BLOWOUT: How Tire Defects Hurt and Kill
Rob Ammons knows about tires.

Years ago, when problems with Firestone tires led to Ford Explorer rollovers, local and national media turned to Rob Ammons to explain what was happening.

Since then, he has written on the subject, teaching other lawyers the important factors to look for and evidence to gather in cases involving accidents caused by poorly manufactured tires, tread separation and similar hazards.

His leading-edge articles about the special safety problems caused by aging tires came about years before the federal agency responsible for auto safety finally decided to issue a warning.

Most important, Rob and the attorneys at The Ammons Law Firm have represented hundreds of people who have been hurt or killed in accidents caused by tire defects and other problems. If you have a case involving such an accident, there is important information you need to know.
Tire failures can occur for a number of reasons, but the most dangerous and common failures are tread-belt separations where the tread and top steel belt tear away from the tire. Tread-belt separations took center stage in 2000, when Firestone tire failures on Ford Explorers took hundreds of lives and injured many more. Following this tragedy, Congress, regulators and safety advocates began to focus on the lack of tire safety oversight and regulation, resulting in a number of significant recalls involving other major tire makers and improved safety standards. Despite new attention to the issue, tire problems continue to emerge as manufacturers change designs to reduce costs and improve rolling resistance to enhance fuel economy, changes that can affect overall tire quality. Combined with growing reliance on overseas production with spotty quality control, tire safety issues continue to cause serious crashes.

Wheel defects also are emerging in conjunction with the growth of custom wheel sales. The percentage of cars produced with custom wheels has increased to more than 66 percent in 2006. The lack of standards and lack of attention to safety are causing a growing number of crashes as more and more vehicles are fitted with a foundation of poorly constructed and untested wheels made with low-grade materials.
Tire Defects

Today, tread-belt separation is the primary tire defect in crashes involving light truck and passenger car steel-belted radial tires. While other types of failures occur, tread separations present the most hazardous situations for drivers because vehicles become uncontrollable, even for professional drivers.

Steel-belted radials experience tread-belt separation predominantly at highway speeds because of higher centrifugal forces. Tread separations differ from blowouts or simple deflations in an important way that makes these failures much more hazardous for drivers. In a blowout or deflation, the tire remains together. In a tread-belt separation, the loss of the tread and belt exposes the lower steel belt at the interface with the roadway, greatly reducing the lateral force generation characteristics and causing the vehicle to yaw to the side of the failed tire. Often the tread and belt wrap around the axle or emergency brake cable, exacerbating the yaw and further reducing the driver’s ability to effectively control the vehicle.

Testing shows that the duration of the tread-belt separation is related to the amount of yaw or pull experienced by the vehicle. The longer the duration of the tread-belt separation, the greater the vehicle pulls to the side of the failure. Rear-tire blowouts in light truck, SUV and passenger vehicles are more difficult to control and frequently lead to rollovers, particularly in vehicles with a higher center of gravity.
Defects Causing Tread-Belt Separations

In a steel-belted radial tire, tread-belt separations occur because of a lack of adhesion between the belts themselves.

Before a complete tread-belt separation occurs, or “belt-leaving-belt” as it’s known in the industry, separations begin with small cracks in the rubber between the belts and the belt edge, the highest stress area on the tire. This rubber between the belts, called “skim stock,” forms cracks that grow and multiply around the whole tire. All tires will experience some degree of cracking at the belt edge over time. The job of the tire maker is to design and construct a tire to ensure that its fatigue life is greater than its tread life – in other words, the tire’s tread should wear out before it suffers a catastrophic tread-belt separation.

The problems begin inside a tire, where crack growth or socketing occurs between the belts until they no longer can hold together under the centrifugal forces of highway speeds. At this point, the upper belt separates from the lower belt and completely detaches from the tire.
Design and Manufacturing Defects

To understand tire defects and tread separation, it is helpful to understand how a tire is made. A steel-belted radial tire has several components, including an inner liner, two polyester body plies, two steel belts, two bead reinforcing strips, the sidewall rubber and a tread.

After these components are assembled in their green (uncured) state, the tire is loaded into a tire press for vulcanization. In this process, the tire is subjected to extreme heat and pressure, which cause the components to fuse into a single structure, a completed tire.

A tire’s design plays a crucial role in its ability to slow and reduce internal separations. Tires are highly engineered products whose material and physical design properties affect their performance and strength, as well as their ability to adequately bond in order to resist tread-belt separation.

Components like the inner liner play a pivotal role in tire strength. This liner acts like the inner tube of a tubeless tire, containing the compressed air between the rim and the tire carcass. While all tires lose inflation pressure over time, the quality and construction of the inner liner will dictate the inflation pressure retention rate. Inflation pressure retention is key to tire durability because it minimizes the movement of air into the tire carcass. Oxidation within the tire degrades the internal materials, making it more susceptible to cracking at the belt edges. Inner liner permeability depends on the gauge, or thickness, of the material, chemical formulation and proper splicing. Similarly, the properties of the skim stock rubber used between the belts are critical to resisting cracking and separation growth. The use of high-grade compounds along with appropriate antidegradants and antiozonants enhance the capabilities of this material.

The design of the belt edge, where the greatest level of stress and heat occurs, is another important facet of tire design. The steel belts, which are coated to allow adhesion between the metal and rubber, are cut at the factory to the appropriate size. It is at these cut edges where the sharp, uncoated part of the belt scrapes away and wears down surrounding rubber components. This edge area is subject to flexing as the tire rotates during service and experiences high strains between the two components.

Appropriate size and material composition of the belt wedge or cushion is also key to designing a robust tire. A rubber wedge-shaped component used between the two belts at the belt edge helps reduce the stresses. The industry has known for years that belt wedges can improve long-term tire durability, yet some manufacturers have significantly reduced their size or eliminated belt wedges altogether in order to reduce costs.
Other crucial design features include the use of nylon cap plies to reduce stress associated with centrifugal forces of the rotating tire. Cap plies, originally added to tires designed for high-speed use, are important for a range of tire types, including light truck models. In many instances, cap plies have been added to meet more stringent safety standards after the Firestone recalls.

Manufacturing also plays a significant role in tire defects. Often, poor bonding between components is the result of out-of-specification materials. Salvaging aged or dry materials that should be scrapped, poor mixing processes or contamination also are frequent contributors to reduced adhesion levels between materials.

Manufacturing processes without tight quality controls can result in improper or open inner-liner splices that allow moisture, contaminants and oxygen to degrade a tire’s internal components. Contamination from oils, waxes and foreign objects used in the manufacturing environment have found their way into tires and significantly affect adhesion between components. The lack of proper bonding and adhesion between components can result in exposed, brassy-colored steel cords. If interfaces between different tire components that should have bonded are visible or evidence of polished areas of rubber are seen, there may be a manufacturing defect.

“The accident was a nightmare. What my family needed was someone who could watch out for us, guide us through the legal system and help us pay the bills. Rob Ammons and his firm did all that and more.”
- Veronica Avila, client
Houston, TX

“We spoke with a number of lawyers, but we chose Rob because he’s good at what he does and most of all, he’s a good listener. I would never want to go through this again, but if I had to, I would want Rob and his firm on my side.”
- Barbara Waynette Baker, client
Katy, TX

Two tires demonstrate different approaches to manufacturing. The tire on the left has two steel belts, but no nylon cap over them. The tire on the right includes a nylon cap, designed to reinforce the belt edges and improve durability.
Failure to Warn – Tire Aging

Tires, like any other rubber product, have a limited service life, regardless of tread depth and use. To address this growing area of concern, the National Highway Traffic Safety Administration issued a Consumer Advisory in June 2008 warning that aged tires, regardless of tread, are subject to greater stress and increase the likelihood of catastrophic failure. Tire aging, or more technically, thermo-oxidative aging, refers to the reduction in or loss of a tire’s material properties, which leads to a reduction in the tire’s performance. Aging is affected by heat generation and the chemical degradation of the rubber components from oxidation.

“Aged” tires often are unsuspecting put into service after having served as a spare, being stored in garages or warehouses, or having been used on a vehicle that is infrequently driven. In many instances, these tires show no visible sign of deterioration or age. And, absent any visible indicators, tires with adequate tread depth are put into service. Often, aged tires experience tread-belt separations very quickly once they are on the road even though they may have full tread and look like a new tire.

Tire age can be determined by decoding the Tire Identification Number or DOT number molded into the side of a tire. The DOT date code, however, is not consumer-friendly.

The deterioration of rubber with age has been recognized since the production of synthetic rubber began in the 1930s. Vehicle manufacturers have been aware of the hazards associated with aged tires for decades. They were warned about aged tire risks following research in Europe in the late 1980s. In 1989, several European and Japanese auto manufacturers began advising consumers to not use a tire that was more than six years old, even if the tire had never been used. These warnings were buried in vehicle-owner manuals, and even today vehicle and tire manufacturers have done little to educate consumers and service providers about the hazards of “aged” tires.

Tire Defect Trends

Read separation remains the most problematic tire design and manufacturing defect and can be found in a range of manufacturers’ products from the well-known to the unknown as tire manufacturing moves to Asia at unprecedented rates. The basis for many of the current tire defects and trends are poor quality control at overseas tire plants, many of them only recently making tires for export to the U.S., and design issues aimed at cost and weight reduction. Other emerging areas of tire safety are counterfeit tires sold under major labels and tires with low speed ratings and low safety margins.
THE MARKET FOR CUSTOM WHEELS HAS GROWN TO MORE THAN $4.5 BILLION ANNUALLY. AS CUSTOM WHEELS HAVE BECOME MORE MAINSTREAM AND NEW BRANDS AND MODELS PROLIFERATE, MORE DEFECTIVE WHEELS ARE FINDING THEIR WAY INTO THE MARKET. THE TWO AREAS OF CONCERN ARE IMPROPER FITTING AND WHEELS WITH LOW MATERIAL STRENGTH AND/OR POOR BUILD QUALITY. BOTH PROBLEMS ARE DIRECT CAUSES OR KEY FACTORS IN SOME CRASHES.

CAST ALUMINUM ALLOY FREQUENTLY IS THE MATERIAL OF CHOICE FOR AFTERMARKET WHEEL MAKERS. THE POPULARITY OF CAST ALUMINUM ALLOY WHEELS ROSE IN THE EARLY 1970S DUE TO LOWER PRODUCTION COSTS AND MORE FLEXIBILITY IN STYLING AND DESIGN. HOWEVER, CAST ALUMINUM AND VARIED AMOUNTS OF ALLOY CONTENT AFFECT WHEEL QUALITY AND PERFORMANCE. CAST ALUMINUM IS ALSO GENERALLY WEAKER THAN MORE EXPENSIVE FORGED VERSIONS. THE CHROME PLATING ON CAST ALUMINUM CAN FURTHER REDUCE TENSILE STRENGTH, MAKING WHEELS MORE PRONE TO SHATTER.

WHEN WHEELS FAIL, METAL PARTS CAN ACT LIKE SHRAPNEL, PIERCING THOUGH VEHICLE COMPONENTS SUCH AS FUEL LINES AND FILLER NECKS, ELECTRICAL COMPONENTS, AND EVEN THE VEHICLE BODY. THESE FAILURES CAN RESULT IN LOSS OF VEHICLE CONTROL OR ENHANCE THE RISK OF FIRE OR INJURY FROM BROKEN PARTS.

THERE ARE NO FEDERAL STANDARDS REQUIRING MANUFACTURERS TO TEST CUSTOM WHEELS. ANY TESTING IS LEFT TO THE DISCRETION OF THE COMPANIES THAT DESIGN, MANUFACTURE AND DISTRIBUTE THE WHEELS. MANY AFTERMARKET WHEELS THAT ARE DESIGNED, MARKETED AND DISTRIBUTED BY LARGE COMPANIES ARE FARmed OUT FOR OVERSEAS MANUFACTURING IN CHINA AND KOREA, WHERE THEY ARE NOT TESTED, AND INSTEAD ARE MANUFACTURED WITH LITTLE REGARD TO PERFORMANCE OR QUALITY.

FITTING PLUS-SIZE AFTERMARKET WHEELS ON VEHICLES HAS REACHED NEW LEVELS, WITH WHEEL AND TIRE SIZES AS LARGE AS 24 INCHES. THE PLUS-SIZE WHEEL/TIRE COMBINATIONS AFFECT VEHICLE HANDLING, STABILITY AND BRAKING. THEY ALSO CAN HAVE NEGATIVE EFFECTS ON SUSPENSION COMPONENTS AND CHANGE THE STRESS POINTS, LEADING TO SUSPENSION AND STEERING COMPONENT FAILURES, AND ALTERING CRASH PERFORMANCE.

VEHICLE MANUFACTURERS ARE QUICK TO BLAME RETAILERS AND DISTRIBUTORS OF PLUS-SIZE WHEEL/TIRE FITMENTS FOR ADDING NON-RECOMMENDED WHEELS AND TIRES WHEN CRASHES RESULT, BUT MOST ARE INVOLVED IN HELPING TO DRIVE THE CUSTOMIZATION OF THEIR VEHICLES. VEHICLE MANUFACTURERS ROUTINELY PROMOTE CUSTOMIZATION. TRICKED-OUT VERSIONS OF THEIR VEHICLES ARE FEATURED AT AUTO SHOWS WHERE MANUFACTURERS PURSUE CUSTOMIZERS WHO CAN GIVE THEIR PRODUCTS ADDED CACHÉ. IN ADDITION, VEHICLE DEALERS PUMP UP THEIR PROFITS BY PACKAGING AND SELLING CUSTOM CONTENT TO CONSUMERS, WITH LITTLE OR NO REGARD TO THE SAFETY IMPLICATIONS.
Like all legal matters, cases involving tire defects, tread separations and the accidents they cause require the attention of someone who understands the details.

Most important, the attorneys should have experience against tire manufacturers and a history of safeguarding the needs of families that have been hurt because of poor design, poor manufacturing or other problems.

The Ammons Law Firm is that firm. If you have a case involving a tread separation or other tire defect, call us at 866-523-1603 or e-mail us at info@ammonslaw.com.

About The Ammons Law Firm

The Ammons Law Firm is a trial firm devoted exclusively to representing individuals who have been catastrophically injured through the misdeeds of others. The firm has a national practice that focuses on the prosecution of automobile product liability cases, including vehicle rollovers, fuel-fed fires, crashworthiness cases and tire failures.

Rob Ammons earned his B.A. from Baylor University in Waco, Texas. After receiving an academic scholarship, Rob continued his education at Baylor Law School, where he was Editor of the Baylor Law Review, and a member of both the Order of the Barristers and the Phi Delta Phi Legal Fraternity. He earned his J.D. with Honors in 1988, and was selected to serve as a Briefing Attorney for the Supreme Court of Texas.

In 1989, Rob began his private practice with the Vinson & Elkins law firm. Five years later, he developed his plaintiffs personal injury practice and began representing consumers in catastrophic injury and wrongful death cases. Rob has gained a national reputation as a leading personal injury lawyer. He focuses on the prosecution of serious injury cases, such as burns, spinal cord injuries, traumatic brain injuries and wrongful death claims against automobile and tire manufacturers. He has taken on significant cases against General Motors, Ford, Chrysler, Honda, Toyota, Isuzu, Hyundai, Nissan, Mitsubishi, Bridgestone/Firestone, Kumho Tire, Cooper Tire and Michelin.

Since 2003, Rob’s peers in the legal community have named him to the list of Texas Super Lawyers® published by Key Professional Media and appearing in Texas Monthly magazine.

Rob is Board Certified in Personal Injury Trial Law by the Texas Board of Legal Specialization and Board Certified in Civil Law by the National Board of Trial Advocacy. He is ‘AV’ rated by Martindale-Hubbell®, the highest rating attainable. Rob is a frequent speaker on product liability issues and a published author.