

## **Tire Defect Litigation**

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*Reprinted from the December 2008 [New Jersey Law Journal](#)*

Tire failures can result in catastrophic consequences. Most accidents can be avoided by following the tire manufacturers instructions and performing proper maintenance. Unfortunately, defects, both manufacturing and design, are causes of a number of failures.

Failures occur during both operation of the vehicle as well as maintenance of the tire. When a tire fails during operation, the operator can experience a sudden loss of control resulting in vehicle rollover or crash. They also fail during mounting and other maintenance resulting in explosive separation of the tire and the rim. The failed tire/wheel assembly becomes a projectile often seriously injuring or killing the tire mechanic or bystanders.

### ***Tread Belt Separation***

Tires can catastrophically fail in service when the tire tread and belt(s) detach from the carcass and/or remaining belts of the tire. Upon detachment, the vehicle becomes unstable and difficult to control. Public awareness of these accidents has increased as a result of the rash of crashes involving Firestone tires which were equipped on Ford Explorers during the late 1990s. Strong safety concerns surfaced after a number of tread separations resulted in vehicle rollovers. This prompted a recall of certain Firestone tires.

Tires are constructed from fabric, steel and rubber materials. Marrying the materials can be a difficult task. The rubber utilized for the tread and other components does not naturally bond to steel which is used for the belts. Manufacturers utilize chemicals and various production processes to increase adhesion. One technique is to plate the steel cords with brass which bonds very well with rubber. Additionally, skim stock is formulated with various chemicals to attempt to increase adhesion. This helps bind the steel belts to the rubber tread.

Tread belt separation occurs when there is a break down in the adhesion between the steel belts and rubber tread. A number of factors can cause the adhesion between the belt and rubber to fail. Weak or improper compounds, contamination during manufacturing, and other problems can cause the initiation of cracks between the belts and treads. Most often, these will begin to form at the belt edge. Progressive fatiguing, crack growth and tearing failure can progress into the skim stock. These cracks propagate during the use of the tire. Heat or friction within the tire may hasten this process. Ultimately, this can result in separation and the potential for catastrophic failure of the tire.

Design and manufacturing defect theories can be the basis for claims as a result of tread separation failures. Design theories include claims that the tire failed to contain protective measures such as belt edge strips or a nylon cap ply which can reduce the likelihood of tread separation.

Manufacturing defects claims are much more common. Here, the plaintiff points to deficiencies in the manufacturing process or improper construction which lead to the failure of tread belt adhesion. Insufficient quality control or the use of poorly trained, inexperienced tire builders can lead to tires which fail. Evidence of contamination in manufacturing process or other manufacturing defects can only be identified through inspection of the tire by qualified experts.

Tire manufacturers often attribute failures to tire misuse. The claims of misuse or abuse include under inflation, over loading, and impact damage. All tires are designed to be used within a range of inflation pressures. Tires that are chronically under inflated will overheat which results in increased friction inside the tire. Clearly, under inflation can exacerbate existing design or manufacturing defects. Overloading can result in similar effects of operating an under inflated tire. Once again, increased heat and friction can result in internal damage.

A common defense to many tire defect claims is that the vehicle was operated chronically under inflated as well as over loaded. When defending defect claims, many manufacturers also claim that impact damage or a "phantom blow" can result internal disruption of the tire which eventually leads to tread belt separation.

### ***Aged Tires***

Tire aging has become an area of great concern. For many years, the life of a tire has been defined by its use and condition such as tread depth and sidewall condition. It is now clear that deterioration within the tire can occur over time which increases the likelihood of catastrophic failure.

Heat and oxygen are both enemies to tires. They work to degrade the internal adhesion of tire components. Environmental conditions such as exposure to sunlight or salt air also may adversely affect tires as they age. Tread separation once again is a typical failure mode of an aged tire.

The Department of Transportation number molded into the tire's side provides information regarding a tire's age. Unfortunately, decoding the age from the number is not easy for the lay person. The last four digits of the number represent the month and year the tire was manufactured.

The National Highway Transportation Safety Administration issued a Consumer Advisory regarding aged tires on June 2, 2008 which recommends replacing tires which are more than six years old.. Many manufacturers have adopted warnings which direct the same.

### ***Bead Failures***

The component which allows a passenger or truck tire to be operated without a tube is referred to as the tire's bead. It is a bundle of wires wrapped together and utilized inside the rubber which contacts the rim. They are made in various configurations depending on the manufacturer. A bead can fail during the mounting and inflation process with devastating consequences. When a bead failure occurs, there is a sudden loss of pressure which can turn the tire wheel assembly into a projectile injuring or killing the mechanic.

Beads may be defectively manufactured resulting in failure at low inflation pressures. Also, a bead can "hang up" during the mounting and inflation process. When a bead fails, it usually does so at its "splice" which is where the two ends meet.

Tire/rim mismatch can result in bead failure. Due to the design of 16.5 inch rims, a 16 inch tire can pass over the flange of the rim with some effort. 16.5 rims are uncommon today and some mechanics lack familiarity with the potential mismatch which can be deadly. If the mismatch is not detected and inflation is commenced, the bead may fail during the inflation process at pressures within the maximum recommended inflation pressure. In mismatch cases, the rim manufacturer as well as the manufacturer of the tire changing machine are potential defendants.

### ***Multi-Piece and Split Rim Explosions***

The exploding components of a failed multi-piece wheel assembly have earned the nickname "widow makers." Multi-piece wheels are two or three piece assemblies which require tube type tires. They are much less common than single piece wheels but can be found on garbage trucks or other heavy duty trucks.

These assemblies utilize a split ring which secures the tire to the rim. The ring can appear to be properly seated on the rim prior to inflation when in fact it is not. If inflation takes place while the ring is not properly seated, the ring may suddenly release. Inflation of these type of tires must always be performed in a tire cage. Unfortunately, explosive separation can occur once the inflation process has been completed and the tire/wheel assembly is being mounted on the vehicle.

The failure mechanisms discussed above all require the same basic initial investigation. Most importantly, get all the evidence. Hire an experienced investigator and obtain and retain the vehicle, all tires, and all of tire pieces which may have detached during the violence of the collision. Also, secure the rims and rim components. Your expert will be in a better position to evaluate the case if all of the accident artifacts can be obtained.

It is important to determine where the tire was purchased and how it was maintained. Obtain all maintenance records. Any records which reflect tire service between the time that the tire was purchased and when it failed are especially important. A servicing entity which should have noted uneven wear patterns or other evidence of tire abuse may be a potential defendant.

Investigate the use of the vehicle. Was the vehicle subject to excessive loading or consistently run below proper inflation pressure? Did the operator regularly check the tire pressure? These are important issues that will become critical during litigation.

Sorting out whether the cause is a defect requires extensive initial investigation and well qualified experts. There is no excuse for failing to spend the time and money at the outset to properly evaluate the case. The tire must be evaluated by an experienced, qualified expert. A former tire company employee with experience in tire failure analysis is preferable. It is very unlikely that an expert without extensive tire experience will have the knowledge to help determine the cause of the failure. Also, consider using a consulting expert for purely evaluative purposes.

Tire failures can result in severe injury to both passengers as well as service people. While maintenance and misuse can contribute to failure, both design and manufacturing defects have resulted in terrible tragedy.