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Body Control System Operation

NOTE
Applicable vehicles:

- Cutlass, Malibu (VIN N)

Body Control System Operation

The body control module (BCM) performs the following functions:

- A/C compressor request
- A/C cooling fan
- Exterior and interior lighting control
  - Daytime running lights (DRL)
  - Automatic lighting control
  - Fog lamps
  - Interior lighting
- Battery rundown
- Chime
- Gauge control
- Instrument cluster indicator control
- Fuel gauge control
- Temperature gauge control
- Theft deterrent

A/C Compressor Control

The powertrain control module (PCM) and the BCM share hardware and software for control of the A/C compressor clutch. The PCM and the BCM communicate this information over the serial data class 2 line.

The BCM performs the following software functions:

- Limits low speed compressor operation
- Prevents clutch slippage
- High coolant temperature
- Monitors for overpressure
- Determines low ambient pressure
- Controls the compressor clutch

The PCM performs the following functions:

- Prevents compressor overspeed
- Limits compressor speed (in PARK or NEUTRAL)
- Drives the compressor clutch
- Performs anti-slug
- Slugging is when a mass of liquid enters the A/C compressor pump.

Battery Rundown Function

The battery rundown function helps to prevent the battery from deep discharge due to interior/courtesy lighting being inadvertently left

ON. The battery rundown function performs this function by turning OFF the inadvertent power output. The power output provides power for the interior/courtesy lighting.

When the ignition switch is turned to the OFF position, one of the following time out period starts:

- 3 minutes when the odometer is less than 24 km (15 miles)
- 20 minutes when the odometer is greater than 24 km (15 miles)

When the time out expires, the inadvertent power output is turned off.

Bulb Check

The bulb check function resides in the BCM. Every time the ignition switch transitions from ACC to RUN, an instrument cluster bulb check will occur for a calibrated amount of time for specified indicators. The bulb check will override the OFF state of the affected indicators. The BCM will determine which indicators to bulb check by looking at an EEPROM table. Every SPI indicator has a bit in the EEPROM table. The gauges will WOW during a bulb check. A WOW occurs when all of the gauge indicators are moved at the same time. If there is an indicator lit before the WOW, the indicator will remain lit after this function has concluded.

Chime Request Function

When the BCM requests a driver warning to the instrument cluster, the BCM may also provide a chime. The following chimes are provided:

- Key in ignition
- Headlamps ON
- Seatbelt not fastened
- Turn signal on
- Park brake warning
- Door ajar warning
- Check gauges

Data Line Communications

The BCM communicates on the following two separate data lines:

- Class 2
- SPI

Class 2 Data Line

Class 2 data is a higher speed data transmission. In order to control serial data line traffic. Class 2 uses the peer to peer method along with message arbitration in order to manage the data line traffic. The class 2 data line includes the following control modules:

- The BCM
- The electronic brake control module (EBCM)
- The powertrain control module (PCM)

Serial Peripheral Interface (SPI) Data Line

The serial peripheral interface (SPI) is a three wire interface connecting the BCM to the instrument cluster. The SPI allows for the exchange information. This interface is a synchronous serial data link where the BCM is the master and the instrument cluster is the slave. Because of the need for modules on the different serial data links to communicate with each other, the BCM acts as an interpreter, or master, for data communication between the class 2 and SPI data lines.

Driver Warning System

The BCM is responsible for the following functions:

1. Interpreting all of the driver warnings sent by the control modules on the class 2 serial data line
2. Sending the information to the instrument cluster in the form of a SPI serial data bus message

The following list of messages are sent by the BCM to the instrument cluster:

- Fuel gauge position
- Temperature gauge position
- Oil pressure