

Electric Throttle Control System Description

The Electric Throttle Control System consists of the following.

- Electric throttle body assembly incorporated with the throttle valve, throttle motor and throttle position (TP) sensors (main/sub)
- Accelerator pedal assembly incorporated with accelerator pedal position (APP) sensors (main/sub)
- Throttle motor control relay
- ECM

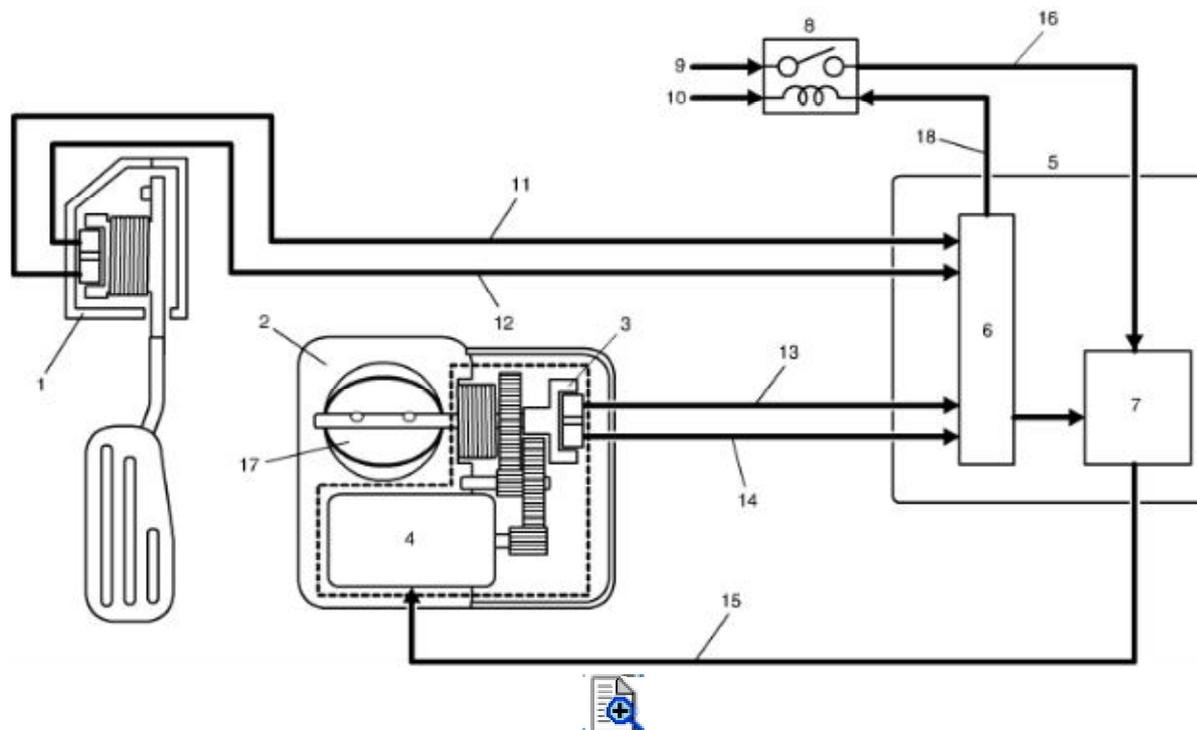
Operation Description

ECM (5) detects opening (depressed extent of pedal) of the accelerator pedal based on the signal voltage of the APP sensor (1). Using that data and engine operation condition, ECM calculates the optimum throttle valve opening. On the other hand, it detects the throttle valve opening based on the signal voltage of the TP sensor (3) included in the electric throttle body assembly (2) and compares it with the above calculated optimum throttle valve opening.

When there is a difference between them, ECM controls the duty ratio (100% – 0%) of throttle motor control according to this difference to drive the throttle motor (4) included in the throttle body. When there is no difference, ECM controls the duty ratio of throttle motor control to about 15% to maintain the throttle valve opening. In this way, the throttle valve (17) is opened and closed to achieve the optimum throttle valve opening.

In this system, TP sensor and APP sensor have 2 sensors (main and sub) each, highly accurate and highly reliable control and abnormality detection are assured. Also, when ECM detects an abnormality in the system, it turns off the throttle motor control relay (8) to stop controlling the throttle motor. When the throttle motor control relay is turned off, the throttle valve is fixed at the opening of about 9° (default opening) from its completely closed position by the force of the return spring and open spring included in the throttle body.

This throttle body is not equipped with IAC valve for idle speed control. Idle speed control is done by the throttle motor which opens/closes the throttle valve.



6. CPU	11. APP sensor (main) signal circuit	15. Drive circuit of throttle motor
7. Throttle motor driver	12. APP sensor (sub) signal circuit	16. Power supply circuit of throttle motor

9. From "THR MOT" fuse	13. TP sensor (main) signal circuit	18. Control circuit of throttle motor control relay
10. From main relay	14. TP sensor (sub) signal circuit	