FUEL PRESSURE CONTROL [SKYACTIV-D 2.2]

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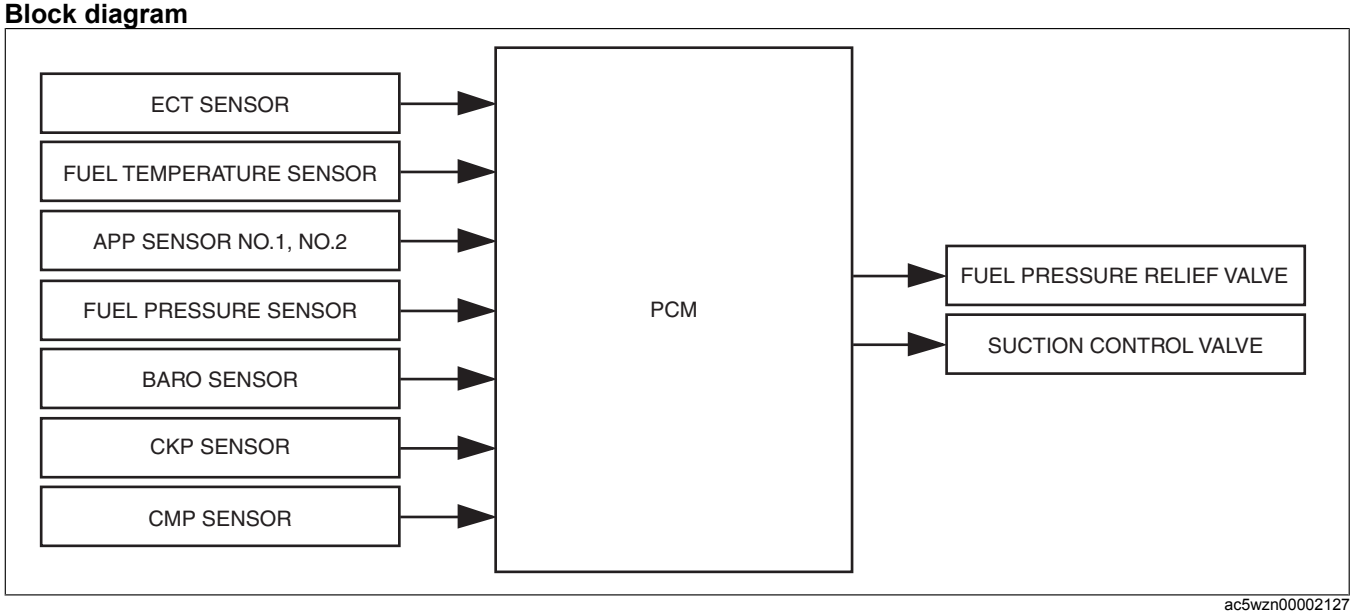
Outline

- The PCM performs feedback control of the fuel pressure in the common rail to gain optimum fuel injection pressure according to engine operation conditions.
- Because the fuel pressure can be controlled regardless of the engine operation conditions, high pressure fuel injection even at low engine speeds is possible. As a result, generation of NOx and PM can be reduced.

Block diagram



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Operation

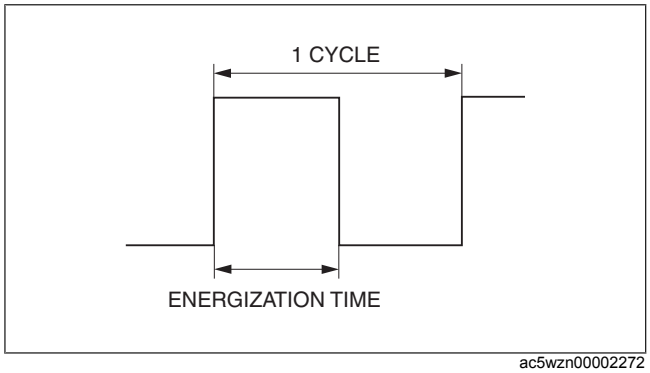
- The PCM controls the fuel pressure in the common rail by controlling the suction control valve and fuel pressure relief valve to maintain a constant, appropriate fuel injection pressure (target fuel pressure).
- The PCM calculates the target fuel pressure based on the engine speed and fuel injection amount.

Target fuel pressure

At engine start
At engine restart by i-stop control
During fuel injection amount learning

Suction control valve learning

- The PCM increases/decreases the fuel pressure from the supply pump by sending a duty signal to the suction control valve.
- The PCM adjusts the percentage of valve open/close time, which is controlled by the fuel pressure feed amount, by changing the duty ratio of the duty signal and the energization time for 1 cycle.
- If the PCM receives an immobilizer system related signal from the start-stop unit (engine starting refused), it stops the suction control valve to interrupt fuel supply to the common rail.



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Fuel pressure relief valve control

- If the fuel pressure in the common rail is higher than the target fuel pressure, the PCM opens the fuel pressure valve and shuttles fuel pressure in the common rail to the lower case side.
- By shuttling fuel pressure in the common rail to the lower case side, the actual fuel pressure is adjusted more closely to the target fuel pressure.