Determining if a Tire Failure Caused a Crash

In this article, tire engineering expert, Richard Sherman discusses the process by which forensic engineers investigate failed tire events. His discussion includes a checklist of information that attorneys should gather when preparing to investigate such claims. He also discusses some of the challenges in performing these investigations.

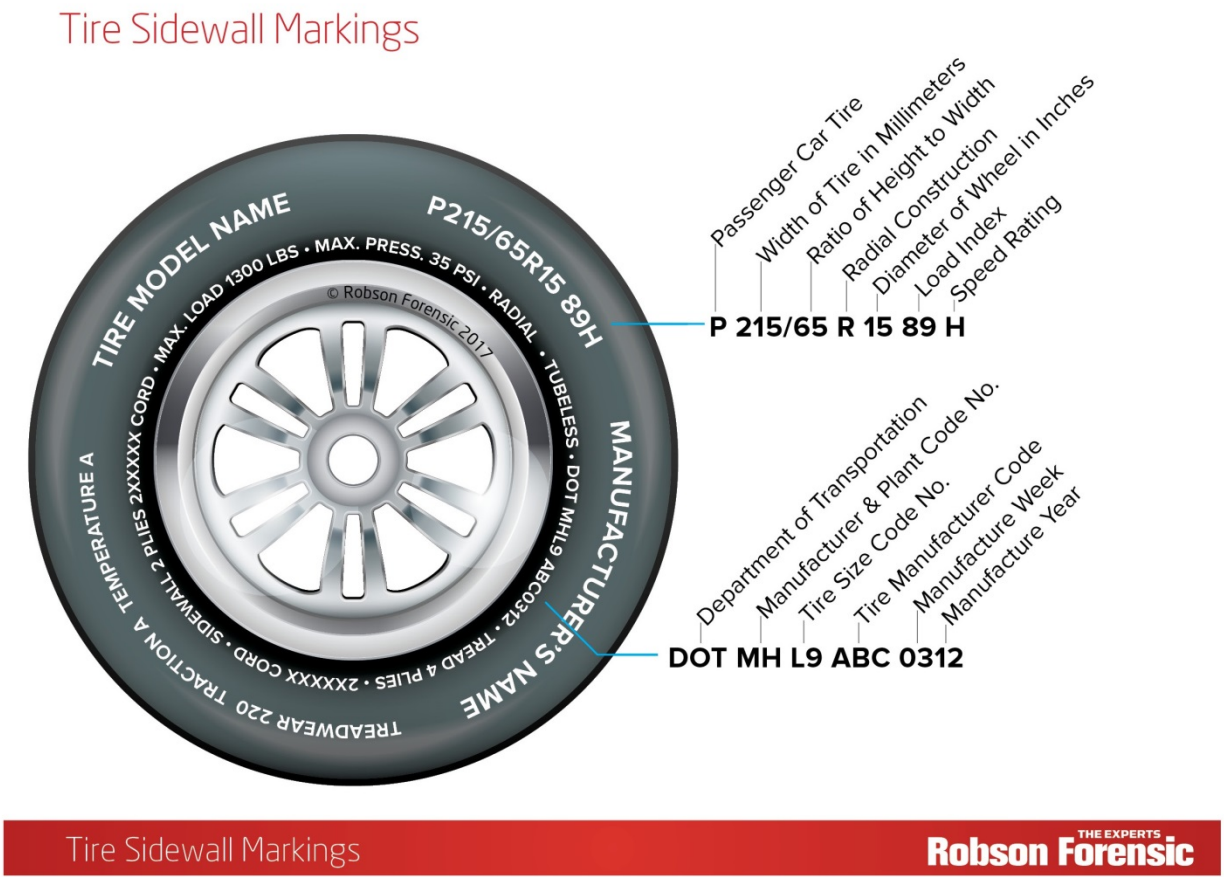
Did the Tire Cause or Contribute To the Cause of the Crash?

At the culmination of a vehicle crash, it is common for one or more of the tires to be scuffed, sliced, or burst. The forces generated in a crash event are frequently sufficient to damage or destroy a vehicle's tires, but in some portion of crash incidents, a failed tire causes or contributes to the cause of a crash. Our experts specializing in tire engineering are frequently retained in these scenarios to determine if tire damage was the cause or result of a vehicle crash event.

The forensic study of a tire failure begins with obtaining enough visual information to understand its condition prior to failure and recovering clues to its demise. Any history available through sales receipts or repair orders will also prove helpful. Although tires look similar and share construction methodology, distinct differences are apparent between Passenger, Light Truck and Heavy Truck tires. These differences extend beyond construction to application and environmental needs including designing for factors to optimize strength, durability, handling and tire service life for the type of vehicle on which it will be installed. An expert will want to know what type of tire it is early in your discussion to properly advise you towards some common failure mode indicators and additional areas of interest.

Tire Identification

As different as each tire can be, they also share some common traits. Every tire has a DOT number molded into both sidewalls near the bead. This “fingerprint” includes the tire manufacturing plant, tire code (manufacturers unique cured tire code), and the last four numeric digits signifying the week and year of manufacture. Due to how they are manufactured, the week and year is usually found on only one of the sidewalls.



[Tire Plant Codes: www.tiresafetygroup.com/tire-dot-plant-codes-sorted-plant-code/]

The tire size can be compared with the vehicle’s tire information placard located near the driver side door pillar to determine if the correct size and type of tire is installed. The sidewall markings can include the load factor (passenger and light truck radials), load range (ply count for light truck tires) and speed ratings (performance radials), if applicable.

Tire Condition

One important factor is determining the inflation condition of the tire. Running flat, sidewalls will receive damage with some uniformity in appearance. Less than optimal inflation conditions have their tales to tell also. Identifying any additional abrasions, punctures or cuts in the sidewall may also provide some clues to tire condition prior to or resulting from the collision. Any unusual scrubbing laterally across the center of the tread may indicate an inflated tire during a spin or lateral skid. Irregular tread and shoulder wear may reveal other factors and are important to note.

Expert Investigation

All of the previous conditions likely describe an ideal situation, regarding the subject tire, where all of the components are still intact or recovered. It is not unusual to lose some of the components of a tire involved in a crash. This raises the difficulty considerably; however, some additional clues may be provided by the remaining tires on the vehicle. Companion tires may allow nondestructive testing such as X-ray or Shearography. Destructive testing may involve removing a cross-section of a tire to evaluate component placement, manufacturing or material defects.

Involving a tire expert early will provide a valuable glimpse into the technical merits of your case. Providing your expert with as much information as practical in the early stages, including photos of the subject tire and any unusual signs of damage or wear may be helpful towards establishing the proper legal strategy that aligns with the evidence. In nearly every case, a personal inspection of the tire will be required to reliably prove or disprove relevant theories of liability. Photos only provide a portion of the conditions surrounding a tire failure; an inspection will allow your expert to identify the most compelling evidence.

Tire Investigation Checklist

If you have a case involving a failed or damaged tire, the checklist below may prove helpful in having a meaningful initial conversation with a tire failure expert. This foundation of information will allow the expert to speak with more certainty regarding the conditions and standards of care relevant to your case.

- DOT Code:
- Tire Manufacturer:
- Tire Brand:
- Tire Size / Load Range:
- Vehicle Information:
    - Model Year:
    - Vehicle Make:
    - Vehicle Model:

- Installed Location of Subject Tire(s): (LF, RF, LR, RR)
- Vehicle Service History:
    - Tire Replacement Date and Mileage:
    - Last Vehicle Service:
    - Current Vehicle Mileage:
- Location of Vehicle / Subject Tire:

Tire Design & Failure Investigations

Our experts in tire design and failure analysis are frequently retained in vehicle crash incidents involving damaged or failed tires. Utilizing crash evidence and industry experience, our experts can determine if tire damage was the cause or result of a crash.

Where tire failures are found to have contributed to the cause of a crash, our engineers have the training, education, and industry experience to determine how and why tires fail. Investigations can include an examination of design and manufacturing practices. Our experts also look at the actions of tire retailers and service stations, including tire fitment, repair, and rotation.

For more information submit an inquiry or visit our Tire Failures practice page.

Featured Expert

Richard Sherman
Tire Design & Failure Analysis Expert
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Richard Sherman is an automotive engineer specializing in tire design and failure analysis. He applies his expertise to the investigation of vehicle crash incidents, with a particular focus on those involving failed or damaged tires. Richard approaches his forensic casework with experience gained working in engineering positions for tire, vehicle, and automotive component manufacturers.

Prior to joining Robson Forensic, Richard worked for the Goodyear Tire & Rubber Company where he was engaged in the design, manufacture, and quality assurance of passenger vehicle tires. As a tire designer, Richard was charged with the development of new tires as well as the tuning of existing product lines to ensure consistent, reliable performance. In a later role as Quality Team Leader, Richard performed root cause failure analyses related to product quality concerns. Richard's experience related to tire engineering and failure analysis is well complemented by the experience he gained earlier in his career selling, mounting, and repairing tires at a quick service tire shop.