

FUEL INJECTOR [SKYACTIV-D 2.2]

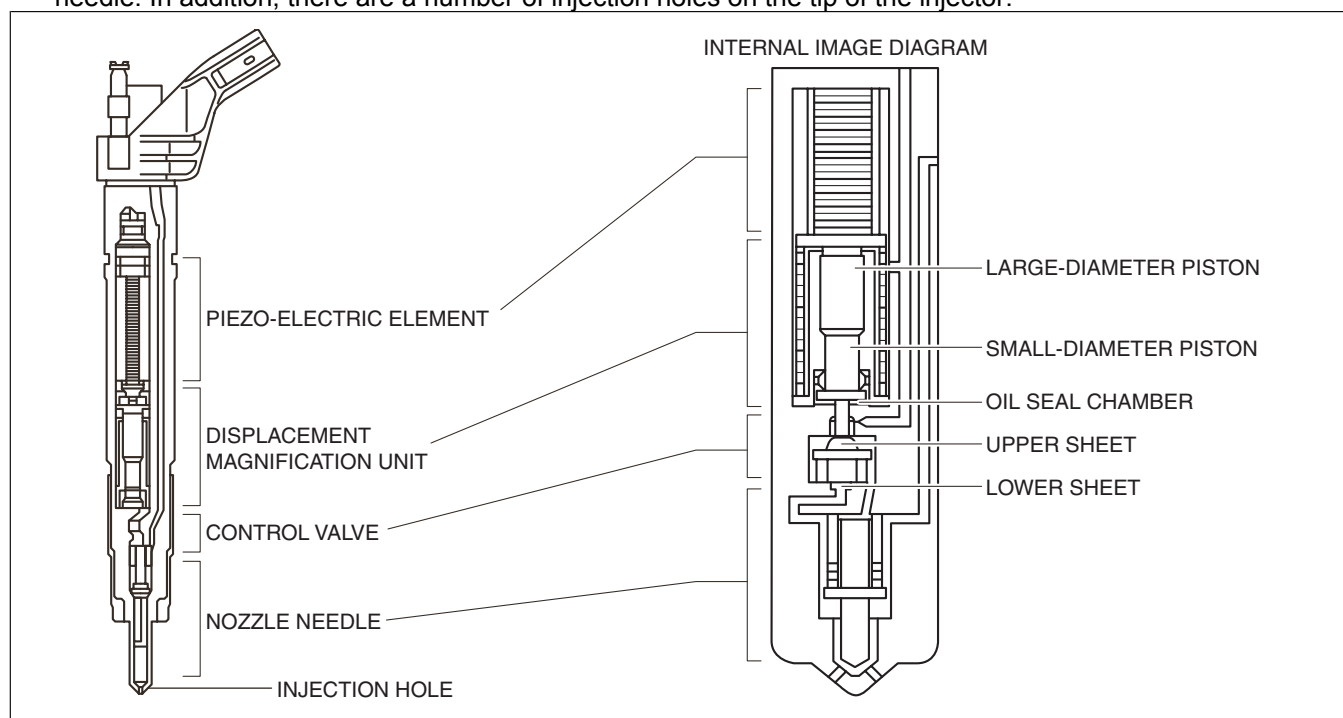
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Purpose, Function

- Fast-response, Piezo-electric type fuel injectors have been adopted which achieve highly precise fuel injection control.
- The fuel injection patterns are varied and the concentration of air-fuel mix can be increased according to the conditions because the fuel amount and timing can be precisely controlled.

Construction

- The fuel injectors are installed to the engine compartment.
- The fuel injectors consist of a Piezo-electric element, a displacement magnification unit, control valve, and nozzle needle. In addition, there are a number of injection holes on the tip of the injector.



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Piezo-electric element

- The element possesses a property which generates voltage when a load (displacement) is applied, and load (displacement) when voltage is applied.

Displacement magnification unit

- Consisting of the sliding part (large-diameter piston, small-diameter piston) and the oil seal chamber, it magnifies the displacement of the Piezo-electric element and transmits it to the control valve.

Control valve

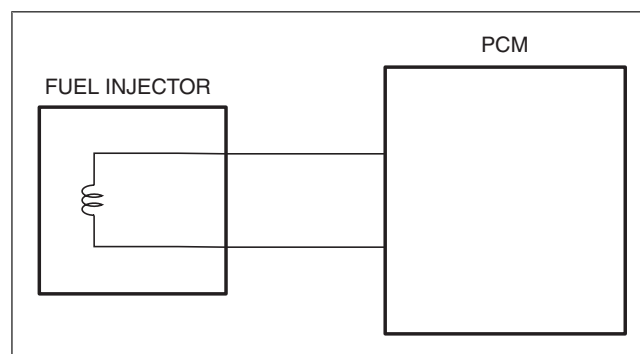
- It opens/closes the upper seat and lower seat by the displacement of the Piezo-electric element, and controls the back pressure on the nozzle needle.

Nozzle needle

- Injects fuel by moving up and down based on the opening/closing of the control valve.

Operation

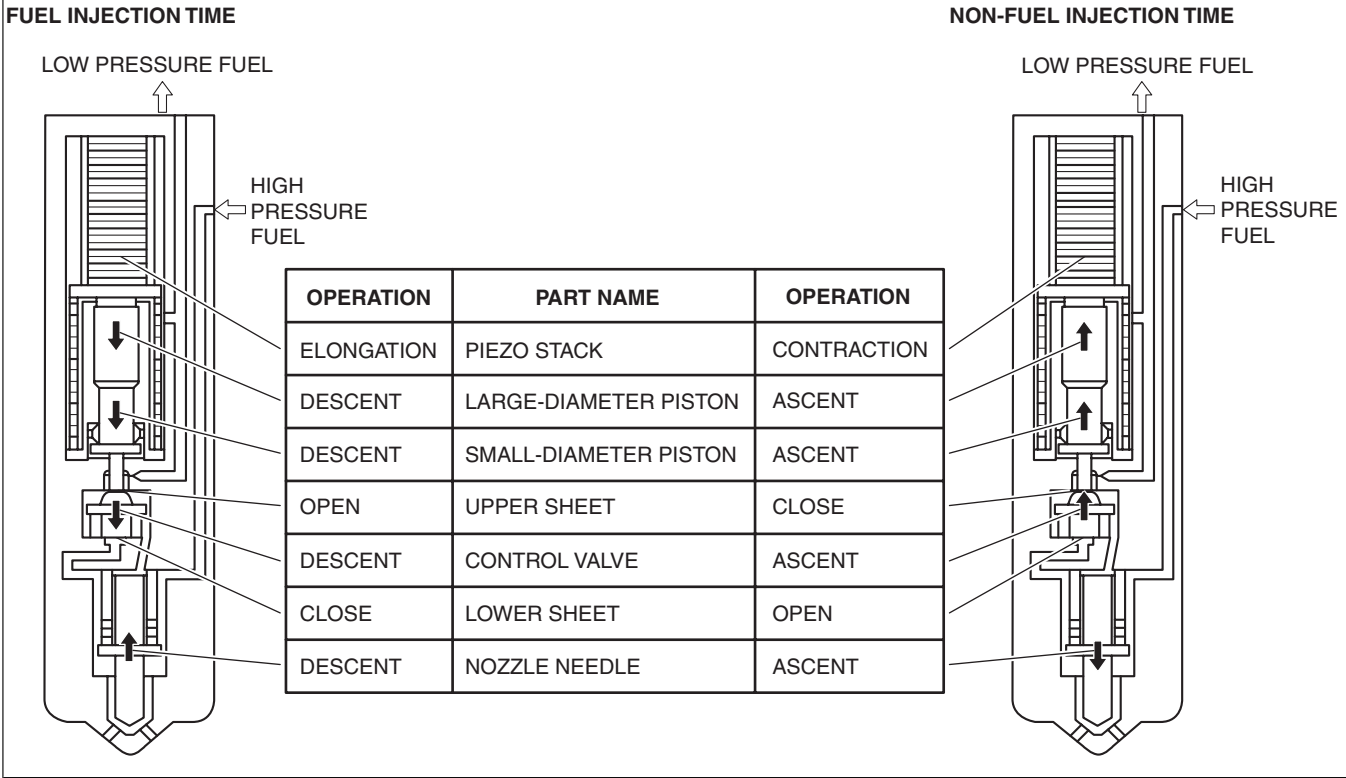
- Injects fuel according to the signal from the PCM. The fuel injection time is determined by the energization time of the coil.



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Fuel injection mechanism

- 1. Applies electric charge to the Piezo-electric element, and utilizes the property of the Piezo-electric element to cause it to expand.
- 2. The amount that the Piezo-electric element expands is magnified by the displacement magnification unit.
- 3. The control valve is driven by the magnified expansion amount, causing the upper seat to open and the lower seat to close, which lowers the pressure in the nozzle back pressure chamber.
- 4. Based on the lowering of the pressure, the fuel injection initiates by the upward movement of the nozzle.



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Fail-safe

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