

Charging Ahead In High-Tech Service

Technology drives continual change that means those in the automotive industry must never stand still. For example, consider today's typical luxury vehicle — a complex platform of electronic features and controls. Simple mechanical systems are a thing of the past compared to electronic devices that now require more than three miles of wiring, 2,000 terminals, 50 connectors, 1,500 circuits and 100 motors. In this typical maze of electrical current are many tiny, solid-state control circuits that can be damaged or weakened during any electrical service operation, including jump-starts and battery exchanges.

In the twelve months ending March 31, AAA responded to more than 31.1 million calls for roadside assistance, of which a large number were caused by a dead battery or other problem in the car's electrical system. In this article we will focus on proactive road service techniques to help you keep up with the latest battery technology.

First, understand how today's electrical systems are designed. To meet the ever-increasing demand for electrical power in today's autos, battery designs have changed to withstand higher under-hood temperatures and increased current flow through the battery.

Unquestionably the battery is the primary source of electrical power for an entire vehicle. The battery also acts as a stabilizer to help prevent voltage surges, or spikes. These surges can cause damage to any number of components throughout the car, including the alternator. For that reason, many modern vehicles have a voltage sensor built into the alternator that does not allow the alternator to charge unless the sensor "sees" a valid battery in the system. This is why the engine may die when you remove the jumper cables if the car battery is unable to accept a charge. The alternator's job is to main-



tain the battery's charge and, if necessary, to supplement the power produced by the battery.

Since a voltage spike of more than 15.5 volts can damage the tiny electronic components in today's cars and trucks, let's take a look at how they can be avoided. Most voltage surges occur in one of two ways.

First, a voltage surge may occur when the jumper cables are connected or disconnected, especially if the battery terminals are touched several times in the process. One way to avoid touching the terminals multiple times is to use a jump-starting device that allows the cables to be connected to the disabled vehicle, then plugged into the service truck's battery using a slide-in plug. Avoid loosening the cables and repositioning them to try to get a "better connection." If the disabled vehicle is not responding to a jump-start attempt, it is likely that its battery will not accept a charge or that your jumper cables are not heavy enough. At a minimum, Number Four-gauge cable should be used, and even heavier gauge may be needed for extremely cold temperature starting.

And, since the normal charging system voltage on a service truck can run as high as 14.8 volts, there is not much margin of error left until the upper limit at which damage can occur — 15.5 volts — is reached. Use a portable jump box or turn off the engine in the service truck to reduce the voltage to the normal battery output of around 12.6 volts.

Train your staff to stay safe and avoid customer vehicle damage. The

jump-starting tips below can increase your chances of keeping damage complaints to a minimum and maximizing your jump-starting success:

- Begin by making sure that everything is turned off. Since a few vehicles may lock the doors if you connect your cables to a dead battery, it's a good idea to remove the keys and have them in your hand or pocket before hooking up the jumper cables.


- Take a close look at the battery itself. A swollen case may indicate one that has been frozen or severely overheated and may not be safe to jump-start. Check the terminals to ensure they are tight and reasonably clean. A defective battery or poor connections will be more likely to allow voltage spikes to occur.

- Remember to ask the customer about the car's symptoms. It is a mistake to just assume that a jump-start is the answer, because the customer may have run the battery down trying to start the engine.

- Check the appearance of the alternator belt to ensure it is tight enough to run the charging system properly.

- Remember batteries are basically boxes of controlled electricity. When connecting the jumper cables, wear eye protection and gloves. Follow the recommended practice of connecting the ground (negative) cable last, away from the battery of the disabled vehicle. If a defective battery does explode, you will be away from splashing acid or flying plastic! Keep the customer a safe distance away, both during connection and starting.

- Finally, once the vehicle is started, allow the engine to run for a few minutes with the jumper cables connected.

Complete information on vehicles with special jump-starting precautions can be found in the 2003 AAA/CAA Towing and Service Manual. 

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