

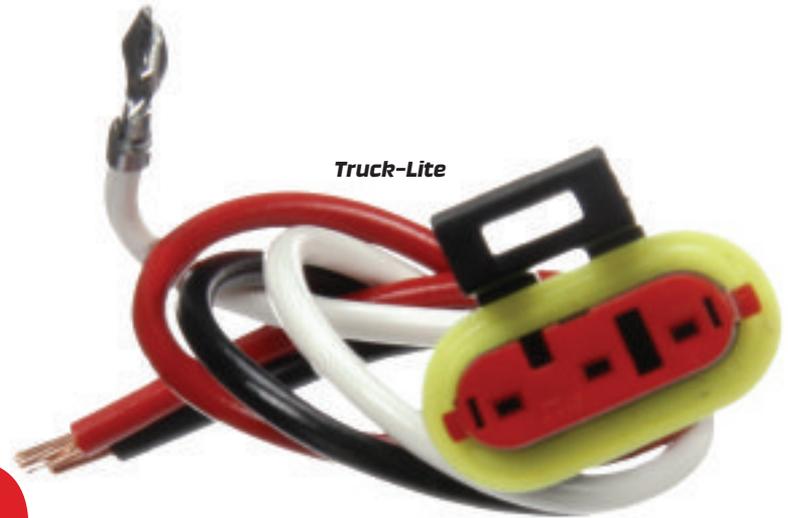
Trailer service issues

BY SETH SKYDEL
SENIOR CONTRIBUTING EDITOR

“COMBATING TRAILER ELECTRICAL SYSTEM CORROSION IS BOTH A SEASONAL AND A YEAR-ROUND PREVENTIVE MAINTENANCE ITEM.”

That’s from Gerry Mead, executive director of innovation at Phillips Industries. “And when it comes to an electrical system, it all starts at the power source,” he continues. “A trailer’s socket must be sealed or water intrusion will begin to wick down through the harness, leading to failure. The socket itself must be clean and dielectric grease applied to prevent corrosion.”

The next items to check, according to Mead, are connection points. “Ensure that dielectric grease is applied any time they are opened or when a component is replaced,” he says. “Make sure they are tight and that any connector locks are in place to ensure they stay closed tightly and water resistant. Electrical components often fail because corrosion got in.”



Allyn Leake, Fleet-OEM director at Peterson Manufacturing, cautions that once there is corrosion in a wire it will migrate further than you can cut it out. “Moisture gets sucked into a wire like it’s a straw and it will continue to corrode,” he says.

“On the preventive side,” Leake adds, “focus on clean connections by pulling them apart and using dielectric grease or compound to protect from moisture. Tire spray is also a big issue, especially for lamps at the rear of a trailer. When replacing a light, clean and grease the connection, and consider



using a cover to protect it.”

Fleets should immediately discontinue the use of wire probes or picks to check voltage or continuity, notes Andrew

Liuzzo, marketing communications specialist at Truck-Lite. “Puncturing the wire enables moisture to wick throughout a vehicle’s electrical system, corroding it from the inside out,” he says.

“Using a multimeter to troubleshoot a wiring harness is the safest way to ensure its longevity without damaging connectors, wires and seals,” Liuzzo continues. “Care should also be taken to avoid the practice of back-probing a connector, which can damage the connector’s seals and provide a direct path for moisture to enter.”

Providing an extra level of protection

Electrical connection points are the weakest link in the chain and each presents an opportunity for moisture to invade the system and cause corrosion, relates Kyle O’Dell, engineering manager at Optronics International. “Some fleets are proactive and apply heat-shrink moisture barriers to all electrical connections as soon as they take delivery of new vehicles,” he says. “These types of barriers provide an extra level of protection and shielding to one of the system’s most at-risk locations.

“When connectors are located above, behind or close to wheels, consider plastic looms, moldings or tubing as additional layers of protection,” O’Dell adds. “Using secondary and tertiary levels of

protection will reduce the opportunity for high-pressure moisture to enter the system. In addition, a vehicle’s movement can adversely impact lighting and harness systems. These physical forces can crack insulation and loosen up connectors, and once a system is vulnerable, moisture moves in and corrosion begins.”

It is well known that corrosion can be accelerated as a result of chemicals used to treat road surfaces in winter, but an unknown fact, according to O’Dell, is that for every 50-degree increase in temperature, the rate of corrosion will essentially double. “Even though winter is coming,” he says, “hot, wet weather can wreak havoc on a vehicle’s electrical system, softening it up for winter to deliver the final blow.”

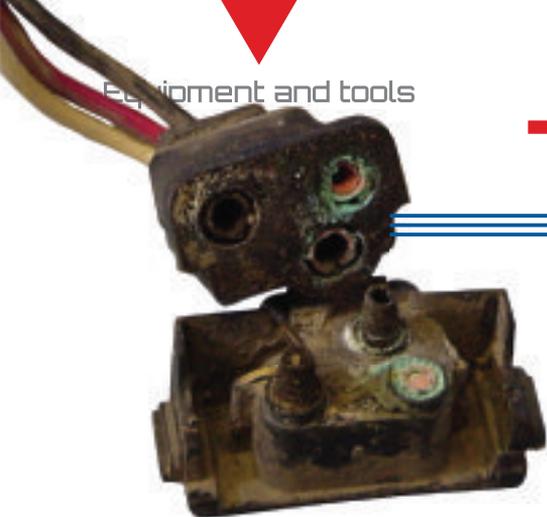
Larry Rambeaux, sales manager at Purkey’s Electric, notes that while today’s road salt chemical cocktails are very corrosive, corrosion is not just an issue related to winter climates. “Damage from weather can happen anytime, and once moisture finds a way into trailer electrical systems there’s no stopping it,” he says.

“One of the biggest issues is that many shops don’t start with a good visual inspection,” Rambeaux goes on. “You can find a lot of problems that way. Then the key is to make quality repairs. It doesn’t take long for corrosion to result in voltage drop and a trailer lamp to malfunction if good repair practices are not followed.”

Rambeaux also advises fleets and service providers to invest in training and to inspect all trailer electrical work regardless of where it’s done, and especially after road service or outside repairs.

“It’s understandable that a fleet might consider it more important to make a delivery than to take the time have a proper repair done,” Rambeaux says, “but the reality is that when you say you don’t have time to fix it right, that can mean you have to fix it two or three times.”

TIPS & PROCEDURES



According to Kyle O'Dell, engineering manager at Optronics International, wiring and harness problems usually come in three identifiable categories, each with its own signs and troubleshooting procedures:

- **Failures due to a grounded circuit** occur when the wire or cable contacts a ground source. Often this means that

the insulation has been compromised and the conducting material is making contact with a vehicle chassis or frame rail. In these cases, technicians will notice that there is no load on the circuit, that all lamps are non functional and there is irregular circuit breaker operation and blown fuses. They should then perform a series of grounded circuit tests.

- **Failures due to an open circuit** occur when there is a disruption in current flow through the system, such as when a connector is dislodged, a cable or wire is severed or a ground is disconnected. In these cases, some of the lamps on a circuit are not working, even though the circuit breaker being tested is good. Technicians should remove and test each lamp individually and perform a series of open circuit tests.

- **Failures due to a short circuit** happen when conducting wires or cables from two different circuits contact one another. This problem most often occurs because wires and cables are rubbing against each other, causing their insulation to become thin or wear away at the contact point. In these cases, some lamps are inadvertently operating as if on the same circuit as others—for example, if the back-up lamps are activated when the brakes are applied. Technicians should first visually inspect wires and, if the problem is not obvious, begin testing from the rear of the trailer and work their way forward.

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Kevin Cornelius, global market manager for trailer and body builders at Grote Industries, offers this advice:

When performing preventive maintenance on a sealed harness system, look at as much of the cable as possible to see if there are any strikes or slices in the cable jacket or wire insulation. If a cut is found, and if there is any exposed copper, start by cutting out all corroded areas. Then splice in a new piece of wire using heat shrink butt-splices, or solder the wires in a J bend and apply adhesive-lined heat shrink over the soldered area.

All areas of the harness should be inspected for any chaffing due to rubbing on a surface or routing. All holes that have wire or cable routed through them should have their edges protected by a grommet or tubing. The harness system should also be checked for areas where the wire or cable is pulled tightly.

If for any reason you need to unplug any molded connection, be sure to clean the interface area so it is free of

debris and contaminants before applying dielectric grease to the connection and reassembling.

For hard-shell connectors, do

not apply any dielectric grease. Simply clean any debris and contaminants from the interface and sealing area and re-engage. ▼

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