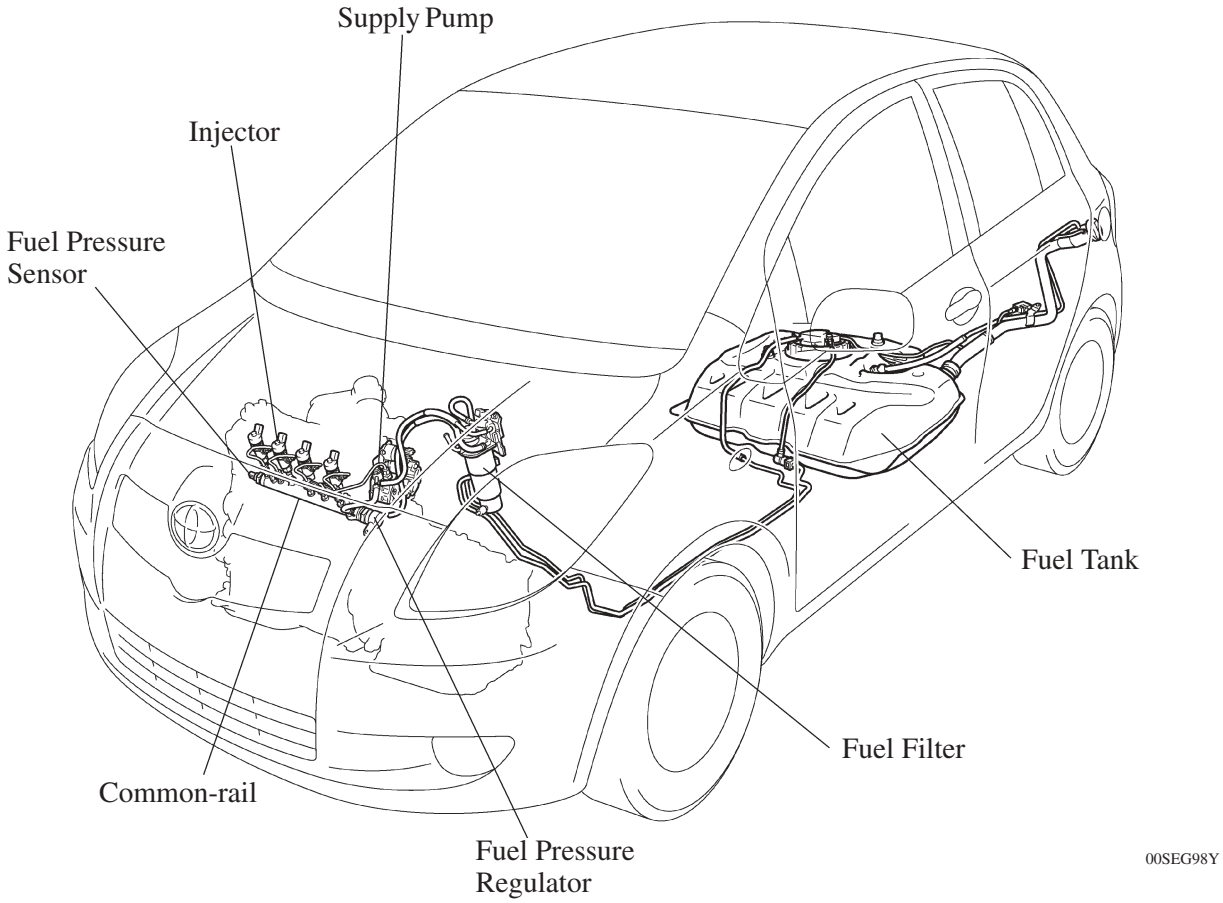
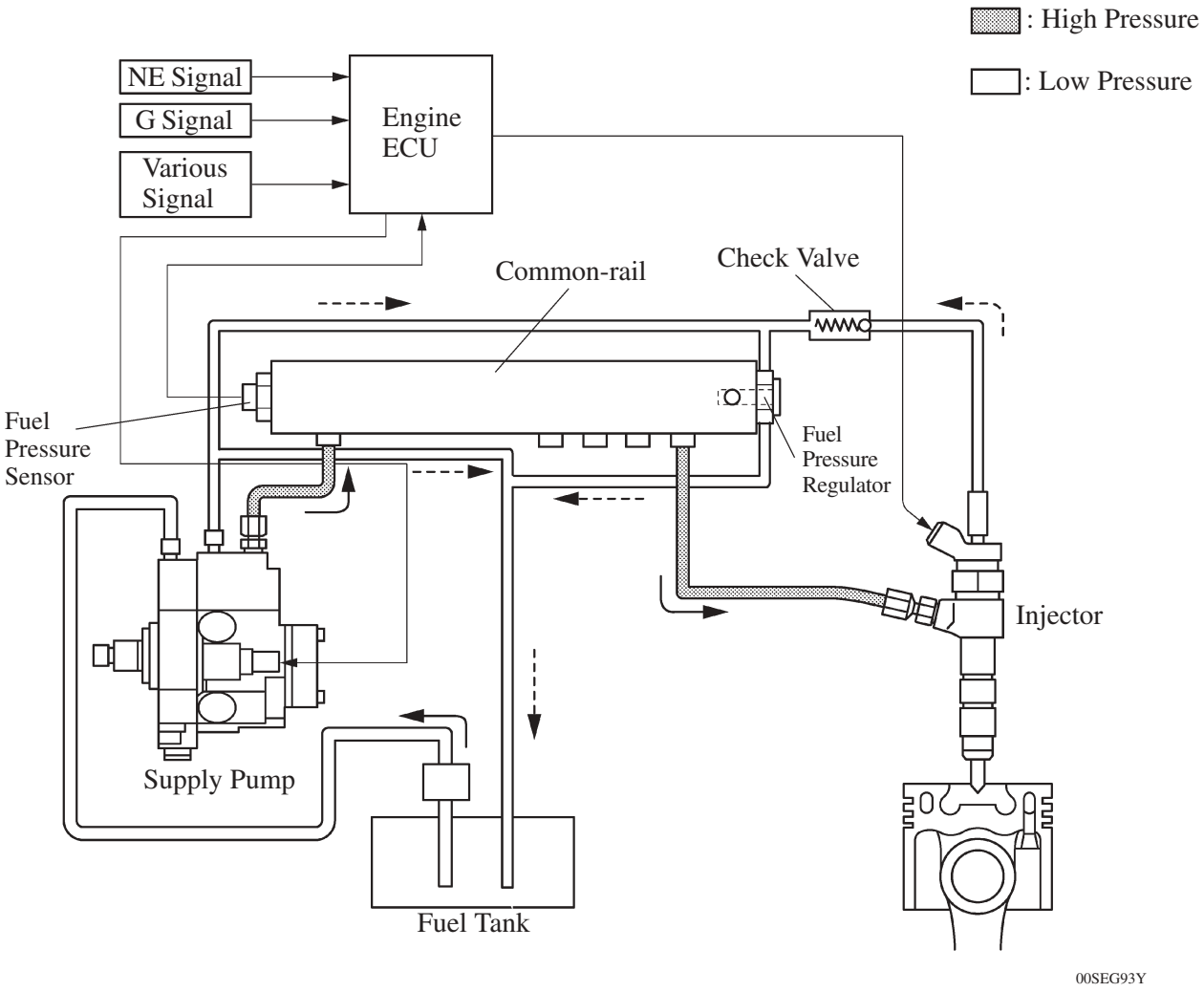
■FUEL SYSTEM

1. General

A common-rail system manufactured by BOSCH is used in the fuel injection system. In this system, the highly pressurized fuel that is supplied by the supply pump is stored in the common-rail, and the engine ECU sends signals to the injectors in order to control the injection timing and injection volume.



▶ System Diagram ◀



Service Tip

If the tank runs out of fuel, or when the fuel filter or fuel piping is replaced, air can get into the fuel line. Therefore, in such a case, it is necessary to use a priming pump integrated with a fuel filter to bleed the air out of the fuel line before starting the engine.

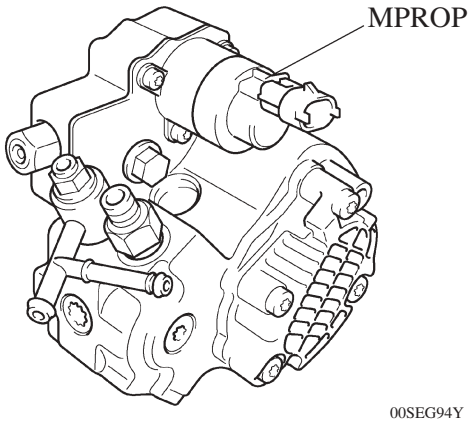
2. Supply Pump

General

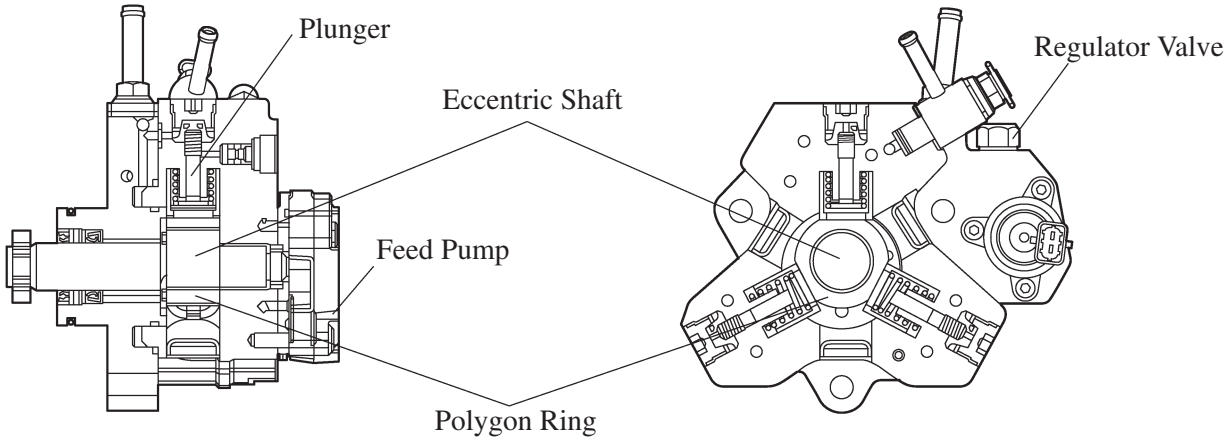
- The supply pump is a 3-plunger type.
- This pump achieves both the high-pressure pumping of fuel.

Construction

- The supply pump mainly consists of a pump body (eccentric shaft, polygon ring, 3 plungers), MPROP (Suction Control Valve), and feed pump.



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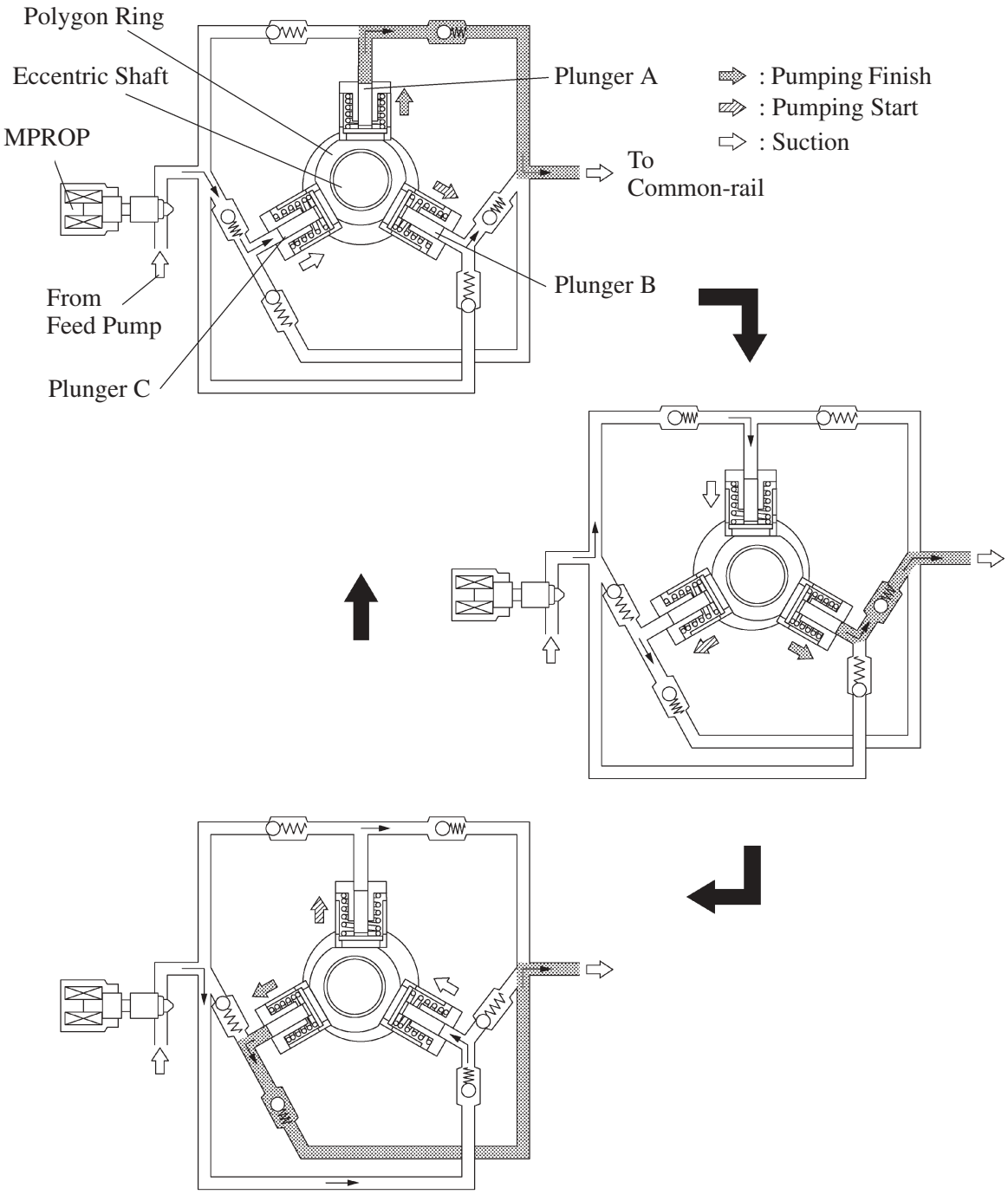
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▶ Function of Components ◀

Component		Function
Feed Pump		Pumps fuel to 3 plungers.
Regulator Valve		Regulates fuel pressure in pump.
MPROP		Controls volume of fuel drawn into plunger.
Pump Body	Eccentric Shaft	Drives Polygon Ring
	Polygon Ring	Drives 3 plungers.
	Plunger	Effects suction and pumping of fuel.

Operation

Due to the rotation of the eccentric shaft, the polygon ring pushes plunger "A" upward as illustrated below. The force of the spring pushes down plunger "B" and "C". As a result, a result, plunger "B" and "C" draw fuel in, and plunger "A" pumps fuel at the same time.

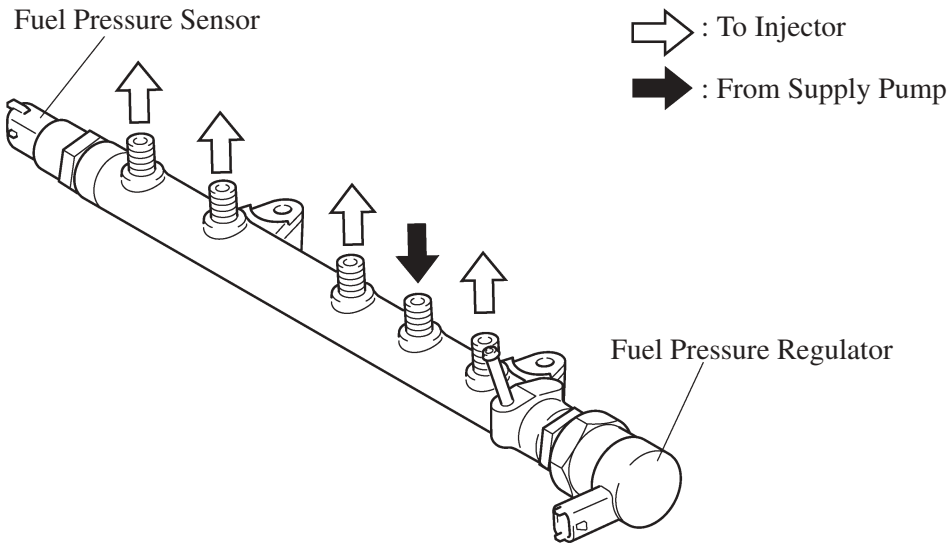


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3. Common-rail

By storing fuel at a high pressure (30 to 160 Mpa), the pump driving torque during the pumping of the fuel under high load conditions has been restrained, thus reducing the vibration and noise of the fuel injection volume.

- The fuel pressure sensor outputs the fuel pressure signal to the engine ECU.
- The fuel pressure regulator adjusts the fuel pressure in the common-rail in order to realize the optimum combustion and the reduction of combustion noise.



Service Tip

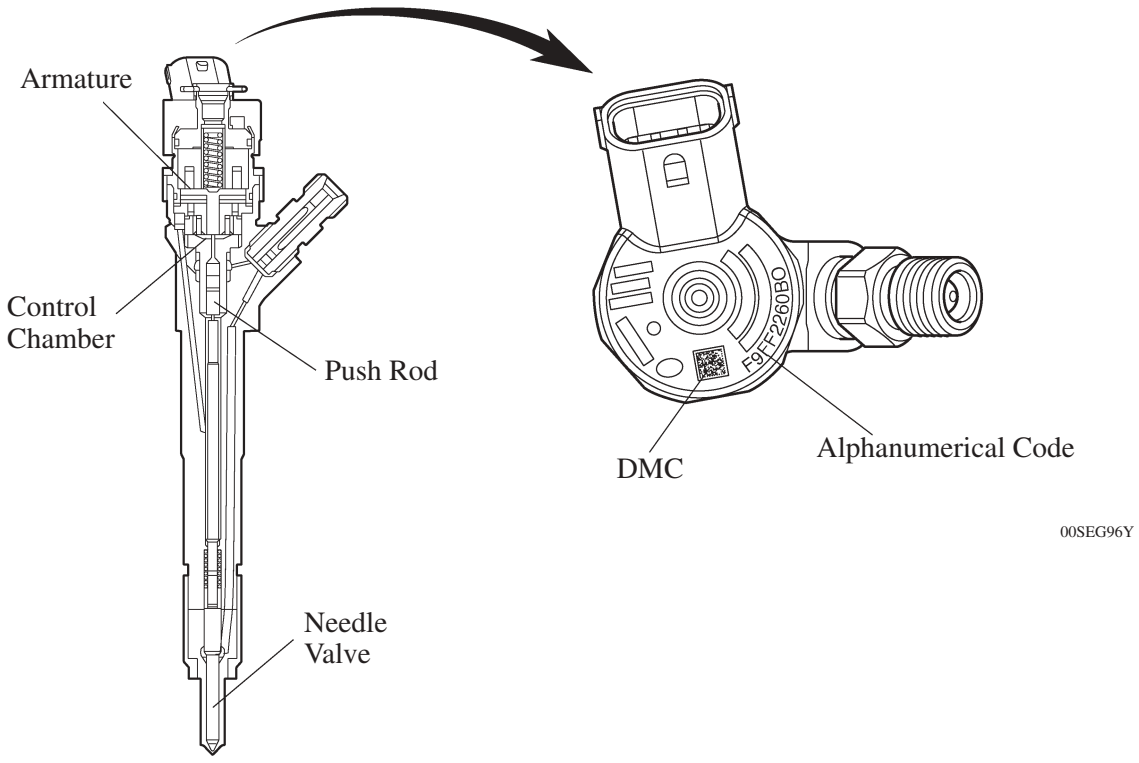
- Fuel pressure sensor and fuel pressure regulator have its sealing portion plastic-deformed in order to keep sealing performance, so do not reuse it after disassembling.
- If parts that affect the alignment have been changed, make sure to replace the pipe with a new one as well. The parts that require the replacement of a pipe are listed below.
  Injection Pipe: Injector, Common-rail, Cylinder Head
  Fuel Inlet: Supply Pump, Common-rail, Cylinder Head

For details, refer to the Yaris Repair Manual (Pub. No. RM00S1E).

4. Injector

General

- An injector consists of a needle valve, push rod, and armature.
- 6-hole type injectors are used to ensure the atomization of the fuel.
- Alphanumerical code and DMC (Data Matrix Code) containing encoded characteristics of the injector are printed on the top of each injector. The alphanumericalcode and DMC contain various pieces of information regarding the injector, such as model code, injection quantity adjustment value.



▶ Specification of Injector ◀

Injection Hole		6
Injection Pressure	MPa (kgf/cm^2)	160 (1632)

Service Tip

- If an injector or the engine ECU is replaced, the injector alphanumerical code can be entered in the engine ECU via an intelligent tester II.
  - When an injector is replaced, enter the injector alphanumerical code of the replaced injector only.
  - When the engine ECU is replaced, enter the injector alphanumerical codes for all injectors. The proper compensation will be made so that the injection volume precision prior to the replacement will remain unchanged. For details, refer to the Yaris Repair Manual (Pub. No. RM00S1E).
- The DMC, which requires a special scan tool, is not used at Toyota dealers.

Operation

(a) When electrical current is applied to the solenoid coil, it pulls the armature up.

(b) The fuel flows out from the control chamber.

(c) The fuel pressure in the control chamber drops.

(d) The force which suppresses the needle valve is weakened.

(e) As a result, the needle valve is raised to inject the fuel.