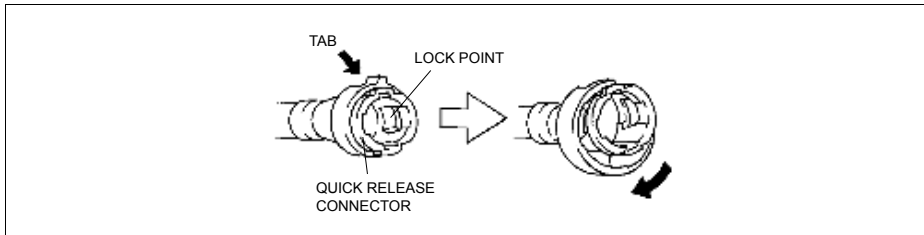
CHU011442692S01

- Quick release connectors that can be connected/disconnected without an SST have been adopted to improve serviceability.

QUICK RELEASE CONNECTOR CONSTRUCTION/OPERATION

CHU011442692S02

- Mainly consists of a retainer and O-ring. The quick release connector is integrated with the fuel hose and therefore cannot be disassembled.
- When the quick release connector is connected, the fuel pipe projection is locked at the clamp lock point. If the clamp release tab is pushed to expand the clamp, the lock point is released allowing the fuel pipe to be disconnected.



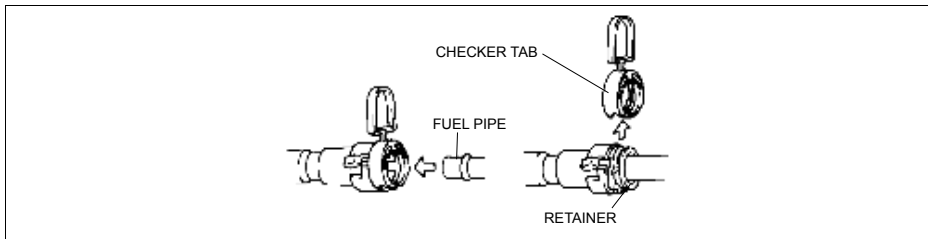
CHU01145008

- To connect the quick release connector properly, push it into the fuel pipe until a locking click sound is heard.

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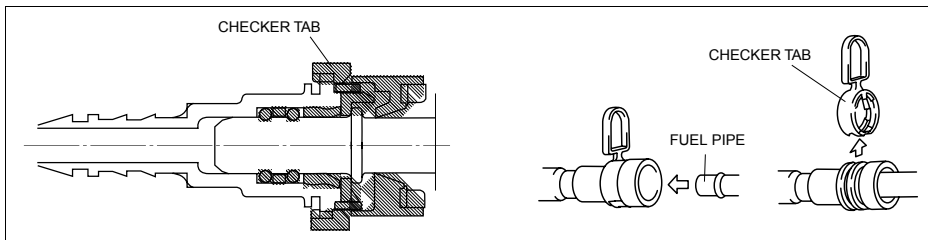
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- New quick release connectors excluding those for the fuel suction pipe, fuel shut-off valve and rollover valve are fitted with a checker tab that prevents improper fit. This checker tab cannot be removed under normal conditions. When the quick release connector is properly connected to the fuel pipe, the lock is released and the checker tab comes off. Due to this, it can be verified that the quick release connector is completely connected.



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CHU0114S009



CHU0114S010

PULSATION DAMPER FUNCTION

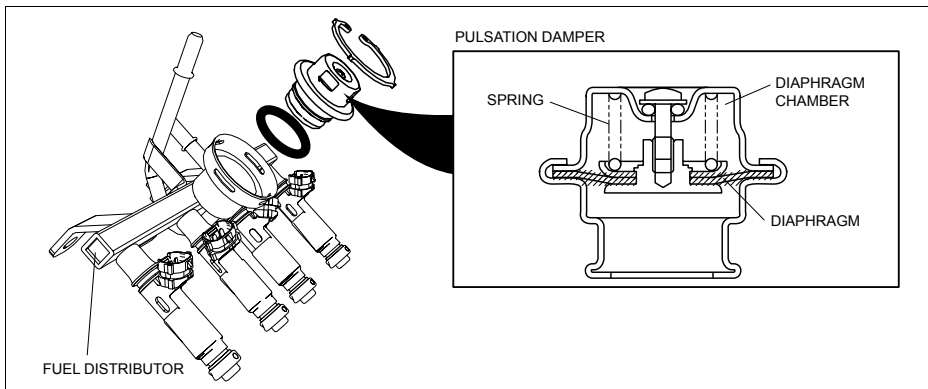
- Reduces pulsation of pressurized fuel between the fuel filter (high-pressure) and the fuel injector.

CHU011420180S01

PULSATION DAMPER CONSTRUCTION/OPERATION

- Installed to the fuel distributor.
- Mainly consists of a diaphragm and spring.
- Uses spring force in the diaphragm chamber to reduce fuel pressure pulsation produced just after fuel injection by the fuel injector.

CHU011420180S02



CHU0114S011

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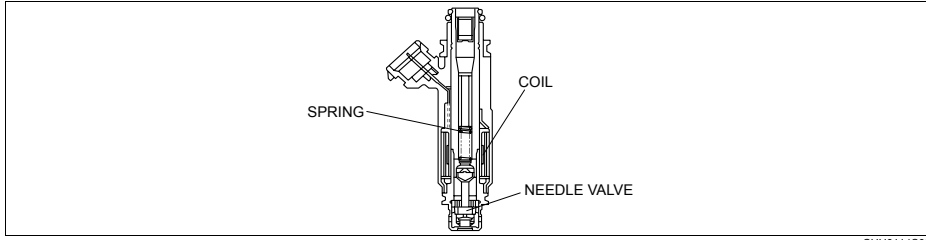
FUEL INJECTOR FUNCTION

CHU011413250S01

- Injects fuel according to fuel injector control signals from the PCM.

FUEL INJECTOR CONSTRUCTION/OPERATION

CHU011413250S02



CHU0114S004

Fuel Injector (FP1, RP1)

- Installed on the intermediate housing at an angle of **approx. 45°**, and injects fuel near the intake port opening.
- Mainly consists of a coil, spring and needle valve.
- Fuel injector with 12 injection holes and injection angle of **approx. 30°** adopted to enhance fuel injection vaporization.
- When a PCM signal is sent, exciting current passes through the coil, pulling in the needle valve and injecting fuel.
- The amount of injection is determined by the open time of the needle valve, i.e. the energization time of the coil.

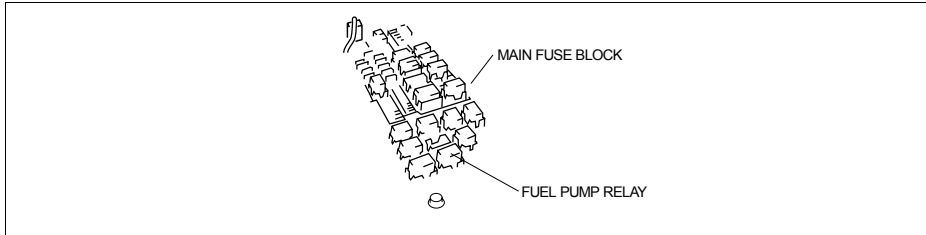
Fuel Injector (FP2, RP2, FS, RS)

- Installed on the intake manifold.
- Mainly consists of a coil, spring, and needle valve.
- Injects fuel into the intake manifold at an angle of **approx. 19°**, so that the fuel is drawn into the housing together with intake air.
- When a PCM signal is sent, exciting current passes through the coil, pulling in the needle valve and injecting fuel.
- The amount of injection is determined by the open time of the needle valve, i.e. the energization time of the coil.

FUEL PUMP RELAY FUNCTION

CHU011413350S05

- Controls the fuel pump on/off according to control signals from the PCM.
- For fuel pump relay control, refer to CONTROL SYSTEM, FUEL PUMP CONTROL. (See 01-40-23 FUEL PUMP CONTROL OUTLINE, 01-40-24 FUEL PUMP CONTROL BLOCK DIAGRAM, 01-40-24 FUEL PUMP CONTROL OPERATION.)
- Supplies voltage to the fuel pump via the fuel pump resistor when the fuel pump speed control relay is off.



CHU0114W001

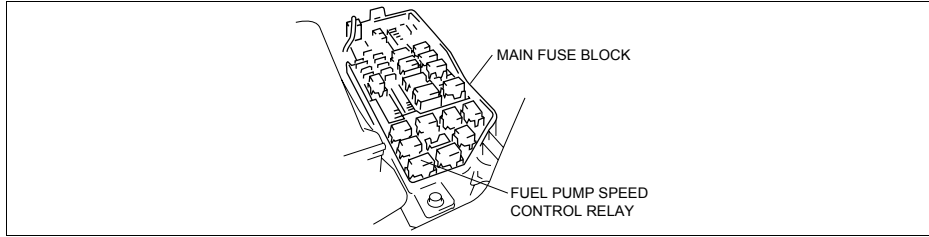
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FUEL SYSTEM

FUEL PUMP SPEED CONTROL RELAY FUNCTION

CHU011413350S06

- Supplies power to the fuel pump according to control signals from the PCM.
- For fuel pump speed control, refer to CONTROL SYSTEM, FUEL PUMP SPEED CONTROL. (See 01-40-23 FUEL PUMP CONTROL OUTLINE, 01-40-24 FUEL PUMP CONTROL BLOCK DIAGRAM, 01-40-24 FUEL PUMP CONTROL OPERATION.)



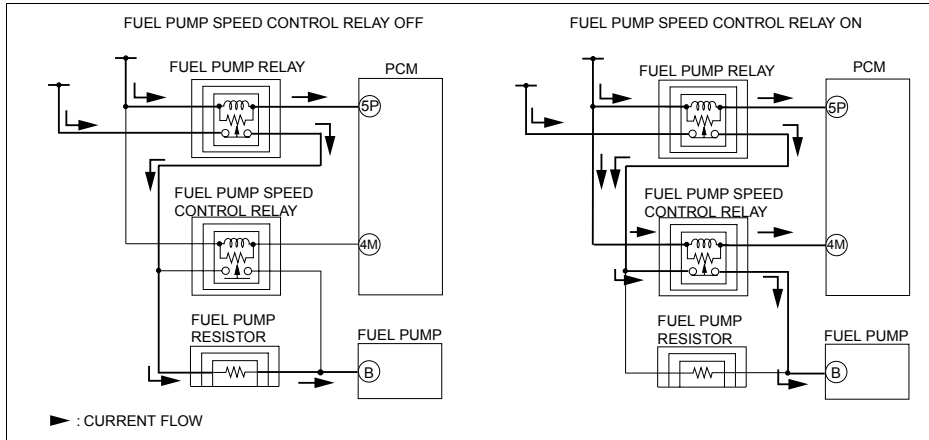
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CHU0114W012

FUEL PUMP SPEED CONTROL RELAY OPERATION

CHU011413350S07

- Reduces voltage by routing it through the fuel pump resistor to protect the fuel pump when required fuel amount is low due to low engine speed.

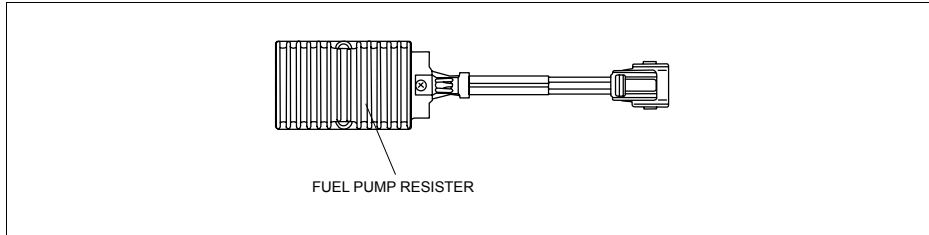


CHU0114S013

FUEL PUMP RESISTOR FUNCTION

CHU011413350S08

- Supplies voltage to the fuel pump via the fuel pump resistor to protect the fuel pump when the injection amount is low (when engine speed is low).
- A fuel pump resistor with a resistance of **0.304—0.336 ohms** has been adopted.



CHU0114S007

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