PHRED SEZ.....

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TIRE TEMPERATURES

By far the highest contributor to premature tire failure is **HEAT**. Overheated tires can be caused by a variety of factors including the following: *under inflation*; *over loading* above the weight carrying specifications on the sidewall; *vehicle speeds* beyond tire design specifications; or *high environmental temperature* for the day. When unheeded each of these builds tire heat to the point where the rubber is almost molten and cannot contain the internal cord or steel belt tire structure. When two or more of these risk factors occur at the same time during continued operation, **tire failure is imminent.**

Most seasoned RVers visually check and touch every sidewall at each rest stop or thump them as truckers do. These are commonly accepted methods for tire health input but also yield very inexact results. It would be much better to measure the heat of the tire to get exact tire temperature readings. How much better would it be if it were possible to get those tire temperatures easily?

A *Noncontact Laser Thermometer*, item 91778 available at *Harbor Freight Tools* and at www.harborfreight.com (see photo) offers such a solution. It is handheld with a trigger on/off switch and an on/off laser switch so the exact spot for the temperature reading is identifiable. It also has an on/off back light for night viewing and always gives its digital readout in less than one second. It can measure temperatures of tires, engine components, and any other machinery or items from several feet away with an accuracy of plus-or-minus 4 degrees Fahrenheit. Go to the on-line web site, enter 91778 in the *Find Item Number* space and click "Go". At the time of writing, this item was available on-line at $40, a price comparable to the in-store sale price. Regular list price is about $60. A similar thermometer from an alternative supplier is available at *Pep Boys Auto*, item W89720/MT-EXP, for $49.99 regular price.

Developing a written log of tire pressure, speed, ambient air, and external sidewall temperatures for in-use tires at each position on your rig can be very instructive. During November and December the tire sidewall temperatures (just off the road service) on our motorhome have been running 90 to 120 degrees F, with outside air temperatures being cool. The inner dual tires are always warmer than the outer dual tires, even with identical starting cold air pressure. That would be consistent with less air flow around the inner dual tires and their proximity to the rear motor on our chassis. In addition, road crown or axle flex may result in the inner dual supporting more load than the outer. The inner dual near the muffler is always the warmest of the two inner dual tires and the one that has historically blown out on my Airstream.

Travelers may notice considerably more tire "gators" (rubber from disintegrated tires) on the road in the summer than the rest of the year due to the effect of the summer heat. Owners measuring

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The CD book, Phred Sez - the First Ten Years, has been well received and is in its third printing. It is available on computer CD (written in Microsoft Works and also Microsoft Word). Order by mail for yourself or for loved ones by sending a check for $15 each (Includes shipping) to the address below.

Help me with topics for the PHRED SEZ column. Send your creative experiences and ideas by US mail, E-Mail, Fax, or phone:

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The ideas expressed in this column are those of the author or fellow Airstreamer and should not be construed as those of a licensed technician. Implementation of any idea is entirely at your own risk. Consult a technician if you do not feel personally qualified.

tire temperatures may find it interesting to notice the effect of hot days on tire sidewall temperatures. Charting your own tire temperatures can also document what temperature changes will result from a five-miles-per-hour reduction in driving speed when the days are hot? Eventually the log will contain multiple entries for normal speeds, ambients, and sidewall temperatures for your selected tire pressure. That way any subsequent temperatures found to be out of the ordinary, especially on only one tire, will result in your doing further analysis, seeking a cause and solution.

Michelin engineering (www.michelinrvtires.com or 1-800 847-3435), has graphed tire temperatures during operation and found that it takes about an hour and a half of constant speed driving for properly inflated and loaded tires to achieve their maximum working temperature. This temperature was measured at the edge of the working belt by the tire shoulder *inside* the tire, so the *outside* of the tire at that point (just off the road surface on the sidewall) is an excellent place for your personal tire temperature readings.

When asked about maximum tire temperatures for motorhomes, Ellis Johnson, a Michelin engineer, suggested a rule of thumb that air *inside* the tire should not exceed 180 degrees F for longer than ten minutes during operation. An interpretation of their graph indicates 70 mph yielding approximately 178 degrees F for contained air temperature *inside* the tire. That combined with Mr. Johnson's rule of thumb would imply a 70 mph maximum speed for tire health and continued operation (other than short bursts of speed). A slightly slower speed of 62 mph indicates approximately 172 degrees Fahrenheit, so slower highway speed brings the internal air temperature down. Since *inside* air is cooler than belt edge temperature, I would personally try to keep exterior belt edge temperatures below 180 degrees Fahrenheit.

Johnson indicates, "the longer the time of exposure, the lower the temperature should be." So my personal range of external temperatures for in-use tires would be 90 to 180 degrees. But if **several** tires were to have temperatures **approaching** 180 degrees F, a significant slowing of my highway speed would be in order for continued travel. Please note that 180 degrees is way too hot to hold your hand against!

Pay attention to your tires! Keeping them within the right working tempera-