## ■ FUEL SYSTEM

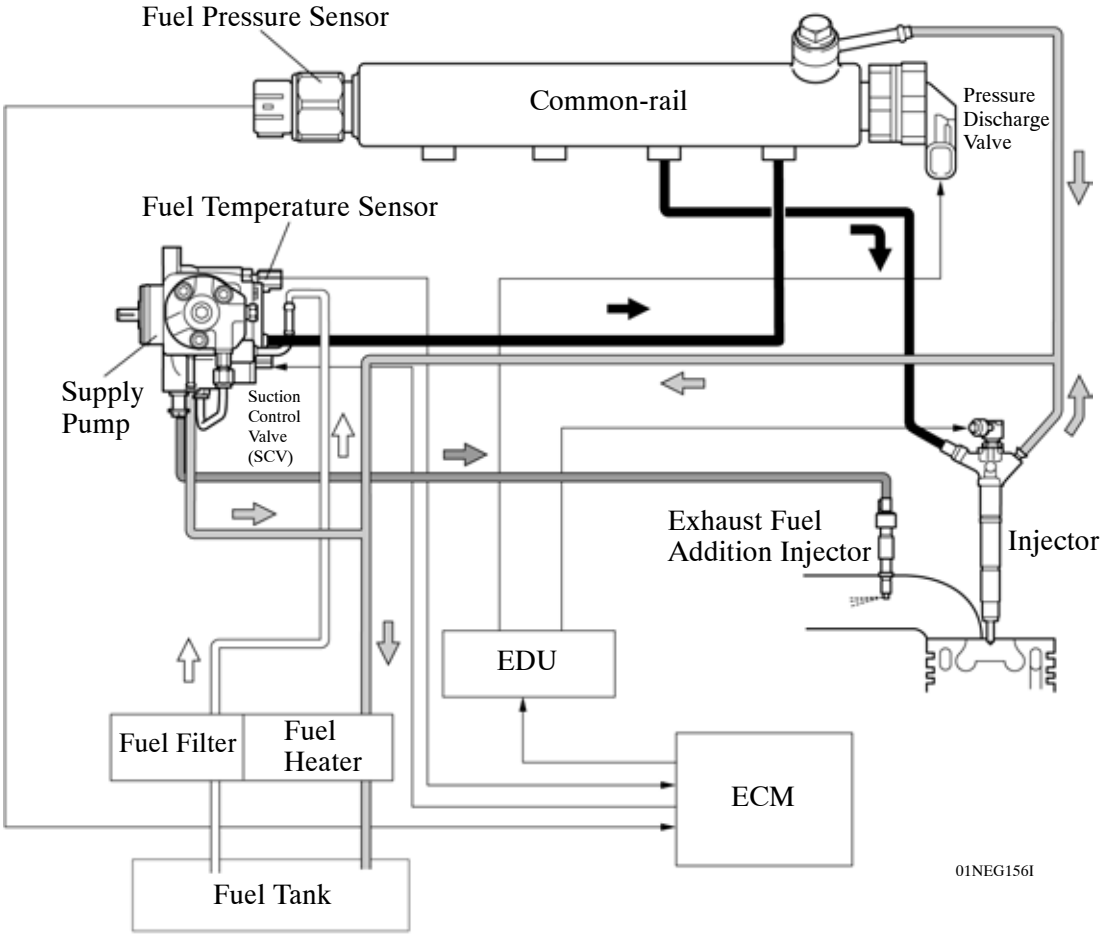
### 1. General

- The pressure limiter from the common-rail has been discontinued, and a pressure discharge valve has been added.
- The injector has been changed from the solenoid type to the piezo type, with the aim of lowering emissions.

### 2. Common-rail System

#### General

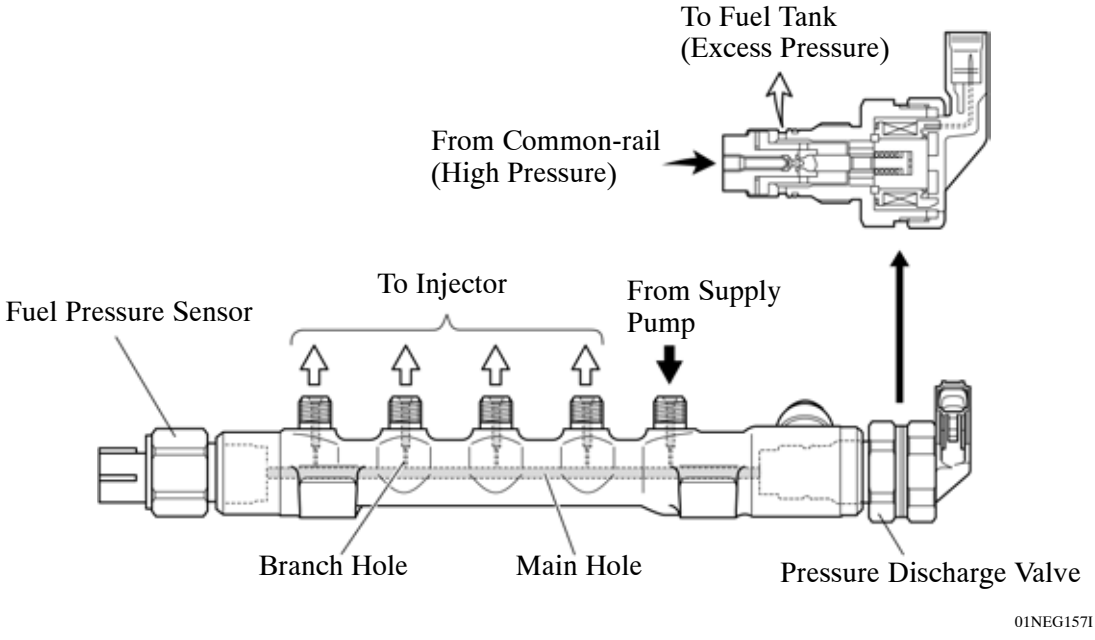
In this system, the high pressurized fuel that is supplied by the supply pump is stored in the common-rail, and the ECM sends signals to the injector by way of the EDU in order to control the injection timing and injection volume.



### Common-rail

- The function of the common-rail is to store the fuel that has been pressurized by the supply pump. The common-rail is provided with a fuel pressure sensor that detects the fuel pressure in the common-rail, and a pressure discharge valve, which regulates the fuel pressure.
- Internally, the common-rail contains a main hole and 5 branch holes that intersect the main hole. Each branch hole functions as an orifice that dampens the fluctuation of the fuel pressure.
- In the pressure discharge valve, the plunger opens and closes in accordance with the actuation signals from the injector driver. Thus, it regulates pressure by releasing excess pressure from the common-rail. In addition, it has a pressure reduction function in case of emergency.





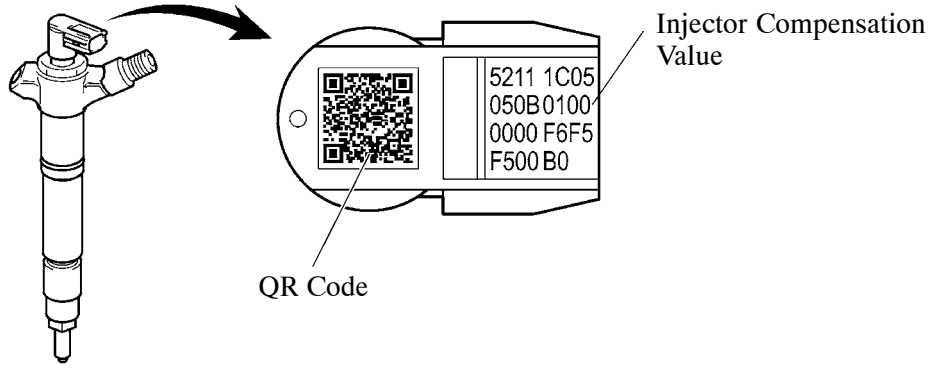

**Service Tip**

- Fuel pressure sensor has its sealing portion plastic-deformed in order to keep sealing performance, so do not reuse it after disassembling.
- The fuel pressure sensor and pressure discharge valve are supplied as a set with the common-rail.
- Do not disassemble the fuel pressure sensor and pressure discharge valve.
- If parts that affect the alignment have been changed, make sure to replace the pipe with a new one as well. The parts that require the replacement of a pipe are listed below.
  - Injection pipe: injector, common-rail, cylinder head and intake manifold
  - Fuel inlet pipe: supply pump, common-rail, cylinder head and intake manifold

For details, refer to the TOYOTA RAV4 Repair Manual.

### Injector

- A piezo type fuel injector is used to optimize fuel injection volume and reduce exhaust emissions.
- An injector compensation value and Quick Response (QR) code containing encoded characteristics of the injector are printed on each injector.
- The injector compensation value and QR code contain various pieces of information regarding the injector, such as model code, and injection volume correction.




**Service Tip**

- If the ECM is replaced, use the intelligent tester II and input the injector compensation values of all 4 injectors. If one of the injectors is replaced, input the injector compensation value of the replaced injector. For details, refer to the TOYOTA RAV4 Repair Manual.
- The QR code, which requires a special scan tool, is not used at Toyota dealers.

***— REFEPENCE —***

*What is QR Code?*

- *QR code, a matrix symbology consisting of an array of nominally square cells, allows omni-directional, high-speed reading of large amounts of data.*
- *QR code encodes many types of date such as numeric, alphanumeric, kanji, kana and binary code. A maximum of 7,089 characters (numeric) can be encoded.*
- *QR code (2D code) contains information in the vertical and horizontal direction, whereas a bar code contains data in one direction only. QR code (2D code) holds a considerably greater volume of information than a bar code.*