

UNITED STATES DISTRICT COURT

DISTRICT OF MAINE

BRUCE THORNDIKE and )  
LETITIA N. JORDAN, as next friends of )  
CHRISTOPHER THORNDIKE, )  
a minor, )

Plaintiffs )

v. )

Civil No. 00-198-B-H

DAIMLERCHRYSLER )  
CORPORATION et al., )

Defendants )

**MEMORANDUM OF DECISION ON DAUBERT MOTIONS**

This Memorandum of Decision addresses and disposes of the several Daubert motions currently pending in this matter. In all, there are four such motions addressing portions of the testimony of 10 witnesses. For the underlying facts and claims of this case, reference can be made to my Recommended Decisions with respect to Defendants' summary judgment motions, issued on May 15 and May 21, 2003.

Pursuant to Rule 702 of the Federal Rules of Evidence:

If scientific, technical, or other specialized knowledge will assist the trier of fact to understand the evidence or to determine a fact in issue, a witness qualified as an expert by knowledge, skill, experience, training, or education, may testify thereto in the form of an opinion or otherwise, if (1) the testimony is based upon sufficient facts or data, (2) the testimony is the product of reliable principles and methods, and (3) the witness has applied the principles and methods reliably to the facts of the case.

In Daubert v. Merrell Dow Pharms, Inc., 509 U.S. 579 (1993), the Supreme Court assigned to federal judges the gatekeeping role of screening from introduction in evidence expert testimony

that, although relevant, is nevertheless based on unreliable scientific methodologies. Id. at 597. In General Elec. Co. v. Joiner, 522 U.S. 136 (1997), the Supreme Court explained that a judge exercising this duty must evaluate whether the challenged expert testimony is based on reliable scientific principles and methodologies in order to ensure that expert opinions are not “connected to existing data only by the ipse dixit of the expert.” Id. at 146. The latest Supreme Court pronouncement on Rule 702, Kumho Tire Co. v. Carmichael, 526 U.S. 137 (1999), extended the gatekeeping obligation to all manner of expert testimony that would purport to introduce specialized knowledge or opinion, whether such knowledge or opinion might properly be classified as “scientific” or not. Id. at 147-48. The Kumho Court reiterated that the gatekeeping function is “a flexible one” that “depends upon the particular circumstances of the particular case at issue.” Id. at 150; see also Daubert, 509 U.S. at 591, 594. In this vein, the First Circuit Court of Appeals has stated that “[b]ecause the exact inquiry undertaken by the district court will vary from case to case, the district court need not follow any particular procedure in making its determination.” United States v. Diaz, 300 F.3d 66, 73 (1st Cir. 2002).

It is the proponent of the challenged evidence who carries the burden of proof. That burden is not to prove that his or her expert’s opinion or conclusion is correct, but that “the expert’s conclusion has been arrived at in a scientifically sound and methodologically reliable fashion.” Ruiz-Troche v. Pepsi Cola of P.R. Bottling Co., 161 F.3d 77, 85 (1st Cir. 1998). In meeting this burden, the proponent must not assume that an evidentiary hearing will be held; the trial court has the discretion to decide the motion on briefs and with reference to expert reports, depositions and affidavits on record. Diaz, 300 F.3d at 83-84. Thus, it is incumbent on the proponent to ensure that the record contains evidence explaining the methodology the expert employed to reach the challenged conclusion and why this methodology is a reasonably reliable

one to employ. E.g., Reali v. Mazda Motor of America, Inc., 106 F. Supp. 2d 75, 79 (D. Me. 2000) (“Reali devoted much of his briefing to impugning the methodology employed by, and conclusions of, Mazda’s expert, . . . claiming that [his] methodology was no better. The effort is misguided. The issue presented by Mazda’s motion *in limine* is whether [the] testimony [of Reali’s expert] satisfies the reliability and relevance standards of Daubert and Kumho Tire.”).

## I.

### **DAIMLERCHRYSLER’S MOTION TO PRECLUDE TESTIMONY OF INGERSOLL’S EXPERT PATRICK B. KELLEY CONCERNING THE DESIGN OF THE SPARE TIRE RETENTION SYSTEM**

(Docket No. 112)

Mr. Kelley is Ingersoll’s metallurgy expert. DaimlerChrysler does not challenge Mr. Kelley’s qualifications to testify as a metallurgy expert. Rather, DaimlerChrysler contends that certain opinions Mr. Kelley would offer exceed the legitimate scope of his expertise and are, therefore, not based on specialized knowledge or a reliable scientific investigation. DaimlerChrysler objects to any testimony by Mr. Kelley about the automotive design implications of DaimlerChrysler’s use of a grade 1, 3/8-inch bolt on a floor pan mounted retention system. (Docket No. 112 at 3-4.) According to DaimlerChrysler, these issues fall into the camp of automobile design and engineering, a field that Mr. Kelley has no experience or expertise in. (Id. at 4.) Additionally, DaimlerChrysler complains that Mr. Kelley’s opinion lacks the necessary indicia of reliability because he “did not analyze the extent to which the tire moved or slid on the floor . . . and the resulting bending loads.” (Id.)

Ingersoll responds with an assertion that Mr. Kelley will not offer an opinion about alternative design. (Docket No. 139 at 21.) Instead, says Ingersoll, “he merely has observed basic alternatives that would have prevented the severe bending overload that cause[d] the subject bolt’s failure in this accident”—i.e., an alternative design that incorporates a wheel well.

(Id. at 23.) This sleight of hand is a little too revealing. Unless Mr. Kelley is designated as an expert with respect to the issue of alternative design, he should not offer his opinions on that issue. Because he was not designated on that issue and because Ingersoll's response does not reveal that Mr. Kelley employed any reliable methodology to evaluate the utility of design modifications with respect to the lateral bending forces imparted during the subject collision event, I agree with DaimlerChrysler that Mr. Kelley's testimony should be precluded on this issue. However, Ingersoll also indicates that Mr. Kelley would testify that the subject bolt was not sufficiently strong to withstand the forces at work in the collision and that a grade 1, 3/8-inch bolt is not designed to withstand significant bending loads such as those present in the collision.

(Id. at 21.) To this DaimlerChrysler objects that Mr. Kelley has not performed any tests to determine the bending tolerances of grade 1, 3/8-inch bolts and should not be permitted to testify that such bolts cannot withstand forces of the kind imparted during the collision. (Docket No. 147 at 3-4.) I conclude that DaimlerChrysler's objection has merit to a limited extent. Although Mr. Kelley should be able to testify that the subject bolt failed when subjected to the lateral, bending forces occasioned by the collision and that Ingersoll's grade 1, 3/8-inch bolts are not adequately designed to be loaded in bending, he should not be permitted to offer an opinion that any and all of Ingersoll's grade 1, 3/8-inch bolts would have failed during this accident in the absence of any test of the lateral tolerances of such bolts.<sup>1</sup> The absence of such testing, in my view, constitutes the sort of analytical gap that Daubert was intended to prevent. In contrast, Mr. Kelley's opinion that the bolt was subjected to a "bending load" is informed by the post-collision, S-shaped deformation of the shank of the subject bolt, the deformation of the floor pan and slot in which the bolt was secured, and the bending observed near the edges of portions of

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<sup>1</sup> This is a qualitatively different statement than those made by certain other experts that they would expect, on average, that any given Ingersoll, grade 1, 3/8-inch bolt would fail in such a severe collision. I would not preclude Dr. Kelley from so testifying and it appears that each party has at least one expert who is of this opinion.

the bolt head. Furthermore, Mr. Kelley's opinion that the subject bolt failed to withstand the lateral force to which it was subjected is, in my view, a readily-deductible fact that is supported by evidence of a significant deformation of the bolt in an S-shaped curve and evidence of the bolt failure itself. This "opinion" can be reliably formed from an evaluation of the hard evidence in this case without conducting laboratory tests to determine the precise measure of the lateral force imparted during the collision and the precise limit on the average bolt's ability to withstand such force. Finally, to the extent that the relevant specifications for grade 1, 3/8-inch bolts—and Mr. Kelley's knowledge and understanding of those specifications—inform the question of whether grade 1, 3/8-inch bolts are reasonably expected to have, or actually have, any appreciable wedge tensile strength (a measure of strength in bending, Docket No. 139 at 22), Mr. Kelley should be permitted to address the same.

For the foregoing reasons, I **GRANT, IN PART**, DaimlerChrysler's Daubert motion and preclude Mr. Kelley's "basic, alternative design observations" and his opinion that any of Ingersoll's grade 1, 3/8-inch bolts would have failed in the subject collision.

## **II. PLAINTIFFS' CONSOLIDATED DAUBERT MOTIONS**

(Docket No. 114)

The Thorndikes move to exclude expert testimony by Ingersoll's occupant kinematics expert and accident reconstruction expert and by DaimlerChrysler's accident reconstruction expert, biomedical expert and seatbelt expert. The experts and the targeted testimony are discussed in the order raised by the Thorndikes in their supporting memorandum.

### **A. The Timing Opinions of Jeffrey Wheeler, M.S., and Richard Ziernicki, Ph.D., P.E., and Knott Laboratory's Animations of the Same**

Jeffrey Wheeler is Ingersoll's occupant kinematics expert. Richard Ziernicki is Ingersoll's accident reconstruction expert. Among other aspects of their testimony, Mr. Wheeler

and Dr. Ziernicki together “reconstructed” the collision event and have illustrated their reconstruction in two animations produced by Knott Laboratory: one depicting the movement of the vehicles involved in the collision from various camera angles (the exterior animation) and another depicting Christopher Thorndike’s motion and the spare tire’s motion following the van’s impact with the tractor trailer (the interior animation).

The only basis asserted for excluding the exterior animation concerns its depiction of the van turning slightly to the left immediately before the van and truck collide. The Thorndikes argue that certain gouge marks found in the van’s lane of travel mean that the collision occurred to the right side of the van’s lane, rather than more centrally. (Docket No. 114 at 20.) According to Dr. Ziernicki, this aspect of the animation is based on his evaluation that the passenger-side of the van experienced the most severe crush and that this would most likely occur if the van’s orientation at the moment of impact was angled slightly toward the center of the roadway. (Docket No. 140, ¶ 29.) The Thorndikes’s critique goes toward weight, not admissibility.

Mr. Wheeler’s expertise informed the occupant kinematics portion of the interior animation; Dr. Ziernicki’s the likely movement of the tire. Their contention is that Christopher Thorndike’s “motion during the course of the collision placed his torso in a position where it could not have been struck by the spare tire, based on Knott Laboratory’s analysis of when the tire would have struck the rear bench seat.” (Docket No. 139 at 7.) The Thorndikes’s motion targets (1) the timing aspects of Mr. Wheeler’s and Dr. Ziernicki’s opinions that serve as the premises for this conclusion and (2) the animation that is meant to illustrate primarily this conclusion. Ingersoll’s opposition to this challenge reveals that Mr. Wheeler’s opinion about Christopher’s millisecond-by-millisecond placement relies entirely on an unreliable source.

The Thorndikes narrowly target Mr. Wheeler's opinion about the timing of Christopher's movement because that opinion is based on data drawn from a 1958 collision study (sometimes referred to as the "Severy study") involving different kinds of vehicles traveling at different speeds, bearing adult-sized rather than child-sized dummies, subjecting the dummies to significantly lower G-forces of deceleration (20 G versus 50 G), involving a different angle of impact, and having lap belts made out of different material with presumptively different degrees of elasticity. (Docket No. 114 at 8-14.) Given these discrepancies, they contend that Mr. Wheeler's incorporation of timing data from the 1958 study was an unreliable approach to reconstructing the subject collision. In its opposition, Ingersoll acknowledges that Mr. Wheeler's estimation as to the timing of Christopher's movement during the collision relies on the 1958 study. (Docket No. 139 at 8.) But, says Mr. Wheeler, this study is the "only one extant that measures the movement in time of a lap belted dummy . . . during a frontal collision." (Id.) Mr. Wheeler asserts that his assumptions have also been born out by "the experimental data produced by Dr. Guenther's [first] sled test," discussed below. In my view, the Thorndikes raise several good reasons why Mr. Wheeler's reliance on the 1958 study should not be misconstrued as an application of a scientific methodology. Ingersoll's opposition to the motion does little to overcome this negative impression. (Exh. 196, p. 258.) On balance, although I consider the 1958 study to contain many findings that contribute to the body of expert knowledge on "occupant kinematics," Mr. Wheeler's affidavit provides absolutely no rationale as to why data on the specific timing of occupant motion in the 1958 study can be reliably utilized to recreate a separate collision involving entirely different vehicles, G-forces, speeds, occupants, vectors, etc. (Affidavit of Jeffrey Wheeler, Docket No. 141.) The fact that the 1958 study may contain the only available motion/timing data taken from a staged collision certainly does not support a

finding that that data can be reliably exported into the context of this dissimilar collision. I am forced to agree with the Thorndikes that an analytical gap exists when it comes to explaining why the 1958 collision can be relied upon to supply specific timing data for a recreation of the actual collision event. In the absence of such an analysis, I conclude that the connection is only provided through Mr. Wheeler's ipse dixit and that Mr. Wheeler's opinion about Christopher Thorndike's exact motion in time lacks a reliable scientific basis. This is not to say that every finding contained in the 1958 study is irrelevant or that Mr. Wheeler should be precluded from sharing his knowledge about occupant kinematics or evaluating the first of Dr. Guenther's sled tests. It is only to say that Mr. Wheeler has not pinpointed Christopher Thorndikes's precise position at given time intervals through the application of a reliable methodology and that, therefore, the Knott Laboratory interior animation that would pretend to illustrate the collision with this degree of precision is unreliable and should be excluded.

As for Dr. Ziernicki, the Thorndikes contend that his work to predict the movement of the tire is also unreliable because Dr. Ziernicki was required to speculate concerning the timing of the bolt's failure, the absolute speed of the tire after its release, the absolute speed of the van at that time and its rate of deceleration up until the moment of the tire's impact with the bench. (Docket No. 114 at 13-14.) According to the Thorndikes, these measurements would depend on the strength of the subject bolt, how tightly it was fastened, and the collision pulse curve, none of which can be determined. The specific conclusions targeted in the Thorndikes's motion are the following:

1. The spare wheel impacted the support beam of the rear bench seat at a time on the order of 160 to 175 milliseconds after the initial contact between the van and the semi.
2. The spare wheel separated from the floor of the van at a time on the order of 50 to 70 milliseconds after the initial contact between the van and the semi.

3. Christopher Thorndike was away from the seatback when the seatback was deforming and therefore, no forces were transferred to Christopher Thorndike's body as a result of the seatback deforming during the accident.

(Docket No. 114 at 14, referencing second, fourth and fifth bulleted items in Knott Laboratory's Feb. 14, 2002 Engineering Report at 10.) The engineering report does not indicate the methodology Dr. Ziernicki used to arrive at these conclusions, other than to say that they are "[b]ased on analysis of the motion of the wheel relative to the van" (Knott Laboratory's Feb. 14, 2002 Engineering Report at 10.) The relevant analysis is provided in Dr. Ziernicki's affidavit, Docket Number 140. That affidavit reveals that Dr. Ziernicki's timing reconstruction is founded upon the exercise of engineering judgment about (1) how fast the spare tire must have been moving relative to the bench seat in order to deform the bench seat to the extent it did, (2) whether a triangular crash pulse of a specified length is capable of providing meaningful insight into a crash that involved a pulse characterized by an indeterminate number of peaks and valleys and an indeterminate, though finite, duration; and (3) the rate of deceleration required to break the Ingersoll bolt. With this framework in place, Dr. Ziernicki mathematically computed parameters for what he thinks was the likely timing of the spare tire's release and impact with the bench seat back. The Thorndikes have not pointed to any facts that flatly contradict Dr. Ziernicki's assumptions or conclusions, only certain facts that might permit other assumptions to be drawn.

There is no question but that Dr. Ziernicki's calculations rely heavily on educated guesswork and theory. However, such guesswork falls within the ambit of expert knowledge and scientific methodology and can, if well-articulated, assist the jury in understanding the physics that governed the spare tire's motion. Although exactitude is certainly not available in these matters, the fact finder will only be able to meaningfully consider what is likely, what is

remotely possible and what is out of the question if this kind of testimony is admitted, particularly where the Thorndikes's theory of causation relies heavily on circumstantial evidence and the judgment of a bio-medical expert. Of course, it is not lost on the Court that an expert such as Dr. Ziernicki might predetermine his "conclusions" based on the inputs he specifies, but cross examination is the more appropriate vehicle for exposing that possibility or any of the perceived weaknesses in Dr. Ziernicki's assumptions.

Accordingly, I **GRANT** the Thorndikes's Consolidated Daubert Motion to the extent that it seeks to exclude Mr. Wheeler's conclusion about the precise body location of Christopher Thorndike at given intervals in time and the Knott Laboratory interior animation that would be offered to illustrate the same, but **DENY** the motion to the extent that it seeks to exclude the exterior animation and Dr. Ziernicki's opinions about the parameters of the spare tire's likely motion and the timing of that motion during the collision event. In contrast to Mr. Wheeler's affidavit, Dr. Ziernicki's affidavit provides a meaningful and reliable explanation for why and how his expert judgment was employed, how his judgment was reevaluated through the application of reliable, albeit theoretical, methodologies and, importantly, how his judgment related to the available physical evidence.

**B. Dr. Guenther's Second Sled Test, Offered to Prove that the Spare Tire Could Not Have Impacted Christopher Thorndike's Thoracic Spine During the Collision**

Dennis Guenther, Ph.D., P.E., is DaimlerChrysler's accident reconstruction and mechanical engineering expert. In an effort to prove that the spare tire's impact with the back of Christopher Thorndike's bench seat could not have been the cause of Christopher's internal and spinal injuries, Dr. Guenther conducted two sled tests in which a "sled buck" constructed from an exemplar 1994 Dodge 350 van was subjected to rapid reverse acceleration on a pneumatic accelerometer. The sled buck was designed with an 11° angle that places the rear portion of the

sled, where the spare tire is mounted, in an elevated position relative to the front floor of the sled, where two bench seats are mounted. This angle assures that the tire, when released, will fly forward on a trajectory that will intersect with the back of the second bench seat. Dr. Guenther calculated this angle “by the physical evidence of the location where the loose spare tire contacted the rear bench seat . . . in the accident.” (Exhibit 256, p.1.) For the first test, Dr. Guenther seat belted an anthropomorphic dummy to the passenger-side, second bench seat to model Christopher Thorndike’s likely body movement during the collision event. In the second test, Dr. Guenther repeated the first test, but also fastened a spare tire to the sled buck’s spare tire retention system. During the second test, the spare tire retention bolt released and the spare tire flew forward into the back of the bench seat at roughly the moment of the dummy’s most forward extension. Although the bench seat deformed significantly at the moment of the tire’s impact, it appears that the deformation did not interact with the fully extended dummy. According to DaimlerChrysler, “The results of the tests demonstrate that Christopher Thorndike was flexed forward away from the back of the bench seat at the time of the tire impact and that the injuries he sustained could not have occurred as the plaintiffs allege.”<sup>2</sup> (Docket No. 113 at 3.)

The Thorndikes have moved to exclude the second sled test and to preclude any testimony by Dr. Guenther with respect to the second sled test. They contend that the test is not a fair reproduction of the accident event and, therefore, is neither “relevant nor scientifically reliable.” (Docket No. 114 at 21.) In order for the second sled test to be of assistance to the fact finder, it should be designed in a manner that takes into account the known facts about the actual collision event. See, e.g., Bogosian v. Mercedes-Benz of N. Am., 104 F.3d 472, 479 (1st Cir.

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<sup>2</sup> The tests were captured on video and a copy of the video has been reproduced on a video cassette contained in the Court’s file and labeled Van Sled Testing—Feb. 15, 2002.

1996) (excluding plaintiff expert's theory where it depended on factual assumptions belied by the plaintiff's own testimony); Habecker v. Clark Equipment Co., 36 F.3d 278, 290 (3d Cir. 1994) (holding that a simulation of an accident did not meet the fit requirement because the conditions of the simulation were far different from those existing at the time of the accident), cert. denied, 131 L. Ed. 2d 195, 115 S. Ct. 1313 (1995).

I am not persuaded that Dr. Guenther's decision to run sled tests was itself an unreliable method of reconstructing this accident. Nor am I persuaded that the judgment Dr. Guenther exercised in connection with assigning the pulse curve, duration and peak are a sufficient basis for exclusion. These concerns can adequately be addressed in cross-examination and by critical commentary from opposing experts. Nor am I persuaded that the second sled test has no reliability insofar as informing Dr. Guenther about the possible kinematics of Christopher and the spare tire up until the moment the spare tire struck the bench seat back. However, Dr. Guenther has acknowledged that the spare tire in his second sled test struck about an inch too low on the bench seat back. (Dr. Guenther January 2003 Depo. at 54-55.) Evidence in the record suggests that this deviation may well make unreliable Dr. Guenther's causation opinion and the second sled test video, not to mention unfairly prejudicial.

An observation of the sled test video reveals quite clearly how the forward momentum of the sled buck's spare tire was significantly translated into vertical momentum when the tire ricocheted off the bench seat's horizontal cross-bar, a heavier component of the bench seat's frame. This downward deviation in the primary point of impact not only redirected the tire,<sup>3</sup> but also caused the tire's forward force to be absorbed significantly more by the bench's metal framing member rather than by the lighter-gauge, wire grid that comprises the internal

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<sup>3</sup> The upward rebound also tends to contradict the fact that in the actual collision event the spare tire rebounded backward and was discovered a considerable distance behind the van.

framework of the bench back. Reflecting the significance of this discrepancy, the horizontal framing member in the sled buck's bench seat has a permanent<sup>4</sup> deformation of five and five-eighths inches forward and four and one eighth inches downward, whereas the horizontal framing member in the subject van's bench seat has a permanent deformation of only one and one-half inches forward and one and three-quarter inches downward. (Dr. Guenther January 2003 Depo. at 57-58.) Thus, the horizontal framing member of the sled buck's bench seat absorbed more force than did the framing member in the subject van. In contrast, the subject van's bench back absorbed more force than did the sled buck's. Crash data reveal nine and three-quarter inches of permanent deformation in the subject van's bench seat back in comparison to eight and one-quarter inches in the sled buck's, despite the fact that the sled buck was subjected to two 50 G accelerations. (Id. at 58 (concerning dynamic deformation of test seat during first test); Exhibit 398 (containing deformation measurements).) Dr. Guenther acknowledged that these relatively significant differences between the permanent deformations on the sled buck's bench and the subject van's bench were attributable to the fact that the tire struck too low in the test. (Guenther March 2002 Depo. at 55-59.) Finally, a bolt securing the right side of the subject van's bench back to the bench seat broke during the collision event, but not during the second sled test. (Exh. 398.) Dr. Guenther acknowledged that the failure of this bolt could have changed the "loading configuration" on the bench back and also caused the bench back to travel further forward in the course of the accident.<sup>5</sup> (Guenther March 2002 Depo. at 37-38.)

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<sup>4</sup> In addition to its permanent deformation, the bench seat would have actually undergone a more severe "dynamic" deformation during the accident event. (Dr. Guenther January 2003 Depo. at 58, 63.)

<sup>5</sup> Christopher Thorndike's lap belt was secured to the bench seat's horizontal cross member. When the tire hits this cross member more directly, it forces the entire bench seat forward to a greater degree, which also permits the lap belt restraint to travel forward with the bench seat and its occupant. However, when the spare tire impacts

These facts and Dr. Guenther's acknowledgements certainly call into question whether the second sled test was a reliable simulation capable of assisting the fact finder in its consideration of the causation issue. Although Dr. Guenther maintains that this "slightly different impact position . . . and the slight difference in deformation to the seat back . . . would not materially alter the [post-tire-impact] occupant kinematics" (Docket No. 129 at 6),<sup>6</sup> this assertion is not backed up with any further testing and it is clear that such testing could have been repeated to provide greater insight into the likely extent of dynamic seat deformation. Indeed, in an affidavit submitted in opposition to the instant motion Dr. Guenther asserts that the sled buck's angle was selected as "the most reliable and *repeatable* way to perform the test" and to "*duplicate* [the] impact position." (Aff. of Dennis A. Guenther, Ph.D., P.E., Docket No. 114, Exh. A, ¶ 3 (emphasis added).)

Were I the trial judge in this case, I would hesitate to rule on this motion without the benefit of a hearing. Although the Thorndikes have raised serious cause for concern with respect to this portion of the second sled test and the conclusion Dr. Guenther would draw from it, it also appears that the second sled test has some probative value.<sup>7</sup> For example, it does present a significant amount of dynamic bending in the bench seat, which tends to show how much greater

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more directly with the bench back, the bench back will absorb more energy and will deform into the occupant's seating space to a greater extent, making it more likely that the force of the tire could be absorbed by the occupant.

<sup>6</sup> Dr. Guenther also would testify that the difference is inconsequential because "the center of mass of the tire must have traveled about the same trajectory" and "there was ample penetration of the seat back . . . during the test." (Aff. of Dennis A. Guenther, Ph.D., P.E., Docket No. 114, Exh. A, ¶¶ 3, 4).

<sup>7</sup> Compare Habecker, 36 F.3d at 290:

To that end we note that during the simulation the ramp was pulled away from the trailer instead of moving on its own. There was no operator on the forklift nor was there cargo on the fork. The height of the fork was disregarded and the rearward movement of the forklift was not replicated. Although Wile recognized the velocity of the forklift as an important effect, he made no attempt to duplicate it. The district court held that the attempt at the accident simulation was unreliable. Further, although not stated by the district court, it appears that the evidence from Wile's simulation does not "fit" the facts of this case and would not assist the trier of fact in determining how the accident occurred.

dynamic, as opposed to permanent, deformation can be. But that is not to say that this evidence and the resulting conclusion that Dr. Guenther would offer at trial are not “probably wrong.” Daubert, 509 U.S. at 597. Nor is it to say that this portion of the video would not also be a strong candidate for exclusion pursuant to Rule 403 in addition to Rule 702. Ultimately, I am not convinced that I should enter an order excluding this testimony and the second sled test video at this juncture. While I believe that I have the authority to conduct a hearing to resolve the matter in advance of trial, by virtue of the Court’s referral, I also believe that such a hearing would not be the most expeditious means of moving this case forward to trial, particularly where the exclusion of this evidence will not resolve any of the pending claims. Accordingly, the motion is **DENIED, IN PART**, and **OVERRULED, IN PART**. The issue related to whether the second sled test is a sufficiently reliable methodology to inform Dr. Guenther’s opinion that “the injuries [Christopher Thorndike] sustained could not have occurred as the plaintiffs allege” is preserved for further consideration.

**C. The Biomedical Opinions of Robert M. Banks, B.Eng., M.D.**

Dr. Banks is DaimlerChrysler’s biomedical expert. Dr. Banks would testify that Christopher Thorndike likely would have received severe injuries during the collision event even if he had been wearing a lap and shoulder belt, sometimes referred to as either a type II restraint or a three-point restraint. (Docket No. 129 at 10; Exh. B, p.1.) The purpose of this testimony is unclear from the filings, including Dr. Banks’s report, but appears to be in support of DaimlerChrysler’s contention that Christopher Thorndike would have suffered severe injuries regardless of the spare tire release, given the severity of the accident. The Thorndikes move to preclude this testimony on the grounds that it is speculative and that a young boy seated on the same bench seat as Christopher, who was wearing a type II restraint, did not suffer severe

injuries in the collision. (Docket No. 114 at 32-33.) At his deposition, Dr. Banks conceded that Christopher would not have suffered the same kind of spinal distraction injury he suffered if he had been wearing a type II restraint. (Dr. Banks Depo at 223.) However, Dr. Banks did not testify that Christopher Thorndike would probably have suffered another kind of distraction injury. Rather, he testified that Christopher “may have had another type of distraction stress.” (Id. (emphasis added).) To this, the Thorndikes’s counsel inquired, “But to actually say what other one he would have had would be speculation at this point, would it not?” In response, Dr. Banks stated, “Yes. These . . . hypotheticals always do involve a large element of speculation, but that’s true.” (Id.)

Dr. Banks now asserts by way of affidavit that the issue he was addressing in his deposition was whether he could identify specifically which kind of distraction stress Christopher would have suffered. (Docket No. 129 at 10-11, Exh. B.) This characterization is certainly permitted given the way counsel framed his question. On the other hand, when Dr. Banks refers to “these hypotheticals,” it is hard to understand what he is referencing other than his own expert opinion. Also, Dr. Banks’s deposition testimony was clearly to the effect that a different distraction injury “may” have occurred, not that it “would have probably.” Still more, Dr. Banks’s testimony about what may have occurred if Christopher had been wearing a shoulder restraint seems to disregard entirely the fact that a spare tire struck the back of his bench seat.<sup>8</sup> Rather, Dr. Banks relies, in part, on “published studies that associate severe/serious injuries with crashes of this magnitude.” Nevertheless, Dr. Banks’s reliance on published studies in his field is an appropriate “methodology” for purposes of Daubert because familiarity with such publications forms the basis for expert knowledge and may be shared with

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<sup>8</sup> A viewing of the second sled test video would suggest that being restrained with a type II restraint under the circumstance of this case might not have been an ideal predicament for Christopher.

the fact finder.<sup>9</sup> If there is an issue with this testimony, it does not concern reliability, the sole ground raised in the motion.

The Thorndikes's other challenge to Dr. Banks involves Dr. Banks's testimony about occupant and tire kinematics. They object to Dr. Banks's assertion in his report that "Christopher was most probably in full forward flexion when the seat deformation occurred, and it is therefore unlikely that it played any role in his injuries." According to the Thorndikes, Dr. Banks relies for this conclusion on a paper (SAE paper 880648) that describes the kinematics of an adult-sized crash test dummy involved in a 15 G sled test having an unknown change in velocity and an unknown pulse curve. They understandably challenge the relevance and reliability of such studies in relation to a collision event involving a child in a 50 G collision. (Docket No. 114 at 34.) In response, DaimlerChrysler asserts that Dr. Banks also relied on Dr. Guenther's sled test, without specifying which one, and Newton's laws of motion. (Docket No. 129 at 12.)

I suspect the parties would agree that mere knowledge of Newton's laws of motion is not a sufficient basis for asserting expertise in the field of occupant kinematics. Still, I consider the SAE paper and Dr. Guenther's sled tests to be a reliable foundation for Dr. Banks's expert testimony regarding the kinematics of a lap belted occupant, the location and orientation of such an occupant's thoracic spine at certain time intervals and the timing of the spare tire's release and its likely impact with the bench back. That Christopher Thorndike may have been in full forward flexion at the moment of the spare tire's impact is probative of whether the tire's impact with the bench was the likely cause of Christopher's particular injuries.

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<sup>9</sup> I consider Dr. Banks's reliance on such studies to be different from Mr. Wheeler's reliance on the 1958 crash test study because Dr. Banks is not attempting to create an identity between two (or among several) factually dissimilar events. Rather, he would relate general knowledge that similarly severe accidents often result in similarly severe injury, even in the absence of the spare tire variable.

The balance of the Thorndikes's argument is based on the fact that Dr. Banks's calculations incorporate certain assumptions, including a pulse chart that is triangular in shape. This is similar to the Thorndikes's challenge with regard to the engineering assumptions Dr. Guenther used when conducting his sled tests. In my opinion, Dr. Banks's assumptions raise the kind of concerns that are always present when expert witnesses testify. This concern, in my view, is best addressed in the context of cross-examination and rebuttal expert testimony. Because Dr. Banks's calculations regarding the timing appear to have depended upon the "area below the impulse plot at select points in time," rather than the shape of the plot, the "free particle" and "integration" methodologies employed by Dr. Banks appear to smooth out the differences between a real collision event having multiple pulse spikes and a scientific model employing a smooth sine wave or triangular plot. (Docket No. 129, Affidavit of Robert D. Banks, Exh. B.) This approach is fair, in my view, given the impossibility of mimicking the true pulse plot of the actual collision event. Accordingly, the Thorndikes's Consolidated Daubert Motion is **DENIED** with respect to Dr. Banks's causation opinion.

**D. Ted Weiman—T. R. Weiman Associates**

Ted Weiman is DaimlerChrysler's seatbelt expert. Mr. Weiman has significant experience testifying as an expert with respect to safety restraints and fiber morphology. In this regard he is able to, among other things, determine the position of a latch on a seat belt at the moment a collision occurred. However, among the several opinions that DaimlerChrysler would have Mr. Weiman offer at trial are various opinions that clearly fall into the territory of accident reconstruction, occupant kinematics, biomechanics and medical causation, territories already occupied by other DaimlerChrysler experts. Many of the challenged opinions are unnecessarily duplicative. These opinions include:

- a. That Christopher Thorndike was forward of the seat back at the moment of the spare tire's impact;
- b. That Christopher's injuries are the result of the severity of the accident;
- c. That tire contact in the collision event was greatest on the seat rail;
- d. That the right side of the vehicle saw a completely different accident than the left side did;
- e. That Christopher was not in rebound when the tire came forward; and
- f. That it was impossible for the tire to either directly or indirectly impact Christopher's buttocks.

Moreover, Mr. Weiman's affidavit in support of his expert opinions is virtually silent with respect to how it is that any of these particular opinions are derived from an independent application of his strain of expertise. Indeed, almost without exception, Mr. Weiman simply refers the Court to Dr. Guenther's or Dr. Banks's deposition testimony or to Dr. Guenther's sled tests. I find that DaimlerChrysler fails utterly to explain where methodology is involved here as opposed to simply the parroting of other experts' conclusions. Although Mr. Weiman may certainly incorporate these experts' opinions in order to form his own opinions, I fail to see what extra information or insight emerges as a result of Mr. Weiman's application of his independent expertise.

Among the challenged opinions, however, is one general topic for which Mr. Weiman's expertise may provide some extra assistance to the jury: the nature of seatbelt injuries and the likelihood that Christopher's side and flank injuries were caused by submarining. Although I do not consider Mr. Weiman qualified to opine about the tire's interaction with the seat and with Christopher's thoracic spine, about medical causation generally or about what alternative modality may have caused Christopher's spinal injuries (including the tire), it appears that he has relevant expertise with respect to the nature of seat belt injuries and the likelihood of

submarining under various circumstances and thus has some relevant knowledge to share in connection with this case. Accordingly, I **GRANT, IN PART**, the Thorndikes's Consolidated Daubert Motion with respect to those of Mr. Weiman's opinions listed above at page 18.

### III.

#### **DAIMLERCHRYSLER'S CONSOLIDATED MOTION TO PRECLUDE PLAINTIFFS' EXPERTS' UNSUPPORTED REBUTTAL TESTIMONY**

(Docket No. 113)

DaimlerChrysler has moved to preclude any testimony from the Thorndikes's experts that would tend to call the reliability of the second sled test into question. DaimlerChrysler contends that the Thorndikes's experts are not sufficiently qualified to critique Dr. Guenther's sled test and that their opinions lack relevance and the requisite degree of reliability. (Docket No. 113 at 3-4.) This motion is **DENIED**. DaimlerChrysler's assessment of the degree of expertise that is required to critique Dr. Guenther's sled tests and his underlying assumptions is overly restrictive.<sup>10</sup> It is apparent that the Thorndikes's experts have sufficient collective knowledge, skill, experience, training and education to identify and explain the various weaknesses in Dr. Guenther's sled test methodology.

### IV.

#### **INGERSOLL'S MOTION TO EXCLUDE PORTIONS OF THE OPINION TESTIMONY OF RICHARD H. MCSWAIN AND DENNIS GUENTHER**

(Docket No. 115)

Ingersoll seeks to preclude the Thorndikes's metallurgist, Dr. McSwain, and DaimlerChrysler's accident reconstruction/mechanical engineering expert, Dr. Guenther, from

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<sup>10</sup> In my view, what amounts to sufficient "knowledge, skill, experience, training, or education," Fed. R. Evid. 702, should be liberally determined, as is the practice in the Third Circuit Court of Appeals. E.g., In re Paoli R.R. Yard PCB Litig., 35 F.3d 717, 741 (3rd Cir. 1994). Although I do not take issue with the conclusion or rationale related in Whiting v. Boston Edison Co., 891 F. Supp. 12, 24 (D. Mass. 1995), I do not agree with Daimler-Chrysler's overly narrow definition of the "specific subject" at issue.

introducing their opinions that Ingersoll's bolt did not meet DaimlerChrysler's manufacturing specifications. The targeted testimony of Dr. Guenther is narrow in scope and was previously addressed in my Memorandum of Decision on Ingersoll's motion to strike certain of Dr. Guenther's testimony from the summary judgment record. Although the discussion in that Decision was not addressed to Daubert considerations, exclusion of the subject testimony is warranted for the reasons stated therein: untimely disclosure of an opinion regarding an issue that is beyond the scope of Dr. Guenther's expert designation. However, this is a fine point. There is no reason why Dr. Guenther cannot address the significance of Dr. McSwain's floorpan testing, discussed below, in relation to the estimated amount of force involved in the actual collision event, including how this evidence tends to show that another Ingersoll bolt might have provided more or less restraint than did the subject bolt. This ruling is limited to precluding testimony that the subject bolt did not meet DaimlerChrysler's manufacturing specifications and that a "defect" or "injurious imperfection" caused the bolt to fail.

Ingersoll's challenge with respect to Dr. McSwain concerns two opinions: (1) that a stacked grain structure in the head-neck juncture of the subject bolt amounted to an "injurious imperfection," in violation of DaimlerChrysler's manufacturing specifications, and (2) that such manufacturing defects explain why Ingersoll's bolts break at the head-neck juncture under significantly varied and significantly lower degrees of force than ordinary, off-the-shelf carriage bolts of the same grade and shank diameter. I conclude that it is within Dr. McSwain's expertise to draw these conclusions and that Dr. McSwain's investigation of these issues is founded upon a relevant and reliable investigative methodology.

Among other applicable standards, DaimlerChrysler's agreement with Ingersoll requires Ingersoll to manufacture DaimlerChrysler's retention bolts so that they are "homogenous and

free of injurious imperfections.” Dr. McSwain’s opinion that Ingersoll’s bolt does not meet DaimlerChrysler’s specifications relies entirely on the “homogenous and free of injurious imperfections” language. Ingersoll insists that this standard is meaningless. As indicated in a previously issued Recommended Decision on Ingersoll’s motions for summary judgment, I consider the “homogenous and free of injurious imperfections” language to be ambiguous and, therefore, subject to interpretation and construction by the fact finder. In my view, the fact finder could reasonably conclude that this language has material significance with respect to the claims against Ingersoll. Ingersoll’s other primary argument is that Dr. McSwain’s opinions are meaningless because, pursuant to the products liability “component parts doctrine,” DaimlerChrysler is the sole arbiter of whether or not its manufacturing specifications have been met. Ingersoll sights no authority whatsoever for this novel proposition. (Docket No. 115 at 14-15.) Nothing in the so-called component parts doctrine gives a product designer the exclusive power to determine whether a component part manufacturer has met its manufacturing specifications. This is a question of fact that should be decided by the fact finder based on all the evidence, not just the testimony of DaimlerChrysler’s metallurgist.

As for the actual Daubert issues raised in Ingersoll’s motion, Dr. McSwain’s opinion is that the subject Ingersoll bolt was neither homogenous nor free of injurious imperfections because of the presence of a fold on the underside of the bolt’s head and because of “non-homogenous stacked grains” at the head-neck juncture. In support of this opinion, Dr. McSwain conducted a static load test on exemplar Ingersoll bolts that was designed to reproduce the kind of conditions imposed on the subject bolt during the accident. Dr. McSwain refers to this testing as his “floorpan testing.” (Aff. of Richard H. McSwain, Docket No. 135, Exh. 1, ¶ 9.) Although it is criticized by Ingersoll for being a static rather than dynamic test, I find nothing inherently

unreliable or irrelevant about Dr. McSwain's floorpan testing. When applied to exemplar Ingersoll bolts, floorpan testing revealed "a significant variation in the failure strength of the bolts." (Id., ¶ 12.) Additionally, every Ingersoll bolt tested failed at the head-neck juncture. (Id., ¶ 15.) According to Dr. McSwain, failure in the head-neck juncture "is usually indicative of a defect" because the weakest point in a bolt is typically "the reduced cross-sectional area at the threads." Furthermore, according to Dr. McSwain, failure at the head-neck juncture confirms the expected deleterious effect of having nonhomogeneous stacked grains at the head/neck juncture. (Id., ¶ 16.) According to Dr. McSwain, nonhomogeneous stacked grains is a commonly recognized forming defect in metal bolts. I consider Dr. McSwain's floorpan testing to be a relevant and reliable methodology for forming his opinion that the subject Ingersoll bolt failed to meet the "homogenous and free of injurious imperfections" standard.

Another aspect of Ingersoll's challenge concerns Dr. McSwain's testing of ordinary, over-the-shelf grade 1, 3/8-inch carriage bolts in his floorpan test. Carriage bolts failed at significantly higher levels of force than Ingersoll's bolts. (Id., ¶¶ 14, 15.) According to Dr. McSwain, the carriage bolts were the same kind of bolts that DaimlerChrysler used in spare tire retention systems prior to using Ingersoll bolts. (Id., ¶ 14.) This alone would make the comparison of the ordinary bolts and Ingersoll bolts relevant because it directly implicates DaimlerChrysler's decisions with respect to the design of the bolt component of the system. Additionally, Dr. McSwain asserts that the carriage bolts did not have stacked grains, thus tending to demonstrate the significance of the stacked grain defect present in Ingersoll bolts. (Id.) This aspect of Dr. McSwain's assessment bears directly on the issue of defective manufacture. Ingersoll contends that the comparison of its bolts to carriage bolts is meaningless because its bolts have a larger head diameter and, therefore, the degree of leverage that the test

applied to its bolts was significantly greater than that applied to the carriage bolts. Ingersoll also contends that the poorer performance of its bolts was due to the fact that manufacturing a larger head requires more extensive “cold forming” and results in a “harder, but more brittle, junction at the head and shank.” (Docket No. 115 at 5.) Although meant to demonstrate the failure of the carriage bolt test to fit the facts of the case, this point further reveals the relevance of the carriage bolt testing to the design issue in this case. To these criticisms, Dr. McSwain would respond that it is the stacked grains, not the greater cold forming, that weakened the Ingersoll bolts and that his test offered a meaningful comparison because a washer was placed under the heads of the carriage bolts to account for the different head diameter. (Aff. of Richard H. McSwain, Docket No. 135, Exh. 1, ¶¶ 16, 17.) These competing perspectives, both of which have a certain rational appeal, make it apparent that whatever issues pertain to the carriage bolt comparison, they are issues of weight, not admissibility. Accordingly, Ingersoll’s Motion to Exclude, Docket Number 115, is **GRANTED, IN PART**, with respect to Dr. Guenther’s opinion that the subject bolt contained a manufacturing defect or injurious imperfection or otherwise failed to comply with DaimlerChrysler’s manufacturing specifications.

### **CONCLUSION**

For the reasons stated herein:

*Docket No. 112*

DaimlerChrysler’s Motion to Preclude Testimony of Ingersoll’s Expert Patrick B. Kelley Concerning the Design of the Spare Tire Retention System is **GRANTED, IN PART**, as is related above at page 5.

*Docket No. 113*

DaimlerChrysler's Consolidated Motion to Preclude Plaintiffs' Experts' Unsupported Rebuttal Testimony is **DENIED**.

*Docket No. 114*

Plaintiffs' Consolidated Daubert Motions are **GRANTED, IN PART**, with respect to:

- (1) Mr. Wheeler's "movement in time" opinion and the Knott Laboratory interior animation, as related above at page 10; and
- (2) Mr. Weiman's "parroted" opinions, as is related at pages 18-20.

*Docket No. 115*

Ingersoll's Motion to Exclude Portions of the Opinion Testimony of Richard H. McSwain and Dennis Guenther is **GRANTED, IN PART**, with respect to Dr. Guenther's opinion that the subject bolt did not meet DaimlerChrysler's manufacturing specifications, as is related at page 21 & 24.

CERTIFICATE

- A. The Clerk shall submit forthwith copies of this decision to counsel in this case.
- B. Counsel shall submit any objections to this decision to the clerk in accordance with Fed. R. Civ. P. 72.

***So Ordered.***

Dated June 4, 2003

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Margaret J. Kravchuk  
U.S. Magistrate Judge

**STANDARD**

**U.S. District Court  
District of Maine (Bangor)  
CIVIL DOCKET FOR CASE #: 1:00-cv-00198-DBH  
Internal Use Only**

THORNDIKE, et al v. DAIMLER CHRYSLER, et al  
Assigned to: JUDGE D. BROCK HORNBY  
Referred to:  
Demand: \$0  
Lead Docket: None  
Related Cases: None  
Case in other court: None  
Cause: 28:1332 Diversity-Product Liability

Date Filed: 09/26/00  
Jury Demand: Both  
Nature of Suit: 355 Motor Vehicle  
Prod. Liability  
Jurisdiction: Diversity

**Plaintiff**

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**BRUCE THORNDIKE**

represented by **DORT S. BIGG**  
WIGGIN & NOURIE  
20 MARKET STREET  
P.O. BOX 808  
MANCHESTER, NH 03105-0808  
(603) 669-2211  
*LEAD ATTORNEY*  
*ATTORNEY TO BE NOTICED*

**STEPHEN B. WADE**  
SKELTON, TAINTOR & ABBOTT  
P.O. BOX 3200  
95 MAIN STREET  
AUBURN, ME 04212-3200  
784-3200  
*LEAD ATTORNEY*  
*ATTORNEY TO BE NOTICED*

**LETITIA N JORDAN, As next  
friend of CHRISTOPHER  
THORNDIKE a minor**

represented by **DORT S. BIGG**  
(See above for address)  
*LEAD ATTORNEY*  
*ATTORNEY TO BE NOTICED*

**STEPHEN B. WADE**  
(See above for address)  
*LEAD ATTORNEY*

*ATTORNEY TO BE NOTICED*

V.

**Defendant**

-----

**DAIMLER CHRYSLER  
CORPORATION**

represented by **PETER M. DURNEY**  
CORNELL & GOLLUB  
75 FEDERAL STREET  
BOSTON, MA 02110  
617-482-8100  
*LEAD ATTORNEY*  
*ATTORNEY TO BE NOTICED*

**THOMAS A. NORTON**  
MILLER, CANFIELD, PADDOCK  
& STONE, PLC  
840 WEST LONG ROAD  
SUITE 200  
TROY, MI 48098-6358  
248-879-2000  
*LEAD ATTORNEY*  
*ATTORNEY TO BE NOTICED*

**DAVID W. MCGOUGH**  
CORNELL & GOLLUB  
75 FEDERAL STREET  
BOSTON, MA 02110  
617-482-8100

**Movant**

-----

**COMMERCIAL UNION YORK  
INSURANCE COMPANY**

represented by **MARK G. LAVOIE**  
NORMAN, HANSON & DETROY  
415 CONGRESS STREET  
P. O. BOX 4600 DTS  
PORTLAND, ME 04112  
774-7000  
*LEAD ATTORNEY*  
*ATTORNEY TO BE NOTICED*

**AARON KENNETH BALTES**  
NORMAN, HANSON & DETROY  
415 CONGRESS STREET  
P. O. BOX 4600 DTS  
PORTLAND, ME 04112  
774-7000

**ThirdParty Plaintiff**  
-----

**DAIMLER CHRYSLER  
CORPORATION**

represented by **PETER M. DURNEY**  
(See above for address)  
*LEAD ATTORNEY*  
*ATTORNEY TO BE NOTICED*

**THOMAS A. NORTON**  
(See above for address)  
*LEAD ATTORNEY*  
*ATTORNEY TO BE NOTICED*

**DAVID W. MCGOUGH**  
(See above for address)

V.

**Defendant**  
-----

**INGERSOLL FASTENERS**

represented by **THOMAS C. NEWMAN**  
MURRAY, PLUMB & MURRAY  
PO BOX 9785  
PORTLAND, ME 04101-5085

773-5651  
*LEAD ATTORNEY*  
*ATTORNEY TO BE NOTICED*

**TIMOTHY H. BOULETTE**  
MURRAY, PLUMB & MURRAY  
75 PEARL STREET  
PORTLAND, ME 04104

**IFASTGROUPE INC**

represented by **THOMAS C. NEWMAN**  
(See above for address)  
*LEAD ATTORNEY*  
*ATTORNEY TO BE NOTICED*

**TIMOTHY H. BOULETTE**  
(See above for address)

**Cross Claimant**  
-----

**INGERSOLL FASTENERS**

represented by **THOMAS C. NEWMAN**  
(See above for address)  
*LEAD ATTORNEY*  
*ATTORNEY TO BE NOTICED*

**TIMOTHY H. BOULETTE**  
(See above for address)

**IFASTGROUPE INC**

represented by **THOMAS C. NEWMAN**  
(See above for address)  
*LEAD ATTORNEY*  
*ATTORNEY TO BE NOTICED*

**TIMOTHY H. BOULETTE**  
(See above for address)

V.

**Cross Defendant**  
-----

**DAIMLER CHRYSLER  
CORPORATION**

represented by **PETER M. DURNEY**  
(See above for address)  
*LEAD ATTORNEY*  
*ATTORNEY TO BE NOTICED*

**THOMAS A. NORTON**  
(See above for address)  
*LEAD ATTORNEY*  
*ATTORNEY TO BE NOTICED*

**DAVID W. MCGOUGH**  
(See above for address)

**Cross Claimant**

-----  
**DAIMLER CHRYSLER  
CORPORATION**

represented by **PETER M. DURNEY**  
(See above for address)  
*LEAD ATTORNEY*  
*ATTORNEY TO BE NOTICED*

**THOMAS A. NORTON**  
(See above for address)  
*LEAD ATTORNEY*  
*ATTORNEY TO BE NOTICED*

**DAVID W. MCGOUGH**  
(See above for address)

V.

**Cross Defendant**

-----  
**INGERSOLL FASTENERS**

represented by **THOMAS C. NEWMAN**  
(See above for address)  
*LEAD ATTORNEY*  
*ATTORNEY TO BE NOTICED*

**TIMOTHY H. BOULETTE**  
(See above for address)

**IFASTGROUPE INC**

represented by **THOMAS C. NEWMAN**  
(See above for address)  
*LEAD ATTORNEY*  
*ATTORNEY TO BE NOTICED*

**TIMOTHY H. BOULETTE**  
(See above for address)