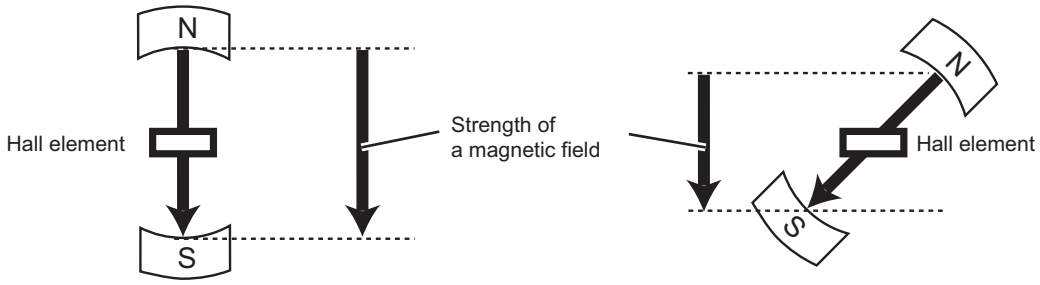
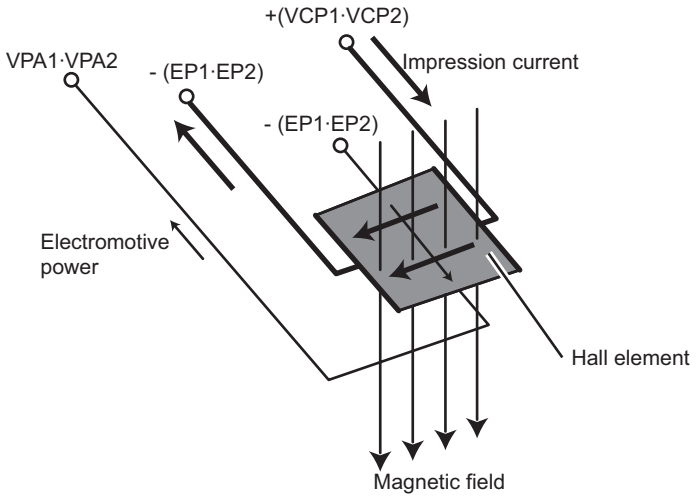
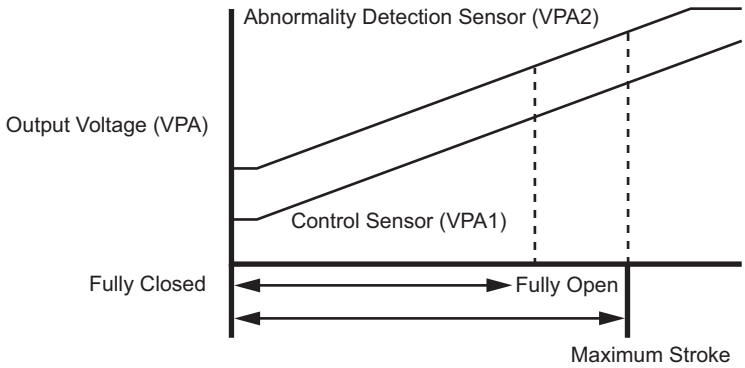
Accelerator Pedal Position sensor

- A no-contact accelerator position sensor is used. This sensor uses a Hall element, which can output the intensity of the magnetic field in the form of electrical signals. This is accomplished through the use of the Hall effect*1, which can attain output voltage linearly in proportion to the amount of pedal effort applied on the accelerator.
- When the amount of pedal effort applied to the accelerator changes, the angle of the magnetic field changes in relation to the current (VC → E2) applied in the Hall element. Therefore, the intensity of the magnetic field that is perpendicular to the applied current changes. Then, the resulting changes in the VPA1 and VPA2 terminal voltage are sent to the engine ECU in the form of a throttle valve position signal. Furthermore, this sensor comprises two (main, sub) sensor circuits with different output characteristics to ensure reliability.



Accelerator Pedal ON　　Accelerator Pedal OFF





Accelerator Position Sensor Output Voltage Characteristics

A4270020P

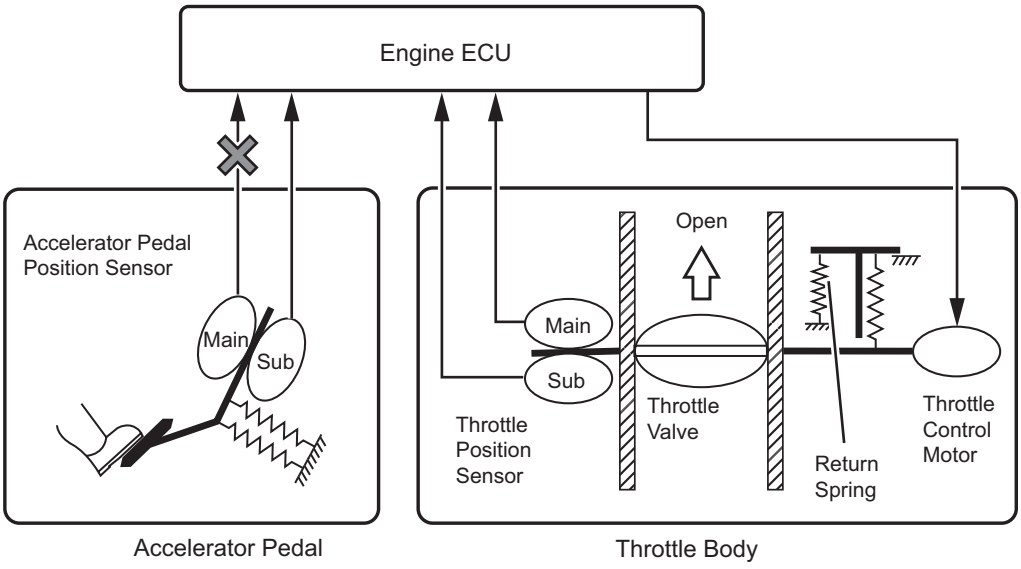
EG

Fail Safe

- The accelerator position sensor comprises two (main, sub) sensor circuits, to detect the pedal position. In case of an abnormal condition in the signal, the engine ECU switches to the failsafe driving mode.

System 1 Failure

The accelerator pedal position sensor comprises two (main, sub) sensor circuits. If a malfunction occurs in either one of the sensor circuits, the engine ECU detects the abnormal signal voltage difference between these two sensor circuits and switches to the limp mode. In the limp mode, the remaining circuit is used to calculate the accelerator pedal opening, in order to operate the vehicle under limp mode control.



System 2 Failure

If both systems malfunction, the engine ECU detects the abnormal signal voltage between these two sensor circuits and regards that the opening angle of the accelerator pedal is fully opened and then continues the throttle control. At this time, the vehicle can be driven within its idling range.