

Wheels: The owner of a Ford Crown Victoria writes that fuses blow regularly for no apparent reason and asks what could be the cause.

Halderman: Fuses are installed in electrical circuits to prevent the wiring from overheating and causing a fire in the event of a fault that can cause excessive amounts of current to flow through the circuit. These faults include two basic types:

- **Short-to-ground** – A short-to-ground is a fault that involves the power side of the circuit where the wire or component has lost its insulation and the electrical current can flow to the metal part of the vehicle. This type of fault is also called copper-to-steel and usually causes the fuse to blow immediately. This is the most common type of fault that causes fuses to blow.
- **Short-to-voltage** – A short-to-voltage is a fault that involves the power side of the circuits that are in electrical contact with each other. The excessive amount of current flow through the circuit can cause the fuse to blow. This type of failure usually involves more than one circuit.

Wheels: Now that we know about the two types of faults, how would this information help the reader find out what causes the problem?

Halderman: If more than one circuit is affected, and then the most likely fault is in the wiring that is close together. A fault can also occur if extra electrical components have been installed such as a sound system, alarm system, or cellular telephone. Connecting an extra electrical load to a fuse can cause an additional amount of current to flow, which can cause the fuse to blow. If the fuse blows immediately, then look for a short-to-ground where a copper wire is close to a metal part of the vehicle. Again, this type of failure can occur once in a while because maybe the wire only touches metal occasionally.

Wheels: How could the reader help the technician find the problem?

Halderman: Try to think when the problem first occurred. Did you or someone else install any electrical or electronic equipment to the vehicle before the problem started? Most electrical failures that cause a fuse to blow involve heat or movement. It requires heat or movement to strip away the insulation around wiring or electrical connections. Also check everything that does and does not work. If something such as an accessory or light does not seem to work correctly, maybe the wiring to this unit is electrically connected to the circuit that blows the fuse. You can save the technician lots of time (and your money) by carefully observing all aspects of your vehicle to see if you can help locate the root cause.

