

ELECTRICAL: OXIDATION (a.k.a. RUST)

The engineers who designed our RV and Tow Vehicle specified electrical components from a variety of suppliers and used complex bundles of pre-assembled wiring, called harnesses, to connect them all together. They chose switches from one supplier, actuators from another, panels from a third and circuit boards from yet other manufacturers. Each of these manufacturers used different metals for their harness connection points. This means that to keep costs low while maintaining flexibility of design and repair, there will be dozens of points of failure where dissimilar metals paired together in an electrical connection react by oxidizing. Electricity has a difficult time passing over this oxidized metal and the result is resistance and voltage drop. This resistance is a leading cause of intermittent operation, outright failure and otherwise poor performance of an electrical system.



Oxidation is a natural process by which metal oxides are created on metal surfaces which are exposed to oxygen. Think of flaking rust. It also happens when two different metals are joined in an electrical connection such when a copper wire harness is hooked to a component with a zinc or aluminum connector. The metal oxides on the surface have a different electrical conductivity capability than the underlying metal and over time, the oxide build-up creates an insulating layer between the contact points leading to heat build-up and eventual contact failure. For this reason, mechanics diagnosing electrical problems generally first check the negative ground and if it is in doubt, cleaning both contact surfaces to assure there is a solid ground.

As part of the pre and post-storage maintenance procedures, we clean the oxides from the major potential problem areas and apply a de-oxidizing solution in a pro-active effort to ensure our time outdoors is spent with the wildlife and not with wrenches doing what we probably should have done before leaving home. That said, if the TT has been on the road for an extended period or has been exposed to an unusual amount of salt air, mud and grime, you may need to perform some oxidation cleaning while on the road. To make this possible, we've provided a tube of De-Oxit to remove the top oxidation layer, some 00-grade steel wool to abrade the contact surface so it shows raw metal and some dielectric grease to provide the newly cleaned connection some protection from oxygen and debris.

We stopped short of bringing the whole shop and left the electrical circuit cleaner at home. This product is basically compressed air with a quick drying, electrically inert solvent that safely cleans dirt, grease & oil from the printed

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circuit boards and electrical contacts found on our RVs. We use this on the major pre and post-season maintenance but is readily available at any decent hardware, home or automotive store should the need arise.

MAINTENANCE POINTS:

- 1) Battery Terminals – whenever working on battery cables
- 2) Shore Power Cable at both ends
- 3) TT 30 AMP twist lock receptacle
- 4) Chassis Ground: Point where the converter ground connects to the TT chassis
- 5) 7-WAY Plug (See separate page for this process)
- 6) Airstream Only: Connectors in the Hot Water Heater and Refrigerator outdoor access panels.

The pages discussing the 7-WAY connector explain in detail what each of the various steps would be and you can vary the procedures depending on what you are working with. A simple outline would be:

- 1) Separate the contact points.
- 2) Soften & remove the oxidation from each contact point using CRC Electrical Contact Cleaner
- 3) Clean the contacts using DeOxit which is sort of a soap for electrical connections.
- 4) Once dry, polish the metal where they meet using the 00-grade steel wool
- 5) Apply a dab of dielectric grease to the contacts and reassemble.