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Electrical problems will bring a truck to its knees, no matter how humble the source of the problem. Prevention begins with proper maintenance.

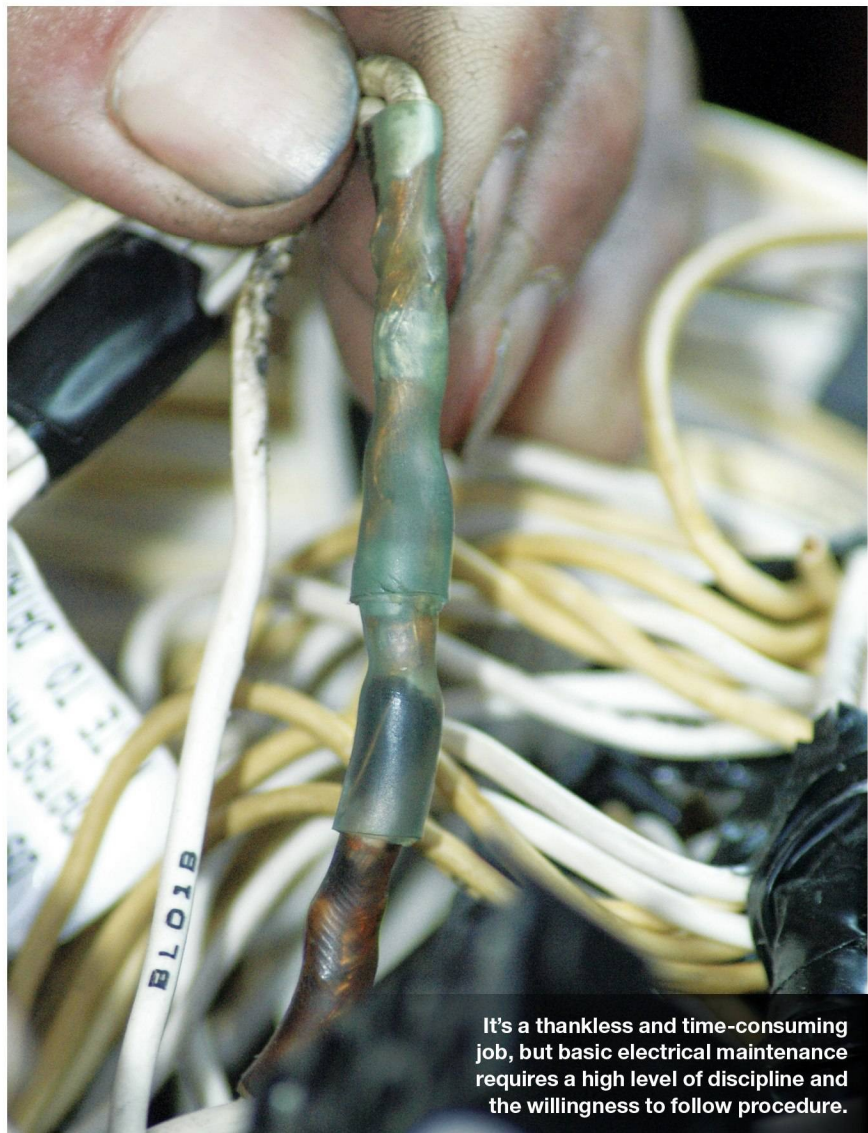
By **Jim Park**
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Most electrical maintenance isn't rocket science — but let's not confuse basic electrical maintenance with electronic troubleshooting, which truly is a science.

The idea is to keep the electrons flowing to where they are needed in the appropriate voltages and current. That means doing everything humanly possible to prevent restrictions to current flow, such as not allowing corrosion to eat away at a wire or a connector. Corroded wires do not conduct electricity very well at all, and that limits current flow to the component, such as an electric actuator on a turbocharger or the shifter servos in an automated manual transmission.

"I have seen AMTs pulled and overhauled for erratic shifting when it was actually a low-voltage problem," says Darryl Stuart, fleet maintenance consultant and frequent moderator at the Fleet Talk and Fleet Forum sessions at ATA's Technology & Maintenance Council meetings. "That's an expensive mistake."

Basic electrical maintenance done right requires disciplined techs following proper



It's a thankless and time-consuming job, but basic electrical maintenance requires a high level of discipline and the willingness to follow procedure.

procedures. Stuart says it's easy to take shortcuts, and since most techs don't really like doing battery maintenance, you have to require them to do the work properly.

"Whether or not to disconnect the cables,

clean the connectors and load test the batteries should not be left to the technician's discretion," Stuart says. "That work has to be done at each and every PM. No ifs, ands or buts."



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Cleaning the terminal posts and the cable connectors, along with inspecting the cables for corrosion and wicking, has to be done right or you're wasting your time.

However, Stuart says, somewhat controversially, that dielectric grease and anti-corrosion compounds should not be used on battery terminals.

"You can lose two volts right at the terminal posts just due to dust inside the connection," he contends. "Those anti-corrosion compounds are messy and difficult to remove when cleaning. They also give you a false sense of security and may lead the tech to neglect to clean the posts and connectors properly."

Another potential problem that is often overlooked at PM is cable routing. This should also be done as part of a pre-delivery inspection, as manufacturers can get a bit sloppy in tying off cables that could rub against metal components and cause what has come to be known in polite company as a "thermal event." The rest of us call it a fire.

"A chafed cable, at the very least, will short out whatever it's connected to," says Bruce Purkey, chief creative engineer at Purkey's Fleet Electric. "At worst, if it's a high-voltage cable, you'll have a fire. I was once at a fleet that had had a fire, and when we inspected the rest of the fleet, we found 27 more fires that just hadn't happened yet. I can't over stress the need for thorough, and I mean very thorough, inspections of the cable routing and the insulation wherever it even comes close to a metal contact. Remember, cable jiggles when the truck is in motion."

Another aspect of electrical maintenance that we are told needs a little more attention

NOT-SO-BASIC BATTERY MAINTENANCE

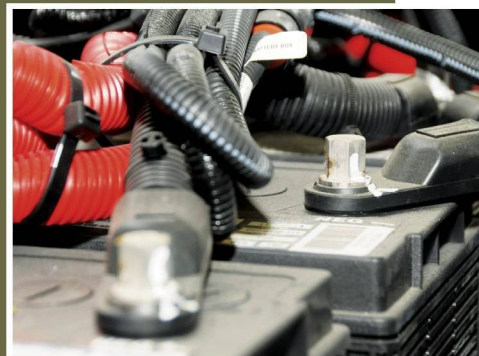
Batteries are tasked with supplying adequate voltage and current to the truck's electrical system, but loads on the batteries are increasing, and sometimes minor physical problems can impair battery performance.

"Technicians will often leave the key on while servicing a truck," says Roy Hellmund, engineering and technical specialist with Interstate Batteries Inc. "They need the systems to be active while running diagnostics, but onboard computers and even a fridge left on can deplete the batteries over the time the tech is working."

Hellmund recommends connecting the batteries to a charger while the truck is under repair to maintain the charge while techs are working.

Here are his top three tips for preventing unnecessary battery problems:

1. Make sure the battery hold-down straps and the battery-box supports are intact and firmly secured. Vibration kills batteries, he says.
2. Check the liquid levels regularly. Even so-called maintenance-free batteries are "maintenance accessible." You may still have to add a little distilled water to the cells from time to time, he says.
3. Most alternators alone will not be able to charge a deeply discharged battery to 100% of its capacity. In the event of deep discharge, remove the batteries and connect them to a charger to restore them.



at most fleets is cable repairs. Modern connectors are made more weatherproof from the outset, but old practices can actually undermine the connector's ability to keep out moisture.

"Some connectors, like AMP connectors, are designed not to have any dielectric grease in them, but techs are still putting blobs of grease in there before sealing the connector," says Tom Begin, director of innovation and emerging technologies at Phillips Industries. "With those connectors, you don't need any additional protection, but if you insist on using something, use nothing more than a light film of material. Otherwise you run the risk of popping out the neoprene seals. That negates the design of the connector."

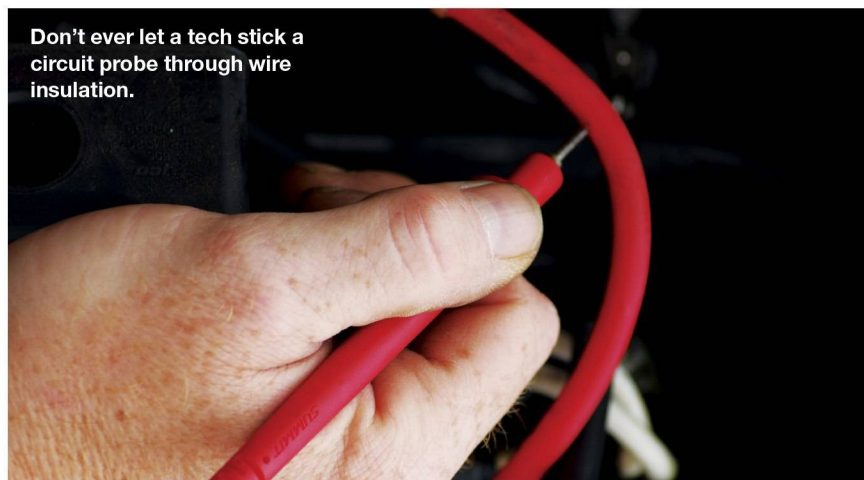
At the other end of the spectrum, we still have mechanics and do-it-yourselfers using the old-fashioned butt connector.

"Diesel technicians have been using butt connectors since Moby Dick was a guppy," says George Arrants, director of training at WheelTime. "It's a really easy way to fix a frayed wire. The problem is they are not sealed. The outside elements can enter the ends of the butt connector, which causes resistance, which changes the way the current flows, which changes both the amperage and the voltage. That either sends erroneous signals back to the computer, or restricts current flow. That can impair the performance of the end component, such as a relay or an actuator."

Arrants stresses the importance of learning proper wire repair procedures, and more importantly, how to repair a Weather Pack connector.

"Once you get those things figured out, most of your problems are going to disappear," he says with a chuckle.

Well, maybe not disappear, but they will certainly be minimized. From the tech's perspective, electrical maintenance might be right up there on the excitement meter with brake and tire work, but it's vital work that has to be done regularly and properly. Stuart says no investment in technician training is ever enough, and the importance of following proper procedures cannot be overstressed. 🗣️





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