

TIRE PRINTS ON THE RIM

By Mark W. Arndt

Despite, or perhaps because of, numerous well paid experts and layers of circumstantial evidence, a key question in a crash that resulted in the forced removal of a heavy truck's front tire from its rim became - which side of the tire was mounted inboard? In the present context, the legal wrangling that presented this question is not important, but instead the solution to the puzzle. The tire was found disconnected from the rim after a serious injury head-on crash in which the investigating officer, after conferring with the local tire shop, reported that the tire lost air before impact. One of the officer's photographs documenting the tire at the scene is figure 1.

The recently replaced tire was on a large well maintained one-year old truck. There were no balance weights that might assist in tire matching, nor tire wear that might give away a tire's direction of rotation. Because of the tire's newness, suggested methods [Ref. 1] for determining the outboard side versus inboard side of the tire were not possible.

Careful examination of the rim flange revealed patterns of

discernible but undecipherable markings. The markings, including regular tic marks, were within a band of darkening that extended the circumference of the rim. Figure 2 shows the band of darkening and Figure 3 is an example of a pattern of marking. The patterns of marking launched a search for their possible source on the tire.

The tire's beads, in fact, revealed numerous raised features including several series of numbers. Raised tic mark features appeared to lie on a regular interval but were similar on both inboard and outboard beads of the tire. The numbers were unique and only present on one bead. The question became can the pattern of numbers be demonstrated to be the same as the marking on the rim flange? Figure 4 shows raised features on the tire bead.

The side of a pencil lead was rubbed on vellum over the raised numbers on the tire bead, the number pattern was reversed by flipping the paper and then the tracing was aligned with the rim flange marking. The

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Figure 1



Figure 3



Figure 2



Figure 4

SPEECH-TO-TEXT DEVICES A DRIVING RISK

Research suggests that sending texts with a hands-free voice recognition system is more distractive for drivers than listening to the radio.

Speech-to-text devices in new cars fail to overcome the well-known perils of hands-on texting while driving, a US study published [recently] suggests.

Developing standards for measuring cognitive distraction behind the wheel, University of Utah researchers wired the heads of 32 drivers with sensors, then gave them an array of tests in vehicle simulators and real cars.

While the research is ongoing, early findings suggest that sending texts with a hands-free voice recognition system - a feature in many new vehicles - was more distractive than listening to the radio or conversing with passengers.

"This clearly suggests that the adoption of voice-based systems in the vehicle may have unintended consequences that adversely affect traffic safety," said the study, sponsored by the non-profit AAA Foundation.

"Just because a new technology does not take the eyes off the road does not make it safe to be used while the vehicle is in motion."

The 12 men and 20 women who participated in the study ranged in age from 18 to 33. All had clean driving records -- and all confessed to regularly using their mobile phones while driving.

In a report last year, the US National Safety Council estimated that 24 per cent of all motor vehicle crashes in the United States involve mobile phone use, despite bans in several states that are openly flaunted by many motorists.

- *World News Australia*

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result was a perfect match of the tire's numbers with the previously undecipherable pattern on the rim. Carefully referencing the rim to the tire, the process was repeated for each tire bead marking producing consistent results and agreement. Figure 5 shows alignment and agreement of the tire bead pattern to the rim's pattern of marking. Careful examination and documentation of the tire printing on its rim, like finger printing, allowed for a conclusion based upon physical evidence about which side of the tire was present on the outboard face of the rim flange.

REFERENCE

1) Giapponi, Thomas R., Tire Forensic Investigation, Analyzing Tire Failure, Section 8.1, SAE International, Warrendale, PA.

AUTHOR CONTACT

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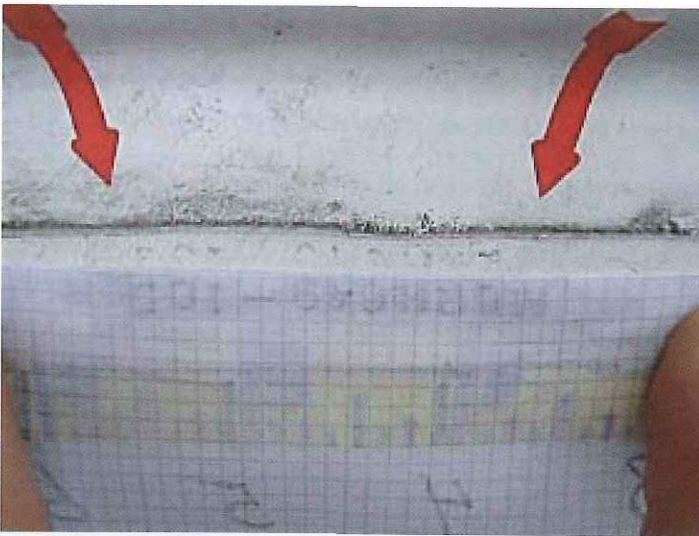


Figure 5

ON THE COVER

On a late summer morning, just after midnight, a 50 year old owner/operator driving a 1999 semi equipped with a sleeper cab began pulling a tanker trailer loaded with asphalt flux. The tanker held approximately 5,000 gallons and the contents had a temperature of approximately 375 degrees Fahrenheit. It was placarded as hazardous material.

The owner/operator drove this route routinely several times a week. It was approximately 200 miles in each direction, and he would be loaded with the asphalt flux, make the delivery, and return the same day. Initially the route took the driver south, then west.

It was approximately 5:00 a.m., and the driver was traveling west on a four lane divided interstate and the speed limit was 70 miles per hour when he approached his exit. It would take him onto a local highway where his customer was located. The exit was unlit and dark; the pavement was asphalt and wet from a previous rain.

As the driver approached the exit, he crossed the fog line and sideswiped the driver's side of an SUV parked in the emergency lane with the semi's right steer tire. After striking the SUV with the steer tire, the semi became uncontrollable and went through the guardrail on the north side of the west bound lane emergency lane. Upon going through the guardrail, the unit proceeded downward into a ravine where tanker dislocated from the semi. Both the semi and tanker struck numerous trees and received considerable damage. According to the police report, the driver had utilized the restraint system, but was still ejected from the semi.

A passing motorist saw debris on the interstate and called emergency services. A sheriff's deputy arrived and seeing the guardrail had been compromised, began looking for a vehicle. He saw the semi in the ravine, contacted dispatch for an ambulance, fire truck, and back-up. Upon finding the driver in the brush, emergency personnel contacted the local coroner who arrived and declared the driver dead at the scene. The cause of death was due to blunt force trauma.

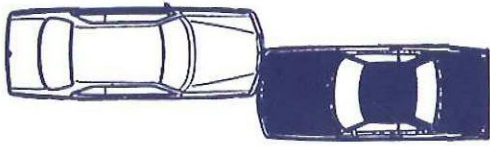
The police report states inattention was a primary factor in this incident. Speed was not listed as a factor.

This incident created a seven mile backup on the interstate with one lane closure for approximately 10 hours.

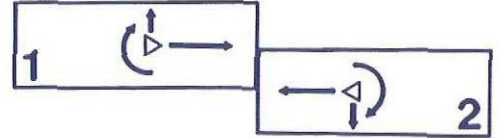
The *ARJ* cover photograph shows the semi-tractor after it had been pulled out of the ravine and back up onto the shoulder. The photograph below shows the tank trailer involved in this incident after it had been pulled back up onto the shoulder.

- *Kentucky Fatality Assessment and Control Evaluation Program (OSHA)*





ACCIDENT RECONSTRUCTION JOURNAL



VOLUME 23, NO. 4

July/August 2013



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