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BY JASON MORGAN | EDITOR

Shining a light on used trailer electrical systems

Lighting is often cited as one of the biggest CSA violations—and it's easy to see why. Or not see, in the case of lighting that is inoperable. You'll want to closely inspect the electrical system integrity of a used trailer. It starts with the cables, wiring and lighting components that are exposed to the elements. Any sign of corrosion at the connection points, or anywhere else along the electrical lines, will be the first red flag. You can get a jump on spotting corrosion by asking the dealer where the trailer was operated to get an idea for the environments it faced.

"Weather and the constant traumas of potholes cause systems to break down over time, making them increasingly more vulnerable to failure due to corrosion," said Brett Johnson, president and chief executive officer of Optronics International. "Fleets purchasing trailers that have been operating in particularly challenging climates must factor this in when purchasing a used trailer."

Challenging climates might sound like bone-chilling cold northern routes or asphalt-melting hot southern routes, but Johnson was quick to point out that corrosion often undermines our assumptions in the same way it attacks trailer electrical systems.

"It's funny—most of us associate wiring and cable corrosion with cold weather," Johnson said. "But for every 50-degree increase in temperature, the rate of corrosion doubles. Hot, wet weather is a killer of electrical systems."

When inspecting a used trailer, maintenance crews should look for small cracks that can develop in outer insulation due to the constant flexing of cables. The metal edges on structural members may also cause abrasions on wire and cable insulation that contact them.

"If an inspection identifies signs of a breach in an electrical system's insulation, the problem should be treated with immediate action, because moisture will probably have already entered the system," Johnson said. "Once present, moisture will slowly wick through the system all by itself, aided by the constant movement of the vehicle."

Inspectors should also pay close attention to anywhere wires pass through metal structures such as walls, cross members and body cavities. "They may also want to look for improperly installed ring terminals connected to frame members causing galvanic response from the contact of two dissimilar metals," Johnson said. "Just looking at the state of a vehicle's lamps gives you clues."

Incandescent and LED lamps are usually attacked at their most vulnerable point—their electrical connection. Incandescent systems tend to be more susceptible compared with LEDs, as they often come with PL-3 connectors that are less reliable than the weather-tight connectors found on most LED lamps, Johnson explained. Optronics recommends the use of weathertight connectors where possible to assure optimal service life. Fleets with existing incandescent lamps using PL-3 connectors can upgrade simply and easily to LED lamps.

"LED lamps last far longer than their more primitive incandescent cousins. Though they are more expensive initially, they pay for themselves many times over," Johnson said, pointing to Optronics' ONE series LED stop, tail, turn lamp as an example. The ONE series touts a service life of 50 incandescent lamps. "That's 100,000 service hours compared to just 2,500 for incandescent and 50,000 for most LED lamps," he said.

If a previous trailer owner has not maintained the system properly by replenishing dielectric grease and replacing worn components, then it can significantly lessen the potential service life of the trailer's lamps and its entire electrical system.

"As trailer refurbishment specialists, we see the result that suboptimal maintenance programs can have on a trailer's electrical system every day," said Dave Letts, president of Transport Finishes. "We see the biggest impact on wiring and cables on forward facing surfaces under the trailer. We also observe that the closer cables and wiring are to a tire, the higher the probability is that this surface will show signs of corrosion."

Letts added that areas below an 8- to 10-ft. "spray line" should be considered the prime corrosion inspection zone.