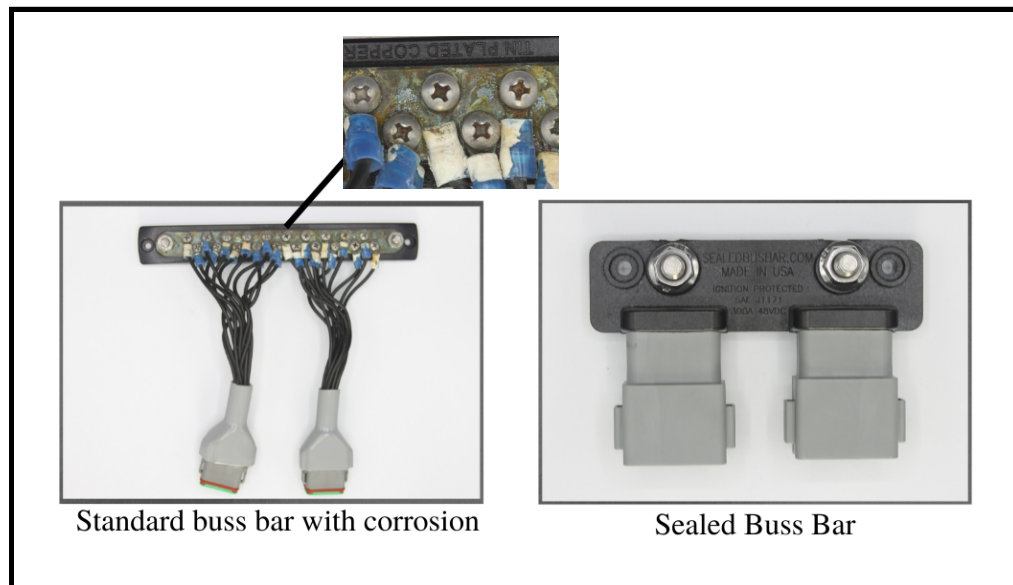


Running Aground? The Benefits of Sealed Bus Bars for Resolving Grounding Issues



This should look familiar to anyone who has ever had to troubleshoot a wiring issue. The ground connections in a system are one of the most critical elements of a robust and reliable electrical system capable of weathering years of harsh environments and operating conditions.

While wiring complexity can increase linearly with each additional wire, the potential for problems has a tendency to increase exponentially. Behind every crimp, terminal, and bend lurks a potential failure point. Oftentimes these failures begin intermittently and are easily overlooked until they reach a point where they can pose serious threats to the entire system.

Thermal cycling, vibration, impacts from shock, variability in manual crimps or improperly used tools can result in degraded contact reliability. Water ingress or atmospheric moisture can form on the wire insulation then drip or pool down onto the exposed metals reacting with them increasing impedances and interfering with the desired current flow to the battery return. The performance of the entire system is under constant assault and external threat.

Modern electrical systems provide enhanced diagnostics and safety features but are more susceptible to electrical noise or differences in potential that can arise from parallel paths in the ground wiring. Since current flows through the path of least resistance any degradation of the connection quality can alter the manner in which it returns to the battery.

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White Paper

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Measuring voltage drop is a common method for troubleshooting issues and margins of drop have been established as acceptable for certain types of loads. For something mission critical like a bilge pump or navigation lights a drop of more than 3% is considered unacceptable. With the load sometimes located far away from the battery making a measurement directly across the pump or light may result in an invalid reading. A small increase in the impedance of the return path could exceed the allowed drop and potential hazard could remain lurking under the surface.

Analog measurements critical to proper system operation can also be affected by differences in the ground potential throughout the system. Reading the fuel level at a tank properly grounded could be accurate to within a gallon or so, but with an offset due to the increased impedance in the grounding that measurement could be wrong by dozens or more gallons possibly running out of fuel with the gauge or MFD still showing plenty available.

One way to simply improve the reliability and robustness of a system would be to use a Sealed Buss Bar solution. Pre-crimped wiring and harness connections provide quick plug and play connections with protection from the elements and a maintenance free design.

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