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## Corrosion: Why Do You Put Up with It?

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It's not the "circle of life"; it's the "circle of destruction." Premature corrosion of your ambulance, fire truck, or rescue vehicle costs you plenty. Take a look. Drive the highway. Look at the trucks and trailers representing major corporations or municipalities. See any corrosion? Some of these vehicles have drivers in nice uniforms driving rusting trucks.

Recently I visited with a truck manufacturer. This manufacturer was quite busy. "Sales are great. We can't make them fast enough". The facility was clean, and the employees were proudly doing their jobs. I asked what the manufacturer does to prevent corrosion. "We paint them and ship them," was its response. "What about the corrosion warranty?" I asked. "One year on the paint," I was told. "That's all we need."

### The Circle of Destruction

The circle of destruction goes like this: You order your trucks, they are manufactured, you have corrosion issues, then downtime. Sometimes the same trucks have corrosion issues multiple times. Why do you put up with it? Much more can be done if you insist on corrosion prevention. I mean insist! Does your written bid specification include what you want done to prevent corrosion? Let me explain.

Most ambulance and fire trucks today are made with aluminum using steel or stainless steel hardware. Today's extruded aluminum is strong and light. Manufacturers take great pride in producing vehicles painted with high-quality urethane paint. However, aluminum assembled with stainless steel hardware will always corrode. Notice-I said always. Some sooner, some later, but they will always corrode. I personally saw a \$750,000 fire truck that had significant corrosion around door handles. The truck was 45 days old. The manufacturer took care of the warranty, but at what cost? Would you be comfortable getting this truck back being told it was "just a bad paint problem"? It's not the paint; it's the dissimilar metals.

Paint coatings, even better ones, are not the solution. The dissimilar metal reaction is what eats away your trucks. If a stainless steel bolt, screw, or fastener is used with aluminum and a barrier coating is not used, paint will bubble, indicating corrosion. Sooner or later this can be a safety issue.

Another truck manufacturer showed me an ASTM-B-117 lab test showing a frame rail piece that split because of magnesium chloride road chemicals. Mylar tape was used to isolate the aluminum and steel. The tape trapped the magnesium chloride, destroying the two pieces. This manufacturer has since stopped using Mylar, replacing it with a corrosion-prevention coating.

### Specifier Action

What can you do? When ordering or doing your specification, make corrosion prevention part of your requirements. I believe that corrosion prevention is like a three-legged stool. One leg needs to create a barrier between the two different metals that are assembled. This barrier should stay moist to keep it from cracking and falling out. Another leg of the stool needs to seal out moisture. Moisture, including sweating and condensation, acts as an electrolyte, allowing dissimilar metals to make contact. The last leg is most important. Zinc ingredients that are sacrificial keep the other metals from corrosion. Choosing a coating that provides all three of these will make your fire apparatus last longer.

Take a look at your last apparatus purchase. Was there any mention of corrosion prevention, dissimilar metal separation requirements, or dielectric grease required on wiring connections, or was the 30-page document void of this potential safety issue? Next, elevate the need for corrosion prevention in your specification. Where it goes on your list remains your decision, although I believe corrosion prevention can be a serious safety issue and suggest it be considered near the top of the list.

Be proactive about corrosion prevention with your truck builder. Insist that corrosion prevention be part of your ambulance or fire truck specifications. Make it a line item. If your department or municipality is remounting or repairing your truck, require a corrosion prevention coating so magnesium chloride corrosion doesn't make you do it all again in a year or two.

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Wording for your next fire truck or ambulance specification could look like this: "All dissimilar metals (usually defined as stainless and aluminum) including frame rails, hinges, door handles, lighting, etc., must be separated by a corrosion prevention coating and/or Mylar tape. Final inspection of the apparatus shall include removing a selected fastener, demonstrating the use and presence of a corrosion-prevention coating."

This elevated and simple requirement can extend the useful life of your next fire apparatus purchase and prevent downtime to fix expensive corrosion and paint issues. Again-it's not the paint; it's the dissimilar metals corrosion that's the problem.

**RICHARD A. NAY SR.** is the president and owner of Van Nay Corporation, located in South Elgin, Illinois. Van Nay Corporation works with fire apparatus and ambulance manufacturers to reduce dissimilar metal corrosion.

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