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## AUTOMOBILE PRODUCTS LIABILITY LITIGATION.

HARRY M. PHILO\*†

### INTRODUCTION

Less than two years after the 1961 Pontiac Tempest was introduced to the public, the General Motors Corporation was faced with more than one hundred and fifty product liability cases arising from the defective design of the front-end main cross member.<sup>1</sup> With the knowledge that numerous accidents had occurred as a direct result of the car being suspended on railroad tracks, manhole covers, tree stumps, and trolley tracks, the manufacturers were forced to redesign the model before the test year had ended. However, by June of 1965, General Motors again found itself a party to at least one hundred and sixty major lawsuits—this time involving the design of the rear suspension system in the 1960 through 1963 Corvair models.<sup>2</sup> When, in January of 1965, a South Carolina jury returned a verdict of seven hundred eighty thousand dollars (\$780,000.00) against the Ford Motor Company and another defendant upon the claim that Ford had been negligent in its failure to adequately guard the gear shift lever on its 1949 Ford,<sup>3</sup> the concept of automobile products liability became an accepted basis for securing responsibility in negligence cases.

This new approach, involving the legal responsibility of a manufacturer, assembler, processor, or non-manufacturing seller for injury to the person or property of a buyer or third party caused by a defective product, was heralded more than nine years ago by Harold Katz in the *Harvard Law Review*.<sup>4</sup> Five years later, Jeffery O'Connell's new philo-

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1. See "Answers to Interrogatories by General Motors Corporation" in *Latham v. Board of County Road Commission, Oakland County, Circuit Court for the County of Oakland, State of Michigan*.

2. See General Motors "Answers to Plaintiff's Interrogatories" in *Drummond v. General Motors*.

3. See *New York Times*, Jan. 6, 1961.

4. Katz, *Liability of Automobile Manufacturers for Unsafe Design of Passenger Cars*, 69 *HARV. L. REV.* 863 (1956).

sophical approach for lawyers in *Taming the Automobile*<sup>5</sup> reinforced it by a brilliant analysis of the futility of placing the primary responsibility for auto injuries and deaths upon drivers. The new outlook becomes more significant when viewed in conjunction with the charge by *Consumer Reports*<sup>6</sup> that 100% of the 1965 cars which it tested were defective in some way when they left the factory.

Thus, in the last few years, a qualitative and quantitative change in automobile products liability litigation has occurred. The increase in the number of suits can be best illustrated by the hundreds of cases on such an obscure design defect as the front cross member of the Tempest, while the sophistication of the design defect suits involving Corvair models marks the beginning of a full scale assault by lawyers on the auto industry's callous willingness to ignore the national tragedy—the yearly slaughter of 50,000 auto passengers and the disablement of two million other occupants.<sup>7</sup> Coupling the high percentage of defectively-manufactured vehicles with the rising rate of yearly deaths and injuries on the highways, one can reasonably expect a geometric increase in the number of auto products liability suits, now that the straightjacket placed around society by the law is being removed.

This article will discuss only motor vehicle cases, but the principles of products liability apply generally. The reader is advised to consult *Products Liability*<sup>8</sup> and the *American Law of Products Liability*.<sup>9</sup>

### THE RESPONSIBILITY OF LAW FOR SAFETY

In the development of our free enterprise economy, the policy of the law in protecting and nourishing the development of the automobile industry, as well as all industry in general, was a necessity. Thus, manufacturers were protected from tort liability for their defective products by privity restrictions, notice requirements, the defense of contributory negligence, jurisdictional limitations, and workmen's compensation election statutes, buttressed by the reluctance of many courts to submit design negligence cases to juries. However, the days when industry required such protection and the moral climate of the nation favored it have long since passed. A poignant example of manufacturing's economic self-sufficiency today is clearly seen when the fact that General Motors' current sales annually exceed the gross national product of many major countries of the world is considered.

Nonetheless, the natural reticence of the law in correcting the evils of the past continued to free manufacturers from liability. Thus, a nation

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5. O'Connell, *Taming the Automobile*, 58 NW. U.L. REV. 299 (1963).

6. CONSUMER REPORTS, April, 1965, p. 175.

7. NATIONAL SAFETY COUNCIL, ACCIDENT FACTS (1963-64 ed.).

8. FRUMER AND FRIEDMAN, PRODUCTS LIABILITY (Matthew-Bender 1964).

9. HURSE, AMERICAN LAW OF PRODUCTS LIABILITY (Lawyers Co-op 1964).

which limited the liability of the manufacturer had to look elsewhere for the scapegoat of responsibility. Despite the responsibility of negligent design for a high percentage of accidents as well as a great majority of the injuries and deaths, auto safety precautions had emphasized not the promotion of greater safety measures through manufacturing, but rather the nebulous safety practices of the individual driver. "Drive Safely" became not only the slogan but the safety philosophy of the country as well. The idea that accidents are always the individual's own fault was created and perpetuated, becoming a major deterrent to finding safer designs and particularly the development of crashworthy vehicles. Daniel P. Moynihan, Assistant Secretary of Labor, detailed the extent of this paralysis in a recent article.<sup>10</sup> He charged that there are no statistics that will enable us to quickly locate the vehicle defects causing accidents and injuries.

This emphasis on individual responsibility did not develop as a logical conclusion of a safety profession which, unfettered by restrictions, had researched, investigated, studied, catalogued injury statistics, and analyzed the statistics objectively. This conclusion is the combined result of the legal straightjackets which insulated manufacturers from suit and caused safety philosophers to speculate that the slogan "Drive Safely" had caused more injuries and deaths than it ever prevented.

Both the problem and its solution are evident: lawyers as legislators, jurists, advocates, and citizens, must lead the way to a new moral consciousness of the extent of this national tragedy and to its solutions. Attorneys are not without allies today in this endeavor. Federal and state governments, the American Medical Association, the American Society of Safety Engineers, the National Safety Council, universities, ergonomists, liability insurance carriers, church leaders, rehabilitation institutes, and even the industry-dominated American Society of Automotive Engineers, have expressed concern and are eager to contribute aid. However, the ultimate responsibility lies with the personal injury trial lawyer, for the protection and vindication of the injured client's interest will necessarily result in a reduction in the profits of the manufacturer who does not seek and find a safer design in order to eliminate defective production.

The task of the attorney handling personal injury suits is not an easy one. The tort lawyer who becomes an able advocate in this area must become acquainted with the theories upon which liability is predicated. Every law school graduate is familiar with the 1916 landmark decision of Justice Cardozo in *MacPherson v. Buick Motor Co.*,<sup>11</sup> and other theories are also readily apparent. Some, however, are avante-garde and

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10. Moynihan, *The Great Debate*, TRIAL, June-July, 1965, pp. 12-13.

11. 217 N.Y. 382, 111 N.E. 1050 (1916).

require development of multiple fact situations, imaginative investigation and piercing legal research, together with trial skill, before the theory will lead to liability. Theoretically, there are some fifteen basically different approaches to liability. While there is a great amount of overlapping, it is important, as a practical matter, to delineate them, insuring the factual proofs necessary to achieve and sustain a verdict based upon any of these approaches.

### BREACH OF EXPRESS WARRANTY OR IMPLIED WARRANTIES

Manufacturers and dealers enjoy a position of undue advantage over the consumer in contracting for the purchase of a car. The car may be entirely or partially defective which may cause serious injuries or fatalities. The purchaser is usually unable to ascertain whether the car is of merchantable quality or fit for the purpose intended. His knowledge of the defect comes after the accident has occurred, and often this is difficult to ascertain from wreckage. Thus, his only recourse against the dealer and the manufacturers is compensation for any resulting damage to the car. Such a remedy is hardly adequate where the accident has resulted in serious personal injury. In justice, the purchaser should be allowed to recover for damages sustained due to the negligence of the dealer and of the manufacturer.

While it is obvious that the law provides a remedy for one who is injured by reliance on the false assurances of an automobile manufacturer or dealer, the scope of the representations which will result in liability and the legal effect of the attempted limitations which manufacturers seek in express warranties, are not clear. The leading express warranty cases of *Bahlman v. Hudson Motor Car Co.*<sup>12</sup> and *Baxter v. Ford Motor Company*<sup>13</sup> emphasize this dichotomy.

In the *Bahlman* case, plaintiff was injured when his head struck a jagged edge of a welded seam of the roof of his automobile which had rolled over during a collision. The automobile had been advertised as having a "seamless steel roof" in "A Rugged Fortress of Safety". The Michigan Supreme Court held that the plaintiff was entitled to recover compensation for the damages he sustained on the breach of an express warranty theory. Similarly, in the *Baxter* case, the plaintiff was allowed to recover for the loss of an eye when a pebble struck and shattered the windshield of his car which had been advertised as being "so made that it will not fly or shatter under the hardest impact". It should be noted that contributory negligence on the part of the buyer does not operate as a defense to the manufacturer's breach of an express warranty.

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12. 290 Mich. 683, 288 N.W. 309 (1939).

13. 168 Wash. 456, 12 P.2d 409 (1932), *affirmed after retrial*, 179 Wash. 123, 35 P.2d 1090 (1934).

Even in the warranty field, courts in the past have generally been disposed against holding manufacturers liable for faulty design. A typical example is *Chanin v. Chevrolet Motor Co.*,<sup>14</sup> where the plaintiff, injured by the shattering of "safety glass" which was warranted to be unbreakable, was denied recovery. The court held that there was no privity of contract between the plaintiff purchaser of the automobile and the manufacturer which would enable the purchaser to recover on a breach of warranty action. Although the number of jurisdictions which so hold today is fast dwindling, the problem remains in a minority of states and continues to exist as a conflicts of law problem.

It is a common business practice for automobile manufacturers and dealers to provide warranties to the purchasers of new cars for the replacement of certain parts which may malfunction within a specified period of time or within a specified number of miles. However, these warranties include an express warranty limiting the amount of damages recoverable under such warranties solely to the cost of part replacement, specifically excluding all other warranties, either express or implied.

There are presently two distinct and conflicting lines of authority on the question of whether such an express warranty which limits liability and excludes implied warranties is legally binding. The question of privity of contract is, of course, necessarily involved in a breach of warranty action against an automobile manufacturer and dealer.<sup>15</sup> One line of authority which has arisen within the last few years advocates what seems to be the most logical view on this subject. It maintains that an express warranty of this type is unfair to the purchaser and, as a matter of public policy, declares many of its provisions void, including the provision which eliminates all implied warranties and the provision which secures the value of the defective part as the sole measure of damages.

The leading case on the public policy theory is the 1960 case of *Henningsen v. Bloomfield Motors Inc. and Chrysler Corporation*.<sup>16</sup> There plaintiff sued both the dealer and the manufacturer on two counts: negligence and breach of an implied warranty of merchantability. The contract of sale included the uniform new-car warranty, applicable alike to both the manufacturer and the dealer, limited to the replacement of defective parts, and expressly stated to be "in lieu of all other warranties, express or implied, and all other obligations or liabilities". Although the cause of action for negligence was dismissed, the case was submitted to the

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14. 89 F.2d 889 (7th Cir. 1937).

15. See *B. F. Goodrich v. Hammond*, 269 F.2d 501 (10th Cir. 1959), which involves the implied warranty of merchantability on an auto tire. Professor Thomas Lambert, the brilliant editor of the *JOURNAL OF THE AMERICAN TRIAL LAWYERS ASSOCIATION* has forever buried any arguments for privity in products cases. See Lambert, *Crumbling of the Citadel; Strict Liability in Advertised Product Cases*, *INSURANCE LAW JOURNAL* (Feb., 1963).

16. 32 N.J. 358, 161 A.2d 69 (1960).

jury on the issue of breach of implied warranty. When a verdict was rendered against them, defendants appealed directly to the Supreme Court of New Jersey.

In a long and well-reasoned opinion, extensively reviewing the subject of implied warranties upon the sale of new automobiles in the light of modern marketing practices, the judgments were affirmed by the Supreme Court. Calling attention to the complete dependence of the buyer upon the manufacturer, the court held that justice required that the manufacturer and the dealer be charged with an implied warranty in favor of the ultimate purchaser, regardless of the lack of privity of contract or the existence of an express warranty. Such an implied warranty was held to exist despite the limitation of liability provision of the express warranty, which was held to be void as against public policy. The unexplained accident, in which the car unexpectedly careened out of control when the steering wheel did not function, was held as sufficient evidence to sustain recovery on the implied warranty. The court also held that the warranty ran in favor of the purchaser's wife or anyone using the car with his consent, even though not a party to the contract of sale.

Another example of the public policy cases is *General Motors Corp. v. Dodson*,<sup>17</sup> also decided in 1960. The facts of this case involve an Oldsmobile car which plunged into a ditch because of defective brakes. The accident had occurred despite the efforts of the dealer to repair the brakes while the usual automobile warranty was in effect. Uncontroverted evidence of defective brakes was manifested by the General Motors organization by an admission to this effect in a bulletin sent to dealers concerning the 1954 model. The court held that an implied warranty of merchantability existed under the Uniform Sales Act, which had been adopted and integrated into the statutory law of Tennessee. The court stated that the implied warranty was not inconsistent with the express warranty under the Uniform Sales Act.

A third case based on public policy is *State Farm Mutual Automobile Insurance Co. v. Anderson-Weber Inc.*,<sup>18</sup> in which the motor of a new Mercury automobile caught fire after being driven only 300 miles. Plaintiff's witness testified that the fire was caused by defective wiring.<sup>19</sup> Since Iowa had also adopted the Uniform Sales Act, the court held that an exclusionary express automobile warranty did not exclude an implied warranty and, therefore, allowed recovery. The court remarked that the case squarely involved warranty, and that the case should go to the jury on circumstantial evidence.

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17. 47 Tenn. App. 438, 338 S.W.2d 655 (1960).

18. 252 Iowa 1289, 110 N.W.2d 449 (1961).

19. Defendant attempted to rebut this by showing that the fire might have arisen from adulterated gasoline.

In contrast to this somewhat limited number of cases holding the automobile dealer's and manufacturer's express warranty to be void in limitations of damages and in the exclusion of implied warranties, the number of cases holding that strict effect is to be given to the terms of an express warranty excluding implied warranties or limiting recoverable damages is legion. Some of these cases, although recognizing the inequalities of the situation from the buyer's standpoint, have remarked that correction of the evil is a legislative and not a judicial duty.

It has been generally stated by the majority view<sup>20</sup> that an express warranty may arise from an oral or written affirmation of the quality of the vehicle (as distinguished from mere expression of opinion) made to induce the buyer, and in fact, inducing him to purchase, but that the measure of responsibility of the seller of an express warranty is limited to the actual terms of that warranty. It should be observed that in the three above-mentioned cases from New Jersey, Iowa, and Tennessee, the plaintiff clearly proved by expert opinion that a defect existed in the automobile and that there had been no external force present. In those states which have adopted the Uniform Commercial Code, an injured party may recover on a breach of implied warranty theory where the contract of sale does not specifically exclude a warrant of merchantability. It is strongly urged that more states adopt the public policy approach taken by the New Jersey courts, prohibiting automobile manufacturers from expressly negating liability for breach of implied warranties of fitness and merchantability.<sup>21</sup>

### COMMON LAW NEGLIGENCE

It is probably more than coincidental in our mechanized society that the modern rule placing an affirmative duty on the part of a manufacturer was promulgated in an automobile products liability case, *MacPherson v. Buick Motor Co.*<sup>22</sup> This case involved an action against the manufacturer of an automobile for injuries sustained as a result of a defective wheel. The case propounded what subsequently came to be the generally accepted *Restatement of Torts*<sup>23</sup> rule, that a manufacturer is liable for harm caused by one using the product in a reasonably foreseeable manner, if the manufacturer had failed to exercise reasonable care or if the product involved an unreasonable risk of harm to the one injured while using it for the purpose for which it was manufactured. This duty also extends to those who the supplier should expect would be in the vicinity of use.

This article will attempt to particularize the kinds of common law

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20. See, e.g., *Payne v. Valley Motor Sales, Inc.*, 146 W. Va. 1063, 124 S.E.2d 622 (1962).

21. See, e.g., *Greeno v. Clark Equipment Co.*, 237 F. Supp. 427 (N.D. Ind. 1965).

22. *Supra* note 9.

23. 2 RESTATEMENT, TORTS § 398 (1934).



negligence by enumerating the various divisions to which the courts have referred.

### *Drawing Board Design Errors*

A lack of due care at the drawing board can and does result in liability. *McKinney v. Frodsham*<sup>24</sup> is an interesting case illustrative of such error at the drawing board level. In *McKinney*, the action was successful against a Volkswagen dealer for injuries sustained by a five-year-old passenger who fell part way through the door of the automobile as it was rounding a curve. Plaintiffs proved to the satisfaction of the jury that the door latch assembly, defectively designed because the door appeared to be completely closed when it was not, allowed the door to be opened with slight force due to the shape of its component parts.

The most publicized drawing board error cases are those involving the negligent design by General Motors of the rear suspension system in the 1960 through 1963 Corvair automobiles. Plaintiffs in hundreds of claims and lawsuits have alleged that the basic design of the vehicle did not provide sufficient cornering force for side force or lateral acceleration which was reasonably to be expected during a multitude of emergency situations in the life of a car. It is claimed that this defect caused the vehicle to veer out of control and even to roll over at relatively low speeds as well as during throughway acceleration.<sup>25</sup> *Carpini v. Pittsburg & Weirton Bus Company and General Motors Corporation*<sup>26</sup> is a classic example of drawing board error. On appeal, the Third Circuit Court of Appeals affirmed a jury verdict in favor of bus passengers against General Motors for the negligent placement of a petcock which, when damaged by loading, permitted air to escape, causing the braking system to fail.

### *Failure to Install Adequate Safety Devices*

The theory upon which there is presently the greatest liability is the negligent failure to install adequate safety devices. A manufacturer charged by law to use due care must use such safety devices as reasonable prudence dictates. This is not an easy task, however, for safe design and manufacture of a motor vehicle is a very sophisticated undertaking. It requires research, investigation, injury and accident statistics, and analysis of those statistics by trained personnel.

A primary principle in tort litigation is that safety is much more than common sense. A prime example of this principle is the question of the desirability of using seat belts. Tens of thousands have been killed and hundreds of thousands have been maimed because of the failure of the

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24. 163 Cal. App. 2d 393, 329 P.2d 605 (1958).

25. While there have been no appellate decisions involving this problem as of this writing, one case has been settled, three large default judgments against General Motors were rendered, and General Motors has been successful in two jury decisions.

26. 216 F.2d 404 (3d Cir. 1954).

automobile manufacturers to install seat belts as standard equipment. It is no answer to say that seat belts were available as optional equipment and that the buyer was equally derelict in failing to purchase this optional equipment, for if the general public had had a fraction of the knowledge of the vehicle manufacturers concerning the necessity of using seat belts, few automobiles would have been purchased after 1959 which did not include belts on front and rear seats.

What has been said about seat belts applies also to the installation of safety glass, padded dash and visors, safety tires and rims, back-up lights, recessed instrument panels, impact-absorbing steering wheels and columns, and safety door latches and hinges. Few American automobiles have both directional stability and yaw oscillatory stability which includes the desirable safety factor necessary for the foreseeable emergency uses of the vehicle. General Motors, Ford, and Chrysler have announced that many of these safety devices are standard equipment for the 1966 cars.<sup>27</sup> The question must be asked: If due care requires that this equipment be standard rather than optional in 1966, did not some, if not all, of the automobile manufacturers have sufficient test data to have made these devices standard as early as 1960? The answer is inherent in the question: due care has required that these devices should have been standardized several years ago. The change was brought about only by the development of products liability litigation and a resulting pressure by federal and state governments.

An attorney who represents the estate of an automobile accident victim or whose client has sustained injury as a result of an automobile accident may be derelict in his duty to his client if he fails to investigate the possibility of, or does not adequately present evidence at the trial to establish, a cause of action arising from the failure of the manufacturer to install a safety device which would have prevented the injury or resulting death. A typical example is *Ulwelling v. Crown Coach Corporation*.<sup>28</sup> There, plaintiff contended that the school bus in which the driver and several minor children were killed should have had an emergency braking system as a safety device. Defendant's presentation relied upon the custom of the industry, which did not require the installation of such equipment. Plaintiff should have offered testimony that federal law prior to 1951, when the bus was manufactured, required dual braking systems for commercial vehicles. Opinion testimony to the effect that the whole industry was negligent should have been brought forth. Again, lack of sufficient proof resulted in a verdict for defendant manufacturer in *Saeter v. The Harley Davidson Motor Company*.<sup>29</sup> The reviewing court upheld the defenses of assumption of risk and contributory negligence only after

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27. See New York Times, July 28, 1965, § C, p. 12.

28. 206 Cal. App. 2d 96, 23 Cal. Rptr. 631 (1962).

29. 186 Cal. App. 2d 248, 8 Cal. Rptr. 747 (1960).

inadequate proof by plaintiff was submitted to show that a "damper", a device for producing friction in the kingpin or spindle to prevent wobbling or shimmy at high speed, had no adequate safety device to lock the damper knob in set position.

#### *Employment of Devices Which Failed in Use*

A theory of liability requiring simpler proof maintains that the defendant was negligent in manufacturing a vehicle with a safety device which failed in use. The Supreme Court of Arkansas in the case of *Land v. International Harvester*<sup>30</sup> affirmed a verdict on this precise theory. The instrumentality involved was constructed in such a manner that when the cab of the truck was raised by a hydraulic jack, the plate of the safety mechanism, installed to keep the cab from falling on those nearby, occasionally failed in use. The opening in the floor of the cab had been fashioned so narrowly that it would not accommodate the free passage of the floor past a particular bracket. The well-respected Arkansas Court recognized the duty of the manufacturer to keep reasonably abreast of scientific knowledge and discoveries related to his product and of the techniques and devices required to make his product safe for the foreseeable use. Thus, brake line failures, seat belt breaks as a result of defective seat belt moorings, and defective safety door latches and hinges, should provide the bases for substantial personal injury litigation.

#### *Failure to Make a Test or Safety Check After Manufacture*

*Consumers Report* attributes its finding that 100% of the vehicles which they tested had left the factory in defective condition to the unrelenting ambition of the automobile industry to achieve increased productivity.<sup>31</sup> It is an almost daily occurrence for inspectors to be eliminated by inept time-study men or for inspectors to replace production workers who fail to report for work. Quality control standards are almost always sacrificed when assembly line production quotas would otherwise suffer. The line of authority in the automobile plants places the unit superintendent responsible for production in a supervisory position over the quality control foreman. Quality is invariably sacrificed in this unequal battle. Many accidents have arisen not only from a failure to test a particular part of the automobile but also from a failure to inspect the entire product. It is obvious that a general safety check of the 1961 Pontiac Tempest<sup>32</sup> would have discovered the defect which drivers experienced when they attempted to drive upon railroad tracks.

A jury verdict against General Motors was affirmed in *Grant v. Walkerson Sales Inc.*,<sup>33</sup> submitted by the lower court for resolution of a fact

30. 234 Ark. 682, 354 S.W.2d 19 (1962).

31. CONSUMER REPORTS, April, 1965, p. 175.

32. See note 1, *supra*.

33. 259 Minn. 419, 108 N.W.2d 347 (1961).

question as to whether or not a necessary cotter pin had been in the bell crank when the vehicle left the assembly line. The court's opinion was explicit in stating that an automobile buyer is not required to produce positive proof that the car was defective when it left the factory. The jury was entitled to infer negligence from later erratic drive and an absence of the cotter pin some thirty days after purchase.<sup>34</sup>

#### *Construction from Unsafe or Unsuitable Materials*

It is well established that a manufacturer must use due care in selecting construction materials and, therefore, must use suitable and safe materials. As early as 1930, the Sixth Circuit Court of Appeals reversed a lower court's directed verdict for defendant in *Goullon v. Ford Motor Co.*,<sup>35</sup> where the plaintiff had presented evidence which demonstrated that a circular rim, connecting the outer ends of the spider arms in a tractor steering wheel, was constructed of material with a tensile strength less than that needed for safe use. In *J. I. Case Company v. Sandifur*,<sup>36</sup> the trial court made a special finding that the defendant company failed to use lumber of the proper type and strength to hold the screws for hinges on a brace designed to support a lid over an augur and that this negligent construction permitted the plaintiff's foot to become entangled in the augur.

#### *Plans for Manufacturing Which Lead to a Defective Product*

A product may be adequately designed and the component parts produced and inspected without noticeable defect. In the manufacturing process, however, a properly heat-treated spring assembly may become defective because of a subsequent welding operation; a slight tolerance variation in the interrelation of parts may create a defective assembly. The chief issue in *Clark v. Zuzich Truck Lines*,<sup>37</sup> involved the manufacturing process of a ball stud, a vital part of the steering mechanism. The plaintiff's expert convinced the jury that the uniform strength and toughness of the metal of the shank of the stud was destroyed when it was heated and tempered by the defendant's procedures. Plaintiff successfully

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34. Other auto cases involving negligent testing and inspection include: *Northern v. G. M. Corp.*, 2 Utah 2d 9, 268 P.2d 981 (1954); *Elliot v. G. M. Corp.*, 296 F.2d 125 (7th Cir. 1961); *Smith's Admr. v. Ford Motor Co.*, 202 Ky. 706, 261 S.W. 245 (1924); *Samaha v. Southern Rambler Sales, Inc.*, 146 So.2d 29 (La. App. 1962); *Hofsted v. International Harvester Co.*, 256 Minn. 453, 98 N.W.2d 808 (1959); *Pierce v. Ford Motor Co.*, 190 F.2d 910 (4th Cir. 1951); *Sutton v. Diimel*, 55 Wash. 2d 592, 349 P.2d 226 (1960); *Ford Motor Co. v. Arquello*, 382 P.2d 886 (Wyo. 1963); *International Harvester Co. v. Sharoff*, 202 F.2d 52 (10th Cir. 1953); *Livesley v. Continental Motors Corp.*, 331 Mich. 434, 49 N.W.2d 365 (1951); *Ford Motor Co. v. Zahn*, 265 F.2d 729 (8th Cir. 1959); *General Motors Corp. v. Johnson*, 137 F.2d 320 (4th Cir. 1943); *Necaise v. The Chrysler Corp.*, 335 F.2d 562 (5th Cir. 1964).

35. 44 F.2d 310 (6th Cir. 1930).

36. 197 N.E.2d 519 (Ind. 1964).

37. 344 S.W.2d 304 (Mo. 1961).

contended that the ball stud should have been so constructed as to overcome this defect.

*Failure To Plan for Foreseeable Uses Which Were Unintended  
by the Manufacturer*

Liability of a manufacturer for injuries caused by its product does not depend upon a finding that the manufacturer should have foreseen the precise manner in which a person might be injured. Nor is it necessary for the plaintiff to show that the buyer utilized the product in the manner intended by the manufacturer. It is sufficient that the use be a foreseeable one even though unintended.

For example, the court in *Calkins v. Sandven*<sup>38</sup> rejected the major argument advanced by the defendants that their design of a wagon Grain-O-Vator was sufficient to guard against reasonable probability of harm to users. Plaintiff had sustained injuries as a result of stumbling on nearby ground, catching his hand in a six-inch opening of the wagon; defendants maintained that this use of the wagon was unintended as a foreseeable use. The court held that it was reasonably foreseeable that someone might be hurt by the defendants' failure to guard the opening and that it was irrelevant that the injury occurred during an unintended use.

*Failure to Foresee Consequences of Ordinary Wear and Tear and  
Improper Maintenance on the Part of the User*

Station wagon and rear engine car models for which an appreciably lower front tire inflation is specified as compared with the rear tires are in wide use today. Auto safety engineers have serious doubts about whether owners or nondescript service station attendants are aware of the importance of maintaining recommended pressures, for a reversal of tire pressures can have disastrous effects on vehicle stability. It is the duty of the manufacturer to foresee this improper maintenance.

The Supreme Court of Minnesota in *Rosin v. International Harvester Co.*<sup>39</sup> concluded that a jury question was presented as to whether a manufacturer should have anticipated, in the exercise of reasonable care in manufacture and design, that a rear axle assembly inner seal might fail with wear, allowing oil to flow into the rear wheel assembly and cause brake failure. The theory of liability in *Ford Motor Co. v. Wagoneer*<sup>40</sup> involved the Ford Motor Company's failure to foresee that a severe jarring or jolting of a particular model Ford would cause the hood to spring loose, obstructing the vision of the driver.

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38. 129 N.W.2d 1 (Iowa 1964).

39. 262 Minn. 445, 115 N.W.2d 50 (1962).

40. 183 Tenn. 392, 192 S.W.2d 840 (1946).

### *The Addition of an Unnecessary Part to the Product*

The frequent Stapp Automotive Crash and Field Demonstration Conferences at various universities have done much to examine vehicle safety. At the Fifth Stapp Conference at the University of Minnesota in 1961, Henry Wakeland, an automotive safety consultant to the United States Senate and the New York legislature, delivered an extremely important paper entitled, "Systematic Automobile Design For Pedestrian Injury Prevention".<sup>41</sup> The theme of this address was that much of the maiming in pedestrian accidents results from unnecessary ornamentation which causes piercing injuries and death.

There have been but two appellate cases involving this theory, both brought by minor children who sustained injury after running into parked cars.<sup>42</sup> Neither court was willing to submit the case to a jury, although the rationale of the *Calkins* case seems applicable. A late federal case, *Elliot v. General Motors Corp.*,<sup>43</sup> featured the addition of an unnecessary splash pan designed with a sharp edge. The Seventh Circuit Court of Appeals, reversing a lower court's dismissal of the complaint, maintained that the jury should have determined defendant's liability based upon a consideration of the necessity of this equipment.

### *Failure to Measure Up to Industry Standards*

Evidence that a manufacturer failed to comply with industry customs or standards is pertinent to the issue of lack of due care. Conversely, the law presently allows admission of evidence by the manufacturer that it conformed to the custom and standards as some proof of due care.<sup>44</sup> It is well to keep in mind that the *Clark* case<sup>45</sup> turned basically on the testimony of plaintiff's expert that the defendant failed to follow the production methods recommended in the *Standard Automobile Engineers' Handbook* and that this failure resulted in plaintiff's injury.

### *Failure to Keep Abreast of Scientific Knowledge When the Entire Industry Is Negligent*

General Motors Corporation, the world's largest automobile manufacturer, had, until recently, only one automotive safety engineer. It had no check and control procedures for ascertaining whether or not the scientific and engineering discoveries or advances made by one unit of

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41. Wakeland, *Systematic Automobile Design for Pedestrian Injury Prevention*, PROCEEDINGS OF THE FIFTH STAPP AUTOMOBILE CRASH AND FIELD DEMONSTRATION CONFERENCE, Sept. 14-16, 1961.

42. *Kahn v. Chrysler Corp.*, 221 F. Supp. 677 (Tex. 1963); *Hatch v. Ford Motor Co.*, 163 Cal. App. 2d 393, 329 P.2d 605 (1958).

43. 296 F.2d 125 (7th Cir. 1961).

44. See generally, 2 WIGMORE, EVIDENCE §§ 451, 461 (1940, Supp. 1964).

45. *Supra* note 35.

the company were utilized by any other unit.<sup>46</sup> In general, all of the automobile manufacturers have been grossly negligent as far as failing to provide needed research. A few months before the Corvair was introduced to the general public, Maurice Olley, one of the foremost suspension engineers in the world and, until recently, Director of Research for Chevrolet Engineering and consultant to General Motors, described the danger of the Corvair-type suspension geometry in what has to be one of the most bizarre warnings in history. In the application for U. S. Patent No. 2,911,052, entitled, "Independent Rear Suspension For Vehicles",<sup>47</sup> granted two months after the Corvair hit the market, Olley reiterated what had been his outspoken position for many years:

In particular the ordinary swing axle, under severe lateral forces produced by cornering, tends to lift the rear end of the vehicle, so that both wheels assume severe positive camber positions to such an extent that the vehicle not only "oversteers" but actually tends to roll over. In addition, the effect is non-linear and increases suddenly in a severe turn, thus presenting potentially dangerous handling characteristics.

Almost simultaneously, Robert Kohr of General Motors Research, writing for the *General Motors Engineering Journal* issue of April-May-June of 1959,<sup>48</sup> cautioned manufacturers that as of June of 1959 there was insufficient research to determine automobile control and stability in an emergency situation. Nonetheless, General Motors produced the Corvair despite these warnings and lack of research. Unfortunately, Corvairs have been involved in thousands of out-of-control and roll-over accidents since that date.

What is said for General Motors applies similarly to other automobile, truck, and farm vehicle manufacturers. They have, since the creation of workmen's compensation liability, performed an outstanding task in bringing safety to the automobile factory, reducing the injury rate to approximately one per million man hours. They have employed some of the most competent industrial safety experts to limit their workmen's compensation liability to a rather minute hourly sum per worker. Since they faced no comparable products liability, they have sacrificed safety in the vehicles they produce.

The teaching of Judge Learned Hand in the *T. J. Hooper* case<sup>49</sup> is, therefore, important:

There are, no doubt, cases where courts seem to make the general practice of the . . . [industry] the standard of proper

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46. See deposition testimony of K. Stonex, *Anderson v. General Motors Corp.*

47. U.S. Patent No. 2,911,052, Olley, issued Nov. 1959, to General Motors Corporation.

48. Kohr, 6 *GENERAL MOTORS ENGINEERING JOURNAL* (April-May-June, 1959).

49. 60 F.2d 737 (2d Cir. 1932).

diligence; we have indeed given some currency to the notion ourselves. . . . Indeed in most cases reasonable prudence is in fact common prudence; but strictly it is never its measure; a whole calling may have unduly lagged in the adoption of new and available devices. It never may set its own tests, however persuasive be its usages. Courts must in the end say what is required; there are precautions so imperative that even their universal disregard will not excuse their omission.<sup>50</sup>

The plaintiff's attorney should approach each case with the assumption that the entire automobile industry has been negligent in gathering statistics, researching and testing, analyzing test results, and formulating and executing quality control procedures and follow-up procedures for analyzing the causes of accidents involving new models and warnings to customers. A case should not be lost for lack of expert testimony that the whole industry was negligent. The jury is not bound by industry standards and may well conclude that indeed the entire industry was lax in its duty.

*Failure to Warn of the Dangers Arising from Defective Design*

The duty to warn of a known danger inherent in a product or in its contemplated use has long been a part of the manufacturer's liability doctrine. The duty to warn which exists at the time of the sale is not exclusive; there is also a duty to give prompt warning when a latent defect which makes the product hazardous to life becomes known to the manufacturer shortly after the product has been put on the market. This duty goes beyond giving notice to its dealers and requires that all purchasers and possibly subsequent purchasers of second-hand vehicles be informed.

The leading automobile products liability case concerning the failure to warn theory is *Comstock v. General Motors Corp.*<sup>51</sup> The *Comstock* case involved Buick power brakes with a defective part. General Motors had had ample warning of a serious problem concerning their 1953 Buick power brakes long before the brakes involved in *Comstock* failed. Although General Motors warned its dealers, it failed to notify those into whose hands they had placed this dangerous instrument and, more important, those whose lives depended upon defective brakes which might fail without notice. In a unanimous and scholarly opinion, written by Justice George Edwards, the Michigan Court held that these facts imposed a duty upon the defendant to take all reasonable means to convey an

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50. *Id.* at 740.

51. 358 Mich. 163, 99 N.W.2d 627 (1959). *Comstock* is also the leading American case on whether an intervening cause may become a superceding cause. The court concluded that an intervening cause becomes a superceding cause to the original tortfeasor's negligence only when the intervenor's act is so unreasonable as not to be foreseeable.



effective warning to those who had purchased 1953 Buicks with power brakes when the latent defect was discovered.

*Wanton and Wilful Misconduct by the Manufacturer*

The case of *Greeno v. Clark Equipment Co.*<sup>52</sup> is significant in many respects; however, it is extremely important that a jurist of the caliber of Judge Eschbach has concluded that a manufacturer can be guilty of wilful and wanton misconduct. The elements of this gross negligence may be summarized as follows: (1) knowledge of a situation requiring the exercise of due care; (2) ability to use due care when to the reasonably prudent person it would appear to be foolhardy to do otherwise; (3) failure to use due care under the circumstances described in (2); and (4) that such failure be the proximate cause of the injury. Contributory negligence is no defense to liability based upon wanton misconduct.

DEFECTS FROM WHICH LIABILITY WILL RESULT

It is important that the lawyer, whose education and training in automotive engineering is necessarily limited, be cognizant of the general area of defects from which liability will result so that the accident victim can receive maximum representation. The cross-fertilization of the lawyer with automotive engineers, metallurgists, accident reconstruction experts, bio-mechanics researchers, and safety specialists, will now enable the attorney to perform a function for which he had formerly been unqualified—engineering research.

*Vehicle Stability and Control*

The most sophisticated but most prevalent serious defect in vehicular operation is the lack of stability and control. The increased production of station wagons and rear engine vehicles with their inherent directional instability and "oversteering" problems has accentuated the problem in America. The number of run-off-the-roadway accidents has increased immeasurably. A glimpse of the problem was indicated in the July 1965 issue of *Popular Mechanics* in an article by Alex Markovich entitled, "Renault's Racey R-8 Gordini":

I entered the corner at about 45 gently feeding gas. What happened next has never happened to me before in my seven years of testing hundreds of cars, highways, by-ways and race-tracks. Instead, without warning it lifted, the car rolled bumpety-bump on its roof and flipped.<sup>53</sup>

The defect is not only inherent in Renault models; junkyards are full of Volkswagens, Corvairs, and station wagons which experienced a similar fate. Vehicles can be designed with cornering ability to meet a lateral

52. 237 F. Supp. 427 (N.D. Ind. 1965).

53. POPULAR MECHANICS, Vol. 124, no. 1, p. 36 (July, 1965).

acceleration equal to the frictional quality of the pavement. Nothing less has a sufficient factor of safety for vehicle stability and control. The warnings by Olley in *Road Manners of the Modern Car*<sup>54</sup> remain for solution: substantial improvement must be achieved in cornering and aerodynamic stability, suspension control, and the design of vehicle controls to best coincide with driver reaction.<sup>55</sup>

### *Braking Systems*

Any survey of existing appellate and lower court decisions, both federal and state, shows a high percentage of suits based upon defective brake design, assembly, or manufacture.<sup>56</sup> The importance of the proper functioning of a vehicle's braking system to the safety of its occupants and others in the vicinity cannot be overemphasized. The numerous brake failures and the resulting accidents which occur on our highways each year clearly point to the necessity of still further improvements in the design, manufacture, construction, assembly inspection, and maintenance of vehicle brakes. Every personal injury lawyer has seen at firsthand the personal tragedy caused by brake failure.

The General Services Administration, charged by the federal government with the duty of determining safety standards for all vehicles purchased for governmental use, has been seeking dual braking systems. The state of the engineering art is such that dual braking systems are presently available on only a limited number of vehicles, namely, heavy duty trucks.<sup>57</sup> More effective brakes, such as disc brakes, are presently available on some European passenger vehicles; standard equipment on all vehicles should include power brakes. The issue of negligent failure to install a dual braking system or an effective emergency braking system has been brought before the courts in at least two cases.<sup>58</sup> In both, serious accidents resulted from brake failure which might have been avoided by

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54. Olley, *Road Manners of the Modern Car*, I.A.E. JOURNAL (Feb., 1947).

55. See *Ford Motor Co. v. Wolber*, 32 F.2d 18 (7th Cir. 1929), where a tractor overturned.

56. See, e.g., *Standard Motor Company, Ltd. v. Blood*, 380 S.W.2d 651 (Texas 1964); *Noble v. Consolidated Beverage, Inc.*, 63 Wash. 2d 478, 387 P.2d 765 (1963); *Wright v. General Motors Corp.*, 158 So.2d 309 (La. 1963); *Rosin v. International Harvester Co.*, 262 Minn. 445, 115 N.W.2d 50 (1962); *Ford Motor Co. v. Fish*, 233 Ark. 634, 346 S.W.2d 469 (1961); *United States of America v. Lobb*, 192 F. Supp. 461 (W.D. Ky. 1961); *General Motors Corp. v. Dodson*, 47 Tenn. 438, 338 S.W.2d 655 (1960); *Gwyn v. Lucky City Motors, Inc. and Ford Motor Co.*, 252 N.C. 123, 113 S.E.2d 302 (1960); *Comstock v. General Motors Corp.*, 358 Mich. 163, 99 N.W.2d 627 (1959); *Gaidry Motors, Inc. v. Brannon*, 268 S.W.2d 627 (Ky. 1954); *Carpini v. Pittsburgh and Weirton Bus Company*, 216 F.2d 404 (3d Cir. 1954); *Dillingham v. Chevrolet Motor Co.*, 17 F. Supp. 615 (W.D. Okla. 1936).

57. See, e.g., Gardner, French & Shutt, *Split Systems for Commercial Vehicle Hydraulic Brakes*, S.A.E. REPRINT 878 A (Jan. 13-17, 1965); Atkin & Bennett, *Safety Brake Systems for Commercial Vehicles*, S.A.E. REPRINT 787 B (Jan. 13-17, 1964).

58. *Ulwelling v. Crown Coach Corp.*, 206 Cal. App. 2d 96, 23 Cal. Rptr. 631 (1962); *Hahn v. Ford Motor Co.*, 126 N.W.2d 350 (Iowa 1964).

the use of an effective dual braking system or emergency braking system. In the absence of federal or state law requiring such systems, the courts were reluctant to impose this duty upon the manufacturers. In the future, however, the courts may well impose such a duty upon the basis of the General Service Administration's requirements for dual braking systems on all vehicles purchased by the federal government. Federal and state legislative bodies may enact legislation which would require that dual brakes be installed upon all future vehicles.

An additional safety device which should be required in connection with a vehicle's braking system is a warning device which would indicate to the driver that his brakes have failed. Such a device would be useful even in those vehicles not equipped with dual brakes.

Until such improvements and safety devices are required, either by law or by industry custom, to be installed in vehicles as standard equipment, personal injury lawyers should always investigate the possibility of a brake failure in accidents where it is difficult to determine the actual cause of the accident. Trained engineers who are familiar with conventional braking systems may well establish, upon investigation, that the true cause of the accident was a defectively designed or manufactured braking system.

#### *Tires, Wheels, and Rims*

Another great cause of accidents on our highways today is the failure of one or more parts of the tire-wheel-rim combination. Although there are no statistics available of the exact percentage of highway fatalities and injuries which are due primarily to tire blow-outs or air-outs, the number would undoubtedly be significant since a tire failure will often result in a complete loss of vehicle control by the driver. Indeed, the number of reported tire failures has assumed such proportions that the Federal Trade Commission recently held three days of hearings to investigate what has become known as the "tire scandal". It has been estimated that approximately three percent of all tires manufactured are substandard and will fail prematurely. The consequences of this national tragedy are appalling, since, of all motor vehicle components, one of the most vital to safe driving is the tire.

The case of *B. F. Goodrich Co. v. Hammond*<sup>59</sup> is in point. In *Goodrich*, the administratrix of the estates of two decedents sued the defendant manufacturer for breach of warranty when a supposedly "blow-out proof" tire exploded violently, causing decedents' car to careen out of control. Although the tire had been represented as having a special sealing substance which would prevent tire blow-outs, the sealing substance proved ineffective. This is just one example of how defective tires produce

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59. 269 F.2d 501 (10th Cir. 1959).

accident fatalities and serious injuries. Even the most substantial judgment for the plaintiff would not compensate for lives so easily destroyed by the production of these defective tires.

Among the chief reasons for tire failures, which have been instrumental in causing accidents, are improper mounting, poor tread splice in retreaded tires, severe tire flexing caused by wheel camber on rear engine passenger cars, improper front end alignment, and improper use and maintenance. Two main reasons for tire failure are heat caused by an insufficient amount of air in the tires and overloading. Tires are designed and built for certain loads and inflation pressures; failure to observe design limits usually results in tire failure. Successful operation of many rear engine automobiles, such as the Corvair, require that a difference of as much as ten pounds pressure be maintained in the front and rear tires, which are of the same size. In fact, the recommended tire inflation pressures of 15 psi front and 26 psi rear in the Corvair do not compensate for rearward weight bias. Underinflation results in overheating the front tires and overloading the rear tires. Both of these factors have undoubtedly contributed to Corvair accidents.

Overloading is also a prime cause of truck tire failures and should be considered in any accident investigation. Sudden deflation of both tubed and tubeless tires can occur if a tire "bead" is not seated when the tire is mounted. The tire bead is the edge of the tire in contact with the rim and is the means by which the tire is held on the rim. During operation, forces are constantly trying to push or pull the tire away from the rim. The bead is designed to counteract these forces. Hence, when the bead is not properly seated, it breaks, causing the tire to deflate suddenly.

Although tubeless tires have come into widespread use in recent years, they have many inherent defects which must be considered in tire design. Among these defects are the tendency for ply separation due to moisture absorption by the tire cords and the seepage of air into the bead area. This latter problem necessitates the use of wider rims to prevent bead separation and a sudden air-out during vehicle operation.

The 1960 case of *Hansen v. Firestone Tire and Rubber Co.*<sup>60</sup> is a perfect illustration of a defectively designed tire-rim combination which resulted in bead separation. In this case, plaintiff sued for breach of an express warranty contained in advertisements which stated that certain tubeless tires could "fit any standard rim" and were "safe enough to cling to the road on dangerous curves". The tires installed by Firestone employees did not, in fact, adequately fit the rims of the plaintiff's car. When the automobile rounded a sharp curve in the road, the bead broke, causing the automobile to roll over. The appellate court upheld a jury verdict for the seriously-injured plaintiff.

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60. 276 F.2d 254 (6th Cir. 1960).

It should be appreciated that this is just one of a multitude of cases brought against tire companies involving accidents caused by tire failure. Of course, it is also possible to bring a tire failure against an automobile manufacturer, as illustrated by the case of *Ford Motor Company v. McDavid*.<sup>61</sup> In this case, a personal injury action was brought against the Ford Motor Company for negligent alignment of the front wheels of a new car purchased by the plaintiff. Excessive tire wear resulted, causing a blow-out after the automobile had been driven only 2,600 miles.<sup>62</sup> Numerous other cases involving defective design, construction, assembly, and inspection of the wheel components of different types of vehicles, not to mention the epic *MacPherson v. Buick* case, have appeared recently.<sup>63</sup>

Presently, numerous groups, including those financed by industry, are doing extensive research on the problem of defective tires. Motor Vehicle Research, Inc. of South Lee, New Hampshire, and The Tire and Rim Association, Inc. of Akron, Ohio, have published various papers and standards for tires which should be consulted by the personal injury lawyer in cases involving possible tire and rim defects. An excellent reference book on the subject is the work by Andrew J. White of Motor Vehicle Research, Inc., entitled, *Tire Dynamics*.<sup>64</sup>

In consulting the references quoted above, most lawyers will be amazed at the variations in tire and rim specifications in common use today. It becomes readily apparent that there is a great need for some form of standardization in this area, as well as the necessity of providing safety tires and rims for all vehicles in the future. Since safety tires and rims are now being demanded by the General Services Administration, federal safety legislation in this field may soon be realized.

### *Door Latches and Hinges*

It has long been appreciated by accident reconstruction and safety experts that the occupants of a vehicle are less likely to be seriously injured or killed if they are retained in the vehicle during an accident. However, doors continue to spring open and occupants continue to be ejected from the vehicle in collisions due to hinge and latch failures. It is obvious that better latch and hinge designs and the use of stronger structural materials would greatly reduce this source of accident injuries and fatalities. The need for safety door locks, latches, and hinges is thus of paramount importance.

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61. 259 F.2d 261 (4th Cir. 1958).

62. However, the Court of Appeals of the Fourth Circuit reversed a lower court decision for the plaintiff on the basis that the evidence was insufficient to support the verdict.

63. *General Motors Corporation v. Johnson*, 137 F.2d 320 (4th Cir. 1943); *Courtais v. General Motors Corporation*, 37 N.J. 525, 182 A.2d 545 (1962); *Payne v. Valley Motor Sales*, 146 W. Va. 1063, 124 S.E.2d 622 (1962).

64. WHITE, *TIRE DYNAMICS* (Motor Vehicle Research, Inc. 1956).

Yet, automobile manufacturers have still not made adequate advances in this area of vehicle safety to the extent which they are so sorely needed. Indeed, during the past nineteen years, General Motors has continued to use malleable iron in the construction of hinges in most of their cars, although many steels are available which would provide a greater safety factor. In the well-publicized recent report by John W. Garrett of Cornell Aeronautical Laboratory, Inc.,<sup>65</sup> involving a study of a large number of accidents wherein the door was torn completely off the vehicle, it was found that, percentage-wise, approximately six times as many General Motors car hinges failed as compared to Ford and Chrysler vehicles. These statistics would indicate that a more suitable material and a more adequate design could be used for the manufacture of hinges utilized in General Motors vehicles.

Latch design, although it has been significantly improved in the more recent passenger car models,<sup>66</sup> still leaves much to be desired. Many safety door locking mechanisms have been available to the automotive industry for a number of years, although they have not as yet been adopted. An example of one such device is described in U. S. Patent No. 2,647,789, issued in August of 1953 to the General Motors Corporation. This locking apparatus appears to be superior in every way to those installed in even the most recent passenger car safety locks. However, this safety door locking means has never been used on any standard production vehicle to date, despite its availability for use and development for over twelve years.

The new General Service Administration standards, which require improved safety door locks and hinges on all vehicles purchased by the federal government, are now stimulating action by automobile manufacturers to make improvements in this area. Manufacturers are incorporating safety door locks and hinges on all 1966 passenger cars as standard equipment. One can only ask why such devices were not employed sooner since the necessity for their use has been known for many years.

An excellent example of a suit involving a defectively designed door latch assembly is the case of *McKinney v. Frodsham*.<sup>67</sup> Prior to this decision, courts generally had been reluctant to impose liability upon automobile companies for design defects of this type. In *Amason v. Ford Motor Co.*,<sup>68</sup> the plaintiff's decedent was driving his 1933 Ford which was equipped with doors that hinged at the rear and which would not close unless they were slammed. While driving at thirty-five miles per

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65. Garrett, *The Safety Performance of 1962-63 Automobile Door Latches and Comparison with Earlier Latch Designs*, CAL REPORT No. VJ-1823-R7, November 1964.

66. *Ibid.*

67. 57 Wash. 2d 126, 356 P.2d 100 (1960).

68. 80 F.2d 265 (5th Cir. 1935).

hour, plaintiff's decedent attempted to open the door in order to slam it shut. Winds hurled the door backward, throwing the decedent out of the car and into the path of an oncoming vehicle. The court held that "the automobile from which . . . [the decedent] was thrown was not defective",<sup>69</sup> emphasizing that the material used in constructing the door did not break.

Similarly, in *Thomas v. Jerominek*,<sup>70</sup> plaintiff alleged that a Studebaker car was constructed in an unusual, unorthodox and unsafe manner in that the doors were hinged at the rear and that, due to improper positioning, the knob for adjusting the window and the knob for opening the door were likely to be confused. The court dismissed the plaintiff's complaint for failure to allege a "latent" defect or concealed danger in design or construction.

However, in view of the likelihood of harm (confirmed by the change of all manufacturers to front-hinged doors since the *Amason* case in 1935) and in consideration of the Restatement view, it would seem that the manufacturer failed to "exercise reasonable care in the adoption of a safe plan or design".<sup>71</sup> In future litigation, the use of unsafe or inadequately designed door locks and hinges should provide a basis for recovery by plaintiffs so injured, as the trend of the law is now, happily, to follow the duty of adopting a safe design as stated in the Restatement.

### *Hood Latches*

What has been said previously in relation to defective door latches obviously applies to hood latches. There have been numerous accidents which have occurred as a result of the hood flying open while the vehicle was in operation. Such an occurrence, especially at high speeds, can readily result in a complete loss of control by the driver of the vehicle. Even at low speeds, a serious accident may result due to the loss of driver vision when the hood springs open. The necessity for safety hood latches and locks is at least as great as the need for safety door locks.

An example of a personal injury suit involving a defectively designed hood latch is the 1946 case of *Ford Motor Company v. Wagoner*.<sup>72</sup> In this case, plaintiff showed that the Ford Motor Company had knowledge that its cars of the model that plaintiff was driving had a defectively designed and manufactured hood latch which would permit the hood to spring when the car was subjected to a severe jolt or jar. The defendant manufacturer proved that it had furnished new latches for this particular model. The court held for the defendant on the basis of the conscious intervening

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69. *Id.* at 266.

70. 170 N.Y.S.2d 388 (1957).

71. 2 RESTATEMENT, TORTS § 398, at 1084-5 (1934).

72. 183 Tenn. 392, 192 S.W.2d 840 (1946).

negligence of the intermediate purchaser who had been informed of the defective latch condition but who had not installed the new latch provided by Ford. This case should have been decided differently on the rationale of the *Comstock* case,<sup>73</sup> particularly since the plaintiff was free from contributory negligence.

#### *Fires—Gas Tank Construction—Smog Control Devices*

Although automobile fires can occur for a number of reasons, two primary reasons are negligent design and improper construction of the fuel system, including the placement of the gasoline tank in the car. It is generally conceded that the placement of the fuel tank in a forward position in rear engine cars, such as the Corvair, Volkswagen, and Renault, involves a definite hazard and collision risk to the occupants of the car.<sup>74</sup> The number of accidents involving these three cars where the automobile burst into flames upon collision probably runs into the thousands. It would appear that prudent design practice should require that cars with a forward fuel tank be completely insulated to minimize the fire-collision hazard to the occupants. Yet, none of the three cars mentioned employ adequate fire insulating materials. Although the forward placement of the fuel tank is required in rear engine vehicles because of the danger of positioning the gasoline tank too close to the hot engine, such forward fuel tanks should also be structurally stronger than conventional fuel tanks. Moreover, adequate ventilation of these tanks should be provided so that in the event that the tank is ruptured during a collision, the gasoline can immediately escape into the surrounding atmosphere. For this purpose, the gasoline tank should be positioned as near as possible to ground level within the vehicle framework.

A very good example of the negligent design, manufacture, and positioning of a fuel tank in an automobile is the 1961 case of *Blitzstein v. Ford Motor Company*.<sup>75</sup> In this case, plaintiff sustained personal injuries in an English Ford as the result of a barely discernible leak in the gasoline tank. The tank was positioned in the car trunk in such a manner that escaping gasoline filled the car instead of being dispersed into the atmosphere. When plaintiff switched on the ignition key, an explosion erupted from the gasoline vapors entrapped in the car body. The Circuit Court reversed a lower court decision for the defendant manufacturer, stating that the manufacturer

. . . was negligent in marketing a product which was inherently dangerous and of which it should have been aware from its long experience in the design and manufacture of automobiles, and

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73. *Comstock v. General Motors Corp.*, *supra* note 51.

74. Olley, *European Postwar Cars*, 61 S.A.E. TRANSACTIONS 508 (1953).

75. 288 F.2d 738 (5th Cir. 1961). See also *Reusch v. Ford Motor Co.*, 196 Wash. 213, 82 P.2d 556 (1938).



that . . . [manufacturer] failed to exercise reasonable care to inform the buying public of this dangerous condition.<sup>76</sup>

Fires can also occur due to leaks in fuel lines, carburetors, or from defective wiring. Two important recent decisions relative to automobile fire cases are *Congressional Insurance Company v. Ford Motor Company*<sup>77</sup> (involving a leak in the gasoline fuel filter) and *State Farm Mutual Insurance Company v. Anderson-Weber, Inc.*<sup>78</sup> (involving defective electrical connections). In the latter decision, the court followed the *Henningsen* decision<sup>79</sup> on implied warranty.

The Georgia Court of Appeals had no difficulty affirming a verdict for the plaintiff predicated on the failure of the defendant to install a device on a tractor which would deflect fumes from the driver. In *J. C. Lewis Motor Co., Inc. v. Williams*,<sup>80</sup> the court held that the issue of negligence in the carbon monoxide death was for the jury to decide.

With the exception of the state of California, the use of smog control devices for automobiles has not yet reached the stage of full and satisfactory development in order to comply with state laws. These devices may also lead to products liability suits if they are inadequately designed or manufactured. The General Services Administration has standardized the use of these devices on cars purchased for the federal government.

### *Steering Mechanisms*

While the number of appellate cases involving defectively designed or manufactured brakes are probably more numerous, those involving defectively designed or manufactured steering mechanisms are nearly as frequent. Of the three mechanisms which the driver utilizes in controlling the operation of his vehicle (brakes-accelerator-steering control), perhaps the most important one is the steering mechanism. It is by means of the steering wheel that the driver maneuvers in and out of traffic and directs his vehicle to follow the desired path and avoid obstacles.

While the foregoing statement may seem to be patently obvious and elementary, one should consider the drastic accidents which ensue from a loss of steering control due to defective design, manufacture, installation, and maintenance of the steering mechanism. Defects in the steering mechanism, which often result in a complete loss of vehicle control by the driver, may arise from a wide variety of sources, such as fractured tie rods, locked steering wheels, bearing failure, and the like.<sup>81</sup>

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76. *Blitzstein v. Ford Motor Co.*, *supra* note 73, at 744.

77. 198 A.2d 918 (D.C. Ct. App. 1964).

78. 252 Iowa 1289, 110 N.W.2d 449 (1961).

79. *Henningsen v. Bloomfield Motors Inc. and Chrysler Corporation*, *supra* note 16.

80. 85 Ga. App. 538, 69 S.E.2d 816 (1952).

81. For appellate cases in this area see *Goullon v. Ford Motor Co.*, 44 F.2d 312 (6th

### *Crashworthiness*

In any automobile collision, the injuries to the automobile and to its occupants are produced by the momentum still actuated when a moving vehicle comes to an abrupt unintended stop. This momentum is dissipated in two separate but related collisions of the same accident. The first collision occurs between the car and another vehicle, tree, or solid abutment; the second collision occurs between the occupants of the car and the car's interior or the ground, should the occupants be ejected. The first collision will produce only vehicle damage, but it is the second collision that kills or injures people. Although these two collisions occur only fractions of a second apart, the usefulness of the distinction between them is not diminished.

Obviously, if the first collision can be averted, the second collision cannot occur. If the first collision is sufficiently gentle, the second collision will not occur or will produce only minor injuries. Even if the first impact is more violent, injury in the second collision can be reduced if the occupant's momentum is dissipated more slowly over a large contact area between the occupant and the car's interior. Several changes in the design of the automobile itself will help to dissipate the momentum of the second collision. Many devices are presently being utilized to effectuate this result, such as seat belts, harnesses, padded dashboards and visors, recessed instrument panels and control knobs, deep-dish steering wheels and collapsible steering columns, pop-out windshields, removal of sharp-edged protuberances, seat anchorages and seat belt anchorages, head rests to avoid whiplash injuries, roll bars, shock absorbing bumpers, and a reinforced passenger compartment shell. Many of these items merely involve the utilization of well-established engineering "packaging" principles which are commonly used throughout industry in other applications.

It would be preferable if some of these safety devices or measures were provided by the manufacturer in a form which did not require any action on the part of vehicle occupants to make them effective, since it is well

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Cir. 1930), involving the breaking of a steering wheel from a tractor, decision for the plaintiff; *Hupp Motor Car Corp. v. Wadsworth*, 113 F.2d 827 (6th Cir. 1940), involving the loss of a cotter pin which permitted a retaining bolt to work loose resulting in a disassembly of the steering mechanism and a loss of vehicle control, decision for the plaintiff; *Kanatser v. Chrysler Corp.*, 199 F.2d 610 (10th Cir. 1952), involving a defective tie rod; *Haward v. General Motors Corp.*, 235 N.C. 88, 68 S.E.2d 855 (1952), involving a steering wheel having excessive play or lost motion; *Henningsen v. Bloomfield Motors, Inc.*, 32 N.J. 358, 161 A.2d 69 (1960), involving loss of steering control; *Pabon v. Hackensack Auto Sales, Inc.*, 63 N.J. Super. 476, 164 A.2d 773 (1960), involving a locked steering wheel; *Clark v. Zuzich Truck Lines*, 344 S.W.2d 304 (Mo. 1961), involving a defectively designed ball stud joint; *Griffith v. Chevrolet Motor Division*, 105 Ga. App. 588, 125 S.E.2d 525 (1962), involving an indeterminable defect in the steering mechanism; *Duckworth v. Ford Motor Co.*, 211 F. Supp. 888 (E.D. Pa. 1962), involving a locked steering wheel; and *Williams v. Chrysler Corp.*, 137 S.E.2d 225 (W. Va. 1964), involving a defective tie rod.

known that many occupants neglect to fasten their seat belts. Hence, a distinction can be made between active and passive safety devices. For instance, a seat belt would be characterized as an active safety device or measure since it requires affirmative action by the occupant to make it useful. On the other hand, a roll bar installed to prevent the roof from collapsing can be characterized as a passive safety measure since it functions without such affirmative action. Where possible, the automobile manufacturers should adopt the passive measure, although it may not be possible to eliminate completely the use of certain active safety devices, as in the case of seat belts.

Although there have been very few appellate decisions involving the crashworthiness of a vehicle in which plaintiff alleged the failure to install the above-enumerated safety devices and measures, there is no reason why such cases should not be won on this basis. Such devices are perfectly feasible from an engineering standpoint and can and should be made available as standard equipment at the present time. The failure to use such devices can be a violation of the manufacturer's duty as stated in the Restatement, "to exercise reasonable care in the adoption of a safe plan or design".<sup>82</sup>

It is interesting to observe that the most noteworthy study of automobile safety design in the United States has come not from the automobile industry, but from the Liberty Mutual Insurance Company in conjunction with the Automotive Crash Research Project of Cornell Aeronautical Laboratory, Inc. Model cars designed on the basis of this research and which include many of the above-mentioned safety devices have been exhibited around the country for years. However, no car which embodies the Cornell-Liberty research has as yet been mass produced.

### *Safety Glass*

There are two kinds of automobile "safety" glass which are in current use by manufacturers. Laminated safety glass, utilized in front windshields, consists of two pieces of glass bonded or laminated together by a tough, flexible plastic interlayer known as polyvinyl butyral. When the windshield is shattered, the plastic interlayer maintains the entire piece intact, thus completely eliminating the possibility of flying glass.

The second type of safety glass is tempered glass, generally used in the production of side and rear windows of current automobiles. Although tempered glass consists of only one layer of glass, the sections are heat treated and quickly cooled to produce a tough, hard outer skin with internal stress forces up to 140,000 pounds per square inch. The hardened outer skin resists breakage when the window is struck by a blunt object, such as a baseball or parts of the human body. However, if the tough outer

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<sup>82</sup> 2 RESTATEMENT, TORTS § 398, at 1084-5 (1934).

skin is penetrated, the entire glass area will instantly disintegrate due to the immediate release of the internal strain set up by the tempering process. Breakage of uniformly tempered glass usually results in flying particles of from one-fourth to one-half inch in size.

Most safety experts feel that laminated safety glass is far superior to tempered safety glass. With the use of laminated safety glass, there is a greater likelihood of severe lacerations to the occupant should the occupant be ejected through the window. Nonetheless, it is generally felt that tempered safety glass is far more dangerous to the occupant in most of the foreseeable accident situations. In a recent report of the Automobile Crash Injury Research Program by Cornell Aeronautical Laboratories, Inc., sponsored by the American Standards Association,<sup>83</sup> the relative merits of laminated safety glass and tempered glass were compared. The results were, in general, inconclusive as to which type of glass was safer. However, this fact only indicates that more extensive research and development of safety glass is required. Perhaps the fast-developing field of plastics will provide windshield and window materials which combine and improve upon the safer aspects of both types of safety glass.

Prior to 1961, laminated safety glass had been used almost exclusively in the production of all automobile windows. In 1961, however, automobile manufacturers secretly substituted the less expensive tempered glass in the manufacture of side and rear windows, thus ignoring the following hazards which tempered glass presents: (1) the quality and uniformity of tempered glass can and does vary and adequate methods of testing its qualities are not presently available; (2) tempered glass is subject to "blow-outs" due to defective manufacture; (3) tempered glass fragments are not harmless as is generally advertised, but can cause severe injury to the eyes and other parts of the body; (4) tempered glass is very sensitive to edge-break, which is extremely dangerous if children are in the vicinity and "fall-out" occurs; (5) when broken, tempered glass offers little protection against flying objects, missiles, or "fall-out", and when shattered, it offers little or no resistance to passenger ejection in a severe roll-over type accident as compared to the energy-absorbing and retention properties of laminated safety glass; (6) tempered glass gives a thief split second entry, whereas laminated glass must be forced open; (7) tempered glass is more difficult to break than laminated glass in case an emergency exit of the car is required; (8) tempered glass is almost unbreakable when struck by blunt objects, which can result in skull fractures or concussions to occupants who are thrown against it, whereas laminated safety glass will yield more readily; (9) tempered glass may temporarily remain in the frame after impact, causing the driver to lose

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83. Campbell & Hapens, *Automobile Glazing as an Injury Factor in Accidents*, CAL REPORT No. VJ-1825 R1 (December 1964).

visibility or protection or both, whereas broken laminated glass does not obstruct visibility to the same extent and may still afford protection to car occupants; and (10) tempered glass breaks with an explosive sound which can readily distract the driver.

Two early personal injury cases relate to the use of safety glass in automobiles. In *Baxter v. Ford Motor Co.*,<sup>84</sup> plaintiff recovered on the grounds of breach of an express warranty when he sustained injuries due to the breaking of supposedly "shatter-proof" safety glass. However, in the case of *Chanin v. Chevrolet Motor Co.*,<sup>85</sup> the defendant prevailed on the basis of lack of privity. Considering the rationale of the *Henningesen* case,<sup>86</sup> a different result would be achieved today.

It should be appreciated that the use of safety glass is a factor in automobile design related to the "crashworthiness" of vehicles. Its importance in minimizing the injury-producing "second collision" cannot be overemphasized. Similarly, "pop-out" front windshields should be considered in the "crashworthiness" theory. Although these are standardized in some automobiles, many manufacturers neither utilize them nor offer them as optional equipment. In most accident situations, a "pop-out" windshield is an asset which must not be overlooked in consideration of the degree of safety which it provides for both driver and occupant. Another related area where design improvements can be made concerns the positioning of the inside rearview mirror and the standardized use of an outside rearview mirror as presently required by the General Services Administration on all government-purchased vehicles. The positioning of the internal rearview mirror is still a great problem from a safety standpoint since, in many cases, it is constructed and positioned in a manner which results in injuries during the "second collision".

Lastly, the use of non-fogging plastic or glass rear windows in convertibles is essential since many rear windows on present-day convertibles still become almost opaque after short periods of use. The production and utilization of improved plasticizers and plastic materials should remedy this safety hazard.

#### *Vehicle Light Systems*

The necessity of providing safe and adequate vehicle lighting systems on automobiles, trucks, and busses is of prime importance to overall vehicle safety. Perhaps one of the most disconcerting experiences a driver faces is the sudden failure of his lights during night driving. The malfunctioning of back-up lights, braking lights, tail lights, and directional blinkers, poses great hazards in everyday driving as do the glares of malpositioned headlights of oncoming vehicles.

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84. 179 Wash. 123, 35 P.2d 1090 (1934).

85. *Supra* note 14.

86. *Henningesen v. Bloomfield Motors Inc. and Chrysler Corporation*, *supra* note 16.

*Ford Motor Company v. Mathis*<sup>87</sup> is an excellent example of an appellate case brought against an automobile manufacturer for personal injuries sustained due to the negligent manufacture of a vehicle lighting system. In this case, plaintiff was injured when his car plunged off the road after his headlights failed due to a defective dimmer switch manufactured by an independent supplier and incorporated into the vehicle by the manufacturer. On appeal, Ford asserted that under applicable Texas law an automobile was not an inherently dangerous instrumentality. In rejecting defendant's contention, the court stated:

A brand new automobile bearing down a highway in the dark of night with a dimmer switch so defective as to plunge the driver in total, sudden, unpredicted darkness is indeed "dangerous" to both those in it and those within its range. On all tests it is "dangerous" and the risk of injury is an unreasonable one. A manufacturer or assembler who produces such an article as a result of negligent manufacture and sells it to one clearly within the range of persons expected to use it owes a legal duty to such person to use reasonable care to prevent injury to him. This duty is not created by contract, but arises from the general duty not to injure another through disregard for his safety.<sup>88</sup>

Almost all states have legislation which sets up minimum requirements for light systems used on trucks or busses, and similarly most states also require certain types of light systems on passenger cars. The improved sealed beam headlights used on 1955 and subsequent model vehicles was a great stride toward safe vehicle lighting systems. Similarly, the four-lamp headlight systems now available on almost all new passenger vehicles has improved the night driving characteristics of automobiles.

The great variance between the tail lights on different vehicles, although aesthetically appealing, often lends to confusion on the highways and resulting safety hazards. Engineers generally agree that too many lights are as much of a hazard as are too few; yet many vehicles continue to look like lighted Christmas trees at night. A vehicle should present an "image" which is simple and uncluttered. Consequently, a sensible compromise must be reached between lights that are too big or too bright and those that are too small or too dim for both day and nighttime driving.

Automatic light dimmers should become standard equipment on all passenger vehicles. Similarly, an emergency blinker system or hazard warning system which would flash all turn signals at the same time is now being required on 1966 model vehicles purchased by General Services

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87. 322 F.2d 267 (5th Cir. 1963).

88. *Id.* at p. 275.

Administration for the federal government. Transistorized electronic turn signal cancelling devices should be made standard equipment to eliminate the problems of mechanical cancelling devices. The manufacture of safer wiring systems, such as that accomplished by dual wiring, is also an area for improvement.

### *Pedestrian Injury Prevention*

It has been estimated that one out of every twenty-five automobiles coming off the production line will strike a pedestrian at some time. Henry H. Wakeland has enumerated several causes of pedestrian injuries and has suggested possible vehicle design changes which would remedy this safety problem.<sup>89</sup> Among the design changes recommended are: (1) elimination of sharp protruding hood ornaments, fins, mirrors, and door handles; (2) addition of shock absorbing, blunt-faced bumpers; (3) elimination of sharp protruding headlight shields and grills; and (4) addition of contoured and flexible front body structure to minimize the force of impact in pedestrian-automobile collisions.

Styling should not take precedence over human life-saving design factors. Yet, in two relatively recent decisions<sup>90</sup> involving injuries to child pedestrians who accidentally collided with protruding parts of the car body, the courts held that there was no obligation on the part of the automobile manufacturer to design a car which would prevent this type of injury. It would appear that the plaintiffs would have been entitled to recover had the federal district court in Texas and the California court adopted the Restatement of Torts view<sup>91</sup> that an automobile manufacturer's liability for defective design extends to those who the manufacturer should reasonably foresee would be injured by a design defect while in the vicinity of the vehicle. In the future, the courts may be convinced by competent attorneys that the automobile manufacturers do owe an injured pedestrian the duty to guard against such injury, particularly where they have notice of a design defect which has caused injury in the past.

### *Gear Shift Levers—Transmissions*

The General Services Administration has specified that all 1966 automatic transmission government vehicles have a standardized gear shift quadrant in which the neutral position separates the forward drive position from reverse. These new models will have a quadrant which reads

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89. *Supra* note 41.

90. *Kahn v. Chrysler Corp.*, 221 F. Supp. 667 (S.D. Tex. 1963), involving a seven-year-old boy who was impaled on the fin of a Chrysler automobile when he inadvertently drove his bicycle into it; and *Hatch v. Ford Motor Co.*, 163 Cal. App. 2d 393, 392 P.2d 605 (1958), involving a six-year-old boy who lost the sight of his left eye when he accidentally walked into a sharp protruding hood ornament.

91. 2 RESTATEMENT, TORTS § 398, at 1084-5 (1934).

as follows: park—reverse—neutral—drive—low, so that there is little likelihood of the gear shift lever accidentally slipping from the drive to reverse position. Such an arrangement is, of course, significantly safer than those previously used.

The case of *Muncy v. General Motors Corporation*<sup>92</sup> provides a good example of personal injury caused by an unsafe design of the ignition and gear control system of a vehicle. In *Muncy*, plaintiff showed that it was possible to remove the ignition key from the switch with the motor running and the car in a forward drive position. With just this situation, a passenger inadvertently stepped on the accelerator while disembarking from the car, causing it to jump the curb, pinning the plaintiff against a nearby wall.

Although the Texas Court of Appeals affirmed the lower court's decision sustaining a plea of privilege by the defendant manufacturer, the ignition gear control system lacked obvious safety features. Had the ignition switch been designed so that the key could not be removed while the engine was running, the accident in question would not have occurred. A safety feature requiring that the gear lever be in a park or neutral position before the ignition key could be removed would also have helped to prevent this type of accident. Modifications of this nature would be relatively inexpensive for the manufacturer to incorporate.

### *Part Failures*

Since most of the component parts of an automobile are made of metal, they are subject to common types of metal failures such as fatigue, shearing, wear, cracking, and corrosion. Failure of one or more of these component parts, such as an axle, bearing clutch plate, or valve, will often result in a complete loss of control of the vehicle. While no metal part can be expected to wear indefinitely, premature failure may be due to poor quality control practices, inadequate testing, or the use of inadequate or unsuitable materials which are not capable of withstanding the foreseeable stresses, strains, and wear which they will encounter. Inadequate or unsafe manufacturing or heat treating processes where the necessary properties are not imparted to the metal or where the composition of the metal is not of the requisite degree of purity may also result in premature part failure.

An exemplary case of metal failure is *Darling v. Caterpillar Tractor Company*.<sup>93</sup> In *Darling*, the operator of a bulldozer manufactured by the defendant stepped on an inspection cover of the deck plate. The hinge on the cover broke off due to a defective welding, thereby allowing his

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92. 357 S.W.2d 430 (Tex. 1962).

93. 341 P.2d 23 (Calif. 1959). See also, *Solomon v. The White Motor Co.*, 153 F. Supp. 917 (W.D. Pa. 1957) for a case involving a fly wheel failure.



right leg to come into contact with unenclosed moving parts of a clutch assembly. In affirming the lower court's judgment for the plaintiff, the appellate court held that a manufacturer of a chattel owes a duty of care to a user, although there is no privity of contract between them where the article, if negligently manufactured, is inherently dangerous or where it is reasonably certain to place life and limb in peril. In all of these cases of accident-causing metal part failures, the personal injury lawyer should obtain the aid of a competent metallurgist and engineer to determine if the part was defectively manufactured or designed.

*Miscellaneous Areas of Negligent Design and Manufacture*

Some other areas where safety devices have been required by the General Services Administration which have not heretofore been mentioned are standard bumper heights for vehicles, glare resistant surfaces on windshield wipers and instrument panels, and windshield wipers and washers. Some other areas of negligent design include fuel pumps and carburation systems.<sup>94</sup> The safety features of these items are obvious and will help to reduce automobile accidents and pedestrian injuries.

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While many areas of automobile design and manufacturer's negligence have not been discussed, it is hoped that the reader will appreciate the scope of this subject. It would, indeed, be inappropriate to state a conclusion, for the area is rapidly enlarging and expanding year by year. In the near future, personal injury lawyers will see a great growth in this burgeoning products liability area.

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94. See *Smith v. New Orleans and Northeastern Railroad Co.*, 53 So.2d 543 (La. 1963), where the plaintiff was injured when his car stalled on a railroad track and was hit by a train; *Capital Automobile Co. v. Shinall*, 103 Ga. App. 695, 120 S.E.2d 351 (1961), where the plaintiff was adjusting his starter in accordance with the dealer's instructions and suffered a severe shock; and *Stonebrink v. Highland Motors, Inc.*, 191 P.2d 985 (Ore. 1943), where the plaintiff recovered in an implied warranty action for injuries incurred when a bumper jack failed.