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The Engineering Institute Newsletter

June 2011: Newsletter

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Vacation & Tire Safety

Summer is the time of year when most families go on vacation. Typically, to help make the vacation a pleasurable experience, we use a checklist or to-do list to help us prepare for the trip. If there's a plan to drive to your vacation destination, your [vehicle](#) should be included on the checklist, specifically the [tires](#).



Website Quick Links

Tire Safety Tips

Tires are the only parts of your car directly in contact with the road. Tires should provide durability and traction during wet and dry weather conditions. In addition, tires should provide a comfortable ride by absorbing shocks from the various abnormalities of the road. To help make your vacation a fun and safe experience, add the following tire safety tips to your checklist.

1. Just like wearing proper shoes, drivers should use proper tires. Your tires should be:

- a) The right size tires for your vehicle
- b) Suitable for your driving conditions
- c) Changed if they are damaged, or bald

Tires should be changed before the tire wear indicators are revealed. According to the Federal Motor Vehicle Safety Standards (FMVSS) 139, tires should to be changed if the tread depth is less than 2/32 inch in height. You can check the tread depth with a penny. Put a penny into the tire tread. If you cannot see Abraham Lincoln's head on the penny, the tire tread depth meets the tire tread-depth requirement.

2. Check your tires regularly.

- a) Check the air pressure with an air gauge.

Note: The pressure on the side of the tire does not indicate the pressure for your particular vehicle. It is the maximum pressure for the tire. Information about your tires can be found on the car-door side placard.

- b) Check tire appearance for scars, cuts, bulges, or any type of abnormality.

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Rollover](#)[Visual Media Display \(Animation\)](#)

3. Signs of tire failure could be vibration, strange handling (maneuver), or abnormal noises coming from the tire. If any of these signs occur, check your tires immediately.



Tire Expert Don Lee

Do not trust that your tires will never fail under any circumstances. For your safety and others, check your tires regularly.

For more about tire safety or other tire related questions, please call our [tire expert](#), Don Lee.

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Sneak Peek: [November 2011 ASME Paper](#)

A rollover accident associated with any motor coach without an adequate occupant protection system may result in serious or fatal occupant injuries. Such is the case of Sara Schewe who died in a tragic bus crash in 1996 while studying abroad in India. In our November 2010 newsletter, we shared a story about our involvement in assisting the Sara's Wish Foundation in the development of a portable restraint for motor coaches without seatbelts.



Computational modeling using MADYMO is used to identify the best suitable shoulder strap configuration to protect the occupant during rollover accident.

In response to retrofitting existing seatbelts on motor coaches, [Dr. Chandra Thorbole](#) and [Dr. David Renfroe](#) will present their study in the November 2011 paper at the ASME International Mechanical Engineering Congress and Exposition. Using the

computational technique, "the study identifies the best suitable shoulder strap configuration of the three-point restraint for [rollover](#) occupant protection, which will

minimize the slippage of the shoulder strap during a rollover accident." Finally, the "study indicates that the shoulder strap on the leading side does not interact with the neck to cause any neck injury."

Featuring Engineer: Mark Partain



Mark Partain

Our featured Engineer this month is Mark Partain. Mark received his master's degree in Industrial Engineering at the University of Arkansas in 1993. Besides his engineering expertise in [accident reconstruction](#), Mark is known for his talents in turning wood into works of art. Before coming to The Engineering Institute in 2000, Mark worked at Baldwin Piano and Organ Company, which allowed him to explore his interest in woodworking. After leaving Baldwin, he continued his passion for woodworking on his own; starting with "flat work" which enables him to make creative wood pieces such as display cases, serving trays, and stereo speakers' cabinets. Taking his creativity a step farther, Mark started woodturning using a lathe. Mark believes, "...the lathe provides a means to produce creative objects quickly," which is evident each time he completes a project.

Using the woodturning technique, Mark has created some unique and interesting

items, such as a corn-cobb
pen, wooden motorcycle
handles, and wood bowls
made from various types of



Wood Pieces Crafted by Mark Partain

trees. Preserving the forest, Mark uses trees that were damaged or uprooted by the forces of Mother Nature. Mark says he finds woodturning to be very satisfying. He further added that he enjoys the detail-oriented nature the wood produces in finished products.

In addition to woodworking, Mark enjoys cycling. Re-introduced to cycling by fellow engineer, [Alex Roberts](#), Mark started mountain biking, but found road bikes were more his style. Recently, Mark purchased a Cyclocross bike. Riding his new bike, he plans to commute to work, and he plans to enter a few cycling races. Mark described, "...cycling as a proven way to get into shape as well as an opportunity to be introduced to some great friends." Over the past five years Mark cycled over ten-thousand miles and he does not have plans to stop cycling any time soon.

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