

## Do You Change the Tires on the Family Auto?

By, Carl Tamm

Most of us gray haired guys well remember the advent of radial belted tires! There was significant skepticism initially, as some of the early models wound up with bulging “pump knots” on the sidewalls, but eventually the problems were ironed out, and the radial tire, along with the non-continuous tread design evolved into our tire of choice today. And with that, most of us are glad to get more than 15,000 miles from a set of tires. We are pleased to commonly get an excess of 40,000 miles with proper maintenance. I just replaced my last tires (Cooper - Discoverer) last month with 80,000 - and was questioning if I could safely get another 5,000 as they still were not scrubbing the wear indicators, but I chose to replace them!

Now, the question of the day. How many of you operate your tire replacement plan on a “run-to-fail” basis? Just run ‘em till they pop! Does this sound absurd to you? It works for socks doesn’t it? Wear ‘em till they get a hole in them! What’s the difference? Well, it is highly unlikely that a hole in your sock is going to endanger your life, nor the lives of anyone else. But those tires could kill you, your family or passengers, or, if loss of control occurs at high speed, possibly endanger the lives of other “innocent” people on the road or sidewalk.

The dilemma has come up a few times with some utilities, and the concern is, “If I start using ClampStar®, I am admitting I have an unsuitable connector in the air.” Engineers worry that they have specified the use of an unsuitable product. C’mon folks – nothing lasts forever. We know the bridge is going to fail, so we repair it. Roads, pipelines, cars, tires, even anvils will eventually wear out with enough use or abuse.

None of the connectors made by reputable manufacturers, which have been tested and approved, are unsuitable for their intended purpose. They work quite well within their intended operating parameters and useful lifetime. Some may be better than others, some may operate in certain environments better than others, and some may exhibit longer useful lives than others. But of one thing you can be certain: ALL of them will eventually FAIL - NONE of them will last FOREVER. Forever and ever is a nice phrase in fairly tales, but it is an awfully long time! You can write this down in your little book, and you can put my name beside of it with a little asterisk, (Carl Tamm\*) said, “The only electrical connection that will last as long as the parent material, is a thermal fusion weld.” With all other designs, there exists an “electrical interface” that NEVER goes away, and WILL DEGRADE over TIME!” We have ample empirical data to back up that statement.

OK, so we started the discussion with tires. Tires have “wear indicators” molded in the tread. There are means of measuring tread depth, and visual inspections will serve to indicate a suitable time to change the tires. Unfortunately, electrical connectors are a little less forthcoming with such obvious indicators. We utilize inline resistance measuring devices. We utilize Infrared Thermography, and one additional effort that is being advanced is a thermo-chromatic paint. One of our major issues is going out and checking the condition of our splice / connector population. It is a bit less expensive to check the inflation pressure in the tires, or to make occasional observations of their condition when we stop for fuel.

The “remaining life” indicators for connectors are not nearly as black and white as those for tires, but that does not relieve us of the responsibility of doing what we can to make these decisions, and in certain instances, perhaps it is not worth the risk, waiting until we have a clear indication of an imminent failure, because we might not catch it in time (before the next scheduled inspection).



Identify Critical Connectors, and prioritize them, based on the potential damage should they fail. Those in the business of designing doorknobs do not have much concern. If a doorknob fails, the major injury one might suffer is a bruised toe – although it is not without risk, as it could impede someone from escaping a burning building. Aerial electrical connectors are ALWAYS a danger.

(A) 1<sup>st</sup> Priority are those that are suspended above areas accessed by the general public, such as sidewalks, parking lots, or any area that is subject to high traffic by pedestrians, where, should a conductor fall due to a connector failure, innocent people are likely to be killed or injured. Aged connectors over such areas should be addressed immediately.

(B) 2<sup>nd</sup> Priority are those that are suspended over roadways, waterways, railroads, where the situation of an overhead conductor falling into these areas due to a connector failure could result in not only direct contact, but also could contribute to secondary fatalities such as automobile wrecks or electrification of remote objects.

(C) 3<sup>rd</sup> Priority are those connectors on lines that serve “critical facilities” such as those structures from which essential services and functions for victim survival, continuation of public safety actions, and disaster recovery are performed or provided. Shelters, emergency operation centers, including fire stations and EMS facilities; public health facilities or hospitals; pumping stations for public drinking water, sewer and wastewater facilities are examples of critical facilities.

(D) 4<sup>th</sup> Priority would include public facilities where a power outage could result in potential harm and certainly major inconvenience, such as malls or shopping centers, or public event arenas or stadiums.

(E) 5<sup>th</sup> Priority are those areas prone to wildfires, especially in highly populated areas. Some utilities with a history of dealing with severe damage from wildfires may place this one as a higher priority.

From a “maintenance” perspective, these “priority” applications could well warrant the enhancement of the connector be made by simply installing a ClampStar® over it without waiting for the opportunity or undergoing the expense to conduct inspections. Utility personnel should be aware if they have lines with “critical location” connectors that are beyond their normal useful life. The design criteria 30+ years ago for compression connectors was 30 years! Today, we have found that those designers did a good job, and we can expect 40 – 70 years of useful life from those connectors operated within their design parameters. The most important parameter is temperature of the conductor, which, per those 30+ year old parameters, was/is 70°C (158°F). If you have “critical location” connectors that are beyond their normal useful life based on either of these parameters, it should become a high priority to address them.

Have you kicked your tires lately? “Run-to-Fail” is NOT an acceptable policy for overhead electrical connectors.

