Throttle Actuator Control (TAC) System Description





- (1) Throttle Actuator Control (TAC) Module
- (2) Throttle Body Assembly
- (3) Accelerator Pedal Position (APP) Sensor

The throttle actuator control (TAC) system uses the vehicle electronics and components in order to calculate and control the position of the throttle blade. This system eliminates the need for a mechanical cable attachment from the accelerator pedal to the throttle body. This system also performs the cruise control functions.

The TAC system components include but is not limited to the following:

- The accelerator pedal position (APP) sensor
- The throttle body
- The throttle actuator control (TAC) module
- The powertrain control module (PCM)

Each of these components interface together in order to ensure accurate calculations, and in order to control the throttle position.

Accelerator Pedal Position (APP) Sensor. All rights reserved.





The accelerator pedal position (APP) sensor is mounted on the accelerator pedal assembly. The APP is actually 3 individual accelerator pedal position sensors within 1 housing. Three separate signal, low reference, and 5-volt reference circuits are used in order to connect the APP and the TAC module. The APP sensor 1 voltage should increase at the same time that the accelerator pedal is depressed, from below 1 volt at 0 percent pedal travel to above 2 volts at 100 percent pedal travel. APP sensor 2 voltage should decrease from above 4 volts at 0 pedal travel to below 2.9 volts at 100 percent pedal travel to below 3.1 volts at 100 percent pedal travel.

Throttle Body Assembly





The throttle body for the TAC system is similar to a conventional throttle body with some exceptions. One exception is the use of a motor to control the throttle position (TP) instead of a mechanical cable. The other exception is the new design TP sensor. The TP sensor mounts on the side of the throttle body opposite the throttle actuator motor. The TP sensor is actually 2 individual TP sensors within 1 housing. Separate low reference and 5-volt reference circuits are used in order to connect the TP sensors and the TAC module. The TP sensor 1 signal voltage increases at the same time that the throttle opens. The voltage increases, from approximately 1 volt at 0 throttle to above 3.5 volts at 100 percent throttle. TP sensor 2 signal voltage decreases at the same time that the throttle is opened. The voltage increases from approximately 3.8 volts at 0 throttle to below 1 volt at 100 percent throttle.

Throttle Actuator Control (TAC) Module





The TAC module is the control center for the electronic throttle system. The TAC module and the PCM communicate via a dedicated redundant serial data circuit. The TAC module and the PCM monitor the commanded throttle position and compare the commanded position to the actual throttle position. This is accomplished by monitoring the APP and the TP sensor. These 2 values must be within a calibrated value of each other. The TAC module also monitors each individual circuit of the TP sensor, and of the APP to verify proper operation.