



TECH TIP

ELECTRICAL 219

ELECTRICAL CHALLENGES *When There's No Diagnostic Chart*

Often, we are confronted with an electrical or performance issue that may not have reference to a diagnostic chart to assist in the diagnosis. When these conditions occur, a lot of diagnostic time can be invested without producing a solution. Many of these problem-solving solutions are resolved through information sharing from fellow technicians and that is the intent of this writing. Another important step in the diagnostic process is researching for the presence of a factory service bulletin for the symptom. These two steps can save valuable diagnostic time. Following are some symptoms and solutions for problems that can be difficult to pinpoint.

ILLUMINATED AIR BAG LAMP

In a recent "On The Line" article, we covered an issue with a C6 Corvette that had just come out of winter storage and was about to receive a complete service, when a warning lamp indicating a failure with the Air Bag System appeared in the instrument cluster. If you have ever witnessed an accidental air bag deployment this lamp will get your attention. A system scan reflected a problem with the driver side seat sensor. Clearing the code resulted in an immediate reset of the code. Repositioning the seat to gain access to the sensor eliminated the fault code, which was an indication of a connection related issue. Loosening the seat from the floor pan to gain access to the sensor connector revealed that the connector had dislodged from the seat frame crossbar. The fore and aft movement of the seat re-established continuity within the connector as it was being dragged across the carpet. The solution was a connector clean-up and securing the sensor to the crossbar with the addition of a tie strap for some added insurance. **CAUTION:** Prior to disconnecting any air bag related sensor, make certain to disconnect the negative battery cable and allow the vehicle manufacturer's recommended wait time for the energy reserve to discharge, prior to disturbing a connection.

Additional Precautions... 1) Do not attach a memory saver tool when servicing the air bag system, as it can keep the system active. 2) Do not apply heat or hammer in the close proximity of a sensor or module. 3) Do not use electrical test equipment other than that recommended by the vehicle manufacturer. The use of test equipment such as battery powered or AC powered voltmeters, ohmmeters or nonpowered probe type testers is not recommended. 4) When making wiring or connection repairs DO NOT use soldering equipment that is battery or electric powered, as they can induce voltage into the circuit, resulting in module or component damage. A butane fueled soldering iron is preferred. 5) Never strike a sensing device in a manner that could result in accidental deployment. 6) When performing an electrical diagnosis on components other than the airbag system, remove the airbag fuses when the diagnostic procedure calls for disabling the airbag system.

Electrical Interference... The passenger airbag indicator or seat belt reminder light/chime may be activated when certain electronic devices such as MP3 players, cell phones or computers are placed in the passenger seat. These devices may interfere with the electric field generated by the Passenger Presence System even though the seat is not occupied. The electronic devices do not have to be turned on to cause these conditions. When troubleshooting, do not lay the scan tool on the passenger seat or touch the seat while the scan tool is in contact with your body to prevent the transfer of electrical noise to the seat sensor mat.

ELECTRICAL DRAIN FOLLOWING ENGINE SHUT-DOWN

The Corvette encountered a second problem following engine shut-down in the form of an electrical drain. Evidence of the electrical drain came in the form of two illuminated rearview mirror lamps and a lighted start stop switch/button. During a normal engine shut-down, the

rearview mirror lamps and the start/stop switch should illuminate for a period of 30 seconds before timing out. In this case, twenty minutes following engine shut-down, the lamps remained illuminated.

To provide battery run down protection, the interior lamps should be deactivated automatically under certain conditions. The body control module (BCM) initiates a 10 minute timer if the interior lamp relay control output is still active and the ignition switch is in the off position. At the end of the 10 minute time period the BCM should deactivate the interior lamp relay thereby disabling the interior lamps. This feature will be canceled if any power mode other than off becomes active. The BCM will reset the timer if any interior lamp switch is turned on, a door is opened, or the remote control door lock receiver module is activated.

In this case the ultimate solution for the electrical drain was to disconnect the negative battery cable for 30 seconds, which provided a system reset. Following this procedure the system functioned normally with the lamps and lighted start/stop switch timing out after 30 seconds.

RADIO FREQUENCY INTERFERENCE

Troubleshooting radio frequency interference (RFI) related symptoms can be a challenge requiring a lot of detective work to pinpoint the source.

If the customer complaint involves any of the following symptoms, chances are the condition may be due to RFI:

- 1) No Fob Detected message requiring the fob to be placed in the fob pocket to start the vehicle
- 2) Poor remote keyless entry (RKE) range
- 3) Keyless or passive entry/start inoperative
- 4) No crank symptoms
- 5) Intermittent no start, or stall after start
- 6) Security message
- 7) Service Tire Pressure
- 8) Tire Pressure Monitor message
- 9) Multiple codes stored

The above systems function via radio frequency and are susceptible to stray RFI signals from another electrical component, which can influence the signal strength of a system or component.

DEVICES THAT CAN PRODUCE RFI

Numerous accessories or devices can produce RFI related symptoms. It is imperative that you have a discussion with the vehicle owner/operator concerning the symptoms. Question them concerning any devices, components, or additional key fobs for another vehicle that may have been removed from the key ring prior to the vehicle being brought in for service. If diagnosing a NO FOB message complaint, make certain you have access to any additional fobs for that vehicle. If possible, identify which fob was being used when the symptom was present. Question them concerning the addition of any electrical accessories that may have been added. In addition, often we spend a lot of diagnostic time chasing a problem that may have been removed from the vehicle prior to it being brought in for service, such as devices or accessories that plug into the ALDL connector.

GM cautions the following devices may cause RFI:

- 1) Vehicle immobilizer keys from other vehicles
- 2) Keyless access transmitters from other vehicles
- 3) Interstate/bridge toll passes
- 4) Gate or door passes to allow access to subdivisions, pools, driveways, entry doors, etc.
- 5) Parking access cards
- 6) Fuel station speed passes
- 7) Building access swipe cards/transponder devices
- 8) Aftermarket LED dome, tail, turn, stop, strip, floor, door, logo, headlights
- 9) Certain cell phone chargers
- 10) USB power banks
- 11) USB flashlights
- 12) Accessory fans
- 13) Any type of USB, 12 volt or 110 volt chargers

Any manufacturer's vehicle is susceptible to these RFI related conditions. These are real world diagnostic challenges that the technician must deal with.

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