Liability for Sudden Mechanical Failure on the Highway: A Case in Point

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This Paper has been prepared for general information and is not intended to be relied upon as legal advice.
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LIABILITY FOR SUDDEN MECHANICAL FAILURE ON THE HIGHWAY: A CASE IN POINT

I. PURPOSE AND SCOPE

The purpose of this article is to provide a reference work to the defense attorney retained to defend a trucking company in a personal injury action caused by a sudden mechanical failure of its equipment on the highway. The article will focus on the category of case commonly referred to as a wheel off accident, because of the prevalence and catastrophic nature of this type of case and the writer’s personal experience in one such case.

A multijurisdictional glossary of wheel off cases, both state and federal, is found at the conclusion of this article. The cases are illustrative of how the courts have addressed legal theories, the quantum and nature of proof required to be presented by a plaintiff, and legal defenses available to the defense in such cases.

II. INTRODUCTION

On October 23, 1992 the National Safety Transportation Board (NTSB) issued a Safety Bulletin H-92-102 as a direct result of a “spate of” five truck wheel runoff accidents across the country in which a total of seven people died. The bulletin recognized the following probable contributing factors for heavy truck commercial wheel separations:

1. Wheel separations involving broken studs, lugs or loose nuts most frequently result from the improper tightening of the nuts or the failure to retighten the nuts after initial seating of the fasteners.

2. Under torquing fasteners accounted for 65% of the wheel separations, while 20% resulted from overtightening.

3. Numerous sources identified the failure to follow proper maintenance practices as the primary cause of improper tightening of wheel fasteners.

4. Maintenance manuals utilized by truck and wheel manuals used in the industry were not uniform in content or presentation.
The NTSB concluded its advisory bulletin by recommending the development of a comprehensive service manual to address the above numerous deficiencies.

It should be noted that the NTSB had earlier issued a Comprehensive Special Investigation Report dated September 15, 1992. Under Section 4 of that report entitled “Wheel Separation Causes and Potential Solutions” the NTSB made a comprehensive assessment and evaluation of medium/heavy truck wheel separations. These are but a few examples of findings contained in the report:

1. Maintenance problems appear to stem from several causes; the two major ones being the failure by maintenance personnel to follow recommended procedures and lack of uniformity in carrier/or maintenance guidelines.

2. Nuts on spoke and disc wheels must be tightened in a crisscross pattern. Survey of manufacturers recommended that the lug nuts be initially tightened using a hand wrench until the nuts are snug followed by use of a torque wrench to tighten the nuts to the desired torque.

3. Hub, stud and spoke wheel manufacturers frequently have different torquing requirements and most manuals have an admonition to seek advice when torquing requirements conflict.

4. Large disc wheels generally require from 400 – 550 ft. lb. of torque and that maximum torque varies between 500 and 550 ft. lb.

5. Use of a torque wrench is preferred over an air impact wrench. Some air wrenches deliver more than three times the torque. Over tightening can overstress studs and damages threads causing lug nut failure.

6. A wheel inspection should be performed after the vehicle has traveled 50 – 100 miles after maintenance which involves removing the wheels. On the first trip following the new wheel mounting, parts “seat” and lug nuts become loose.

Although there are no current, available statistics cited herein regarding wheel off incidents involving injury and death resulting from commercial truck wheel separations, industry speculation is that the number has decreased due to the NTSB recommendations and the switch by many trucking companies from stud piloted to hub piloted wheels for the last fifteen or so years.
When wheels come off a commercial truck traveling at a high rate of speed a likely result is catastrophic injury to the motoring or pedestrian public. Proof of negligence is often required. Wheel separation may occur for a variety of reasons, including metal fatigue, product failure, implementation of improper mounting procedures, a failure of periodic maintenance, or the failure to perform an adequate daily inspection of the vehicle. Establishing the proximate cause for such a failure may often prove challenging. Because of what some courts and commentators have characterized as the “unusual nature” of the wheel off genre of case, the doctrine of res ipsa loquitur has been effectively applied to assist injured plaintiffs in successfully meeting the burden of proof in such cases.

Potential defenses in wheel detachment cases, depending on the applicability in a given jurisdiction, may include “the sudden emergency doctrine” or the “sudden mechanical failure” defense—simply stated, that the mechanical problem could not have been discernable or anticipated based upon a reasonable inspection of the vehicle.

III. SUDDEN MECHANICAL FAILURE

A trucking company cannot be held liable for a sudden unanticipated failure of its equipment during operation of its truck, unless such failure was foreseeable. Negligence must be proven by direct or circumstantial evidence in order to establish liability. In the instance of a wheel off accident, the doctrine of res ipsa loquitur may be applicable to establish an inference of negligence under the proper circumstances. In many jurisdictions, it is then incumbent on the defendant to present evidence that it was not negligent in the inspection and maintenance of its vehicle.


IV. PROOF OF NEGLIGENCE

Proof of negligence is often required in order for a plaintiff to establish liability in the instance of a sudden mechanical failure as in a wheel off case. The fact that an accident
occurred, absent the applicability of the doctrine of *res ipsa loquitur*, requires the plaintiff to establish the elements of negligence; namely, a legal duty or standard of care, a breach or violation of that duty, and a showing by a preponderance of the evidence that the breach or violation of that standard of care proximately caused injury.

A recognized leading treatise stated the rule as follows:

The mere fact that an accident or injury has occurred, with nothing more, is not evidence of negligence on the part of anyone . . . what is required is evidence, which means some form of proof; and it must be evidence from which reasonable men may conclude that, upon the whole, it is more likely that the even was caused by negligence than it was not.


V. STANDARD OF CARE

Fundamental to proof of negligence in any case is the establishment of a standard of care which has been violated. This analysis may become complicated in a *wheel off* case.

Among the difficulties that are confronted in such litigation are:

(1) Establishment of the proximate cause for the accident. The precise cause for a wheel disengagement may prove difficult from a forensic standpoint. A bevy of experts may be necessary to assist in that determination. These may include a metallurgist, a truck design engineer, an accident reconstructionist, a certified mechanic, and an individual fully conversant with recommended inspection and maintenance requirements under the Federal Motor Carrier Safety Regulations (hereafter FMCSRs) in the establishment of an industry standard.

(2) The obtainment of historical records establishing repairs and maintenance of the vehicle.

(3) Whether company maintenance and inspection standards were adhered to or violated and thereby proximately caused or contributed to the wheel disengagement.
(4) Whether violations of minimal inspection and maintenance standards under FMCSR were proximate contributing causes of the *wheel off*.

The Federal Motor Carrier Safety Administration has promulgated safety regulations defining standards for commercial vehicle equipment, its inspection, maintenance and repair. These standards establish minimal standards for the trucking industry. Often internal maintenance programs prescribed more stringent maintenance requirements ultimately imposing higher standards for compliance. Adherence to maintenance standards and the formulation of the standard of care in any given case may ultimately become the subject of expert opinion testimony.

Because most *wheel off* accidents have been statistically determined to be caused by the undertorquing, or overtorquing of lug nuts, analysis usually focuses on whether proper mounting procedures have been followed in the mounting of the tire. In that analysis, the following questions should be asked:

(1) What does a forensic examination of the wheel and its component parts reveal?
(2) Who was the person or persons that mounted the tire?
(3) Was that person sufficiently trained in proper mounting procedure?
(4) What equipment was used in the wheel mounting process?
(5) Was a torque wrench or impact wrench used in the tightening of the lug nuts?
(6) Did the individual or individuals mounting the tire apply the correct amount of torque in tightening the lug nuts in accordance with established company rules or manufacturers recommendations?
(7) How many miles had the vehicle traveled since the last scheduled maintenance?
(8) When was the last repair done on the truck, irrespective of whether it required tire or wheel maintenance, if a set of tires had to be pulled in order to access the repair area.
(9) Did the trucking company delegate the responsibility for maintenance to third party vendor or was the maintenance done in house with company employees?
(10) Were the lug nuts checked within fifty to one hundred miles of initial tightening and retorqued to specifications?

(11) Was a torque wrench or an impact air wrench utilized in the tightening of the lug nuts?

(12) Was the torque wrench properly calibrated?

(13) Were the loose lug nuts detectable by the driver during his pre-trip inspection, i.e. were visible signs of rust streaks and other issue of looseness detectible during his walk around before leaving the terminal?

(14) Who was the last individual to put a lug wrench on the lug nuts?

VI. FMCSRs GOVERNING THE REQUIREMENTS FOR AND MAINTENANCE OF VEHICLE EQUIPMENT

Specific regulations govern both the requirements for and sufficiency of component part equipment. The regulations entitled “Parts & Accessories Necessary for Safe Operations,” which are found, in part, at 49 C.F.R. § 393, cover requirements for a multitude of types of equipment and should be consulted when a specific component system is suspected of causing an accident.

VII. TIRES AND WHEELS

Vehicle tires are subject to the requirements of 49 C.F.R. § 393.75, which reads in part:

(a) No motor vehicle shall be operated on any tire that (1) has body ply or belt material exposed through the tread or sidewall, (2) has any tread or sidewall separation, (3) is flat or has an audible leak, or (4) has a cut to the extent that the ply or belt material is exposed;

(b) Any tire on the front wheels of a bus, truck, or truck tractor shall have a tread groove pattern depth of at least 4/32 of an inch when measured at any point on a
major tread groove. The measurements shall not be made where tie bars, humps, or fillets are located; and

(c) Except as provided in paragraph 9(b) of this section, tires shall have a tread groove pattern depth of at least 2/32 of an inch when measured in a major tread groove. The measurement shall not be made where tie bars, humps or fillets are located.

Specific requirements for “wheels” are specifically provided for under 49 C.F.R. § 393.205, which states:

(a) Wheels and rims shall not be cracked or broken;

(b) Stud or bolt holes on the wheels shall not be elongated (out of round); and,

(c) Nuts or bolts shall not be missing or loose.

VIII. REQUIREMENTS FOR INSPECTION, REPAIR AND MAINTENANCE

In addition to specific requirements for equipment, the FMCSR requires directives and standards for inspection, repair and maintenance. 49 C.F.R. § 396, provides specific requirements for inspection, repair and maintenance.

49 C.F.R. § 396.1 places a broad duty of inspection and maintenance, to-wit:

Every motor carrier, its officers, drivers, agents, representatives, and employees directly concerned with the inspection and maintenance of motor vehicles shall comply and be conversant with the rules of this part...

49 C.F.R. § 396.3 requires “every motor carrier shall systematically inspect, repair and maintain, or cause to be systematically inspected, repaired, and maintained, all motor vehicles subject to its control.” Additional requirements are “parts and accessories shall be in safe and proper operating condition at all times.”

49 C.F.R. § 396.11 requires covered drivers to complete at the end of the day a “driver vehicle inspection report” that identifies the vehicle and lists any defects or deficiencies
that would affect the safety of the vehicle’s operation or result in a mechanical breakdown.

49 C.F.R. § 396.13 requires a legible copy of the last vehicle inspection report be carried in the power unit of each vehicle. Before each trip, a drive must review the last vehicle inspection report and be satisfied that the vehicle is in safe operating condition.

49 C.F.R. § 396.17, entitled “Periodic inspection,” requires periodic owner-operator inspection of the vehicle in accordance with the terms of the regulation.

49 C.F.R. § 396.21 details the specific requirements for the content of a written inspection report and requires that the original or a copy of the inspection report be retained by the motor carrier for a period of fourteen months from the date of the inspection report.

IX. VIOLATIONS OF FMCSRs AS NEGLIGENCE PER SE

The doctrine of negligence per se has been utilized in cases involving alleged violations of specific statutes or regulations. In a negligence per se case three essential things must be shown: (1) that the plaintiff belongs to a class that the regulation was intended to protect; (2) that the plaintiff’s injury is the type the statute was designed to prevent; and (3) that the violation of the statute was the proximate cause of plaintiff’s injury. Omega Contracting, Inc. v. Tores, 191 S.W.3d 828 (Tex. 2006); Estate of Hazelton Exrel Hester v. Cain, 950 So.2d 231 (Miss. 2007); Whaley v. Perkins, 197 S.W.3d 665 (Tenn. 2006); Brazier v. Phoenix Group Mgmt., 633 S.E. 2d 354 (Ga. App. 2006); Raymaker v. American Family Mut. Ins. Co., (Wis. Ct. App. 2006).

Violations of federal regulations have been held to be a basis for a negligence per se instruction when the requisite elements of proof have been established. Brandes v. Burbank, 613 F.2d 658 (7th Cir. 1980) (violation of 49 C.F.R. § 392.22 is presumptive negligence); Wallace v. Ener, 521 F.2d 215 (5th Cir. 1975) (violations of 49 C.F.R. §§ 392.22 and § 393.95 are negligence per se); Drawn v. Freeman Truck Line, 456 So. 2d 698 (Miss. 1984) (violations of 49 C.F.R. §§ 391.21 and 392.22 are negligence per se); Teal v. E. I. Dupont de Nemours and Co., 728 F.2d 799 (6th Cir. 1984) (violation of OSHA regulations is negligence per se); Arthur v. Flota Mercante Gran Scentro Americana, S. A., 487 F.2d 561 (5th Cir. 1973) (violation of federal safety regulation requiring hand rail on ladder steps to be negligence per se).

The Texas Supreme Court in the case of Omega Contracting, Inc. v. Tores, 191 S.W.3d 828 (Tex. 2006) provides some useful analysis of the refusal to apply alleged violations of FMCSRs as negligence per se in the context of a wheel off case. In that case, a tractor trailer rig,
whose tire separated from the tractor unit allegedly caused a wreck involving multiple tractor trailer rigs. Plaintiffs allege specific violations of FMCSR’s relating to inspection and maintenance of commercial vehicles. Specifically plaintiffs alleged a failure to comply within FMCSR’s 49 C.F.R. §§ 393.205, 396.3(a) and 396.13. The Texas court specifically refused to apply 49 C.F.R. § 396.205, requiring “nuts or bolts shall not be missing or loose” as an indicator of negligence per se when it reasoned:

[T]he requirement that lug nuts shall not be “loose” does not put the public on notice by clearly defining the required conduct because the regulations do not define the word ‘loose’ nor specify any particular amount of torque.

In this context, the word ‘loose’ is vague and not susceptible to precise meaning. It does not put the public/or in this case the owners, operators, and drivers of commercial vehicles on notice of what conduct is prohibited or required.

[C]laimant is correct in observing that we must give ‘loose’ its ordinary definition of ‘not rigidly fastened or securely fastened,’ but that definition does not make the regulation any more precise. We hold that section 3963.205(c)’s requirement that nuts shall not be loose is not an appropriate standard for applying negligence per se.

Id. at 840.

The court addressed the applicability of §§ 393.3(a), and 396.13 regarding the general requirement of repair to “systematically inspect, repair, and maintain. . .” the vehicle when it reasoned:

Likewise, §§ 393.3 and 396.13 simply require a motor carrier to maintain motor vehicles ‘in safe and proper operating conditions’ and a driver to “[b]e satisfied that a motor vehicle is in safe operating condition.’ Determining what is or is not safe in these circumstances bears practically no difference from what is or what is not reasonable. We hold that §§ 393.3 and 396.13 are not appropriate basis for a negligence per se instruction. The trial court erred by submitting these instructions to a jury[.]

Id. at 840-41 (citations omitted).

X. APPLICABILITY OF THE DOCTRINE OF RES IPSA LOQUITUR
Res ipsa loquitur is a Latin phrase meaning “the thing speaks for itself.” PROSSER AND KEETON ON THE LAW OF TORTS, § 39, at 243 (5th Ed. 1984). When the doctrine is applied, it relieves plaintiff of the requirement of proving specific acts of negligence and permits the jury to infer negligence. Typically, the result is that the plaintiff can establish a prima facie case of negligence and the burden then shifts to the defendant to offer an explanation and evidence to rebut the inference of negligence created. Whether the doctrine of res ipsa loquitur applies at a given situation is usually a question of law is determined on a case by case basis. Curtis v. Lein, 239 P.3d 1078 (Wash. 2010); Pacheco v. Ames, 69 P.3d 324 (Wash. 2003).


XI. CONCLUSION

Wheel off cases present unique problems for the defense practitioner. The proper evaluation and successful defense of these cases requires a thorough understanding of the mechanical parts of a wheel, the proper methodology for wheel mounting and inspection, relevant legal theories and defenses available in such cases, and the statutes and FMCSRs regulating wheel inspection and maintenance.
Glossary of WHEEL OFF Cases
State and Federal


2. **Beier v. Int’l Harvester Co. and Cliff Maki**, 178 N.W.2d 618 (Minn. 1970). Right rear dual wheels sheered off when the lugs became loose. Court directed verdict for defendants – adequate warning in routine mounting manual dismissed. Court also found evidence that the defendant was negligent in failing to undertake to tighten the lug bolts during the 10,000 mile checkup.

3. **Hiigel v. General Motors Corp.**, 525 P.2d 1198 (Colo. Ct. App. 1974). Alleged strict product liability case for alleged failure to warn. The trial court found that plaintiff’s failure to apply proper torque to lug nuts caused them to shear was the proximate cause of the wheel disengagement.


5. **Clayton v. General Motors Corp.**, 286 S.E.2d (S.C. 1982) Wheel separated from 1975 Oldsmobile. Manufacturer sued for strict product liability theory – Court found no liability product defect but that damage to the lug bolts and subsequent wheel separation to be proximately caused by the mechanic’s improper application of torque.


7. **Salter v. Westra**, 904 F.2d 1517 (11th Cir. 1990). Wheels separated from truck rolled upon embankment and hit construction worker. Defendant raised the defense of “sudden emergency” and “mechanical failure or defect”. Jury verdict upheld finding defense inapplicable finding the cause of the accident to be poor maintenance and failure to detect loose lug nuts on inspection.
8. *Golian v. Stanley*, 334 S.W.2d 88 (Mo. 1960). Where an award of damages by jury was affirmed when wheel suddenly came off vehicle. Doctrine of *res ipsa loquitur* affirmed inasmuch as wheel coming off a vehicle is an unusual occurrence.

9. *Holten v. Parker*, 224 N.W.2d 139 (Minn. 1974). Left rear wheel disengaged when lug nuts released and bolt was found snapped off causing truck to cross centerline causing injury to car occupant. Appellate Court held that the trial court erred in instructing jury of doctrine of “unavoidable accident” and held the jury should have been given a *res ipsa loquitur* instruction.

10. *DREJKA v. Hitchens Tire Ser. Inc.*, 15 A.3d 1221 (Del. 2010). Without warning a wheel came off a concrete truck because the lug nuts were stripped and struck a car causing permanent injuries to the occupant. Judgment for the defendant affirmed because there was no proof of improper inspection or that an inspection would have shown that the lug nuts were stripped.

11. *Jones v. Babst*, 323 So. 2d 757 (Miss. 1975). Left rear wheels of truck came off, causing truck to turn over on its side, skid down the highway, ignite and burn. Plaintiff tried to advance strict products liability theory. Improper attachment of the lug nuts was the factor which caused the accident and not the system design utilized by the manufacturer.

12. *Pontello v. Quartz and Dugas, Inc.*, 534 S.W.2d 386 (Tex. Civ. App. 1976). Appellate Court affirmed a jury verdict for the defendant on issue of negligence right rear tire wheel came off truck and truck came to stop blocking both lanes and oncoming car struck it. Expert testimony was advanced indicating lug bolts were improperly tightened. The Court reasoned that there was no evidence presented as to how long such condition existed.

13. *Hoover v. Montgomery Ward*, 528 P.2d 76 (Or. 1974). Negligence and strict liability action for loss of wheel causing accident and injuries to the plaintiff. Plaintiff alleged negligence on the part of the defendant in failure to tighten the lug nuts to the lug bolts on the wheel and failure to inspect the wheel to ascertain if it was properly attached. The court refused to expand the definition of “dangerously defective product” within the theory of strict liability to include the negligent installation of a non-defective product.

14. *Ex parte Crabtree Industrial Waste, Inc.*, 728 So. 2d 155 (Ala. 1988). Wheel came off moving truck causing injuries to plaintiff. The evidence indicated that no one knew the cause of the accident. The Alabama Supreme Court held the lower court in error for applying the doctrine of *res ipsa loquitur* because the truck had been repaired three days earlier and the defendants did not therefore have full management and control of the truck and the time for the relevant period of time.
15. *Omega Contracting, Inc. v. Tores*, 191 S.W.3d 828 (Tex. Civ. App. 2006). Eighteen (18) wheeler wheels weighing 150 – 200 pounds each separated and cross center line causing accident and death of one victim, major injuries to another. Evidence established that wheels fell off because the lug nuts were not securely tightened when the wheels were installed. Significant discussion of Standard of Care Established under FMCSR and the application of negligence per se regarding alleged violations of specific Regulations 49 C.F.R. 393.205, 3496.3, and 396.13 regarding defective equipment, and the duty to inspect.