

In examining the factors to be considered under Rule 404(b), the Court finds that the evidence in question — Balanescu's prior moving violations — is relevant to Plaintiff's claims of negligent hiring and retention, and therefore has a proper purpose under Rule 404(b). The Court next turns to the issue of whether the probative value of this evidence outweighs the prejudicial effect under Rule 403. The risk of the jury inferring a propensity by Defendant Balanescu might be inclined to commit a violation on the day of the accident due to his past moving violations is possible, and the Court finds that the prejudice that might attach to Defendant Balanescu's prior DUI arrests to outweigh any probative value they might have to Plaintiff's negligent hiring claims, particularly since those arrests are wholly unrelated to his operation of a tractor-trailer. However, the Court finds that the prejudice that might attach to the remaining prior moving violations, including driving without a seatbelt, speeding violations, and using a cellular device while driving, does not outweigh the probative value to Plaintiff's negligent hiring claims. Further, the Court will instruct the jury on the proper consideration of this evidence for the purpose of the negligent hiring claims only, and not to show any propensity by Defendant Balanescu to act in accordance with his past behavior. This instruction will be given at all appropriate stages of trial, including before the introduction of this evidence, and during closing instructions. *Id.* at \*20-21.

## CONCLUSION

Truck-involved crashes in the United States result in significant costs to lives and property — over 47 trillion dollars annually.<sup>11</sup> As scientific studies have shown that drivers with past crashes are 113 percent more likely than others to have another crash,<sup>12</sup> the Rule of Three can be a valuable tool for

litigants seeking redress for damages caused by drivers who should not have been behind the wheel in the first place.

1. American Transportation Research Institute, *Predicting Truck Crash Involvement* – 2018, p. 33, Table 10.
2. The "Rule of Three" has also been referred to as the "Rule of Threes," "Rule of 3," and "Three in Three" rule. Regardless of the rule's name, its implications for commercial drivers remains the same: more than three strikes, and you're out.
3. <https://nap.nationalacademies.org/catalog/13770/individual-differences-and-the-high-risk-commercial-driver>.
4. <https://truckingresearch.org/2005/10/18/predicting-truck-crash-involvement-2005/>.
5. <https://truckingresearch.org/2011/04/01/predicting-truck-crash-involvement-a-2011-update/>.
6. <https://truckingresearch.org/2018/07/31/predicting-truck-crash-involvement-2018-update/>.
7. <https://truckingresearch.org/2022/10/11/predicting-truck-crash-involvement-2022-update/>.
8. <https://www.ddsexpress.com/general-requirements.html>.
9. <https://www.qualitycarriersinc.com/drivers/company-drivers/requirements>.
10. Potential causes of action against motor carriers in these cases include (but are not limited to) claims for negligent hiring, negligent retention, negligent supervision, and negligent entrustment.
11. American Transportation Research Institute, *Predicting Truck Crash Involvement* – 2018, p. 33, Table 10.
12. <https://truckingresearch.org/2022/10/11/predicting-truck-crash-involvement-2022-update/>.



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# Wheel Separations Result from Systemic Installation and Inspection Failures

## Mark Emison

It started as an exciting day for John and Mary Anderson.<sup>1</sup> They had spent months hauling loads of furniture, clothes, and other items couples accumulate over 49 years of marriage. This was the last load in their move from rural Missouri to their new home in Kansas City where they would enjoy their retirement.

For this last load, John and Mary caravanned in separate vehicles. Mary led as they drove on a highway separated by

a grassy median. John followed several car lengths behind Mary. Suddenly, Mary sees an object coming toward her vehicle from across the grassy median. The object is black, round, and moving fast. It is a semi truck's wheel and tire. The tire strikes the highway in front of Mary's vehicle and bounces 25 to 30 feet in the air over her. Relief turns into terror as she comprehends that John is driving closely behind. As Mary looks in her review mirror, her terror is realized as she watches the tire and wheel crash through John's windshield.

This did not have to happen. Like most wheel separations ("wheel-offs"), this was a result of systemic failures in both the installation of the wheel and inspections leading up to this tragedy.<sup>2</sup> Absent a design defect issue, wheel separations only occur due to negligence.

### **SIMPLICITY IS KEY**

This article is focused on cases that do not involve a design defect. In these cases, it's important to focus on simplicity. Everyone should agree that a wheel should never separate from a moving vehicle — and become what the industry calls a "200-pound unguided missile."<sup>3</sup> A wheel-off means someone didn't do their job. It's that simple.

It is tempting to hire a slew of experts to attempt to show exactly how and why a wheel separated. In response, the defense will likely hire a slew of experts to give counterarguments regarding the exact failure mode. This battle of the experts misses the point and risks unnecessary confusion. The bottom line is a wheel should never come off a moving vehicle for any reason. A wheel separation equates to negligence, akin to *res ipsa*. Naturally, the defendant who installed the wheel will likely blame the defendant who last inspected the wheel, and vice versa. They may both be right. That is a powerful position to be in when seeking justice for a wheel-off victim.

### **STATISTICS ON WHEEL SEPARATIONS**

Accurate data and statistics regarding wheel separations are lacking. In the early 1990s, the National Transportation Safety Board performed a six-month investigation of wheel separation accidents.<sup>4</sup> The study estimated 750 to 1,050 wheel-off accidents happen per year.<sup>5</sup> The report noted limitations in the estimate because most databases did not distinguish between wheel separation and tire failure incidents. In addition, non-injury wheel-offs are not likely reported. In the 30 years since the report, the data continues to be lacking regarding the frequency of wheel-offs.

### **WHY DO WHEEL-OFFS OCCUR?**

The root cause of wheel-offs is a loss of clamping force on the wheel. The Tire Industry Association publishes widely

accepted wheel installation training to prevent wheel-offs. The "R.I.S.T." procedure is considered "Wheel Installation 101".<sup>6</sup>

"R" – Remove debris from mating surfaces;

"I" – Inspect all components, especially the studs and lug nuts;

"S" – Snug the lug nuts in a star pattern on the wheel hub;

"T" – Torque to specification.

Below are common causes of wheel-offs:<sup>7</sup>

- Debris on the wheel's mating surfaces. Failure to clean and remove debris and dirt from the wheel's mating surfaces may lead to a loss of clamping force and eventually a wheel-off. The debris trapped between dual wheels can work itself free and create gaps between the mating surfaces. Over time, the wheel loses tension from the lug nuts. The lug nuts loosen and a wheel-off may occur.
- Improper torquing. Wheel-offs may also result from improper torquing — the process of fastening the lug nuts to the wheel. Most commercial wheels specify torquing to 450-500 foot-pounds. If the lug nuts are under-torqued, they may become loose over time. This can lead to the movement of the wheel, and an eventual loss of clamping force. Likewise, over-torquing may stretch the lug nuts, studs, or threads and eventually lead to a wheel-off event.
- Miscalibration of the impact gun. Technicians typically use impact guns to torque lug nuts. If the impact guns are not periodically recalibrated, the torquing levels may be inaccurate and lead to torquing levels outside recommended specifications.
- Improper lubrication. Depending on whether the wheel is hub-centric or lug-centric, either over-lubricating or under-lubricating may eventually lead to loose lug nuts and a loss of clamping force.

In the wheel-off event that killed John Anderson, there was evidence that the tire installer improperly lubricated the wheels, over-torqued the lug nuts, and failed to clean debris on the wheel mating surfaces. It was difficult to pin down

the exact cause with certainty because the wheel separation occurred four weeks after the wheel was installed and evidence of the installation largely relied solely on testimony from the installer. The separation was likely a combination of causes. Of course, the defense hired a slew of experts to attack each of these potential causes. Ultimately, the best evidence of negligent installation is the fact that the wheel separated.

In pursuing claims against the wheel installer, other potential areas in discovery include:

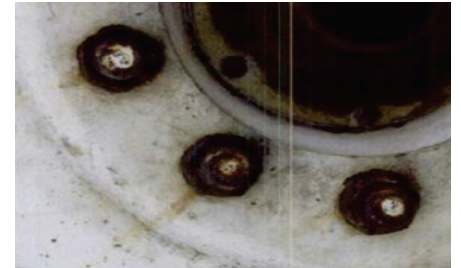
- Do policies require technicians to do a full inspection of all the vehicle's wheels, or just the wheel that is being worked on?
- Does the facility have any quality assurance procedures? Is there any process to check a technician's work?
- What is documented in the wheel installation process?
- Are technicians given any history of the vehicle or wheel?
- What was used to clean the surfaces/wheel assembly?
- What was used to fasten the lug nuts — a torque wrench, impact gun, or a combination of the two?
- How often were the torque wrenches calibrated? Who calibrated them?
- How many vehicles are serviced per day? How much time does a technician have with each vehicle?

### **RED FLAGS OF A POTENTIAL WHEEL OFF**

Commercial drivers and motor carriers are responsible for ensuring a tractor-trailer is in safe operating condition, including the vehicle's wheels and tires.<sup>8</sup> After a wheel is installed, it may take thousands of miles for the clamping force to catastrophically fail and cause a wheel-off event.<sup>9</sup> Commercial drivers must inspect and identify red flags before a deadly wheel-off occurs.

There are multiple tell-tale signs of a potential wheel separation. When lug nuts are loose, there may be signs of

corrosion or streaks coming from the lug nuts.<sup>10</sup> Any streaks from the lug nuts must be immediately addressed and further investigated.<sup>11,12</sup>



In addition, wheel movement may cause visible markings surrounding the lug nuts. As demonstrated below, the markings appear shiny and surround the lug nuts.



The markings may also appear to be in a crescent moon shape that does not complete a full circle around the lug nut. Elongated holes and studs are also indicators of loose lug nuts.

### **Professional drivers must complete thorough inspections to identify red flag wheel-off risks**

The Federal Motor Carrier Safety Regulations require both pre-trip and post-trip inspections. Federal regulations require drivers to complete a driver vehicle inspection report (DVIR) that includes an inspection of the wheels and rims.<sup>13, 14</sup>

CDL Manuals provide further instructions to drivers

## "When wheels separate from a moving vehicle, it is likely due to systemic failures in installation, maintenance, and inspections. It is important to focus on the simplicity of these cases — they should never happen."

regarding inspections. For example, the Missouri CDL Manual instructs drivers to "[c]heck that all lug nuts are present, free of cracks and distortions, and show no signs of looseness such as rust trails or shiny threads."<sup>15</sup> In addition, the CDL manual instructs drivers that after a wheel is installed to "stop a short while later and re-check tightness of the nuts."<sup>16</sup> Like all states, the Missouri CDL Manual is modeled after the AAMVA Model Commercial Driver Manual. The federal regulations require that all states provide a CDL manual comparable to the Model CDL Manual to a CDL applicant, so your state's CDL manual likely has similar statements.<sup>17</sup>

To evaluate whether a driver performed thorough pre-trip and post-trip inspections, request hours of service logs and driver vehicle inspection reports. Although federal regulations do not require a minimum amount of time to perform inspections, a trucking industry standard of care expert can explain that a thorough pre-trip inspection should take at least 15 to 30 minutes.

In the case involving the death of John Anderson, the driver whose wheel separated and struck Mr. Anderson logged pre-trip and post-trip inspections that ranged from 1 to 4 minutes on his log reports. The only potential explanation is that he: (1) he falsified his logs and underreported his time, or (2) he performed woefully inadequate inspections. A driver may be tempted to perform shorter inspections or falsify logs because inspections count as "on-duty" time that contribute to maximum hours-of-service calculations. Cutting corners with shorter inspections allows drivers to be on the road to drive longer at the expense of safety.

### SYSTEMIC FAILURES IN MAINTENANCE, TRAINING, AND INSPECTIONS CAUSE WHEEL-OFFS

Discovery and Freedom of Information Act (FOIA) requests focused on a motor carrier's history of violations can be instrumental in showing how systemic failures ultimately result in a wheel separation. A high rate of maintenance violations and vehicles out-of-service reflect inadequate inspections. If thorough inspections were performed, these issues would be fixed before the motor carrier was cited with a maintenance violation or was required to take a vehicle out of service.

The John Anderson case illustrates the importance of requesting these items. A FOIA request to the Federal Motor Carrier Safety Administration revealed that the motor carrier whose wheel-off killed John Anderson had been notified of unacceptably high maintenance violations about a year before John's death. Although requested in formal discovery, the motor carrier did not produce any of this history in litigation. Documents in the FOIA request showed that six months prior to Mr. Anderson's death, the DOT implemented an "intervention" and audited the motor carrier. The DOT concluded that the motor carrier had "systemic failures" and that the violations "probably resulted from company drivers failing to conduct and complete pre- and post-trip inspections." The DOT warned the motor carrier that they needed to implement training to make sure their drivers did more thorough inspections.

The motor carrier's failures in training were evident in the driver's testimony. The driver testified that after the subject wheel was installed, streaks immediately appeared from the

lug nuts. In the four weeks leading up to the wheel-off, he repeatedly power-washed the streaks for aesthetic reasons. The streaks kept returning, but he never re-checked the lug nuts. Due to systemic training and inspection failures, the driver had no idea these red flags posed a lethal risk to others.

### TECHNOLOGY TO PREVENT WHEEL-OFFS

Technology is widely available to aid in identifying loose lug nuts. Lug nut indicators are a low-cost option that allow drivers to visibly identify loose lug nuts quickly. If any indicators rotate out of alignment, this communicates the lug nuts may be loose and should be checked.



Likewise, loose wheel sensors are available that provide drivers real-time warnings of the loss of torquing force.

### CONCLUSION

Wheel-offs are unacceptable, deadly "never events." When wheels separate from a moving vehicle, it is likely due to systemic failures in installation, maintenance, and inspections. It is important to focus on the simplicity of these cases — they should never happen. In addition, adequate inspections should identify wheel-off risks before someone is seriously injured or killed.



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1. For the privacy of the family, their names have been changed.
2. "Basic Commercial Tire Service Training Program Student Workbook." Tire Industry Association, 2010, at 7-1, 7-13.
3. *Id.* at 7-1.
4. "Special Investigation Report. Medium/Heavy Truck Wheel Separation." NTSB/SIR-92/04. National Transportation Safety Board. Sept. 15, 1992.
5. *Id.*
6. "Basic Commercial Tire Service Training Program Student Workbook." Tire Industry Association, 2010, at 6-6.
7. For general information, see "Special Investigation Report. Medium/Heavy Truck Wheel Separation." NTSB/SIR-92/04. National Transportation Safety Board. Sept. 15, 1992.
8. 49 CFR § 396.13 requires a driver inspection before driving the vehicle and be satisfied that the vehicle is in safe operating condition.
9. Data studying this issue is lacking. Baily, M. and Bertoch, J. "Mechanisms of Wheel Separations." SAE International. 2009-01-0111 studied 11 wheel separations from passenger cars, light trucks, and RV's and found that the wheel offs occurred from 200 miles to 2,900 miles after installation. Anecdotal, the wheel that killed John Anderson separated about 4 weeks after installation after the vehicle had been driven 700 miles.
10. Alice Adams: Delmar's Tractor-Trailer Truck Driver Training 4<sup>th</sup> Edition, p. 148.
11. *Id.*
12. "Recommended Practices Manual." Technology and Maintenance Council. 2020-2021, at RP 222D-47.
13. 49 CFR § 396.11.
14. 49 CFR § 392.7(a).
15. "Missouri Commercial Driver's License Manual." Missouri Department of Revenue. Version 4.0, AAMVA All Rights Reserved. Revised May 2021, at 11.2.4.
16. *Id.* at 2.1.3.
17. 49 CFR § 383.131-135; 49 CFR § 384.107.