

EA 03-010

Ford

10/22/03

Attachment F

Book 24 of 24

IN THE UNITED STATES DISTRICT COURT  
FOR THE SOUTHERN DISTRICT OF MISSISSIPPI  
JACKSON DIVISION



PLAINTIFFS

VS.

CIVIL ACTION NO. 3:01CV403BN

FORD MOTOR COMPANY, BUDGET  
RENT-A-CAR SYSTEMS, INC. and TEAM  
FLEET SERVICE FINANCING  
CORPORATION

DEFENDANTS

**FORD MOTOR COMPANY'S DESIGNATION OF EXPERTS**

Pursuant to Federal Rules of Civil Procedure 26(a)(2), Ford Motor Company designates the following experts who are expected to testify at the trial of this case:

1. Vern L. Roberts, Ph.D., #7 Surf Court, Figure 8 Island, Wilmington, North Carolina 28411-0248; (910) 686-9945. A copy of Dr. Roberts' *curriculum vitae* and testimony record are attached hereto as part of Exhibit "A."

Dr. Roberts' testimony will be based on his education, training and experience, relevant documents and photographs, various pleadings in this civil action and the documents outlined in his report. A copy of Dr. Roberts' report is attached hereto as Exhibit "A."

2. Gerald E. Corwin, Carr Engineering, Inc., 12500 Castlebridge Drive, Houston, Texas 77065-4532; (281) 894-8955. A copy of Mr. Corwin's *curriculum vitae* and testimony record are attached hereto as part of Exhibit "B."

Mr. Corwin's testimony will be based on his education, training and experience, relevant documents and photographs, and various pleadings in this civil action. A copy of Mr. Corwin's report is attached hereto as Exhibit "B."

3. Roger C. Wagner, Ragan Research Corporation, 14050 Eckless Road, Livonia, Michigan 48150; (734) 542-6500. A copy of Mr. Wagner's *curriculum vitae* and testimony record are attached hereto as Exhibit "C."

Mr. Wagner's testimony will be based on his education, training and experience, relevant documents and photographs, and various pleadings in this civil action. A copy of Mr. Wagner's report is attached hereto as Exhibit "C."

4. Robert Gratzinger, Gratzinger Engineering & Consulting, Inc., 2201 Martin Street, Suite 103, Irvine, California 92612; (949) 955-3400. A copy of Mr. Gratzinger's *curriculum vitae* and testimony record are attached hereto as Exhibit "D."

Mr. Gratzinger's testimony will be based on his education, training and experience, relevant documents and photographs, and various pleadings in this civil action. This designation will be supplemented with Mr. Gratzinger's report as soon as it is available.

5. Carl G. Brooking, Economic Systems, Inc., Box 150109, Jackson, Mississippi 39210; (601) 974-1261. A copy of Dr. Brooking's *curriculum vitae* and testimony record have been previously produced to Plaintiffs.

Dr. Brooking's testimony will be based on his education, training and experience, relevant documents and photographs, and various pleadings in this civil action. A copy of Dr. Brooking's report has previously been produced to Plaintiffs.

6. Ford reserves the right to call any treating physician as an expert witness in this matter.

7. Ford reserves the right to call Phillip Hardeman as an expert witness in this matter.

Mr. Corwin's testimony will be based on his education, training and experience, relevant documents and photographs, and various pleadings in this civil action. A copy of Mr. Corwin's report is attached hereto as Exhibit "B."

3. Roger C. Wagner, Ragan Research Corporation, 14050 Eckless Road, Livonia, Michigan 48150; (734) 542-6500. A copy of Mr. Wagner's *curriculum vitae* and testimony record are attached hereto as Exhibit "C."

Mr. Wagner's testimony will be based on his education, training and experience, relevant documents and photographs, and various pleadings in this civil action. A copy of Mr. Wagner's report is attached hereto as Exhibit "C."

4. Robert Gratzinger, Gratzinger Engineering & Consulting, Inc., 2201 Martin Street, Suite 103, Irvine, California 92612; (949) 955-3400.

Mr. Gratzinger's testimony will be based on his education, training and experience, relevant documents and photographs, and various pleadings in this civil action. This designation will be supplemented with Mr. Gratzinger's report, *curriculum vitae*, and testimony record as soon as it is available.

5. Carl G. Brooking, Economic Systems, Inc., Box 150109, Jackson, Mississippi 39210; (601) 974-1261. A copy of Dr. Brooking's *curriculum vitae* and testimony record have been previously produced to Plaintiffs.

Dr. Brooking's testimony will be based on his education, training and experience, relevant documents and photographs, and various pleadings in this civil action. A copy of Dr. Brooking's report has previously been produced to Plaintiffs.

6. Ford reserves the right to call any treating physician as an expert witness in this matter.

7. Ford reserves the right to call Phillip Hardeman as an expert witness in this matter.

8. Ford reserves the right to call any involved law enforcement officers as an expert witness in this matter.

9. Ford reserves the right to call as expert witnesses and/or elicit expert testimony from any and all experts designated by Plaintiffs or co-defendants.

10. Ford reserves the right to supplement this Designation of Expert Witnesses.

This the 6 day of June, 2002.

Respectfully submitted,

FORD MOTOR COMPANY

By Its Attorneys,  
BAKER, DONELSON, BEARMAN  
& CALDWELL

By: Bradley W. Smith  
BRADLEY W. SMITH

Walker W. Jones, III, Esquire (MSB #3303)  
Barry W. Ford, Esquire (MSB #5410)  
Bradley W. Smith, Esquire (MSB # 9834)  
BAKER, DONELSON, BEARMAN & CALDWELL  
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**CERTIFICATE OF SERVICE**

I hereby certify that a true and correct copy of the foregoing has been served via United States mail, postage paid, to:

Jay M. Kilpatrick, Esquire  
**YOUNG, WILLIAMS, HENDERSON  
& FUSELIER, P.A.**  
2000 AmSouth Plaza  
Post Office Box 23059  
Jackson, Mississippi 39225-3059

Forrest Stringfellow, Esquire  
**DANIEL, COKER, HORTON & BELL**  
Post Office Box 1084  
Jackson, Mississippi 39215

This the 6 day of June, 2002.

  
\_\_\_\_\_  
BRADLEY W. SMITH

*Verne L. Roberts, Ph.D.*  
*#7 Surf Court*  
*Figure 8 Island*  
*Wilmington, N.C. 28411-0248*

Telephone (910) 686-9945  
Fax (910) 686-9940  
Email vroberts@insan.net

June 5, 2002

Mr. Bradley W. Smith  
Baker, Donelson, Bearman & Caldwell  
4268 I-55 North  
Meadowbrook Office Park  
PO Box 14167  
Jackson, MS 39236

Re: [REDACTED] v. Ford

Dear Mr. Smith:

Relative to the above matter I have reviewed the following materials:

Medical Records of [REDACTED]      Lauderdale County Coroner  
Toxicological Analysis Report  
Helen Keller Memorial Ambulance ECG Report

Medical Records of [REDACTED]:      Mississippi Methodist Rehabilitation Center  
Arizona Home Care/Sunset Care  
Eliza Coffee Memorial Hospital/Dr. Charles  
Marchman  
Verde Valley Medical Center/Dr. Daniel  
Goldsmith  
UMC Orthopaedics  
Dr. Dave Schillington  
Sedona Orthopaedics/Dr. Geoffrey Cook  
Dr. Pahl Vohra  
Eliza Coffee Memorial Hospital  
University Hospitals and Clinics/Jackson, MS.  
Institute for Bone and Joint Disorders  
Dr. Brant Oxford, DDS  
Northern Arizona Physical Therapy

Other Materials Reviewed:      The Barnett Group Investigation Report  
Report of Irving Brock  
Statement of Mike Engelman

Home Towing and Recovery  
Lauderdale County Volunteer Fire Department  
Vehicular Accident Report  
Newspaper report of accident from *The Times Daily*  
Ford Motor Company's Response to Plaintiff's First  
Set of Interrogatories Propounded to  
Defendant Ford Motor Company  
Nancy Lobb's Responses to Ford Motor Company's  
First Set of Interrogatories  
Plaintiffs' Response to First Set of Interrogatories  
Propounded by Budget-Rent-A-Car Systems,  
Inc. and Team Fleet Financing Corporation  
Complaint  
Summons  
1 laser copy of accident scene taken by *The Times  
Daily*  
24 laser copies of accident site taken by Chris Walker  
7/3/01  
33 laser copies of accident scene and deceased  
Plaintiff's Designation of Expert Witnesses  
Plaintiff's Supplemental Designation of Expert  
Witnesses  
Report of Steven Haynes  
Report of Wayne Ross  
Report of Theodore Zinke  
Report of Thomas Kuechler

In addition to my review of the above materials, I had the opportunity to inspect the subject vehicle on April 4, 2002 and the three point restraint systems for the front seat occupants on May 6, 2002. Inspection of the vehicle revealed a 2000 Ford Taurus with obvious, severe impact damage to the center front of the vehicle. The collision deformation appeared to be consistent with impact between the front of the vehicle and the end of a concrete bridge abutment at or near the posted speed limit of 50mph. This would provide a change in velocity of the vehicle during the collision in the approximate range of 41 to 45 mph. Review of the accident scene diagram indicates that [REDACTED] was traveling southbound on the Natchez Trace when his vehicle gradually crossed into the northbound lanes before striking the end of concrete bridge abutment. During this period of time he was off the road and on the shoulder for an extended distance.

The three point restraint systems had been removed from the vehicle, however, the latch assemblies were still in place. The pretensioner system that was installed with the vehicle had deployed in the collision. The supplemental restraint systems did not deploy for either the driver or the right front passenger.

Examination of the three point belts was possible after the initial vehicle inspection. Both systems were found to have been worn in the collision and to have performed appropriately during the collision from a mechanical standpoint.

There are only sparse medical records available for [REDACTED]. The coroner's



report indicates that he died as the result of blunt head and chest injuries, however, no postmortem examination was performed. He was noted to be without a pulse and not breathing by the emergency rescue workers at the scene. There is no indication that any individual witnessed the collision nor that anyone observed any indication that [REDACTED] was alive immediately post accident or that he was alive immediately prior to the collision.

[REDACTED] sustained a number of serious injuries in the collision. She was found to have lacerations of the forehead, lip, nose and right thumb as well as fractures of the left tibia and fibula, the left acetabulum with dislocation of the femoral head, the left foot, the left iliac crest of the pelvis, the right thumb and the nasal bone at the bridge of the nose. She has had an extensive and prolonged recovery.

In addition to my review of the file materials provided, I have also analyzed the collision data collected and maintained by the National Highway Traffic Safety Administration, NHTSA, of the U.S. Department of Transportation. The data are collected and made available for analysis as a part of the Crashworthiness Data System, CDS, of the National Automotive Sampling System, NASS, database. I have appended two printouts created from data that are a part of the NASS data. The first chart illustrates the cumulative distribution of 36,014 frontal collisions, in terms of the Delta V of the collision, for those collisions wherein the Principal Direction of Force was 11, 12 or 1 o'clock. The data helps to place the violence of the Schaeffer accident in the context of the collisions investigated by NHTSA.

The second chart shows the distribution of frontal collisions where either a driver or a right front seated passenger were wearing their three point restraint systems, a supplemental restraint system deployed and the occupants sustained fatal injuries. The data are consistent with the data cited by Steven Hayne in his report where he reported an 11% reduction in fatalities with deployment of the supplemental restraint system.

Based the materials reviewed, my inspection of the accident vehicle and restraint systems, my analysis and review of the NASS database as well as my background, experience and research in Biomechanics, occupant kinematics, crashworthiness and motor vehicle accident database analysis, I have reached the following conclusions.

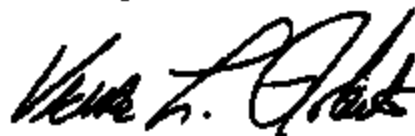
- 1- The collision in question was caused by the failure of [REDACTED] to maintain proper control of his vehicle, allowing it to cross the Natchez Trace Parkway and strike the bridge abutment.
- 2- The cause of death of [REDACTED] has not been determined to any degree of scientific certainty at this time. The conclusion of the coroner does not appear to consider the very real possibility that [REDACTED] had a medical emergency that caused not only the collision, but also his death. Motor vehicle fatalities that are the result of a disease rather than trauma are uncommon but not unknown and are documented in the scientific literature and accident databases.
- 3- The severe orthopedic injuries sustained by [REDACTED] were the result of the violence of the collision, particularly for occupants in her age group, and were not related to the absence of the supplemental restraint system.
- 4- Supplemental restraint systems when combined with a three point restraint system represent the best available occupant protection that we have at this time. They do not, however, guarantee that no serious injuries or death will occur particularly with motor vehicle occupants when they are involved in collisions that are as violent as the one that forms the basis of this litigation.

5- The collision between the [REDACTED] vehicle and the bridge abutment, as shown by the NASS data, was more violent than 98.9 percent of all of the frontal collisions investigated by the U.S. Department of Transportation.

6- The NASS data also show that in those collisions wherein an occupant in an outboard front seat position was restrained by a three point restraint system with a supplemental restraint system that deployed and received fatal injuries, that 88.9 percent of those occupants were involved in collisions with a Delta V less than that experienced by the Schaeffer vehicle.

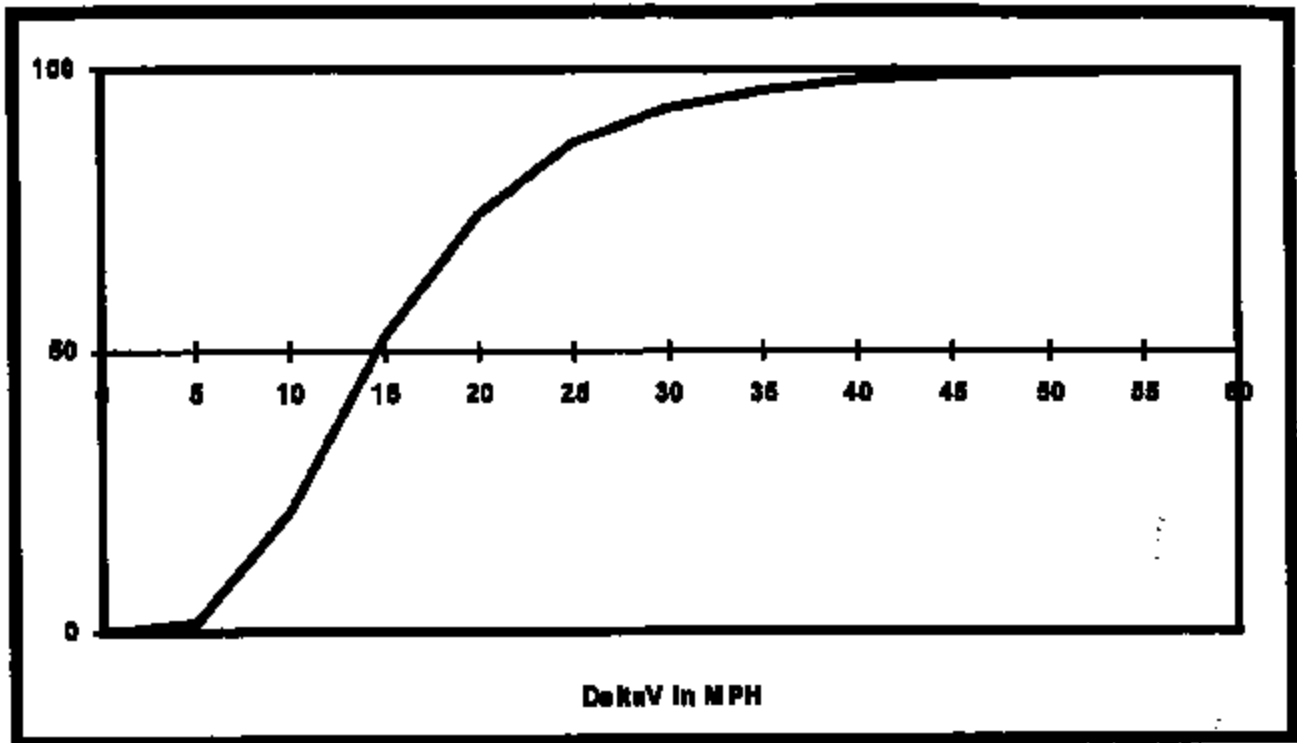
I am being compensated for my time at my normal hourly rate of \$400/hour. To date I have received payment in the amount of \$12,500. I have appended to this report a copy of my current Professional Biography and a list of those matters in which I have given testimony in the past four years. Should additional information become available that substantially modifies my opinions, I will provide a supplement to this report.

Sincerely,



Vame L. Roberts, Ph.D.

Direction of Force, Horiz.



36014 Vehicle records. Plot #1: in List 1 O'Clock, 11 O'Clock, 12 O'Clock.

NASS Planner (since 1981) Database

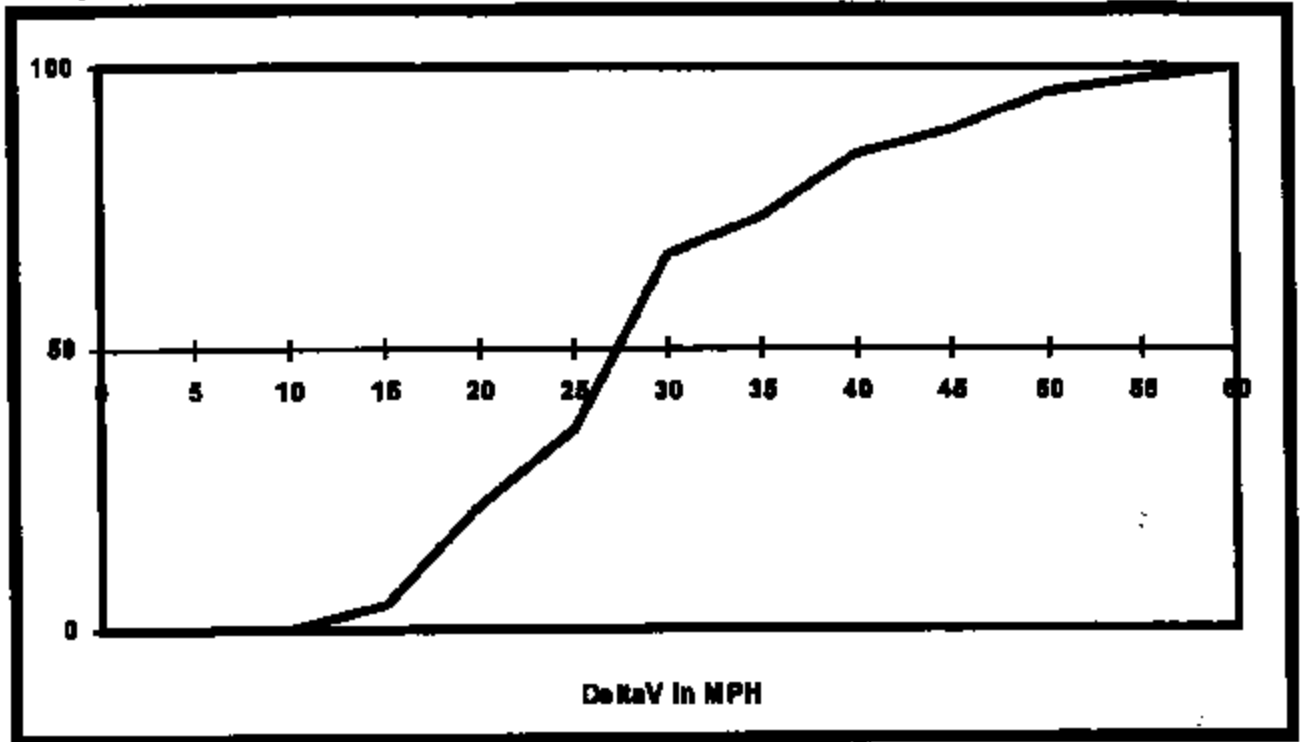
Delta-V MPH	Count	Plot #1 Cum	Percent	Remain
0 DeltaV	0	0	0.0	0
0-5	621	621	1.7	767
6-10	7117	7738	21.5	5471
11-15	11238	18976	52.7	6703
16-20	7769	26745	74.3	3698
21-25	4624	31369	87.1	1863
26-30	2187	33554	93.2	768
31-35	1145	34699	96.3	366
36-40	624	35323	98.1	169
41-45	388	35711	98.9	88
45-50	175	35886	99.4	33
51-55	108	35994	99.7	27
55+	108	36014	100.0	0

All cases in the database were tallied.

06/05/2002



Seat position of occupant



45 Occupant records. Plot #1: In List Front left, Front right.

NASS Planar (since 1981) Database

Delta-V MPH	Count	Plot #1 Cum	Percent	Remain
0 DeltaV	0	0	0.0	0
0-5	0	0	0.0	0
6-10	0	0	0.0	0
11-15	2	2	4.4	0
16-20	8	10	22.2	0
21-25	6	16	35.6	0
26-30	14	30	66.7	0
31-35	3	33	73.3	0
36-40	5	38	84.4	0
41-45	2	40	88.9	0
46-50	3	43	95.6	0
51-55	1	44	97.8	0
55+	1	45	100.0	0

Case selection criteria:  
INLIST(DIRECTION,11,12,1) AND ACTIVEUSE = 3 AND PASSIVUSE = 3 AND TREATMENT = 1

06/05/2002



Verne L. Roberts, Ph.D.

Depositions and Trials - T Denotes Trial; 'D' Denotes depo

1988

[REDACTED] v. Ford, State Court, Detroit, MI D  
 v. Ford, State Court, Tusculumbia, AL D  
 v. Nissan, State Court, New Orleans, LA T  
 v. Ford, State Court, Philadelphia, PA D T  
 Parche, Federal Court, Hartford, CT T  
 Ford, Federal Court, Toledo, OH T  
 v. Isuzu, State Court, Raleigh, NC D T  
 v. Makha, Federal Court, Aberdeen, MS D  
 v. Ford, Federal Court, Miami, FL D  
 v. Ford, State Court, Charleston, SC D  
 v. Ford, State Court, Detroit, MI D  
 Pride Health Care, State Court, Kansas City, MO  
 v. Hodgeson Concrete et al, State Court,  
 AL D  
 v. Ford, State Court, Rutledge, TN D T

1989

v. Mazak, State Court, Atlanta, GA D  
 v. Ford, State Court, New Roads, LA D T  
 North Carolina v. Lowes Foods, State Administrative  
 Hearing, Charlotte, NC T  
 v. Volvo, Federal Court, Cleveland, OH D T  
 v. Ford, State Court, Pinellas County, FL D T  
 v. Toyota, State Court, Owen County, KY D  
 v. Ford, State Court, Lancaster, PA T  
 v. Ontario Sewing Machine Co., State Court,  
 County, GA D T  
 v. Ford, State Court, South Bend, IN D T  
 Toyota, Kershaw County, SC D  
 Ford, Lake County, OH D T  
 v. North American Van Line, Angelinas County,  
 TX D T  
 v. Volkswagon, State Court, Bergen County, NJ D  
 v. American Augers, State Court, Tuscaloosa County,  
 AL D  
 v. Nissan, State Court, Franklin County, KY D T  
 v. Chrysler, Federal Court, Cleveland, OH D T  
 v. Nissan, State Court, St. Lucie County, FL D  
 v. Ford, State Court, Mobile County, AL D  
 v. Chrysler, State Court, State Court, Huntington,  
 WV  
 v. Glock, State Court, Birmingham, AL D  
 v. Mazda, Federal Court, Bowling Gree KY D

2000

v. Ford, State Court, Wayne County, MI D T  
 v. Nissan, Federal Court, Jackson, MS D  
 v. Toyota, State Court, Louisville, KY D T  
 v. Ford, State Court, Bullock County, AL D  
 v. Ford, State Court, Jefferson County, Wt D T  
 v. Advance Mbr, Federal Court, Long Island,  
 NY T  
 v. Ford, Federal Court, Atlanta, GA D T  
 Ford, State Court, Wayne County, IN D  
 Ford, State Court, Orange County, FL D  
 v. Ford, State Court, Dallas County, TX D  
 v. Polaris, State Court, Crookston, MN D

v. Ford, State Court, Philadelphia, PA D T  
 v. NUMMI, Federal Court, Opelika, AL D T  
 v. Ford, State Court, Fairfax County, VA D T  
 v. Nissan, State Court, Bessemer, AL T  
 v. Ford, State Court, Orange County, FL D

2001

v. Ford, State Court, Okaloosa County, FL D T  
 v. Isuzu, State Court, Jasper County, MS D  
 v. Volkswagon, State Court, Hinds County, MS D T  
 v. Ford, State Court, Queens, NY T  
 Chrysler, State Court, Cleveland, OH D T  
 Mazda, State Court, Leflore County, MS D  
 v. Boyd, State Court, Jefferson County, AL D T  
 v. Ford, State Court, Bibb County, AL D  
 v. Isuzu, Federal Court, San Juan Puerto Rico  
 v. Ford, State Court, Palm Beach County,  
 FL D, T(02)  
 v. Honda, State Court, New Iberia Parish, LA D  
 v. Mazda, State Court, Oklabbaha County, MS D T

2002

v. Volvo, Federal Court, Memphis, TN D  
 v. Ford, State Court, Jefferson County, AL D  
 v. Chrysler, State Court, Cuyahoga County, OH DT  
 v. Ford, State Court, Hidalgo County, TX D

## PROFESSIONAL BIOGRAPHY

**VERNE L. ROBERTS**

**Birthplace and Date:**

**Kansas City, Missouri, August 11, 1939**

**Education:**

**B.S., Mechanical Engineering, University of Kansas, 1960**

**M.S., Mechanical Engineering, University of Illinois, 1961**

**Ph.D., Theoretical and Applied Mechanics, University of Illinois, 1964**

**P.E. Safety Engineer (CA. #1769)**

**Experience:**

**1997-Present Verne L. Roberts, PhD, Inc.**

**1977-1997: Director, Institute for Product Safety, 1410 Duke University Road, Durham, N.C. 27701**

**1974-1985: Associate Staff, Transportation Safety Institute, U.S. Department of Transportation, Oklahoma City, Oklahoma.**

**1973-1982: Adjunct Professor of Mechanical Engineering and Materials Science, Duke University, Durham, N.C.**

**1973-1976: Director, National Driving Center, Research Triangle Park, N.C.**

**1968-1973: Head, Biosciences Division, Highway Safety Research Institute, The University of Michigan, Ann Arbor, MI.**

**1966-1968: Coordinator, Biomechanics Research, Highway Safety Research Institute, The University of Michigan, Ann Arbor, MI.**

**1966 Associate Professor, Department of Neurosurgery, Wayne State University, Detroit, MI.**

**1965-1966: Associate Professor, Department of Engineering Mechanics, Wayne State University, Detroit, MI.**

**1964-1966: Consultant in Biomechanics, Veteran's Administration Hospital, Dearborn, MI.**

**1964-1966: Associate, Department of Urology, Wayne State University, Detroit, MI.**

**1963-1965: Assistant Professor, Department of Engineering Mechanics, Wayne State University, Detroit, MI.**

**Verns L. Roberts**

**Membership in Honor Societies:**

**Sigma Xi, Pi Tau Sigma, Sigma Tau and Tau Beta Pi**

**Honors:**

**American Men of Science**

**A.S.T.M. Research Award, 1966**

**Award of Merit, Society for Technical Communication, 1977**

**Certificate of Commendation, American Society of Mechanical Engineers, 1974**

**Metropolitan Life Award of Merit for Research in Accident Prevention, 1970**

**Wayne State University Faculty Research Fellowship, 1965**

**Who's Who in the Midwest**

**Commendation from Brock Adams, Secretary, U.S. Department of Transportation as a Recognized**

**Expert in Highway Safety, 1980**

**Who's Who in Technology Today**

**Membership in Technical Societies:**

**American Society for Mechanical Engineers**

**American Society for Safety Engineers**

**Systems Safety Society**

**American Society of Biomechanics**

**European Society of Biomechanics**

**Society of Automotive Engineers**

**Association for the Advancement of Automotive Medicine**

**Committee Memberships:**

**Chairman, Biomechanics and Human Factors Division, American Society of Mechanical Engineers**

**Committee on Biomechanics, Biomechanics and Human Factors Division, American Society of Mechanical Engineers**

**Planning Committee, First International Congress on Vehicle Mechanics**

**Crash Test Dummy Task Force, Society of Automotive Engineers**

**Human Simulation Test Devices Task Force, Society of Automotive Engineers**

**ANSI Committee Z90.1, Head Protection**

**ASTM Committee F-4 on Surgical Implant Materials**

**Chairman, 14th Stapp Car Crash Conference**

**Human Factors Committee, Society of Automotive Engineers**

**Canadian Standards Association Subcommittee on Child Seating Systems for Motor Vehicles**

**ASTM Committee F-8 on Protective Equipment for Sports**

**Chairman, Bioengineering Division, American Society of Mechanical Engineers**

**ANSI Committee Z89, Industrial Head Protection**

**ISO Committee on Human Exposure to Vibration**

**Chairman, Southeastern Conference on Safe Product Design and Failure Analysis**

**Member, General Committee, Design Engineering Division ASME**

**Member, Medical Devices and Sporting Equipment, Design Engineering Division ASME**

**ANSI Committee Z354.1, System Safety for Products Equipment, Facilities and Services**

**Verne L. Roberts**

**Editorial Affiliations:**

**Editor-in-Chief, Product Safety News**  
**Editor-in-Chief, Journal of Products Liability**  
**Editor-in-Chief, Journal of Biomechanics**  
**Editorial Advisory Board, Journal of Bioengineering**  
**Editorial Advisory Board, Journal of Biorheology**  
**Editorial Advisory Board, Mechanics Research Communication**

**Patents:**

**U.S. #3,791,694--Child Safety Seat**  
**U.S. #3,954,280--Child Restraint Harness**

**Publications, Books:**

**Byars, E.G., Contini, Renato and Roberts, V.L.: Biomechanics Monograph, American Society of Mechanical Engineers, 1967.**

**McElhaney, J.H., Roberts, V.L. and Hilyard, J.H.: Handbook of Human Tolerance, Japanese Automobile Research Institute, 1976.**

**Roberts, V.L.: Product Standards Index, Second Edition: Pergamon Press Ltd., 1977.**

**Roberts, V.L.: Machine Guarding, Institute for Product Safety, 1980.**

**Thomas, Elaine, Benton, C.E., Roberts, V.L.: Safe Chain Saw Design, Institute for Product Safety, 1983.**



Verne L. Roberts

Publications, Articles and Reports:

Aston, R., and Roberts, V.L. "The Effect of Drugs on Vibration Tolerance." *Arch Internationales de Pharmacodynamie et de Therapie*, Vol. 155, No. 2, pp. 289-299, 1965.

Hopkins, W.F., Pierce, J.H. and Roberts, V.L. "Observations on Pressure and Flow Measurements in the Lower Urinary Tract." *J. Urol.*, Vol. 94, pp. 479-482, 1965.

Roberts, V.L., and Terry, C.T. "Radiological Studies of Organ Displacement due to Impact." *Proceedings of the 19th Annual Conference on Engineering in Medicine and Biology*, November 1965.

Roberts, V.L., and Lisner, H.R. "A Correlation Between Cadaver and In Vivo Results," *Eighth Stapp Car Crash Conference Proceedings*, pp.134-146, 1966.

Lisner, H.R. and Roberts, V.L. "Evaluation of Skeletal Impact of Human Cadavers." *Studies on the Anatomy and Function of Bone and Joints*, pp.113-120, Springer-Verlag, Heidelberg, 1966.

Pierce, J.H., Martyn, F.E. and Roberts, V.L. "Lower Urinary Tract Resistance: Pressure-Flow Relationships." *J.Urol.*, Vol. 94, pp. 671-673, 1965.

Pierce, J.H., Hopkins, W.F. and Roberts, V.L. "Comparison of Voiding Pressures, Urine Flow Rates, and Resistance Measurements in Evaluation Lower Urinary Tract Obstruction." *J. Urol.*, Vol. 95, No. 4, pp. 516-519, 1966.

Roberts, V.L. "Strain Gage Techniques in Biomechanics." *Experimental Mechanics*, Vol. 6, No. 3, pp. 19-22A, 1966.

Roberts, V.L., Moffat, R.C. and Berkas, E.M. "Blunt Trauma to the Thorax- Mechanism of Vascular Injuries." *Proceedings of the Ninth Stapp Conference*, pp. 3-12, 1966.

Gurdjian, E.S., Roberts, V.L. and Thomas, L.M. "Tolerance Curves of Acceleration and Intracranial Pressure and Protective Index in Experimental Head Injury." *J. of Trauma*, Vol. 6, No. 5, pp. 600-604, 1966.

Roberts, V.L., Hodgson, V.R., and Thomas, L.M. "Fluid Pressure Gradients Caused by Impact of the Human Skull." *American Society of Mechanical Engineers*, Paper No. 66-HUF-1, 1966.

Moffat, R.C., Roberts, V.L. and Berkas, E.M. "Blunt Trauma to the Thorax- Development of Pseudoaneurysms in the Dog." *J. of Trauma*, Vol. 6, No. 5, pp. 666-680, 1966.

Roberts, V.L. and Terry, C.T. "Review of Mathematical Models which Describe Human Response to Acceleration." *American Society of Mechanical Engineers*, Paper No. 66-WA/BHF-13, 1966.

Verne L. Roberts

Publications cont'd

Thomas, L.M., Roberts, V.L. and Gurdjian, E.S. "Biological Engineering - A New Discipline in the Life Sciences." Proceedings of the Symposium on Biomedical Engineering, Vol. 1, pp. 243-245, 1966.

Roberts, V.L. "The Bioengineering Program at Wayne State University." Proceedings of the Fourth Bioengineering Symposium, Rose Polytechnic Institute, Terre Haute, Indiana, October 17-18, 1966.

Thomas, L.M., Roberts, V.L. and Gurdjian, E.S. "Experimental Intracranial Pressure Gradients in Human Skull," Journal of Neurology, Neurosurgery and Psychiatry, Vol. 29, pp. 404-411, October 1966.

Roberts, V.L., Jackson, F.R. and Berkas, E.M. "Heart Motion Due to Blunt Trauma to the Thorax." Tenth Stapp Car Crash Conference Proceedings, pp. 147-150, 1966.

Roberts, V.L. "Integrated Seat and Occupant Restraint Performance: Final Report" HSRI, Oct. 1967. 32 p. Sponsored by the National Highway Safety Bureau. Contract No. FH-11-6685. (PB-176-161).

Roberts, V.L. "Engineering for Bodily Stress." Science and Technology, Vol. 6, October 1967, pp. 72-82.

Roberts, V.L. "Experimental Studies on Thoracic and Abdominal Injuries." Prevention of Highway Injury. Highway Safety Research Institute, The University of Michigan, 1967, pp. 211-215.

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Aston, R., Roberts, V.L. and Silbergleit, A. "The Effect of Whole Body Mechanical Vibration on Pulmonary Pathology." Presented at the Fall Meeting of the Michigan Thoracic Society, October, 1964.

Moffat, H., Roberts, V.L., Silbergleit, A., and Berkas, E.M. "Experimental Thoracic Arterial Injury," presented to the Michigan Thoracic Society, April 1965.

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Roberts, Verne L. "The Role of the Change in Velocity in Motor Vehicle Injury Production", Iowa Association of County Medical Examiners, Des Moines, November 7, 1997.

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June 5, 2002

Mr. Bradley W. Smith  
BAKER, DONELSON, BEARMAN & CALDWELL  
4268 I-55 North  
Meadowbrook Office Park  
Jackson, Mississippi 39211

Re: [REDACTED] v. Ford Motor Company

Dear Mr. Smith:

At your request, I have investigated the crash involving a 2000 Ford Taurus that led to the referenced lawsuit. As part of my investigation to reach preliminary conclusions and opinions, I have analyzed the Complaint, various interrogatories, Alabama State Trooper's Accident Report and scene photographs, various scene photographs taken by Chris Walker, reports by Wayne K. Ross, Thomas E. Kuechler, and Dudley T. Zinke, vehicle specifications for a 2000 Ford Taurus, and crash test report number 99124-1 for a 2000 Ford Taurus conducted by TRC.

In addition, I inspected the crash-involved 2000 Ford Taurus on April 16, 2002. I have also inspected the safety belts which were removed from the vehicle and were not available for inspection in April.

I have not inspected the scene of the crash. I plan to complete that inspection in the near future.

Based on my investigation to date, I have reached the following preliminary conclusions and opinions:

- 1) This crash occurred on the Natchez Trace Parkway near Sheffield, Alabama, on April 20, 2000. According to the Trooper's report, [REDACTED] was driving a 2000 Ford Taurus when it crossed the opposing lane of traffic at highway speed and struck the NE bridge abutment head-on. At the time of the crash, [REDACTED] was the right-front passenger. The report also states that both [REDACTED] were wearing

their safety belts and the driver and passenger-side air bags did not deploy. The Trooper did not find any tire skid marks prior to impact which would indicate that [REDACTED] did not apply the brakes. The speed limit on this roadway is 50 miles per hour.

- 2) Using standard crash reconstruction techniques, I have determined that the change in velocity, or Delta-V, experienced by the Ford Taurus as it collided with the end of the bridge abutment was approximately 43 miles per hour. Delta-V is a measure of crash severity. As a comparison, the National Highway Traffic Safety Administration conducts crash tests of vehicles into immovable barriers at a speed of 30 miles per hour as part of their compliance requirements. This crash, with its Delta-V of approximately 43 miles per hour, would represent a crash that is approximately 99 percent more severe than a 30 mile per hour barrier impact. Analysis of the crash scene photographs confirm that the Ford Taurus traveled some distance in a relatively straight path with its left-side tires off the roadway prior to impact with the bridge abutment. Following impact with the abutment, the Taurus rotated clockwise coming to rest approximately 10 feet from the abutment. This was a very violent crash which posed a risk of significant injury to the occupants regardless of restraint system design or use.
- 3) I inspected the safety belt components and found that both safety belt restraints exhibited load marks on the webbing, D-ring, and latch plate consistent with use during the crash and consistent with proper lock-up. It is my opinion that both occupants were using the safety belt restraints at the time of the crash and that both safety belts locked properly to provide restraining forces to the occupants.
- 4) I inspected the steering system, front suspension, and rear suspension components of the crash-involved Ford Taurus and found them to be properly installed and in proper working order except for those components damaged during the crash. It is my opinion that a malfunction of these components did not cause the vehicle to lose directional control and did not cause the vehicle to cross the oncoming lane of traffic, exit the roadway, and collide with the bridge abutment.

In summary, it is my opinion that this crash was caused by the failure of [REDACTED] to control the path of his vehicle and to allow it to cross the oncoming lane of traffic and collide with a bridge abutment. Based on the Trooper's report and the scene photographs, there was no attempt by [REDACTED] to avoid striking the bridge abutment which would lead to the conclusion that he likely fell asleep, suffered some type of some medical problem, or was inattentive. This was a very violent crash that would pose a significant risk of severe injury or death to its occupants.

Mr. Smith  
June 5, 2002  
Page 3 of 3

Included as Attachment 1 to this report is my current Curriculum Vitae. Attachment 2 is a listing of other cases in which I have testified either in deposition or at trial. Carr Engineering, Inc., of which I am an employee, is being compensated at the rate of \$260 per hour for my time in study and testimony. I reserve the right to supplement this report based upon information or opinions that may become known as part of the discovery process.

Sincerely,

  
Gerald E. Corwin

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**GERALD E. CORWIN**

**Specialized Professional Competence**

- Design and evaluation of automotive crash protection systems, including driver and passenger air bag systems.
- Analysis of vehicle crashworthiness, including vehicle structure, fuel system integrity, occupant kinematics and passive restraint performance.
- Accident reconstruction and mechanical design analysis.
- Application of Federal Motor Vehicle Safety Standards to automobiles and MPVs.

**Professional Qualifications**

- Bachelor of Science (Automotive Engineering), Western Michigan University, 1980
- Graduate Engineer,  
Carr Engineering, Inc.- 1990 to Present
- Specialist - Vehicle Safety Programs,  
Chrysler Corporation - 1988-1990  
(Vehicle engineering to meet safety standards.)
- Senior Engineer - Business Group,  
Chrysler Corporation - 1985-1988  
(Product quality engineering.)
- Design Engineer - Impact Test and Development,  
Chrysler Corporation - 1984-1985  
(Crash testing to assure compliance to safety standards.)
- Design Engineer,  
Ford Motor Company - 1973-1984  
(Design, testing and manufacture of motor vehicles.)
- Member, Society of Automotive Engineers

04/04/00

ER03-010 0525

## DEPOSITION TESTIMONY

OF

GERALD E. CORWIN

Peterson (Kenneth) v. Ford Eastern Dist., LA	96-1902	06/19/98
Daniels, J. Dennis v. Chrysler Tarrant Co., TX	352-169403-97	07/17/98
Gillespie, Jacqueline v. Morton International Waller Co., TX	94-08 13,164	07/20/98
Garcia (Lynni) v. Pool Energy Services, Inc. Brooks Co., TX	97-03-07679-CV	08/24/98
Mack (Abe) v. Suzuki Brazoria Co., TX	95-C-1509	10/08/98
Cruze (Margret) v. Ford Grainger Co., TN	6764	10/19/98
Rodriguez (Luis) v. Midwest Industries, Inc. Travis Co., TX	97-12648	12/16/98
Hart (Cecilia) v. Mazda Bexar Co., TX	97CI-15195	01/21/99
Hartshorn (Douglas) v. Chrysler Wood Co., WV	96-C-196	01/22/99
Castillo (Maria) v. Mazda U.S. Dist., Puerto Rico	97-2555 (RLA)	02/26/99
Hayes (Susan) v. Mazda Northern Div., MD	WMN97-4378	03/31/99 - Part 1
Hayes (Susan) v. Mazda Northern Div., MD	WMN97-4378	05/05/99 - Part 2
Cummings (Brian) v. Ford Central Dist., CA	98-8294 GHK (AJWx)	06/23/99

Robinson (Leslie) v. Dornier Dallas Co., TX	97-04629-G	04/06/00
Gutierrez (Irene) v. Isuzu Ventura, CA	CIV 171967	05/24/00
Pagan (Anthony) v. Ford Parish of Jefferson, LA	536-131	06/27/00
Gabriel (Theresa) v. Chrysler San Antonio, TX	1:98CV488RG	07/06/00
Elizondo (Angie Maria) v. Chrysler Houston, TX	00-E-21752	08/09/00
Judson (Danita) v. Nissan Dale Co., Alabama	CV-98-338	09/08/00
Vasquez (Victor Manuel) v. Hyundai Bexar Co., Texas	99-CI-14064	09/12/00
Johnson (Brenda Holland) v. Ford Houston, TX	96-3877	9/20/00
Kedzuch (Cherryl M ) v. Ford Cook Co., Illinois	97-L-012931	11/20/00
Holland (Precious) v. Hertz Hillsborough Co., Florida	99-1301	12/28/00
Ramirez (Charles) v. Isuzu Jefferson Co., Texas	D-160, 692	02/26/01
Dourado (Barbara) v. Ford Broward County, Florida	99-021429	03/19/01
Thibodeaux (Monica) v. Ford US District Court - Eastern District of Louisiana	00-0785	04/27/01
Bravo Santiago (Amaris Maria) v. Ford US District Court for the District of Puerto Rico	99-1823 (SC)	08/28/01
Bazer (Eleanor Haik Etie) v. Honda Motor Iberia Parish, Louisiana	889-74F	10/23/01

Garland (D'Arcy) v. BMW  
Harris County, Texas

2000-07904

01/04/02

Amell (Heather) v. Ford  
Houston, Texas

CV-98-08236

02/13/02  
& 3/15/02

Lozano (Rachel) v. DaimlerChrysler,  
Houston, Texas

03/26/02



**TRIAL TESTIMONY****OF****GERALD E. CORWIN**

Misplay (Taylor) v. Isuzu Allegheny Co., PA	GD 93-17493	05/08/98
Bryant (Pamela) v. Mazda Jefferson Parish, LA	502-725	09/16/98
Garcia (Lynni) v. Pool Energy Services, Inc. Brooks Co., TX	97-03-07679-CV	10/15/98
Cruze (Margaret) v. Ford Grainger Co., TN	6764	11/20,23/98
Woodbury (Maria) v. LP&L St. John the Baptist Parish, LA	28174 Div "C" & 29048 Div "B"	12/22/98
Gillespie, Jacqueline v. Morton International Waller Co., TX	94-08 13,164	01/28,29/99
Hart (Cecilia) v. Mazda Bexar Co., TX	97CI-15195	03/25/99
Robin (Christi) v. Mazda Monroe, LA	CA97-0118	04/20/99
Cummings (Brian) v. Ford Central Dist., CA	98-8294 GHK (AJWx)	10/01/99
Ramos (Randy) v. Bay Jim Wells Co., TX	98-02-36425	01/14/00
Martin (Lessie) v. Ford Monroe, LA	42834	8/1/00
Gray (Robin) v. Ford		11/00/00
Dourado (Barbara) v. Ford Broward Co., Florida	99-021429	05/07/01

Kedzuch (Cheryl & Timothy) v. Ford  
Cook Co., Illinois

97-1-012931

05/24/01

Thibodeaux (Monica) v. Ford  
New Orleans, LA

88333

01/30/02

Tyson (Irene A. & Robert M.) v. Ford  
Jacksonville, FL

03/11/02

**RAGAN RESEARCH CORPORATION**  
14080 EDGEMOOR ROAD, LYONNA, MICHIGAN 48190  
734 642-8800 FAX 734 642-8827

June 6, 2002

J. Randolph Bibb, Jr., Esquire  
Baker Donelson Beaman & Caldwell  
Commerce Center, Suite 1000  
211 Commerce Street  
Nashville, Tennessee 37201

Re: [REDACTED] vs Ford Motor Company

Dear Mr. Bibb:

Per your request, I am providing expert opinions with respect to the design and performance of the 2000 Ford Taurus operated by John Schaeffer that was involved in a very serious head-on collision with a bridge abutment on April 20, 2001. All findings and opinions in this letter are expressed with a reasonable degree of scientific and engineering certainty.

**Background**

The 2000 Ford Taurus was being driven by [REDACTED] southbound on the Natchez Trace Parkway in Lauderdale County, Alabama. The vehicle crossed over the northbound lane and collided with a bridge abutment on the opposite side of the roadway. The right-front passenger seat was occupied by [REDACTED]. Both front seat occupants were using the three-point continuous loop restraint systems at the time of the collision. The vehicle was equipped with a driver and supplemental air bag restraint system, seat belt buckle pretensioners and seat belt energy management retractors. Both the driver's and passenger's air bag were dual-stage inflators designed to be activated by a forward electronic crash severity sensor and a personal safety system restraint control module.

In order to form my opinions with respect to the design and performance of the 2000 Ford Taurus occupant restraint system during this very severe frontal collision, I have reviewed the following information:

- Police report, dated April 23, 2000;
- Plaintiff's expert reports from Wayne Ross, D. Zinke and Thomas Kuechler;
- My vehicle inspection of the 2000 Ford Taurus on August 11, 2000;
- Federal Motor Vehicle Safety Standards 208, 209 and 210 for the 2000 Ford Taurus as well as compliance testing records;

- The 2000 Ford Taurus Owner's Guide;
- Ford Motor Company's response to plaintiff's interrogatories and request for production;
- My experience and knowledge of passenger vehicle occupant protection systems during static and dynamic loading conditions.

Opinions

My opinions are based on a reasonable degree of scientific and engineering certainty, my knowledge, training and education. These opinions are as follows:

- (1) The 2000 Ford Taurus front seat occupant restraint systems met and exceeded all applicable requirements of Federal Motor Vehicle Safety Standards 201, 209 and 210.
- (2) The front seat occupant restraint systems in the 2000 Ford Taurus were reasonably safe and not defective in their design.
- (3) This was very serious collision with a bridge abutment and serious injuries to vehicle occupants occur in this type of accident regardless of restraint system design.

If any additional information is provided during subsequent investigations and discovery, my opinions may be revised or supplemented to reflect this additional information.

My curriculum vitae and prior testimony is attached.

Sincerely,

*Roger C. Wagner, PE.*

Roger C. Wagner  
Principal Engineer  
Ragan Research Corporation

Attachments

RCW/bb

## RAGAN RESEARCH CORPORATION

### Roger C. Wagner

#### Specialized Professional Competence

- Automotive engineering component and structural design
- Body structure, active and passive restraint systems, seating systems and interior occupant protection systems
- Dynamic and static testing involving vehicle crashworthiness and system performance
- Federal Motor Vehicle Safety Standards rule making and compliance process
- Design analysis and evaluation of body components and structures in laboratory or real world crash performance
- Safety analysis of vehicle structure and occupant protection systems

#### Education

- Bachelor of Science Mechanical Engineering - Detroit Institute of Technology, 1966
- Professional Development Engineering Degree - University of Michigan, 1980
- Registered Professional Engineer, State of Michigan, 1970

#### Continuing Education

Traffic Accident Reconstruction; Biomechanics and Human Tolerance; Passive Restraints; Head and Neck Injury Symposium; Rollover Cause and Prevention; Lower Limb Safety; Side Impact; Air Bag Design and Performance; Rescue and Extrication; Sensor Design for Air Bag Systems

#### Professional Experience

- 1962-1966 General Motors Corporation  
Project Engineer Body Structure Mechanisms and Body Systems Testing,  
Fisher Body Division
- 1966 Chrysler Corporation  
Design Engineer, Design and Testing of Body Seating Systems
- 1966-2001 Ford Motor Company
- 1966-1968 Design Engineer Advanced Body Structures Car Research design development of advanced structures and human factors evaluations
  - 1968-1970 Design Engineer Advanced Pre-program, Product development design and development of concept vehicles and systems
  - 1970-1973 Design Engineer, Body Safety Engineering  
Design and development of passive restraint systems

## **RAGAN RESEARCH CORPORATION**

1973-1978 Senior Design Engineer, Advanced Body Engineering  
Design and development of advanced body safety, structural and  
lightweight systems and components

1978-1994 Design Analysis Engineer, Car Design Analysis  
Analysis of vehicles, systems and components

1994-2001 Design Analysis Engineer, Global Core Engineering Design  
Analysis of vehicles, systems and components

2002-Present Ragan Research Corporation  
Principal Engineer

### **Memberships**

Member, Society of Automotive Engineers (SAE)  
Member, National Society of Professional Engineers (NSPE)  
Member, Michigan Society of Professional Engineers - Faidano Chapter (MSPE)

## RCW Testimony Log.

8/25/98	McVey, Kelly	30,B,6 Deposition	Seat Belt/Seat
8/12/98	Newman, Anna Belle	30,B,6 Deposition	Seat/Seat Belt
10/1/98	Wilder, Shelley	30,B,6 Deposition	Seat Belt
11/12/98	Ashby, Rex	30,B,6 Deposition	Seat Belt
11/18/98	Romo, Juan R.	30,B,6 Deposition	Roof Crush/Rollover
1/28/99	Rodriguez, Noemi	30,B,6 Deposition	Set Belt
1/28/99	Domingo, Erving C.	30,B,6 Deposition	Seat Belt
2/23/99	McVey, Kelly	Expert Deposition	Seat Belt
4/5/99	Wallgora, Sandra M.	Expert Deposition	Seat Belt
4/27/99	Domingo, Erving C.	Expert Deposition	Seat Belt
5/11/99	Carini, Lonna	Expert Deposition	Seat Belt
6/22/99	Carini, Lonna	Expert Trial Testimony	Seat Belt
6/23/99	Carini, Lonna	Expert Trial Testimony	Seat Belt
6/24/99	Carini, Lonna	Expert Trial Testimony	Seat Belt
6/28/99	Carini, Lonna	Expert Trial Testimony	Seat Belt
7/28/99	Garcia, Consuelo	30,B,6 Deposition	Air Bag
7/29/99	Garcia, Consuelo	30,B,6 Deposition	Air Bag
8/17/99	Sparks, Diana	30,B,6 Deposition	Seat Belt
8/24/99	Ashby, Rex	Expert Deposition	Seat Belt
9/28/99	Rollins, Harley	30,B,6 Deposition	Seat Belt/Seat
9/29/99	Rollins, Harley	30,B,6 Deposition	Seat Belt/Seat
10/13/99	McVey, Kelly	Expert Trial Testimony	Seat Belt
10/19/99	Newman, Anna Belle	Expert Deposition	Seat Belt
11/18/99	Wolfe, Judy	30,B,6 Deposition	Seat Belt/Seat
11/30/99	Story, L.F.	Expert Deposition	Seat Belt
12/21/99	Schweitzer, Carlin	Expert Deposition	Seat Belt
1/5/00	Forbis, Jennifer Jean	30,B,6 Deposition	Seat Belt
1/26/00	Schweitzer, Carlin	Expert Trial Testimony	Seat Belt
3/15/00	Ford, Kelly Lynn	30,B,6 Deposition	Seat Belt

RCW Testimony Log

3/21/00	Sommer, Sharon	Expert Deposition	Air Bag
7/20/00	Shores, John Montroy	30,B,6 Deposition	Air Bag
7/26/00	White, David	30,B,6 Deposition	Air Bag
8/15/00	Wolfe, Judy	Expert Deposition	Seat Belt
8/21/00	Coughlin, April	30,B,6 Deposition	Seat Belt
8/28/00	Zamora, Magdalena	30,B,6 Deposition	Seat Belt
10/13/00	Rutherford, Carolyn F.	Expert Deposition	Air Bag
11/13/00	Hanebutt, Althea D.	30,B,6 Deposition	Seat Belt
11/15/00	Janson, Candy S.	30,B,6 Deposition	Seat Belt
11/16/00	Janson, Kyle	30,B,6 Deposition	Seat Belt
12/7/00	Fahy, Jonathan	Expert Deposition	Seat Belt
12/21/00	Coughlin, April	30,B,6 Deposition	Seat Belt
2/8/01	Dourado, Barbara	30,B,6 Deposition	Seat Belt
2/7/01	Quezada, Gerardo	30,B,6 Deposition	Seat Belt
2/14/01	Rafferty, Penny	30,B,6 Deposition	Seat Belt
2/16/01	Gibbins, Dawn Louise	Expert Deposition	Seat Belt
3/5/01	Savage, Michael	Factual Testimony	Seat Belt
3/20/01	Bradford, Melissa	30,B,6 Deposition	Seat Belt
6/4/01	Dourado, Barbara	Trial Testimony	Seat Belt
8/1/01	Rainford/Walker	30,B,6 Deposition	Seat Belt
8/28/01	Roland, Herman Charles	30,B,6 Deposition	Seat Belt
7/17/01	Zamora, Magdalena	Expert Deposition	Seat Belt
8/21/01	Kinoid, Terry	30,B,6 Deposition	Seat Belt
8/23/01	Lopez, William	30,B,6 Deposition	Air Bag
10/3/01	Havill, Georgiana A.	30,B,6 Deposition	Seat Belt
11/8/01	Vonderharr, Timothy	Expert Deposition	Seat Belt
11/13/01	Lynch Kenneth	30,B,6 Deposition	Seat Belt
1/4/02	Camara, Noale	Expert Deposition	Seat Belt
2/13/02	Rainford/Walker	Trial Testimony	Seat Belt

EN03-018 0356



RCW Testimony Log

2/25/02  
3/13/02  
3/25/02

Rainford/Walker  
Banks, Kimberly  
Banks, Kimberly

Trial Testimony  
30,B,6 Deposition  
30,B,6 Deposition

Seat Belt  
Seat Belt  
Seat Belt

8802

FROM :GRATZINGER ENGINEERING

FXR NO. :948953487

Jun. 84 2002 01:23PM P2

**ROBERT J. GRATZINGER, MS, MBA  
CURRICULUM VITAE**

**EDUCATION:** Master of Business Administration, December, 1989  
University of Michigan, Ann Arbor, Michigan

Master of Science - Engineering Mechanics, May, 1973  
Case-Western Reserve University, Cleveland, Ohio

Bachelor of Science - Mechanical Engineering, June, 1971  
General Motors Institute, Flint, Michigan

**EXPERIENCE**

7/94 - Present **GRATZINGER ENGINEERING & CONSULTING, INC.** - Irvine, California  
President; Principal Engineer

- o Automotive safety consultant; engineering consultant on automotive design performance, particularly crashworthiness components and occupant protection. Expertise includes: airbags, passive and manual seat belts, body structures, interior components, occupant kinematics, biomechanics and injury mechanisms, accident reconstruction, and crash testing.

**NISSAN**

8/80 - 7/84 **NISSAN NORTH AMERICA, INC.** - Torrance, California  
Corporate Manager; Engineering Analysis Department

7/88 - 8/90 **NISSAN MOTOR CORPORATION IN U.S.A.** - Carson, California  
National Manager; Engineering Analysis Department

- o Manage engineering activities related to analysis of Nissan field product performance.
- o Corporate technical consultant on engineering design performance matters, particularly crashworthiness components. Also review technical and other corporate publications and provide engineering advice.



FROM :GRATZINGER ENGINEERING

FRX NO. :8495533487

June 84 2022 03:23PM PB

**GENERAL MOTORS CORPORATION**

**3/83 - 7/88**

**G.M. TECHNICAL CENTER - Warren, Michigan**  
**Staff Analysis Engineer; Engineering Analysis Department**

- o Corporate consultant on light truck structures, restraint systems and crashworthiness testing and product development.
- o Field performance analysis of crashworthiness components.
- o Designed and conducted numerous rollover tests, including portions of GM 'Malibu' series.

**11/75 - 3/83**

**G.M. PROVING GROUND - Milford, Michigan**  
**Senior Project Engineer; G.M. Engineering Staff**

- o Crash sensing 'Systems Manager' of corporate airbag development program (1975-1981).
- o Developed numerous advanced concepts for crashworthiness testing and product development.
- o Chairman and secretary of unrestrained occupant task force; consultant to steering system design coordination committee on design analysis for unrestrained occupants.
- o Consultant on new vehicle and restraint system development: design guidelines, performance objectives (including biomechanical), test data analysis.
- o Conducted over 1,000 full scale, sled and lab-components tests between 1975 and 1983.

**5/78 - 11/78**

**G.M. PROVING GROUND - Milford, Michigan**  
**Project Engineer; G.M. Automotive Safety Engineering Dept.**

- o Major contributor to GM response to NHTSA proposals for crashworthiness FMVSS regulations

**4/73 - 5/75**

**G.M. PROVING GROUND; Milford, Michigan**  
**Test Engineer; G.M. Automotive Safety Engineering Dept.**

- o Conducted and developed hyge sled, full scale crash, and component tests for evaluating crashworthiness components.

**2/71 - 9/71**

**G.M. PARTS DIVISION**  
**Junior Project Engineer**

- o Developed specifications for re-manufactured clutches and water pumps

FROM: GERTZINGER ENGINEERING

PRX NO.: 19499203407

Jun. 86 2002 01:24PM P4

### CASE-WESTERN RESERVE UNIVERSITY

9/71 - 3/73 Research/Teaching Assistant; Department of Civil Engineering and Applied Mechanics.

- Research, testing and thesis on analysis of thermal buckling of thin cylindrical shells
- Taught undergraduate Strength of Materials Lab

### AWARDS AND HONORS

Beta Gamma Sigma - National Honorary Business Administration Fraternity, 1967  
Steen Foundation - Graduate Assistant Award, 1971

### PROFESSIONAL AFFILIATIONS

American Management Association  
American Society of Mechanical Engineers  
Association for the Advancement of Automotive Medicine  
Society of Automotive Engineers

### CONTINUING EDUCATION

- AMA - Improving Your Managerial Effectiveness, Newport Beach, CA., September 20 - 25, 1992.
- NHTSA - Region IX, Occupant Protection Update, San Francisco, CA., June 30 - July 1, 1992.
- AAAM - Biomechanics of Impact Trauma Seminar, San Antonio, TX., February 15-17, 1989, and Torrance, CA., March 30-31, 1992.
- UM-TPI - Anatomy, Injuries and Biomechanics of the Vertebral Column, Ann Arbor, MI., May 18-19, 1984.

FROM :GRATZINGER ENGINEERING

FAK NO. :9493553487

Jun. 04 2002 01:24PM PS

**PUBLICATIONS AND PRESENTATIONS**

Chairman: Passenger Vehicle Safety and Risk. Safety Engineering and Risk Analysis Division. American Society of Mechanical Engineers Winter Annual Meeting. New Orleans, LA. December 8, 1993.

Gratzinger, Robert J. - "GM Rollover Testing". Presentation at Accident Reconstruction Conference. Illinois Association of Technical Accident Investigators - Normal, Illinois, October, 1987.

Kicher, T.F., T.C. Esselman, and R.J. Gratzinger - Thermal Buckling of Fluid Supported Liner Shells. And International Conference on Structural Mechanics in Reactor Technology. Berlin, Germany, September 10-14, 1978.

FROM: GRATZINGER ENGINEERING

PRX NO. : 9499553487

Jun. 84 2082 01:24PM PG

**EXPERT TESTIMONY LIST  
ROBERT J. GRATZINGER  
FOUR YEAR HISTORY**

DATE	CASE	LOCATION	DEI
6/17/98	DEMAREE V. TOYOTA	COSTA MESA, CA	DEPO
6/26/98	STRANO V. GOODYEAR	LOS ANGELES, CA	TRIAL
8/7/98	HANOVER V. TOYOTA	TORRANCE, CA	DEPO
8/14/98	MCGEE V. NISSAN	SANTA ANA, CA	DEPO
8/21/98	DICKERSON V. MAZDA	COSTA MESA, CA	DEPO
9/16/98	THOMASSON V MAZDA	COSTA MESA, CA	DEPO
9/29/98	HORTON V. NISSAN	TORRENCE, CA	DEPO
10/14/98	DICKERSON V. STEWART	SUGAR LAND, TX	TRIAL
10/23/98	HOWARD V. ISUZU	TORRENCE, CA	DEPO
11/20/98	HALIM V MAZDA	IRVINE, CA	DEPO
12/10/98	HALIM V. MAZDA	SAN ANTONIO, TX	TRIAL
2/9/99	CYPHERS V. SUBARU	COSTA MESA, CA	DEPO
3/3/99	DENNEY V. NISSAN	TORRANCE, CA	DEPO
3/24/99	BRAVERMAN V. MAZDA	INGLEWOOD, CA	TRIAL
4/14/99	CLINGENPEL V. TOYOTA	IRVINE, CA	DEPO
5/9/99	CLINGENPEL V. TOYOTA	COSTA MESA, CA	DEPO
5/14/99	JERETINA V. NISSAN	COSTA MESA, CA	DEPO
5/27/99	TAYLOR V. FORD	IRBA, CA	DEPO
6/4/99	JERETINA V. NISSAN	TROY, MI	DEPO
7/14/99	LEONARD V. SUBARU	SALT LAKE CITY, UT	DEPO
7/23/99	SCOTT V. NISSAN	TORRENCE, CA	DEPO
7/29/99	GARCIA V. ISUZU	SANTA MONICA, CA	DEPO
8/5/99	CLINGENPEL V. TOYOTA	OKLAHOMA CITY, OK	TRIAL

FROM :GUNTZINGER ENGINEERING

PRK NL :549953487

Jul. 04 2002 01:24PM P7

8/10/99	GREGORY V. TOYOTA	COSTA MESA, CA	DEPO
8/13/99	TEUCHLARE V. MAZDA	IRVINE, CA	DEPO
8/16/99	CLINGENPEL V. TOYOTA	OKLAHOMA CITY, OK	TRIAL
8/24/99	LOUAFRE V. TOYOTA	COSTA MESA, CA	DEPO
9/22/99	NEMTEC V. VOLKSWAGEN	NEWARK, NJ	DEPO
9/28/99	HAN V. FORD	PASADENA, CA	DEPO
9/30/99	WORKMAN V. NISSAN	COSTA MESA, CA	DEPO
10/5/99	HARPER V. NISSAN	PHOENIX, AZ	DEPO
11/3/99	ZABOLI V. MAZDA	SANTA ANA, CA	DEPO
11/12/99	WALSTEAD V. NISSAN	COSTA MESA, CA	DEPO
12/14/99	MARTIN V. NISSAN	COSTA MESA, CA	DEPO
2/4/00	GASS V. NISSAN	TORRENCE, CA	DEPO
2/10/00	DEESE V. MAZDA	AUSTIN, CA	DEPO
3/17/00	WOODYARD V. NISSAN	COSTA MESA, CA	DEPO
3/23/00	GREGORY V. TOYOTA	LOUISVILLE, KY	TRIAL
4/13/00	GASS V. NISSAN	LOS ANGELES, CA	TRIAL
6/1/00	HOWARD V. HUZU	WORCESTER, MA	TRIAL
6/14/00	CROSS V. NISSAN	COSTA MESA, CA	DEPO
7/19/00	NELSON V. FORD	COSTA MESA, CA	DEPO
8/18/00	WALSTEAD V. NISSAN	TYLER, TX	TRIAL
8/22/00	NELSON V. FORD	DENVER, CO	TRIAL
8/25/00	CHANDLER V. FORD	LOS ANGELES, CA	DEPO
8/30/00	JUDSON V. NISSAN	TORRANCE, CA	DEPO
9/1/00	ZABOLI V. MAZDA	SANTA ANA, CA	DEPO
9/7/00	WYATT V. NISSAN	COSTA MESA, CA	DEPO
11/17/00	MILERO V. MITSUBISHI	SAN ANTONIO, TX	DEPO
12/14/00	PALMER V. VOLKSWAGEN	COSTA MESA, CA	DEPO

FROM : BRATZINGER ENGINEERING

FAX NO. : 9498553487

Jun. 04 2002 01:25PM PB

2/8/01	SIEB V. VOLKSWAGEN	COSTA MESA, CA	DEPO
3/7/01	LOONEY V. MAZDA	COSTA MESA, CA	DEPO
3/9/01	GIBBINS V. FORD	SAN FRANCISCO, CA	DEPO
3/13/01	GRIFFIN V. KIA	COSTA MESA, CA	DEPO
3/23/01	PALMER V. VOLKSWAGEN	JACKSON, MI	TRIAL
3/27/01	ASKIE V. NISSAN	TORRANCE, CA	DEPO
5/2/01	LOONEY V. MAZDA	GREENVILLE, TN	TRIAL
5/18/01	TRAWICK V. NISSAN	COSTA MESA, CA	DEPO
6/8/01	BOWLEY V. FORD	SANTA MONICA, CA	DEPO
7/13/01	NGUYEN V. GM	NEWPORT BEACH, CA	DEPO
7/18/01	CLIBURN V. FORD	HUNTINGTON BEACH, CA	DEPO
7/20/01	LONG V. FORD	HUNTINGTON BEACH, CA	DEPO
8/23/01	KOENIG V. TOYOTA	IRVINE, CA	DEPO
9/26/01	BLACKMON V. FORD	HUNTINGTON BEACH, CA	DEPO
10/12/01	BAZER V. HONDA	LOS ANGELES, CA	DEPO
10/24/01	MORSE V. FORD	COSTA MESA, CA	DEPO
10/30/01	SCHLOSS V. GM	TORRANCE, CA	DEPO
11/12/01	VONDERHARR V. FORD	LOS ANGELES, CA	DEPO
11/29/01	DEMASO V. FORD	IRVINE, CA	DEPO
12/14/01	PHAM V. GM	COSTA MESA, CA	DEPO
1/23/02	AMELL V. FORD	IRVINE, CA	DEPO
1/25/02	CAMARA V. FORD	LOS ANGELES, CA	DEPO
2/7/02	RICCI V. VOLVO	TORRANCE, CA	DEPO
4/9/02	BROWN V. MAZDA	REDONDO BEACH, CA	DEPO
4/12/02	ZIMMER V. NISSAN	SHORT HILLS, NJ	DEPO
4/25/02	GIBSON V. NISSAN	DENVER, CO	DEPO



FROM :GRITZINGER ENGINEERING

FRX NO. :9499553487

July 04 2002 01:25PM PS

5/23/02	FORD V. FORD	PLYMOUTH, MA	TRIAL
5/30/02	BLAIR V. TOYOTA	COSTA MESA, CA	DEPO

0001

1 IN THE UNITED STATES DISTRICT COURT  
2 SOUTHERN DISTRICT OF MISSISSIPPI  
3 JACKSON DIVISION



7 Plaintiffs,

Case No.:

8 v.

3:01-CV403BN

9  
10 FORD MOTOR COMPANY, BUDGET  
11 RENT-A-CAR SYSTEMS, INC., and  
12 TEAM FLEET SERVICE FINANCING  
13 CORPORATION,  
14 Defendants.

13 DEPOSITION OF ROGER C. WAGNER

14 Taken at 30559 Flynn Drive, Romulus, Michigan, on  
15 July 17, 2002, commencing at or about 11:05 a.m.

16 APPEARANCES:

17 Co-Counsel for the Plaintiffs:

18 MR. ROBERT L. WELLS  
19 MR. JAY M. KILPATRICK  
20 Young, Williams, Henderson & Fuselier  
21 2000 AmSouth Plaza  
22 Jackson, Mississippi 39201  
23 601-948-6100

24 For the Defendants:

25 MR. JOHN RANDOLPH HIBB, JR.  
Baker, Donelson, Bearman & Caldwell  
Commerce Center  
211 Commerce Street, Suite 1000  
Nashville, Tennessee 37201  
615-726-5600

0002

1 REPORTED BY:  
2 Dora L. Doletzky, CSR-6110  
Certified Shorthand Reporter

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I N D E X

8 WITNESS: PAGE

9 ROGER C. WAGNER

10 Examination by Mr. Wells 3

11

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15 EXHIBITS: PAGE

16 Wagner Deposition Exhibit No. 1 3

17

18

19

20

21

22

23

24

25

1 Romulus, Michigan

2 July 17, 2002

3 At or about 11:05 a.m.

4 \* \* \*

5 MR. WELLS: This is the Rule 30B6 deposition of  
6 Ford Motor Company taken pursuant to notice dated  
7 July 17, 2002.

8 I want to attach a copy as Exhibit 1, and I'll just mark  
9 it and you can put your label on it later. You got the  
10 notice so you can make sure we're all talking off the same  
11 page?

12 MR. BIBB: It looks to be the same one.

13 MR. WELLS: Okay.

14 MR. WAGNER: Okay.

15 (Wagner Deposition Exhibit No. 1 marked for  
16 identification)

17 ROGER C. WAGNER,

18 having first been duly sworn or affirmed, was examined and  
19 testified as follows:

20 EXAMINATION

21 BY MR. WELLS:

22 Q Okay. State your name please, sir.

23 A It's Roger, R-o-g-e-r, C, middle initial, Wagner,

24 W-a-g-n-e-r.

25 Q Okay. And it is Mr. Wagner?

0004

1 A Yes.

2 Q Okay. It's not Dr. Wagner?

3 A No, no Ph.D.

4 Q Okay. I just did not know that because I just looked at this  
5 part.

6 You understand you're here today to testify on behalf of  
7 Ford Motor Company in the litigation we're dealing with?

8 A Yes, sir.

9 Q Have you ever been a Rule 30B6 designee in a deposition  
10 before?

11 A Yes, sir.

12 Q Okay. Do you understand how that works?

13 A I think I do.

14 Q Okay. There is a notice that we've attached as Exhibit  
15 No. 1, and what it does is it has a series of categories that  
16 are numbered here. You are the person who is -- who has the  
17 information to testify as to the information that is under  
18 the control of Ford Motor Company with regard to these  
19 categories. And you're educated with regard to these  
20 categories?

21 A Yes, sir.

22 Q Okay. Tell me what you did to get ready for the deposition.

23 A I basically went back and determined what had been produced  
24 in the discovery process, and I attempted to review a good  
25 deal of the documents. I don't know whether there was

1 25 boxes or so of documents. There's quite a number. I  
2 didn't count them specifically, but there's an awful lot of  
3 information that's been produced as far as, you know,  
4 engineering documents. I think there were some other  
5 business kind of documents that were produced that I really  
6 didn't look at because that's not my background. I'm an  
7 engineer, and I look at technical information.

8 Q Okay. Are you a present employee of Ford Motor Company?

9 A No, sir. I retired from Ford on December 31st, 2001.

10 Q Okay. Have you gone in preparation for this deposition or as  
11 part of this litigation and talked to any employees at  
12 Ford Motor Company?

13 A I think I've had some conversations in the last few months  
14 with people, yes.

15 Q Tell me who.

16 A I had a brief conversation with Paul Bacina.

17 Q Okay. And who else?

18 A That's the only one that I recall.

19 Q Who is he?

20 A Paul Bacina, he was one of my co-workers that I worked with  
21 when I was at Ford, and he is currently still employed by  
22 Ford. He's an engineer.

23 Q What's his position other than just engineer?

24 A I think he's a design analysis engineer currently.

25 Q Okay. And is he in a department or section?

1 A He's part of the design analysis engineering department, and  
2 from time to time they change names of different groups  
3 within it, so I never memorized which name it was at the  
4 current time. I -- God knows what it could be, but I think  
5 it's interior -- vehicle interiors or something like that.

6 Q Does Mr. Bacina deal with seat belts and/or airbags?

7 A I think he has, yes.

8 Q Okay. Why did you talk with him versus somebody else?

9 A I was trying to recall what was the characteristics of some  
10 of the systems initially and refresh my memory with respect  
11 to what I remembered when I was looking at some of the  
12 documents.

13 Q Okay. And did he give you any information other than just  
14 refreshing your memory?

15 A That's about it. Actually, he wasn't really of any great  
16 help. I asked him questions and he didn't recall what I was  
17 talking about, because I think the fact when you start  
18 reading, you know, 25 boxes of documents and you call  
19 somebody up and say, well, what does this mean, they say I  
20 don't remember. Basically, I think that was the context of  
21 the conversation.

22 Q He didn't provide you any information; is that correct?

23 A Not anything meaningful.

24 Q Okay. So thus far what you've told me is you've reviewed the  
25 documents in discovery. You talked to Mr. Bacina. Have you

1 done anything else to prepare for this deposition?

2 A Well, I don't know whether -- I mean, at one point in time I  
3 inspected the vehicle, but, you know, that is as far as  
4 preparing for a deposition of this nature. It certainly  
5 wouldn't have a great deal -- I mean, it's general knowledge  
6 to have, but I did inspect the vehicle at one time.

7 Q Okay. Now, in this case you've also been designated as an  
8 expert. Today you're testifying as a corporate  
9 representative, but other than reviewing the documents  
10 produced in discovery, inspecting the vehicle and talking to  
11 Mr. Bacina, what have you done in this case?

12 MR. BIBB: With respect to preparing for the 30B6 or  
13 just in general in this case?

14 BY MR. WELLS, CONTINUING:

15 Q Any -- as an expert, as a witness, as a 30B6 designee,  
16 anything.

17 A Certainly, the things that -- I prepared to write an expert  
18 report, and preparing for that aspect were quite different  
19 than what the 30B6 preparation would be because that's  
20 more -- a 30B6, my understanding, is to review documents and  
21 look at the way things are engineered and tested and  
22 specifications and things of that nature that help design and  
23 manufacture and put into production products of certain  
24 types. That's a completely different kind of thing than  
25 looking at the kind of background information that you would



1 have to have in order to do an expert's report, because an  
2 expert's report you would have to form opinions and you would  
3 have to look at reports --

4 Q I understand all of that.

5 A -- generated by --

6 Q But since you're sitting here I need to know what you know  
7 and what your source of information is, and you have dual  
8 hats, but they are going to end up crossing over. So I just  
9 need to know with regard to both of these what have you done  
10 in this case? I've got your expert report right here. I  
11 understand what you say, but I want to know what you've gone  
12 and looked at, what you've done, what you've gathered that  
13 would be your source of knowledge right now. You looked at  
14 the documents produced in discovery --

15 A Let's go back to the beginning. I was asked to be part of an  
16 investigation of the vehicle before I think there was any  
17 litigation involved and be part of -- and help the NHSTA  
18 people, the special crash investigation team that was  
19 involved, early on and also try to provide any information  
20 from downloading the information that might have been stored  
21 in a module and try to understand what had occurred in this  
22 accident to some degree.

23 And that all took place, I believe, way before any  
24 litigation was involved in the case, because we had an  
25 interest, because, it being a new product, that -- we wanted

1 to try to understand what had occurred and try to explain and  
2 see what we could do, if there was something that had to be  
3 corrected or whatever. I mean, that's the normal feedback  
4 process that engineering would do to -- anytime you put a new  
5 product out, you try to keep -- be apprised of what happens  
6 in the field, because things that occur in accidents in the  
7 field help you design and change products in the future. So  
8 that was part of what we were doing.

9 It's a function that we've had when I was employed by  
10 Ford in design analysis, was to look at real-world incidents  
11 and provide information back to the engineering community as  
12 to what was happening during crashes and other things that  
13 could occur while a consumer was using the product. Because  
14 that's a function that the engineering community doesn't  
15 necessarily have. They have specifications and they have  
16 testing and things that they do that have to conform to  
17 Federal Motor Vehicle Safety Standards and those kind of  
18 things, but that was the first part of it.

19 And then as it turned into litigation -- I don't recall  
20 when the suit was filed, but I think I was still employed by  
21 Ford -- some of the interrogatories and things started to --  
22 requested information and that -- I assisted to supply some  
23 of that information before I retired. And more recently I  
24 was requested by Mr. Bibb to look at the documents and  
25 prepare for deposition and so forth.

1 Q Okay. As far as this case, did you look at anything to --  
2 any documents or photographs or anything before you actually  
3 went to Nashville and looked at the car?

4 A I don't recall having any photographs. I think what was  
5 provided to me by the NHSTA, National Highway Safety  
6 Transportation people -- Transportation Administration  
7 people -- that they provided me with the police report from  
8 the -- I'm trying to think of the name of the organization.

9 Q That's fine.

10 A Park patrol or something -- because it was actually written  
11 by some park rangers. I know I received -- I received a  
12 faxed copy of that, and beyond that I don't think there was  
13 much more than that prior to going to the Budget Rent-a-Car  
14 facility in Nashville.

15 Q Okay. Then you went to Nashville and you examined the car?

16 A Right.

17 Q Have you done it once or more than once?

18 A I've only examined the car once.

19 Q Okay. As a result of examining the car did you go and look  
20 at any publications or documents or anything of that nature?

21 A I probably did, but I don't recall. Usually when something  
22 like this would occur, then you start trying to look at shop  
23 manuals and procedures for, you know, obtaining information,  
24 how things were put together and things like that, but I  
25 don't recall specifically what I may or may not have done at

0011

1 that time. I certainly had to acquire some kind of  
2 information, but I don't recall what it was.

3 Q Did you go and look at any publications to get any  
4 information from after your first --

5 A Let me understand what you mean by publication. You mean  
6 like a shop manual?

7 Q Anything. Publications that are internal to Ford or external  
8 to Ford or in the automotive industry or anything.

9 A I don't recall. Like I just told you, I don't recall  
10 specifically what I looked at, but generally you would try to  
11 understand what the system was doing and try to get some  
12 background information on it. But I don't recall  
13 specifically what I'd done.

14 Q Okay.

15 A Typically you would look at a shop manual, perhaps you would  
16 look at some kind of -- shop manuals are pretty good because  
17 they give you illustrations and they give you troubleshooting  
18 kind of information to give you some preliminary information  
19 if you're not totally familiar with all the details, because  
20 there's so many different products, you can't memorize  
21 everything anyway. I haven't been able to.

22 Q Did you keep a file of what you did in this case; notes,  
23 anything?

24 A When I was at Ford I did, yes.

25 Q Okay. Subsequent to --

1 A When you say notes --

2 Q Do you have a file for your expert testimony and all the  
3 things you do as an expert?

4 A I do have a file for that, yes, sir.

5 Q And where is that kept?

6 A It's kept at my place of business.

7 Q Okay. And you've got some notes in there?

8 A When you say notes --

9 Q You made some notes somewhere. I make them. You make them.

10 Everybody makes their notes. Do you have a notes file of  
11 some sort?

12 A Not necessarily. I had -- it's sometimes confusing. Some  
13 people write extensive notes. I usually just take  
14 photographs. I may at the time write down where I'm at, the  
15 date, things like that until I put together a photo book so  
16 that I can remember, you know, what was the date and so forth  
17 and things of that nature, but I don't tend to write  
18 extensive notes.

19 I know some people use tape recorders and -- I've never  
20 been in the habit of doing that because my photographs  
21 usually are extensive enough that I can understand -- if I  
22 look at them, I can review them and see what occurred.

23 Q Okay. When you looked at something in this case, did you  
24 generally make some -- did you make some notations somewhere  
25 or some evidence of what it is that you looked at?

1 A Not that I can recall.

2 Q Did you make photocopies of any articles or shop manuals or  
3 documents or anything that you put in your file?

4 A I probably did, because certainly I knew that -- at that time  
5 I had a copy of the police report that was sent to me by the  
6 special crash investigation people who I have known for a  
7 number of years, and I probably had some other information,  
8 but, again, I don't recall what I had in my Ford file. When  
9 I left Ford, I couldn't -- you know, it's Ford's file, so I  
10 can't take it.

11 Q Let me say where we're going. You looked at the car. You  
12 went back. You may have looked at some shop manuals. You  
13 don't know whether you did or not?

14 A Well, I think I did because we were talking about trying to  
15 obtain information from the restraint control module, and I  
16 would have probably tried to determine what was the  
17 procedure. I mean, that makes sense to me and I generally  
18 would do that. And I probably would have made inquiries with  
19 other people to try to understand what to do.

20 I know there was an issue that the -- special crash  
21 investigation people wanted to know how to understand how to  
22 measure the load limiting device and the seat belt  
23 retractors, and I don't think we -- when I was at Ford, we  
24 never resolved how to do that because I made inquiries to  
25 some of the suppliers, and it becomes -- it would be a

1 difficult thing without doing destructive tear down of the  
2 seat belts. And you'd have to have a protocol and so forth  
3 and agreements with you folks and others to make sure we had  
4 done it appropriately.

5 Q Well, I hear what you're saying. I hear you say that you  
6 probably would have done certain things because that would be  
7 the normal course. But in this case do you remember doing  
8 those things?

9 A I did make inquiries to some of the seat belt suppliers, and  
10 I remember calling TRW. And they told me -- no, that's not  
11 their product. It happened to be Allied Chemical which ended  
12 up being Breed Corporation seat belts, and because of some of  
13 the changes that were happening within Allied Chemical and  
14 Breed, I was not able to get any substantial answer from  
15 people because people were moving around on that issue.

16 So because of the destructive nature that would have  
17 taken place in order to look at the torsion bar and how much  
18 load limiting had occurred, I think we kind of put that on  
19 the back burner. I think I might have had a discussion with  
20 in-house counsel about that, and we decided not to do it. So  
21 I don't know what has transpired with that.

22 And I think there was some confusion about who the  
23 airbag manufacturer was, and, again, I think I contacted TRW,  
24 because TRW supplied us with a lot of those different  
25 components. But things were changing, and this particular

1 product had Autoliv, which is a foreign company that acquired  
2 Morton, who used to produce airbags.

3 Q But what about manuals, do you recall actually looking at any  
4 manuals in this case?

5 A You mean like owner's manuals?

6 Q Shop manuals, owner's manuals, design manuals; do you  
7 remember looking at any documents?

8 A To be honest -- I'm only speculating -- I don't recall what I  
9 looked at, and it was in my Ford file wherever that went when  
10 I left.

11 Q Now, what do you mean a Ford file? You had a Ford file of  
12 your investigation?

13 A No. I would have had documents that were part of the  
14 Office of General Counsel's file on the case because these  
15 things would either be claims or what they call if-come kind  
16 of things. And somebody within the Office of General Counsel  
17 provided me with information. Other parts of the company  
18 would have provided me with information. So whatever was in  
19 the Office of General Counsel's file, I may have copies of  
20 it, you know, such as the police report. Somebody acquired a  
21 police report --

22 Q Okay.

23 A -- so eventually -- I know initially I got a bad fax copy  
24 that I could hardly read from the SCI people, and later on I  
25 got an official copy that was more legible that you could



1 read through the Office of General Counsel.

2 Q So you were doing some of the investigating while you were  
3 still a Ford employee and then you've done some work on this  
4 case after being a Ford employee and retiring?

5 A That's correct.

6 Q The work that you did as a Ford employee, did it go into a  
7 file somewhere?

8 A Yes. It went into the Office of General Counsel's file.

9 Q Okay. What would be in that file?

10 A I don't know. You'd have to check that file. I mean --

11 Q Okay.

12 A -- I didn't keep the file. I supplied information to it.

13 For example, when I went back and looked at interrogatory  
14 responses -- I think some of them came in -- were sent out in  
15 2001. I seen dates of that.

16 Q Yeah.

17 A And since I was assigned this case -- I don't have any  
18 independent recollection of obtaining information, but it  
19 would have been in the course of business I would have said  
20 if there's certain documents, whether it was drawings or  
21 whatever, crash tests or something like that, in order to  
22 help the discovery people within the Office of General  
23 Counsel, I would have asked people to go out and acquire that  
24 information and then send it to them to provide it to local  
25 counsel and in turn provide it to people like yourself.

1 Q Gotcha. And some of it would have been when you went down to  
2 Nashville and what you did as far as looking at things or if  
3 you made any notes or subsequent to the litigation being  
4 filed if you helped in the discovery process, all that stuff  
5 that you did before you left Ford would ultimately have been  
6 gathered and shipped to the Office of General Counsel's file?

7 A That's correct.

8 Q Okay. The photographs you took at the investigation, were  
9 they also ultimately sent to that file?

10 A I believe they were, yes.

11 Q Any notes that you made would have gone into that file?

12 A They would have, yes.

13 Q Any pages from manuals or Ford documents that you thought  
14 pertinent to the issues in this case you would have sent to  
15 that file when you were still at Ford?

16 A If that was the case. Like I indicated, I don't recall  
17 specifically what the -- what they were.

18 Q Is it correct to say that everything you would have done  
19 before leaving Ford on this case would have been organized  
20 and put into the Office of General Counsel's file as you  
21 refer to it as?

22 A Yes, sir.

23 Q Okay. Now, would you have kept a separate file from the  
24 Office of General Counsel's file?

25 A Yes. I typically would have kept copies of the photographs

1 and other things that were the same material that was in the  
2 Office of General Counsel file in case somebody asked me a  
3 question or there was additional work to be done and so you  
4 didn't have to go and try to get it out of their file,  
5 because sometimes their files are stored in different  
6 locations, and you can't always get them back. If somebody  
7 calls you on the phone, it's been my practice to keep copies  
8 of photographs and things like that that if somebody was  
9 going to ask you a question, you had them to refer to rather  
10 than waiting two weeks to get them out of storage.

11 Q Gotcha. Those things that you kept separate from the Office  
12 of General Counsel's file, once you left Ford, where did they  
13 go?

14 A It's Ford's property. I left them at Ford. I don't know who  
15 has them.

16 Q Was there a file or a box that you kept them in?

17 A I had file cabinets with, you know, typical file folders with  
18 different case numbers on them, so somebody at Ford would  
19 have continued to work on that.

20 Q Did you have a file folder or something for this case?

21 A Yes.

22 Q And so there would have been -- let's call it the Schaeffer  
23 case.

24 A Right.

25 Q Would you have had a file folder or a box that would have had

1 all your material for the Schaeffer case that you were  
2 keeping that were separate from the Office of General  
3 Counsel's file?

4 A That's correct. But I did not know it as the Schaeffer case.

5 Q Okay.

6 A In the beginning I think it was referred to as the  
7 Budget Rent-A-Car, and I think some of that changed after the  
8 litigation was filed, because it really came to us as a  
9 Budget Rent-A-Car, and we did not know that there was any  
10 litigation involved at that point.

11 Q And your file, you would just call it the Budget Rent-a-Car  
12 file?

13 A Initially. But then it was changed when it became -- I don't  
14 know whether it was filed as a claim and then a lawsuit, but  
15 sometimes cases come in as claims and then they're escalated  
16 to lawsuits, and I don't recall what occurred.

17 Q Okay. When you went down to examine the vehicle in  
18 Nashville, what was your purpose in going?

19 A To help the Department of Transportation people. They  
20 requested us because -- my recollection was that they had a  
21 contract to -- and I don't know who was funding the contract.  
22 I think -- you know, I never get into those details. I don't  
23 know whether Ford or the federal government was contracting  
24 them to investigate a number of these vehicles because it was  
25 one of the new advanced restraint systems that was in a

1 massed-produced vehicle. Certainly other people had them and  
2 they were interested in them, but it certainly was one of the  
3 first advanced restraint systems that was mass produced, and  
4 the government was quite interested as to what its field  
5 performance was.

6 So when we were initially contacted, it came through the  
7 SCI people because they wanted our assistance because they  
8 didn't understand some of the issues in the product.  
9 Apparently they had investigated -- my recollection was they  
10 had investigated some other accidents and they had a lot of  
11 questions and they wanted some help.

12 Q That's a normal thing for Ford to do when the federal  
13 government got involved investigating the file?

14 A Sure. Through the years I've helped police agencies and  
15 federal government people and National Transportation Safety  
16 board people, people of that type. I think that's perhaps  
17 why I was asked to get involved, because I knew the people  
18 and I kind of knew what they wanted to have done. And I in  
19 the past in other cases have assisted them to try to  
20 determine causes of problems and things like that. So I had  
21 some knowledge of how they work and what they needed.

22 Q You were down in Nashville looking at the car, doing your  
23 thing, taking pictures. That was something you were doing in  
24 the ordinary course of business at Ford of assisting and  
25 dealing with the government agency and investigating the

1 wreck of this car?

2 A That's correct.

3 Q At that point there hadn't been any lawsuit filed; is that

4 correct?

5 A That's correct.

6 Q You weren't acting as a claims adjuster or anything like

7 that; you were a Ford employee going down to look at a

8 government investigation?

9 A That's right. We were helping the federal government with

10 their investigation.

11 Q When is it that you opened up a claim file and started doing

12 something because you were preparing for a lawsuit or

13 something; was that later on?

14 A Oh, yeah, it was later on. I was trying to recall. I think

15 that was -- I'd have to go back and look at some documents,

16 but I believe the initial investigation was, like, in

17 August of 2000, and sometime during 2001 I think the lawsuit

18 might have been filed.

19 Q And up until the time the lawsuit was filed, were you just,

20 for the things you were doing, dealing with it as though it

21 was a government investigation and you all were trying to

22 deal with the government and this accident failure --

23 potential failure?

24 A We were trying to assist them with providing them

25 information.

1 Q Okay. And up until the lawsuit was filed, you really weren't  
2 prepared for litigation or anything; you were just working  
3 with the government in the ordinary course of Ford business?

4 A That's correct.

5 Q Now, prior to the lawsuit being filed, when you were doing  
6 this helping the government, did Ford make an effort to find  
7 out what information had been obtained by the RCM? That's  
8 where the information goes, isn't it?

9 A Right. I think initially we had -- you had perhaps -- I  
10 don't know whether you were involved with that. Somebody on  
11 the outside was hired to -- as an independent, and I don't  
12 know who they were working for, whether it was the rental car  
13 company or somebody else. Mr. Kuechler was involved. He's  
14 an accident reconstructionist. He's an ex-police officer,  
15 isn't he?

16 Q I don't know.

17 A That's my recollection.

18 But he was involved at that time, and any time there are  
19 third or fourth parties involved, I always try to be open and  
20 understand that, you know, there's certain evidence and you  
21 establish protocols of how to evaluate things.

22 And I think before we had left the Nashville Budget  
23 Rent-A-Car facility we had removed the RCM and the satellite  
24 sensor and boxed it up, and I think maybe parts of the seat  
25 belt too. I don't know whether we removed the retractors at

1 that time or not. I'd have to look at the photographs.

2 But we boxed this stuff up and sealed the box, and I  
3 think we left it in the possession of whoever. I don't know.  
4 I think there was an attorney involved, and I don't know who  
5 he represented, but we left it in his possession. And we  
6 agreed to take the next step to go to Dearborn to our  
7 engineering facilities and attempt to download the  
8 information that may or may not have been in the RCM. And I  
9 think at that time we decided some date in September -- this  
10 was in August because people -- we looked at schedules, I  
11 recall, and everybody was busy and so forth. And we decided  
12 on a date in September.

13 And somehow there was some issue -- I think the  
14 government -- because the SCI people work and wear different  
15 hats and they report to different agencies, that there was  
16 some interest by the government to push -- pull it forward.  
17 And we did do it within, I think, about a month after the  
18 initial investigation.

19 Rich Lawrence came from Buffalo. He was an employee of  
20 Veridian who was part of the SCI crash investigation group,  
21 and he brought -- maybe they had possession, because now that  
22 we're discussing it, I think he did maintain the possession  
23 in a sealed box, because I learned that you sign your name  
24 across it on the tape and so forth so if there's any  
25 tampering and so forth -- and because it was a government



1 investigation, they do have the authority by the federal  
2 government to take parts for additional evaluation. I think  
3 they keep these in their possession. Because he brought it  
4 to our facility in Dearborn, and we went through the opening  
5 of the box and setting up the instrumentation and downloading  
6 what was there. And there was not any useful data that we  
7 were able to extract from that.

8 Q Okay. How did you know it wasn't useful data?

9 A Because the data that we extracted from it -- you should be  
10 able to -- if there was useful data, you should be able to  
11 get an acceleration versus time, a crash pulse from the RCM,  
12 and we could not do that. And due to the circumstances of  
13 this severe collision or whatever, the data was lost. And --

14 Q Okay. We'll come back to that, but going back into what your  
15 file might have, does it have the results of that download in  
16 it, the one when you were at Ford, the general counsel file I  
17 guess you call it?

18 A Yes, it would have had that information in it --

19 Q Okay. The --

20 A -- even though it wasn't useful. We did -- once you obtain  
21 information, you keep it. And we provided copies to -- I  
22 think it was part of the -- the decision to provide  
23 information to the other parties. I don't recall. I'm sure  
24 of that, because Rich Lawrence was there and the government  
25 had asked for that information. He walked away with whatever

1 we had and we kept a copy of the data.

2 Q Once you --

3 A And I would assume, also, just to make it clear, that we did  
4 not keep that module. He took it with him. So I don't know  
5 if you have possession of it today or what happened to it.

6 But Mr. Lawrence, representing the United States Government,  
7 took that with him back to wherever.

8 Q Okay. Is it a correct generalization to say that all of your  
9 files that you have had related to this case would be in  
10 three locations; 1, information you sent into the file of the  
11 Office of General Counsel while you were still at Ford and  
12 doing the normal business investigations you were doing?

13 A Yes, sir.

14 Q 2, a separate file that you kept that you originally called  
15 the Budget Rent-A-Car file -- it got another name later -- so  
16 that you wouldn't have to go and look at duplicates that were  
17 in the Office of General Counsel's file?

18 A Right. It was just merely copies of what was part of the  
19 Office of General Counsel's file.

20 Q Yes, sir.

21 And then the third file would be any files that you had  
22 after you left Ford as an expert witness or as a consultant  
23 dealing with these matters?

24 A That's correct.

25 Q Had the litigation been filed by the time you left Ford?

1 A I believe that's the case. I did not recall until I started  
2 looking at some of the documents in the last month or so that  
3 it appears that it must have been filed someplace in 2001,  
4 but I didn't have a clear recollection. Because sometimes --  
5 I always used to have 50 or 60 files, so some of them are  
6 more -- you know, they're more active at certain points in  
7 time. I didn't have a certain recollection, and somebody  
8 probably said, yes, this is now a file and it's escalated to  
9 a lawsuit and so forth.

10 Q Your file when you were at Ford dealing with this matter, did  
11 you send any correspondence you had to the Office of General  
12 Counsel file?

13 A Any correspondence?

14 Q Somebody writes you and says just to confirm we're going to  
15 be at the airport.

16 A Oh, yeah. I think there might have been some kind of a  
17 letter from Mr. Kuechler at one time, because I think he was  
18 verifying some dates that -- because I think he was  
19 interested -- I'm not sure whether he was from Pennsylvania  
20 or Florida. I think he had a couple addresses, and he was  
21 interested in coming to -- to the inspection. And that's why  
22 we talked about doing in it September.

23 When all the people got their calendars out and -- there  
24 was some date in September that I recall. I don't know what  
25 date it was, but it was pushed forward, and apparently he

1 agreed that as long as, you know, the federal government --  
2 well, they had possession and they were controlling it  
3 anyway, so I think he had a conflict in dates so he did not  
4 come. He was invited.

5 Q But if you had any correspondence, a piece of paper that came  
6 to you that involved this case or these matters, would a copy  
7 or the original of it had gone into the Office of General  
8 Counsel file?

9 A Yes.

10 Q What about E-mails, did you work off E-mails?

11 A I used E-mails, but I don't recall that there was  
12 correspondence with E-mails.

13 Q If there had been any E-mails that had involved these matters  
14 when you were at Ford, would they have been printed off and  
15 put in the Office of General Counsel file?

16 A Yes, they would have. I know that there was an interest by  
17 the automotive safety office because they were overseeing the  
18 field investigations of these Taurus and Sable vehicles. So  
19 they did want information. And it's possible that there were  
20 E-mails back and forth to the automotive safety office  
21 because they wanted to be kept informed of what was happening  
22 with this investigation.

23 Q But printed copies of those E-mails would be in the Office of  
24 General Counsel file?

25 A If there were hard copies generated. A lot of times E-mails

1 are just discarded after somebody says can you do  
2 dah-dah-dah.

3 Q And then you click.

4 Did you keep any type of electronic files involving the  
5 matters involved in this case?

6 A Not that I recall.

7 Q Would you have had any word processing documents? Some  
8 people do that. They'll keep it in word processing and may  
9 or may not print them off; notes, correspondence, E-mails,  
10 just all kinds of things.

11 A I generally have not done that. I don't recall anything of  
12 that nature.

13 Q Did you have a log of any sort that you would maintain,  
14 printed or electronic, of your activities?

15 A Let me understand. A log of -- you mean like a daily kind of  
16 thing?

17 Q Possibly. Or a periodic. You could be recording phone calls  
18 or actions or -- it could be a number of things. Claims  
19 people have that a lot of times. Lawyers do it. Accountants  
20 do it.

21 A I understand. I do it today because of being in a different  
22 position, but I don't think I did at that time. I relied  
23 upon the Office of General Counsel's file at that time, and  
24 whatever was there, I could share.

25 Q Did you have someone at Ford who was an attorney that you

1 would deal with? I assume Office of General Counsel would be  
2 their legal counsel?

3 A Yes. At that time I was dealing with an attorney who had --  
4 I think he initially made the request that I get involved  
5 with this investigation.

6 Q Who was that?

7 A Jonas Saunders.

8 Q Is he still there?

9 A I don't under -- since I've left, a lot of things have  
10 changed with Ford because of economic issues. And my  
11 understanding is that Jonas Saunders is no longer with Ford,  
12 and he may still be doing Ford work, but he's not with Ford.  
13 That's my understanding. He may still be employed by Ford,  
14 but I've heard -- it's hearsay information -- but Jonas is no  
15 longer working for Ford.

16 Q So when you were doing all these things, dealing with the  
17 federal government and looking at this car, was he your  
18 contact at Ford to coordinate what you were doing?

19 A Yes.

20 Q Did you ultimately have a different contact after Jonas?

21 A It was always Jonas, because up until the time I retired from  
22 Ford Jonas was still in that position.

23 Q So why were you involved in this investigation with the  
24 federal government?

25 A I think it was just because that I've probably spent a great

1 deal of my life doing this kind of work, that I knew the  
2 people, and I think once you know people and they -- you have  
3 a rapport with them, it's a lot easier to work with them, so  
4 I think they asked me to become involved because I had done  
5 these things before on many occasions.

6 Q Had you done litigation before?

7 A Oh, yes. Yes.

8 Q Your day-to-day operations at Ford, what kind of work would  
9 you generally do? Were you a design engineer, a safety  
10 engineer? Were you mostly dealing with litigation and  
11 claims? Were you mostly dealing with the federal government?  
12 Just give me an idea the best you can.

13 A Certainly. You know, depending on what period of time you're  
14 talking about -- I was with Ford 35 years.

15 Q The last year or two.

16 A The last year or two, primarily most of my work was  
17 concerning legal issues, and, you know, usually when you say  
18 how much, if you want to talk about percentages, in my mind  
19 it was -- like, 70 or 80 percent of my time was involved with  
20 lawsuits or claims. And there was certainly other issues.  
21 You know, you have corporate issues as to whether you're  
22 doing community projects or whether you're doing -- one of  
23 the big things we used to do in design analysis was to  
24 provide feedback to the engineering community which had  
25 necessarily no relationship to litigation.

1       And this certainly in the beginning was one of those  
2 projects where it was nonlitigation. It was helping the  
3 government, also providing feedback to the engineering  
4 community. Because whether it's restraints or structures or  
5 whatever group within the company, they need some liaison  
6 with the real world because they don't know the context in  
7 the real world, and lots of things happen in the real world  
8 where consumers use products, and they need to know that  
9 information. And we were able to know how to do  
10 investigations, work with police agencies, work with  
11 insurance carriers or whatever to obtain that information.

12 Q   And your job in these positions, was it mostly to gather  
13 information, understanding the engineering side, determine  
14 what the pertinent facts were so that you could help in the  
15 investigation, or were you more of a legal kind of person?

16 A   No. I think it, you know, certainly went beyond what you  
17 just characterized, but that was basically to acquire  
18 information and also try to understand different aspects of  
19 design and performance and things of that issue -- issues  
20 that were involved with these different cases.

21 Q   The expertise you were lending to this investigation was  
22 mostly from an engineering perspective; is that correct?

23 A   Yes, sir.

24 Q   Okay. Now, the attorney, what was his name again?

25 A   Jonas Saunders, S-a-u-n-d-e-r-s.



1 Q And I apologize. I'm not very good with names.

2 A Jonas like the whale.

3 Q Okay. I have in my mind and I need you to correct me and I

4 short circuit a few of these. Up until the lawsuit was

5 filed, were you dealing with anybody other than

6 Jonas Saunders at Ford regarding the matters in this case?

7 A Yes. I had indicated that I had conversations and provided

8 information to people within the automotive safety office

9 because the automotive safety office is sort of an interface

10 with Ford Motor Company and the government. And once you get

11 involved in something like this and the government is doing

12 an investigation, they want to make sure that they understand

13 that -- because the automotive safety office is a liaison

14 between the regulatory branch of the government for rules and

15 regulations -- and also try to make sure they have compliance

16 issues resolved. It's basically a liaison between any

17 governmental agency and the company.

18 Q Did you send them anything in writing, the automotive safety

19 office; E-mails, letters, summaries, anything like that?

20 A I know when I obtained a good copy of the police report that

21 I provide it to those folks, and -- and I probably gave

22 them -- it was generally -- I don't recall specifically, but

23 I probably gave them a set of photographs because they wanted

24 to see what it was all about.

25 Q Did you tell them what you had found?

1 A I think I had conversations on the telephone that I remember.

2 Q Who was it that you talked to there?

3 A A fellow by the name of Joe Marsch, M-a-r-s-c-h --

4 Joe Marsch.

5 Q Did you talk to anybody else at the automotive safety office

6 other than Joe?

7 A Not that I recall. I'm sure I did, because I think we were

8 trying to understand what had happened in this system, and I

9 noted there was a number of discussions about it. But

10 principally I would have talked to Joe Marsch.

11 Q Do you recall anybody you spoke to at Ford Motor Company up

12 until the time that you left Ford about the matters involved

13 in this case other than Jonas Saunders and Joe Marsch?

14 A I remember having contacted a fellow by the name of

15 JB Drummond who had design responsibility for the electronics

16 portion of the airbag system.

17 Q What department was he in?

18 A He was, I believe, part of inflatable restraints engineering,

19 but I could be wrong on that, because JB could have been in

20 some kind of electrical group as well.

21 Q He had --

22 A But he -- he had the responsibility of, I believe, the design

23 of the electronics as part of body engineering.

24 Q And that's the electronics for this car, this 2000 Taurus

25 airbag system?

1 A Right. He had -- don't -- I should clarify that because  
2 there are different people that had different  
3 responsibilities.

4 You had what is the electronics division of Ford, which  
5 is now part of Visteon. He had the restraint, the control  
6 module plus the satellite sensor. He certainly had that  
7 responsibility.

8 You had a group that used to be called body engineering.  
9 Some of these organizations have changed and names have  
10 changed, but generically it was called body engineering. It  
11 had a systems level responsibility as to how did the seat  
12 belts work in conjunction with the steering wheel, the knee  
13 bolster, the instrument panel, the other -- all performance.  
14 So there was a group that was part of the restraints  
15 engineering that had a systems level responsibility, and  
16 there was another group that JB Drummond was part of that had  
17 to do with the electronics portion, the packaging, the wiring  
18 characteristics, how you get the feedback from the  
19 pretensioners to the readiness indicator to the RCM.

20 So you had different -- you had components people, like  
21 the Visteon people, other suppliers like the airbag  
22 suppliers. Autoliv was part of the team. It's sort of a  
23 team where you have different people that provide different  
24 information.

25 Q Gotcha.

1 A You had Allied Signal which eventually became Bredt -- and I  
2 don't know when that occurred -- that had the seat belt  
3 responsibility. So you had these different team members  
4 working together to make the product come together.

5 Q We'll go into that a little bit in a minute.

6 But you talked to JB Drummond, you talked to  
7 Jonas Saunders, you talk to Joe Marsch about the matters  
8 involved in this case. Anybody else?

9 A Certainly because Paul Bacina was assisting me with some of  
10 these things, he was doing things under my direction.

11 Q Who is he?

12 A He was an engineer in the design analysis group that -- he  
13 had the ability to do some of the downloading with the  
14 software that was available.

15 Q Anybody else?

16 A I'm sure that there were other people, but I don't -- I work  
17 for a manager by the name of Rick Ruth, and I'm sure he asked  
18 questions about what we were doing, but I don't recall any  
19 specific conversation.

20 Q Okay. What I'm doing in my mind here is making a list of  
21 people who might have knowledge regarding the facts and  
22 circumstances in this case or how Ford analyzed it after it  
23 occurred, and what I've made on the list, of course, is  
24 yourself, Jonas Saunders, Joe Marsch, JB Drummond and  
25 Paul Bacina. Anybody else?

1 A There had to be others, but I can't -- you know, because  
2 there were meetings and so forth that discussed this at  
3 different points in time, there certainly were other people,  
4 but I don't recall who was there.

5 Q Each of these people if they prepared some written document  
6 or gathered some investigation materials looking at this,  
7 would they have then shipped that to the Office of General  
8 Counsel file?

9 A I don't know.

10 Q Potentially they might have a separate file that they kept  
11 notes or something like that?

12 A It's possible. It was simple for Jonas. He was part of the  
13 Office of General Counsel, so --

14 Q Yes. And hard for others because of where it was?

15 A Right.

16 Q Was the Office of General Counsel file located in Dearborn?

17 A Generally I would say that's true, but depending on the  
18 activity of the files, there are different places that they  
19 store information. So I think that's probably a correct  
20 assumption, that it would be in Dearborn.

21 Q Have you looked at the documents that have been produced in  
22 this case, the 20-something boxes?

23 A I have.

24 Q Who gathered those up?

25 A I don't know.

1 Q Do you know where they came from?

2 A I believe they came out of -- you know, I guess I shouldn't

3 even speculate. I don't know where they came from, but

4 generally there is what is called a passive restraint reading

5 room where since passive restraints began back when I first

6 became involved in the late '60s or early '70s that

7 information has been kind of stored and collected, this

8 massive document collection. And it would appear that --

9 that the documents that were in those 25 boxes, a good deal

10 of them came from that type of collection. I have to make

11 the assumption that they were trying to be -- whoever made

12 the decision -- trying to be responsive to the Request for

13 Production and the interrogatories that were requested.

14 Q Have you looked at any documents in this case that are not in

15 the documents that have been produced in discovery?

16 A Yes. In preparing for my expert's report I requested

17 information from Mr. Bibb and Brad --

18 MR. BIBB: Smith.

19 THE WITNESS: -- Smith. I can never remember his last

20 name. It should be easy to remember. They provided me

21 certain information in order to write the expert report.

22 BY MR. WELLS, CONTINUING:

23 Q Is that information in your file? Is that in your file at

24 your office now?

25 A Yes.

1 Q And what was that information, if you recall?

2 A Oh, I'd have to go back and look at the report. It certainly  
3 was the vehicle inspection photographs, the police report. I  
4 don't know whether there's specifications and Federal Motor  
5 Vehicle Safety Standards. Those kinds of things usually are,  
6 but I guess you'd have to refer to that report to see what I  
7 relied upon.

8 Q Okay. What was your E-mail address when you were at Ford?

9 Did you have one?

10 A I had several. In the beginning when they first implemented  
11 E-mail, they gave me an E-mail address, and I think it was  
12 r-w-a-g-n-e. There's certain character -- maybe there was a  
13 one after that, but something had happened and I lost that  
14 and I was demoted to r-w-a-g-n-e 10.

15 Q And what was it --

16 A I don't know whether I was promoted or demoted, but there  
17 must have been other R Wagners and some numeric number. I  
18 don't know whether it was a certain number of digits you had  
19 to have in order to have an E-mail address, and I ended up --  
20 I never had the R on the end of my name.

21 Q So that's -- I've got a guy in New York who has me on his  
22 E-mail, and I get all the copies of his -- he's part of -- I  
23 won't tell you which one -- it's Earon or Arthur Anderson,  
24 and I'm getting all the litigation E-mails. Don't send them  
25 to me. You have to be careful about nines and tens and all.

1 A Of course --

2 Q Last year what was --

3 A Just to correct that, I didn't give you my complete -- I

4 mean, it's got the at Ford dot com.

5 Q The last year that you were there, during the time that you

6 were doing the matters in this case, what was your E-mail

7 address?

8 A R-w-a-g-n-e 10 -- numeric 10 -- at Ford dot com.

9 Q Okay. Thank you.

10 A I just gave you part of the address.

11 Q I understand.

12 A And I just wanted to make sure you understood that.

13 Q Now, these documents that I've got 20-something boxes of have

14 all got numbers on them.

15 A Bates stamped.

16 Q I'm not sure what it is, but I'll pull one out that's the

17 accelerometer sensor review, grabbed it at random.

18 AACG 2792, what is that?

19 A Those are bates stamp numbers. I think they generally call it

20 a bates stamp because that's -- that's a device -- a

21 device -- a bates stamp that you can change the numbers and

22 forward them and so forth, and that's just a code that, I

23 believe, as the reading room people acquire documents and

24 file them, they have some system, and I don't know what it

25 is, but it's kind of like they -- and I think it was one of



1 the interrogatory answers that you wondered how -- it's  
2 certainly not a sequential number.

3 It's kind of-- when they got the documents, they put  
4 them in a sequence for that document, but the next one may  
5 totally be in some other random number. But some of these  
6 follow; some of them don't. Like, for example, these pages  
7 that you have, and you haven't made this an exhibit, say AACG  
8 2792 and 93, 94, and they follow some sequence, but not  
9 necessarily true.

10 Q Do you understand the sequence at all?

11 A I do not.

12 Q What's the AACG stand for?

13 A I do not know what that is. The only thing I ever understood  
14 was it was some kind of random thing; as they came in, they  
15 gave them numbers.

16 Q If I take the -- I've got one notebook in my lap here of  
17 these documents, and if I started asking you what's AAGQ,  
18 what's AADV, AAHI, or anything of those, you couldn't tell  
19 me?

20 A No, sir.

21 Q We'll get to that a little more later then.

22 MR. BIBB: They don't relate to a source. They're just  
23 a random letter-number code that's assigned when the document  
24 is collected. It doesn't relate to a department it came  
25 from.

1 MR. WELLS: Well, it doesn't -- what we're trying to  
2 figure out, and that's -- I'll get more into it when we get  
3 to the designation -- there is no organization of the  
4 documents we've got. We've got 20-something boxes. I've  
5 looked at it. I can't -- there are huge gaps. We'll have it  
6 go along. There will be a gap of two or three numbers.  
7 There will be a change of prefixes, and since they're on  
8 there, I think we're going to have the right to find out,  
9 well, what file did that document come from.

10 MR. BIBB: You can go to the reading room and see them  
11 all.

12 MR. WELLS: I'll take you up on your invitation.  
13 Accepted.

14 MR. BIBB: You're welcome to do that. In fact, that was  
15 made in the initial response -- in the initial disclosures.

16 MR. WELLS: We didn't pick that up I guess. We can do  
17 that?

18 MR. BIBB: But it is -- you know, they can make  
19 arrangements. They'll have to make a time for you to go and  
20 look at them because they don't keep it -- it's not a  
21 library, okay? I mean, it's a room, but it's -- that's where  
22 these materials are kept, organized by crash tests or  
23 engineering documents or whatever. It depends on the  
24 question asked as to what documents are responsive to that.

25 MR. WELLS: We can do that though? We can set that up?

1 MR. BIBB: We can make arrangements for you to go look  
2 at the reading room.

3 MR. WELLS: That would solve a lot of the confusion and  
4 problems. Thank you. We'll set that up.

5 MR. BIBB: Because as Mr. Wagner said, they've been  
6 collecting these documents, I don't know, 20 or 30 years,  
7 whenever they started doing passive restraint.

8 THE WITNESS: Some of these go way back.

9 MR. WELLS: That will save us a couple hours of  
10 questions regarding those numbers and whatever. We'll accept  
11 your invitation.

12 MR. BIBB: The numbers -- really the numbers and letters  
13 don't correspond to a source. They're just assigned when  
14 materials are collected.

15 BY MR. WELLS, CONTINUING:

16 Q Now, have you looked at the responses to interrogatories in  
17 this case?

18 A Yes, sir.

19 Q And in looking at all the documents produced in this case,  
20 did you go through the entire 22 boxes and look at that?

21 A I attempted to. I have to admit that because of the massive  
22 amount of material and the time, that I was looking for  
23 things that kind of made sense. I didn't review page -- I  
24 mean, it would have taken me a long time to read page by  
25 page. For example, at the crash test I was principally

1 interested in what the tests were about. You know, if there  
2 was sensor information on it, I kind of looked at that, and I  
3 might have looked at some of the curves and so forth. But  
4 each crash test, some of those go for a hundred, 150 pages,  
5 and I was looking for certain information that would help me  
6 try to understand issues that I was looking for with respect  
7 to this system, because there were photographs of the  
8 vehicle, and you kind of leaf through those.

9 I mean, if you look at each page and spend -- I don't  
10 know how many pages are in 25 boxes, whether it's 500 or a  
11 thousand per box or whatever, you know, it's a lot of paper.  
12 And if you spend a minute on it, I probably wouldn't live  
13 long enough to read each one in detail.

14 MR. WELLS: Why don't we take a few-minutes break.

15 MR. BIBB: Okay.

16 (Recess taken)

17 BY MR. WELLS, CONTINUING:

18 Q Mr. Wagner, I want to know something about the organization  
19 of Ford in dealing with the design of airbags, and I'm almost  
20 afraid to ask because you were telling me how things were  
21 consistently changing. Can you give me some sort of break  
22 down, hierarchy of how an airbag system such as this is  
23 initially designed, what the departments are and then how  
24 it's decided to go into production and who is doing that sort  
25 of thing?

1 A I think I gave you some bits and pieces. People that -- like  
2 I said, the names have changed from time to time, but there  
3 was a group called body engineering which by the time we get  
4 into this time frame was in a transition to be called  
5 something else, and I don't know what they call themselves  
6 today. I think they call them vehicle centers, where they  
7 had small car, large car, trucks and things like that. But  
8 they were generally called body engineering, where they would  
9 have the responsibilities of basically the restraint system.

10 I mean, you have different groups. You have a  
11 structures group, because you have to deal with the stiffness  
12 or the crash pulse of the vehicle, so that's part of it.

13 Q Okay.

14 A You have people that are involved with computer-aided  
15 engineering that look at the rigidity of the vehicle so that  
16 when you put an airbag and restraint system in you tailor it  
17 to the crash pulse or the structure, the relative stiffness  
18 of it. And there are differences between small cars, trucks,  
19 body frame, unitized construction. There's many differences.

20 So you have to have a structured group that is part of  
21 the organization. That would be like the front-end structure  
22 and the occupant compartment and so forth.

23 Q Okay.

24 A I mean, even chassis components sometimes enter into crash  
25 pulse analysis, so you can't discount them, but they don't

1 play the same role that the body structure people would.

2 Then you have -- obviously occupants have to have seats,  
3 so there are different people that do interior trim in  
4 seating that work with the seat cushion structure, the  
5 articulation of the seats, whether it's recliners or seat  
6 tracks, those issues. And they're all part of how to design  
7 an airbag system and tailor the occupant kinematics for that  
8 type of vehicle.

9 Then you would have instrument panel people that deal  
10 with certainly the gauges, radios, air conditioning, but more  
11 importantly with airbags. They deal with knee bolsters and  
12 energy absorption characteristics when the occupants would  
13 come in contact with them.

14 You have steering column -- steering wheel people for  
15 the driver's position, so they -- they have to look at the  
16 controls on the steering wheel, whether it's washer controls  
17 or horns and things of that nature, but it's principally the  
18 steering wheel, steering column.

19 Then you have the inflatable restraints people which  
20 would deal with the airbag modules and wiring and circuitry.  
21 And there would be subgroups within the restraints people  
22 that would deal with the active portion, the seat belts,  
23 whether it's the buckle, retractor, webbing, those issues.

24 And also within the restraints group you would have the  
25 electronics people. And I told you previously that within

1 Ford we used to have components -- groups. When we started  
2 the project for the 2000 Taurus, we actually had a group that  
3 was called the electronics engineering portion of Ford. It  
4 was called ELD, Electronics -- I probably won't get that  
5 right, but it was called ELD.

6 MR. BIBB: Lighting?

7 THE WITNESS: Yeah, Electronics Lighting Division. They  
8 took care of all those issues, and they had their own plants.  
9 Within Ford we used to have captive component divisions,  
10 whether it was a transmission, engine, but I believe in the  
11 late '90s they started the process of spinning off part of  
12 the company which ended up being called Visteon. And Visteon  
13 is now an independent company that's a supplier to Ford and  
14 other people that provides part of the airbag system just  
15 like I had indicated that Autoliv provided the airbag modules  
16 for the driver and the passenger.

17 The seat belts were provided by Allied Signal which  
18 later became Breed, and there were other people that provided  
19 wiring harnesses. There was slip rings in the steering  
20 column that -- different components that made up this system,  
21 the different suppliers.

22 So when you have a team effort to actually have certain  
23 suppliers actually physically sit and work with the Ford  
24 people in -- or maybe they don't sit in the same office, but  
25 they are part of the team, and they're within the same area

1 that -- they work together. They attend meetings and resolve  
2 problems together. So the engineering is done today -- the  
3 suppliers are part of the team.

4 It used to be that they were isolated, and then they got  
5 to the point they manufactured it. We designed everything up  
6 to a point, but today they participate from the very  
7 beginning. That's generally how it happens.

8 But let me give you a little history lesson.

9 BY MR. WELLS, CONTINUING:

10 Q Okay.

11 A Stepping backwards, in order to do any of this work you have  
12 to have decisions made at a high level to finance this. You  
13 have to say, okay, for 2000 we are going to provide -- you  
14 know, this is at a very high level because it costs millions  
15 of dollars to do that. We are going to design and test and  
16 manufacture a system for the 2000 Taurus that would have this  
17 level of airbag restraint system. And you would have to  
18 appropriate money to that and get people in with the  
19 technology to support that design.

20 And those things take place. You've probably seen that  
21 in some of the documents. It goes back into the mid, you  
22 know, '93, '94 time frame. Because I believe at one time  
23 they were targeting this for 1999 and for some reason it  
24 slipped to 2000. I mean, there's always -- you always have a  
25 goal, but quite frequently on very high-tech items it's very



1 difficult to meet those objectives, and you have to develop  
2 this.

3 And certainly you don't want a system put out that you  
4 don't have confidence it's going to reduce the risk of injury  
5 in these accidents. So there's a lot of development, a lot  
6 of invention took place in order to get this product into  
7 production. So you had to have approval by finance people at  
8 the high level of the company who could do this, appropriate  
9 the money, and then get the various groups, whether it's body  
10 engineering, whether it's Visteon -- you've seen documents  
11 where it talks about Siemens, Bosch, Intel, Arrow Jet,  
12 General. I mean, I can't remember all the different  
13 documents that are in that collection, but you have to sort  
14 out the alternatives to try to understand what is the  
15 appropriate design that you believe can improve your product  
16 and provide the restraint system that you desire.

17 So you have to go through a number of -- as it turned  
18 out, I think it was a number of years of sorting out the  
19 alternatives to try to understand what is appropriate. And  
20 that's why you have this massive collection, and it's part of  
21 the thought process. Nobody sits down -- I mean, you could  
22 go backwards and write a book about it, but there's no clean  
23 script that would tell you how you went from Point A to  
24 Point B, C and so forth.

25 It's sort of like you have to look at it and have an

1 understanding of how the products go into production and say,  
2 well, okay, they looked at Siemens, they looked at that and  
3 they finally made a decision at a point in time and said  
4 Visteon has the manufacturing capability, they have the  
5 engineering capability, and they can get it to us at a high  
6 reliable cost level.

7 So the same thing happened with the seat belts. There's  
8 various seat belt manufacturers, and you've probably seen  
9 different talk about whether you have retractor  
10 pretensioners, whether you have buckle pretensioners and even  
11 when you talk about -- I think there was -- they were  
12 initially trying to get proximity sensing devices because  
13 there's talk about infrared sensing. There's talking about  
14 sonar pre-sensing. And some of these things have pretty much  
15 blue-skied. We've been looking at them for a number of  
16 years. So you go back to the aerospace industry perhaps  
17 where you think there's a lot of technology and you see  
18 whether it's doable and you try to sort through that.

19 Q Is this one of these processes that we have in our firm; it's  
20 organized and it's kind of not organized at times?

21 A Organized chaos perhaps.

22 Q And it kind of comes together and then it centralizes and  
23 decisions get made and it gets adjusted over time until  
24 people get a comfort level that works?

25 A That's essentially it. I mean, you have to -- you have to

1 look at research ideas, and perhaps you have to invent  
2 technology. That's where you get delays in the program. And  
3 one of the keys I think when you're talking about, you know,  
4 single-point electronic technology, is it doable, is it  
5 reliable. And we looked at other people's systems and  
6 decided that we needed a satellite sensor on this vehicle  
7 because we weren't satisfied with a true single-point sensor  
8 where you put in a box and -- I mean, it sounds like a good  
9 idea to have everything in one box, but if it doesn't meet  
10 your performance criteria, you have to do other things.

11 Q And I saw some of the documents on that. When you do all  
12 this, there's got to be a certain amount of organization that  
13 some central thinking had in the engineering side that kind  
14 of says, yeah, we're going to go off and work in this area  
15 and we're going to go off and work in this area and it all  
16 comes back somehow to the middle, doesn't it?

17 A Basically -- I think --

18 Q That wasn't a very good question.

19 A I think that's correct, but when you look through the  
20 documents, you'll see that there are certain periods of time  
21 as you're going through this invention and retesting and  
22 redesign and testing sequence that they have major meetings,  
23 and, like I had indicated, I believe we were targeting  
24 something prior to 2000 to put this on, but we didn't quite  
25 meet those goals.

1       So when you go through this process, you — you look at  
2       it and you say are there open issues that we haven't  
3       resolved? What's the confidence level? You know, what's the  
4       risk benefit kind of thing? Those are the kind of questions  
5       that you have to flush up to higher management and say, look,  
6       we were targeting 1999 but we can't make it. We're going to  
7       put it into 2000, you know, or can you give me, you know,  
8       another \$10 million? Perhaps I can meet those goals.

9       That's the kind of negotiation you go through. And, you  
10      know, some of those things are in those documents and some of  
11      those things I'm using as examples.

12 Q   I gotcha. Now, were you involved in the development of this  
13      electronic sensing airbag system or is this something that  
14      you've learned from some other source?

15 A   I did not have hands-on development, but because I have spent  
16      a great deal of my life involved with automotive safety, I've  
17      worked on some of the original airbag programs, hands-on  
18      design and so forth, so I had an interest in it.

19      And being part of Ford you go to meetings and you're  
20      apprised of technology advancements and, you know, what's the  
21      next level that you're going to get to, and I have worked  
22      on — you know, whether it was the Tempo airbag program or  
23      the Continental dual-bag program and understanding some of  
24      the sensing technology and things like that, I'm aware of  
25      what the technology is, but I did not have any hands-on

1 design release responsibility if that's what your question  
2 was.

3 Q Yeah. Who is it that -- who are the people that were at Ford  
4 in the last year or two before this thing went into the 2000  
5 Taurus that were kind of the decisionmakers -- the ultimate  
6 decisionmakers? Usually there's one or two people. Even at  
7 NASA, when they press the button for the space shuttle to go,  
8 there's a guy that says go.

9 A I think you'd have to go back and look at the document. Some  
10 of the reviews I know that depending on -- you'd have to go  
11 back and reconstruct historically the right organizational  
12 charts, but I know that there were vice presidents such as  
13 Lou Ross. I think there were some Lou Ross reviews. I think  
14 you seen at some points in time Nassar [phonetic] reviews  
15 when Jack Nassar was the CEO. I know there were documents  
16 like that, but I never commit to memory at -- you know, in  
17 September of 1997 who made that decision. I think that you'd  
18 have to go back and look at the documents.

19 I know there were a number of documents. I think  
20 Lou Ross was there and was the vice president for some period  
21 of time, and I know that Jack Nassar was there for a period  
22 of time. And I know there were high-level product reviews to  
23 make sure that they understood where the company was going  
24 with this technology.

25 Q Okay. Let's go back then and let's do the history a second.

1 Some of this I have been able to glean from the documents and  
2 some of it I have lots of question marks on it.

3 But as I understand it, we're dealing here with the  
4 2000 Ford Taurus that was the first year that they had a new  
5 type airbag sensing system in it, is that correct, that was  
6 not previously in the '99 version?

7 A That is correct. I was having a little bit of a problem  
8 answering that question because electronic sensing systems  
9 were not new to us. Our first one was in the 1997 econoline,  
10 the production, and certainly through the years, you know,  
11 probably if you go back 20 years, we became interested when  
12 Mercedes had some primitive systems that Bosch made. And we  
13 looked at that those, and I don't know if it was the mid-80s,  
14 but certainly that was something that people were looking at,  
15 because electromechanical always has some limitations.

16 And when -- it's a matter of feedback. If you can do  
17 things purely electronically, when you're talking these  
18 little milliseconds to make decisions, electronics and  
19 telemetry and things like that, multiplexing, those kind of  
20 concepts certainly are product improvements over something  
21 that's like our previous design with ball-and-tube sensors  
22 where you had to take a mass and roll it in a tube and so  
23 forth. I think you understand those to some degree.

24 Q Okay. Well, what I want to do then is try to understand a  
25 little bit of the history as you have gleaned it from the

1 documents and your experience of the develop of this type  
2 system that occurred in the 2000 Taurus. As you understand  
3 it, can you kind of walk me through the history of the  
4 development of that system in the 2000 Taurus?

5 A Okay. Basically we were interested in electronic systems  
6 because they had the ability to provide feedback from  
7 different characteristics, whether it was buckle  
8 pretensioners, dual-stage inflation, just troubleshooting  
9 technology. Because an important part of airbags is to have  
10 a system that can sense and look at each component in the  
11 system, and if there is a problem, you want the ability for  
12 the restraint control modules, which it's called the brains  
13 of the system, to -- if you have a wiring problem, if you  
14 have a service problem, if the vehicle is improperly  
15 repaired, you want the system to disable -- be disabled and  
16 give you a fault code and seek service.

17 So part of the concept is to make sure you have a  
18 feedback of different controls within the system so that if  
19 you wanted to just have a firing of a pretensioner or if you  
20 wanted to have one stage of the dual-stage inflation --  
21 primarily to look at the problems that we were aware of that  
22 we didn't know how to solve.

23 When initial airbags came out, we had some aggressive  
24 systems because we had to meet the federal criteria, which is  
25 a 50th percentile, male in a midseat position, as defined in

1 208. Then we were trying to look at some of the these  
2 concepts, and we had to get the federal government to agree  
3 with a different test procedure to depower the systems in  
4 order to look at principally smaller women and children that  
5 became identified as a problem because of the positioning to  
6 the airbag.

7 So the ultimate solution was to have a system that would  
8 have feedback controls to provide some degree of protection,  
9 reduce the risk of injuries in these accidents to a 50th  
10 percentile female, which is five foot tall, in that range,  
11 about a hundred pounds, and also six year olds.

12 The government started writing regulations taking  
13 three-year-olds and 18-month-old dummies and so forth -- and  
14 there's still development issues, as I understand it, with  
15 some of those dummies to get repeatable, reliable injury  
16 information. Plus, also the fact that hybrid-3 dummies were  
17 coming out where you could now accumulate neck loading and  
18 neck moments and stuff like that -- even though there's been  
19 50 years of development in anthropomorphic dummies, they  
20 still are not human beings. So you use what's available and  
21 what you believe to be reliable and repeatable test devices  
22 to test these systems.

23 So during this evolution of changing the feedback  
24 systems, the dummies were also being evolved and the injury  
25 criteria was being established and fine tuned. So some of



1 that still is -- you know, if you go to these conferences  
2 where there's a staff crash conference through AAA or other  
3 conferences, they talk about these on a continuing basis, and  
4 it's way too confusing to talk about here, but basically the  
5 interest was to have a system that was called a SMART airbag  
6 initially or the intelligent airbag that would -- if you had  
7 a child in an out-of-position situation, that you could  
8 either grossly depower or turn it off.

9 And that's why we were looking at infrared sensors at  
10 one point in time, to say, okay, if a person misuses the  
11 system -- even though we gave advice, even sometimes people  
12 put children in car seats in the front seat -- if you put  
13 them out of the zone, the airbag is probably not an issue,  
14 but if you have the seat in the zone where the airbag could  
15 cause injury to the child, then it becomes a major problem.

16 Or if you improperly restrain a child -- we used to call  
17 it the standing child, where even though there's been a lot  
18 of education, people -- I still see it today. I am appalled  
19 by it -- they drive around with children unrestrained. If  
20 you're on top of the airbag, because of the aggressive nature  
21 of it that you have to have to comply with the Federal Motor  
22 Vehicle Safety Standard 208, you have to have injury criteria  
23 for a 50th percentile male in a midseat position that's  
24 167 pounds, five foot nine, you have to meet that criteria in  
25 order to sell the product. Then you have to be responsible

1 and look at all these other situations to try to -- to have  
2 the best system to minimize the risk of injuries in these  
3 different types of accidents. So that was the idea.

4 Go to the next stage, having the feedback system. Do  
5 you need the pretensioners? Are the belts fastened? What's  
6 the position of the driver's seat? We were looking at weight  
7 sensors, which we didn't get in this particular product to  
8 try to understand what was on the passenger side. We looked  
9 at a lot of other things, as you probably seen in the  
10 documents, to try to sort out whether people were using child  
11 seats.

12 There's a lot of different technologies out there, but  
13 for 2000 we certainly weren't prepared to do that.

14 Q It was the thought over the years that you at Ford and other  
15 automobile manufacturers were learning some of the  
16 limitations of the electromechanical systems, and they were  
17 learning some limitations of their previous airbag systems  
18 and realizing they had to have an electronic system in order  
19 to incorporate all the information and all the options to  
20 make everything go just right?

21 A Right. It's the old Darwinism principle; once you get  
22 something out there and you start seeing what it does, you  
23 say I can make it better, but you didn't know how to make it  
24 better until you got that experience. So it's an  
25 evolutionary kind of process.

1 Now, sometimes people look at -- from the outside --  
2 look at the industry and say, you could have invented that  
3 40 years ago. Well, maybe you could have invented it, but  
4 you didn't know how to manufacture it or you didn't know how  
5 to do it at a reasonable price to put it in a product. The  
6 kind of products that Ford and General Motors sell are  
7 certainly not like some of the manufacturers that don't worry  
8 about costs or weight or whatever.

9 So, I mean, you have to be aware that even though  
10 somebody has an idea and it's -- I've always been impressed.  
11 You go back and look at patents, and some of those things  
12 are -- you know, the ideas are never new, but technology  
13 changes. And one of the things that was changing was the --  
14 was the computing capacity. And I think if you go back and  
15 look at PCs, personal computers, and you say what did we have  
16 in 1990, they were pretty primitive. And that whole industry  
17 was coming along with the Motorolas and Intel and so forth,  
18 so, you know, in the computer business they talk about  
19 Pentium 3s and things like that. Well, we had -- that same  
20 kind of technology was becoming advanced, so now it was  
21 becoming doable to put in small package controls that could  
22 be thinking and -- not like a human being -- but looking at  
23 parameters, looking at the algorithms and looking at the --  
24 the velocity and acceleration changes, depending on what  
25 approach you used, to give you feedback in very short periods

1 of time.

2 In order to make these decision processes, it's in a  
3 very small number of milliseconds. And there are a thousand  
4 milliseconds in one second. A blink of an eye is 250  
5 milliseconds, depending on who you believe. And you have to  
6 make these decisions in, you know, 10 to 20 milliseconds, and  
7 you have to have vast computing speeds in these systems to  
8 say, yes, this is the crash that requires this to do this and  
9 that to do that. And when you look at these specifications,  
10 they are very complex. The whole system is very complex.

11 Q So for a number of years you guys had things that you wished  
12 it would do; dual-stage airbags, pretensioners going off at  
13 certain times, different things you wanted to see happen in a  
14 wreck, but the computing ability and some of your experiences  
15 lead you to believe that you needed some internal computer in  
16 the car to gather the information from various areas and send  
17 out a coordinated response of some sort?

18 A That's a good analogy.

19 Q Okay. And this was not as available -- this response was not  
20 as available in your mind as the result of these  
21 ball-and-tube systems and that sort of thing; is that  
22 correct?

23 A That's correct. I think everybody knew that there was a  
24 period of time that ball-and-tube sensors were the best  
25 system out there. In fact, if you look at the history of

1 ball-and-tube sensors, when we first put airbags out, we had  
2 a five-sensor array where we had three crash sensors up front  
3 and we had a safing sensor up front and we had a safing  
4 sensor in the back, and, you know, you had to have this to  
5 verify that.

6 And then we got confidence that we didn't need the  
7 five-sensor array to do the job. We narrowed it down to a  
8 four sensor and to a three sensor and, finally, before - I  
9 think most systems were a three-sensor system unless there  
10 was some kind of product that required - again, it goes back  
11 to looking at the vehicle, the crash pulse, and how the  
12 structure reacts as to what you can do. So it's an  
13 evolutionary type of process.

14 Perhaps we were overconservative in the beginning, but  
15 we didn't know what we were dealing with. We knew from a  
16 laboratory point of view, but there were concerns about  
17 sensing angular crashes, sensing under-rides and over-rides  
18 and poles and trees and things that, you know, offset  
19 barriers. Those kind of things we check in the laboratory.  
20 There's certainly a lot of concern.

21 So once you get the confidence that maybe you don't need  
22 five sensors you can go to four sensors, then you make that  
23 change and you retune the system. And there's always this  
24 constant technology improvement until you do have feedback  
25 ability to tailor the airbag performance to the conditions of

1 the accident.

2 And who knows, maybe in the future we'll have an  
3 infinite variable inflator out, but -- you know, people keep  
4 looking at some of these things, and how do you make it,  
5 rather than two stage, maybe three or four stage. I mean, it  
6 has -- these systems have that potential. You know,  
7 certainly nobody has it today.

8 Q All these variables of how a wreck can happen, I assume that  
9 in the laboratory they try to think of all the variables, but  
10 they can't get them all and they have to wait for real-world  
11 experiences to tell them something else later on?

12 A That's correct.

13 Q And with their real-world experiences, then they adjust and  
14 it evolves into hopefully a better and better system?

15 A That's correct.

16 Q Okay. And you mentioned a minute ago that in the beginning  
17 you guys may have been -- I don't know what your word was for  
18 it -- but more conservative or excessively conservative or  
19 too conservative with, what is it, five sensors?

20 A Initially our products had five sensors because we didn't  
21 have the knowledge what was going to happen in the field and  
22 we didn't know whether we could really sense the angularity  
23 of a frontal collision, because when you look at the  
24 specifications, you're looking at plus or minus. The federal  
25 government tells you plus or minus 30 degrees from a center

1 line. So you do have a lot of variability across the front  
2 of vehicles, and some vehicles change with their structure  
3 quite a bit.

4 So, again, you have to go back and do a lot of fine  
5 tuning with the computer-aided design. When you open the  
6 hood of a vehicle, you see convolutions and holes that maybe  
7 don't make sense to a layperson, but those are all designed  
8 into the product to make it crush at certain controlled rates  
9 so that you're trying to take -- I mean, if you wanted a  
10 vehicle to survive, you could build it like you did in the  
11 old days; make it big and stiff like a locomotive. That  
12 certainly -- you know, people will tell you stories when they  
13 ran tanks into trees at different places during, you know,  
14 testing. You open the tank, looks great. There's no  
15 problem. You got people dead inside.

16 So you have to have -- you have to have a controlled  
17 crushable structure. So the crash pulse on these vehicles  
18 vary grossly between, you know, some of the big vehicles that  
19 have more space versus the subcompact that just in the nature  
20 of the vehicle you have to cram an engine, transmission up  
21 front, and those become pretty rigid.

22 People have actually figured out how to use some of  
23 these components to absorb energy. Repairability becomes a  
24 problem, and people get upset with us that things have  
25 crushed that used to crush, but, you know, we look at the

1 total systems and how to mitigate the crash pulse to, again,  
2 reduce the risk of injury. And all this other stuff, whether  
3 it's seats, instrument panels, windshields, it's all part of  
4 the system to try to provide a survivable occupant  
5 compartment.

6 Q Is it correct that we're talking about two system types; one  
7 is the electromechanical, the ball-and-tube type, and the  
8 other is the type that is now in the Ford Taurus, which is  
9 the -- I saw the word for it -- electronic -- that's not  
10 correct -- electronic accelerometer type?

11 A Right.

12 Q Okay.

13 A Well, when you say in the Ford Taurus, it's now 2002. That's  
14 not the same system that was in 2000.

15 Q I realize there's some changes.

16 A I think you were talking perhaps between '99 and 2000.

17 Q Here's what my question is. Is it correct to say that there  
18 was a type system, lots of variations, one of which was  
19 basically the world of the electromechanical sensor types,  
20 the ball and tube, and then there is a new type, the SMART  
21 systems, that are now the electronic type that -- and these  
22 are really two different type worlds?

23 A That's correct.

24 Q Okay. Now, before the 2000 Taurus, the Taurus had had in it  
25 the electromechanical type airbag systems?



1 A That's correct.

2 Q Okay. And a lot of cars had electromechanical type systems?

3 A Right. And just to make it clear, you know, ball and tubes

4 were one type. There were other versions. Some people used

5 what was called a Rolamite. But there were different

6 versions.

7 I mean, even back in the early days of airbags you used

8 to have inverted pendulum crash sensors where you had a

9 weight on a shaft that would deflect and close the contact.

10 Other people within the industry used different systems, but

11 Breed had a very good gas dampened ball-and-tube system that

12 a good deal of the companies used. Not everybody used it.

13 There certainly were others.

14 I just want to make that clear. Ford used ball and

15 tube. In some applications we did use a Rolamite on a few

16 vehicles in combination with ball and tube. So there were

17 other electromechanical type of crash sensors.

18 Q The key to all of these is there's a mechanical type sensor?

19 A Well, electromechanical.

20 Q Yeah.

21 A I mean, if you go back, way back, there was strictly

22 mechanical sensors that were not -- I guess they still had

23 wires and they had contacts, but --

24 Q And, now, let's use by way of example the ball and tube. Is

25 it correct to say that what basically happened was there was

1 a momentum change that would cause the ball to go forward, it  
2 would strike something, it would make an electrical contact  
3 which would send just a signal that it's turned on or turned  
4 off, whatever the case may be, to an airbag and it would  
5 blow?

6 A Essentially that's right. The ball and tube was a ball that  
7 was held by a magnet and a change in velocity of a collision,  
8 which is sometimes called deceleration --

9 Q Okay.

10 A -- it usually is by engineers -- that the ball would roll a  
11 short distance, break away from that biasing force of the  
12 magnet, and because of the air contained within the sealed  
13 tube system, the gas dampening would allow it to move at a  
14 controlled rate to compress the gases in the tube and close  
15 the contacts. And if it stayed there long enough, it would  
16 cause the power to be transmitted through these contacts.

17 And these were gold-plated balls initially, and then I  
18 think they changed them to palladium or some other exotic  
19 metal because gold was too difficult to deal with. I don't  
20 know whether people were borrowing it from the company or --  
21 they initially were gold-plated, because in the beginning we  
22 had some issues of being hermetically sealed and whether you  
23 had some corrosion problems, so you couldn't have that ball  
24 corrode and stick in place and cause a problem.

25 And these systems were tailored; you had crash sensors

1 and you had safing sensors. So depending on where you  
2 located the safing sensor -- you usually put the crashing  
3 sensors up forward so that they were in the crush zone so  
4 that when you had a major deceleration, they would close.  
5 But you also had a safing sensor that would verify further  
6 back, either in the rear of the occupant -- the rear of the  
7 engine compartment or someplace in the occupant compartment.

8 You had to have a safing sensor and a crash sensor to  
9 close simultaneously, so you had this window that would  
10 provide the power through the system. And they say, okay,  
11 this is -- and it worked very well. It sounds a little  
12 complicated, but --

13 Q I understand.

14 A -- the systems worked very, very well. They're very  
15 reliable.

16 Q Both sensors may be -- the safing sensor and the crash sensor  
17 may both be a ball and tube, for example?

18 A Well, there were ball and tube, yes, but in some cases on  
19 some of the products the safing sensor was a Rolamite, which  
20 is a little bit -- it was a spring that had a -- would wind  
21 and unwind like a jelly roll with a weight on it.

22 Q Now, in the electromechanical airbag systems, if these -- for  
23 instance, if the safing sensor and the crashing sensor went  
24 off at the same time, they would send an electrical impulse  
25 of some sort to the airbag which would then go off as a

1 result of the electrical signal; is that pretty correct?

2 A Pretty correct. But I think what you have to understand is  
3 you had to have a dwell period so you have enough period of  
4 time -- you had enough milliseconds that they were both  
5 closed simultaneously. You couldn't have one hit the switch  
6 and bounce back, for example. They had to have that dwell  
7 period. And I don't recall whether it was two or  
8 three milliseconds, but there was some period of time that  
9 they had to close that circuit, and that was enough to set  
10 off the detonators or igniters within the airbag to provide  
11 the gases that fill the airbag.

12 Q And all these things with how much gas or how long the tube  
13 or short the study or how many sensors had to go off at the  
14 same time, you guys figured in to try to figure out what was  
15 the best time, what were the best circumstances for the  
16 airbag to go off?

17 A Right. Because timing is everything, because you have to --  
18 depending on what the nature of the collision is, you have to  
19 have the bag deploy before the occupants head and chest moves  
20 very far. It has to be -- you have to provide the bag and  
21 get it inflated before the occupant moves. So you have to  
22 sense it, get it inflated, all before the occupant moves.

23 Q But in the electromechanical system there's not a computer  
24 that's sitting there interpreting all of this, is it, and  
25 then making a decision go or not go, is there?

1 A Not in the same -- there was a device that was in those  
2 systems that was called a -- it may have different names in  
3 the drawings -- but depending on what stage you were at, it  
4 had the ability to disable a system. There was -- some of  
5 the first ones has a fuse in it that if it seen a short  
6 circuit in a wiring, it would disable the system. A fuse  
7 would melt and disable the system.

8 Later on it had the ability to store fault codes; in  
9 other words, if somebody had a fault code where the light  
10 could come on and say, you know, hey, the right front crash  
11 sensor is shorted out or something is not within the  
12 specification, it doesn't have the right resistance or  
13 something, then it would start blinking that light.

14 Initially the light would blink and there was no  
15 information stored. Later on these systems would tell you  
16 how many key cycles that -- on and off. So it would give you  
17 an idea that it might -- there was a limitation, I think a  
18 256 or something, because the -- the head goes, but you have  
19 to have an electronics person tell you why it was 256. But  
20 it had a number like that that wasn't maxed out.

21 You could say, okay, whether it was a hundred key cycles  
22 or it maxed out at 256, it could have been 10,000 that  
23 somebody ignored the fault code, but those systems really did  
24 have some primitive ability to store some data as it evolved  
25 from the '80s into the '90s.

1 Q But that's for fault codes and things like that.

2 A Well, disabling and -- there were different evolutions of it.

3 Q I'm with you. Yeah.

4 Okay. But when you went to the electronic accelerometer  
5 system, then you have -- instead of the ball and tube, you  
6 have something else determining deceleration, and that sends  
7 information to a computer. And that computer interprets the  
8 information and then makes a decision that it sends to the  
9 airbag?

10 A That's correct.

11 Q Okay. And in the world of airbags, can I kind of, for the  
12 purposes of our discussion, draw a bright line between the  
13 world of the electronic accelerometer systems and the  
14 electromechanical sensor systems? They're basically two  
15 different type things; there's a big quantum leap between the  
16 two?

17 A Yes, there are.

18 Q Okay. Now, the electronic accelerometer system that was in  
19 the Ford Taurus before 2000 -- the 2000 car, would you tell  
20 me how that kind of evolved? How many sensors? Did they  
21 change the sensors? Just give me the history of that if you  
22 know it.

23 A Prior to 2000?

24 Q Yes, sir.

25 A I mean, when -- you're talking about 1999?

1 Q Yes, sir. You say in early 1900s they had whatever.

2 A I just wanted to understand what your question was.

3 Q Yes, sir.

4 A Maybe I wasn't paying close attention to it.

5 Q I apologize. Sometimes I'm not very good at this.

6 A The Taurus -- if you're talking about the Taurus family -- I

7 mean, we have different families. As I indicated before,

8 Tempo had the first vehicles in 1985 with airbags in the GSA

9 fleet, and then we sold them to the public in '86.

10 But let's just talk about Taurus-Sable. Sable is the

11 Mercury version --

12 Q Are those the two in the family?

13 A Right.

14 Q Okay.

15 A They're pretty much similar with -- I mean, you know, styling

16 they might have some plusher seats in the Sable or the hood

17 might look a little bit different, but for all practical

18 purposes the Taurus and Sable are similar vehicles.

19 The first airbag that went into the Taurus type of

20 vehicle went in in 1990, and that was driver-only airbag,

21 because the way the FMVSS was worded, there was a period of

22 time that you could get credits for driver-only airbags, even

23 though you had no protection for the passenger's side in

24 those vehicles.

25 Then there became a time, I believe it was 1992, that it

1 became optional, but I'm not sure whether we ever put them  
2 out because we had a problem with the manufacturing facility  
3 that was making them. That -- they had an incident where  
4 they were shut down for a period of time. So it was in the  
5 '92, '93 time frame that the Taurus had a dual-bag system.

6 Initially, when we talk about sensors in 1990, Taurus  
7 had a five-sensor system.

8 Q As in the driver-only system?

9 A Driver-only airbag, five-sensor electromechanical  
10 ball-and-tube sensors, three crash sensors, two safing  
11 sensors.

12 During the model year 1991, like mid-year, we retuned  
13 the sensor system for the Taurus and went to a four-sensor  
14 system. We had -- we still had three crash sensors, but they  
15 had different calibration characteristics in the '90 and  
16 early '91s and one safing sensor. So it went to a  
17 four-sensor system in 1991 and a half.

18 Q All right.

19 A I -- from recollection I can't tell you precisely what year  
20 it was that we went to the three-sensor system.

21 Q I've got some documents that show some of that. I can't say  
22 that I understood it very well, but if you're off on a year  
23 by a little bit, I won't hang you.

24 A It could have been '93 or '94 that we went to a three-sensor  
25 system. I'm not absolutely certain about that.



1 But also you have different series of vehicles. When  
2 you talk about Taurus, you had a design that goes from 1990,  
3 there's a refreshing that occurs in '92, and it carries  
4 through until 1994 model year on the Taurus. And that's  
5 called the -- if you go back and you look at the documents,  
6 it's DN5.

7 Q Okay.

8 A Which is the designation that started -- where we started on  
9 the Taurus in, like, '86. So usually a product, once you  
10 design it, will stay -- the platform and major  
11 characteristics will stay around for eight to ten years. You  
12 do refreshing to keep competitive, you know, changes, things  
13 on the outside. Sometimes the product looks different, but  
14 there's a sequence.

15 And then in 1996 --

16 Q I always suspected that. Go ahead. I'm sorry. I should  
17 keep my mouth shut.

18 A You have to be practical. When you talk about power trains  
19 and you talk about floor pans and some -- they're expensive  
20 parts of the vehicle.

21 Q It makes sense.

22 A You have to keep it and then every two to three years, to be  
23 competitive with other people, you have to change its  
24 appearance because people have the expectation that when they  
25 buy a new car they can show the neighbors and family and

1 friends that they got a new car. When you follow the  
2 principles like Volkswagen used to do and -- nobody knew what  
3 year you had, but those kind of people didn't care I guess.

4 So now we have a cycle that goes up through 1994 on the  
5 Taurus, 19 -- I said '94. I believe it was '95. Because the  
6 DN 101 is a new vehicle that comes out in 1996. That still  
7 has electromechanical sensors, but because the structure is  
8 different, the whole design is different. It's a different  
9 vehicle. And that follows through until 1999.

10 Q Okay. And --

11 A When you get to 2000, we refreshen that vehicle, and you look  
12 at those code names and it says -- the N is dropped for some  
13 reason. It says D 186.

14 Q So a D 186 is the 2000 Taurus?

15 A That's correct.

16 Q A DN 101 is a '96 to '99?

17 A That's correct.

18 Q And a --

19 A DN 5.

20 Q -- predates that?

21 A And it's really simple. Just to give you another historical  
22 lesson. That's the D class vehicle. That fits that category  
23 for weight and characteristics. N means North America  
24 design, because some of them you'll see CDW 27, for example,  
25 which is C-class vehicle that was designed for world car.

1 So, I mean, each one of these vehicles have different  
2 designations, but the Ford system kind of makes sense.

3 Q Okay. Good. If I have you right, the system was -- in 1990  
4 there was a driver-only airbag with five sensors; three  
5 crash, two safing?

6 A Safing.

7 Q Safing -- '91 and a half model you dropped four sensors,  
8 three crash, one safing. In '92 and '93 there were dual  
9 airbags put in. Somewhere in the '93, '94 area there was the  
10 DN 5, but it went to a three-sensor system?

11 A That's my recollection, but I could be off on what year it  
12 was.

13 Q From '96 to '99 how many sensors were there?

14 A That was a three-sensor system.

15 Q Three sensor.

16 A Electromechanical.

17 Q Now, in all of these Taurus family cars from 1990 through  
18 1999, were the sensors basically the same? I realize you  
19 change the gas a little bit, change the type of ball, but  
20 it's basically a ball and tube?

21 A Basically a ball and tube, yes. They were supplied by Breed.

22 Q And in all of the systems it was -- basically the ball in  
23 either the safing system or the crash sensor would close the  
24 contact, and if the appropriate contacts were closed at the  
25 same time, it would send a signal back here, if it would not

1 have a computer that would interpret the information, it  
2 would then send it to the airbag and the airbag would blow?

3 A Well, it was called a diagnostic module, and it depends at  
4 which point -- or diagnostic monitor -- it had the ability,  
5 like I explained, to disable the system, and it had the  
6 ability, depending on what type we're talking about, to store  
7 fault codes and provide feedback information for people to  
8 repair the vehicle or to warn the driver or operator of the  
9 vehicle to get some service.

10 Q The event that would fire the airbag if there wasn't a fault  
11 code that has occurred somewhere was a ball rolled forward in  
12 a tube, it closed a contact, it might be more than --

13 A Two of them.

14 Q -- two contacts --

15 A Two simultaneous.

16 Q -- two simultaneous contacts that sends a signal to the  
17 airbags, the airbags blow?

18 A Well, when you say signal, all it is is transmitting power.

19 Q Power -- okay. No signal power?

20 A To turn on a light you have to have two switches close  
21 simultaneously. The light goes on because now you got the  
22 power going through the system, otherwise --

23 Q Good analogy. Now, the rationale from going to five sensors  
24 to four sensors to three sensors, who would make that  
25 decision?

1 A Well, it's not one person. You have to -- you have to get  
2 confidence. Like I said, we were conservative. The Tempo,  
3 which was a lead program -- actually, we had been looking at  
4 airbag systems from the '60s, and we looked at different  
5 sensing systems back in the '70s. And there was a program  
6 that had ball-and-tube sensors when we started really looking  
7 at them. It was called the 1991 Lincoln Program that had a  
8 limited number. It was a very small number of police  
9 vehicles that we were trying to get experience.

10 Because when you go back and you look at the regulations  
11 through a period of time, it said -- the government would say  
12 you have to have passive restraints and such and such, and  
13 then they'd say, okay, technology is not available. We have  
14 to delay it until it becomes available.

15 So there were peaks and valleys in the regulation  
16 process if you read 208, and we continued probably over a  
17 period of 30 years to continue looking at systems until  
18 finally we thought we had the confidence to do a program. We  
19 always were interested in having some high-volume program  
20 where we could get out and get field information. And we  
21 finally agreed that the kind of vehicle we should put it on  
22 was a fleet vehicle.

23 And the Tempo became a logical product because there was  
24 regulations being proposed to have passive restraints. And  
25 we used to think about looking at a 10,000 fleet program

1 to -- you know, statisticians -- and I'm not a  
2 statistician -- would always say, you have to have 10,000  
3 units at least. So we put together this program for the GSA  
4 and eventually went to insurance companies where there was a  
5 controlled fleet where we had a driver-only airbag in it, and  
6 we had these sensors that we thought we had confidence in.

7 There were Breed electromechanical ball-and-tube  
8 sensors. We put them out there, and we got a lot of  
9 experience off of that. And then that's when other  
10 manufacturers were watching what we were doing apparently, so  
11 all of a sudden, you know, airbags were showing up all over  
12 the place.

13 Because certainly some of the other alternatives -- we  
14 used passive belts, other people used different things. But  
15 when the regulation was phasing in where you had the  
16 10 percent, 25, 40 and a hundred percent that we knew was  
17 coming because they always send you preinformation out, you  
18 had to prepare and make sure that your products are going to  
19 be able to be sold and comply with the federal requirements.

20 Q But the information they would send you from a five-sensor  
21 system to a four-sensor system has got to be interpreted  
22 somewhere to say, yes, this makes sense to drop a sensor and  
23 somebody has to make a call, let's do that.

24 A That's correct.

25 Q Okay. Was that something happening in Ford?

1 A Yes.

2 Q Okay. Was it based on statistics that were occurring out in  
3 the field or would it have been crash tests or both?

4 A Both.

5 Q Okay. And would it have been such that there would have been  
6 some sort of standards to determine the effectiveness of five  
7 sensors versus four sensors and what's appropriate to make  
8 that change?

9 A I'm not sure what you mean by standards, but there are  
10 specifications and performance criteria you have to meet.  
11 Ultimately you have to meet the HIC -- head injury  
12 criteria -- the chest deceleration, you have to meet the  
13 femur loads, and that's the criteria you're looking at to  
14 meet the FMVSS 208 criteria.

15 Q But that's not applicable to the question of how many  
16 sensors. The question of how many sensors says does it go or  
17 not. Go ahead.

18 A Performance is always the consideration. I mean, if you  
19 thought you could do it with one sensor and you thought you  
20 could do it reliably and repeatedly, you'd do it with one  
21 sensor. But we felt we needed five sensors in order to do it  
22 repeatedly and reliably until we had the confidence that we  
23 could recalibrate. Each one of those sensors when you went  
24 from a five-sensor system to a four-sensor system were  
25 recalibrated.

1 Q Okay.

2 A And sometimes the bracketry and positions were changed. So

3 it was a matter of obtaining field experience and confidence

4 in the system that I could make these changes.

5 Q Okay. There's a document in the production that shows the

6 various years and where the sensors are located. Are you

7 familiar with that?

8 A I've seen -- there's various versions of that.

9 Q Okay. With regard to the '96 to '99 three sensor, which

10 would be two sensors and one safing sensor --

11 A Two crash sensors and one --

12 Q Two crash and one safing -- do you know where they were

13 located?

14 A My recollection is the crash sensors were located up front on

15 the radiator support, and they were probably located at about

16 third points. If you look and divided the front end of the

17 radiator support, which is just where the hood would latch --

18 the hood latches usually on the top of the radiator support

19 and then you have the headlights and the grill and stuff that

20 goes forward and -- that's where the radiator fits in there.

21 It's like a big horse collar.

22 Q Yeah.

23 A Do you follow what I'm saying? A horse collar is, you

24 know -- maybe I'm from a different generation.

25 Q I've been to museums.



1 A The crash sensors were located at third points where if you  
2 divided the front end of that radiator support they were like  
3 one-third of the way from the outboard --

4 Q Like this?

5 A -- ends. They weren't -- previously there was one at the  
6 center and there were two towards the end of the radiator  
7 supports. And we eliminated the center and readjusted the  
8 other two on the Taurus. Other vehicles had different  
9 locations.

10 Q When there were a total of five sensors -- when there were a  
11 total of five sensors I think you said there were two safing  
12 sensors. Were there three across the front of the car?

13 A There were three crash sensors.

14 Q Here it is. Let me show you what is AAC00898. I'm not going  
15 to burden the record with all of these. There's a  
16 1995 sensor system, and there's a little code down here.

17 A See, it says 1990 that you pointed to on the left.

18 Q Yes.

19 A You said '95.

20 Q I'm sorry. The brain doesn't work sometimes.

21 It has five sensors. The little square boxes are a  
22 sensor. Is this correct that this is four across the front  
23 or is that three?

24 A There was four. There was a central box there at the center  
25 line that had two sensors in it. One was a crash sensor and

0081

1 one was a safing sensor.

2 Q Okay.

3 A So if you counted up the boxes that they were in that were  
4 sealed, you would look at three up front but the center line  
5 had two sensors in it --

6 Q Okay.

7 A -- one safing and one crash.

8 Q And then we went to the '91 and a half. You have a good  
9 memory. It had three sensors across the front.

10 A Those were all crash sensors.

11 Q And then it had one safing sensor?

12 A That's correct. So the safing sensor was taken out of the  
13 center line of the 1990 model and they were recalibrated  
14 because the characteristics had changed somewhat.

15 Q Okay. And then it went to the '92 that had two sensors  
16 across the front and one safing sensor somewhere in the  
17 passenger area?

18 A Right.

19 Q Then in '94 --

20 A But just to make it clear, this is not necessarily  
21 representative of the Taurus. This is kind of like a generic  
22 chart, so they're talking about a lot of different -- I mean,  
23 this is all Ford vehicles. This is not just Taurus.  
24 Because, remember, we talked about life of vehicles.  
25 Certainly to go back and change a sensor system on a

1 carry-over vehicle might not be practical.

2 Q Gotcha.

3 A So you have some cycle problems here.

4 Q Then let me -- the information you gave me --

5 A I was --

6 Q -- for the dates would have been more of a Taurus date --

7 A Right.

8 Q -- as opposed to this document?

9 A Right. Because when you get over here to 1995, it says

10 single point, which apparently it was speculation. We were

11 working towards that, and I'd have to borrow some magnifying

12 glasses to see the date on this chart, but it probably was

13 speculating that we were going to have a single point in

14 1995, which we didn't have.

15 Q Yes, sir. Okay. So this chart -- skipping ahead of

16 myself -- is generic. In the time that they were using

17 five-sensor systems in the Taurus, would a five-sensor system

18 in other cars be basically the same system; same location,

19 maybe a little variance?

20 A Depending on the vehicle, that's essentially correct.

21 Q And then --

22 A When you had body-framed vehicles like the Ford Crown, the

23 Lincoln Towncar, those vehicles you had a different

24 structure, so some of those were -- the crash sensors were

25 located within the fender, which you -- on a unitized body

1 you have different structures, so you could locate them on  
2 what was called the apron, which was the edge of the engine  
3 compartment, which if you open the unitized vehicle hood, you  
4 see some kind of angular structure that goes from the top of  
5 where the fender is down to some unitized structure that's  
6 welded together to carry the front suspension and the engine.

7 Q But across the Ford line of cars if we had a five-sensor  
8 system, generally what you would have is four sensors in the  
9 front, maybe it would be three crash, one safing?

10 A No. That's the way it was. It wasn't maybe. That's the way  
11 it was.

12 Q That's the way it was in all lines?

13 A Right.

14 Q And there would be one safing somewhere back here in the  
15 passenger compartment area?

16 A Right. It could be at the rear of the engine compartment or  
17 it was actually up under the instrument panel, or in some of  
18 the products they put it down in what's called the sides  
19 cove, which is down on the edge -- it's the area where --  
20 some people call it the kick panel down there at the lower  
21 part. If you look at A, B, C pillars starting at the front  
22 where the edge of the windshield is, it's that portion down  
23 there that they put the safing sensor.

24 Q Behind the engine somewhere?

25 A Right. It was a matter of calibration again and where you

1 could position it and what made sense to the packaging  
2 characteristics of the occupant compartment of the vehicle.

3 Q All of those would be behind the engine somewhere?

4 A Right.

5 Q And I'll just use behind the engine.

6 All the five-sensor electromechanical systems would have  
7 three safing -- three crash sensors across the front, one  
8 safing, I'll say the front of the car, and then one safing  
9 sensor somewhere behind the engine?

10 A That's correct.

11 Q Then when all of the -- I'll assume a couple of things and  
12 you tell me if I'm wrong.

13 Then when Ford would do a four-sensor system, it would  
14 then have three crash sensors across the front and one safing  
15 sensor somewhere behind the engine?

16 A Right.

17 Q And then when Ford went to a three-sensor system sometime in  
18 the --

19 A '92, '93, someplace in there.

20 Q Okay. -- it would have two sensors -- crash sensors in the  
21 front of the car, somewhere in the grill, radiator-type  
22 areas, and it would have one safing sensor back behind the  
23 engine somewhere?

24 A That is correct.

25 Q Okay. Did Ford ever -- with the electromechanical system --

- 1 ever go to a two-sensor system?
- 2 A Not that I recall.
- 3 Q Okay. Why did Ford have more than one crash sensor in the
- 4 pre-19 -- the pre-2000 -- or the pre-electro accelerometer
- 5 systems?
- 6 A The question is why did we have two?
- 7 Q Yeah. Why would you have two crash sensors?
- 8 A The plus or minus 30 degrees.
- 9 Q On either side?
- 10 A Right. You got to pick up left and right, not only center
- 11 but left to right.
- 12 Q Okay. Would these ball and tubes -- the tubes be pointed in
- 13 some direction that would be important?
- 14 A Yes.
- 15 Q Okay. Would it be that in a, let's say, three-sensor system
- 16 you might have one pointed more forward in the direction of
- 17 the car, one more to the left and one more to the right to
- 18 kind of pick up the --
- 19 A No. My recollection is because of vector analysis all you
- 20 had to do was keep them square to the road, if you pointed
- 21 them longitudinally.
- 22 Q Then why wouldn't one work?
- 23 A Because you had plus and minus, right and left. These are
- 24 vector problems and structure. Do you have any understanding
- 25 of vector analysis when you're looking at longitudinal,

- 1 transverse--
- 2 Q I can do that.
- 3 A -- X, Y, Z? I don't know what your background is, so --
- 4 Q I've got a chemistry degree.
- 5 A Okay. So you understand vectors.
- 6 Q Yeah. I got three years of physics and I got calculus and
- 7 all that.
- 8 A Okay. So if you longitudinally mount a ball and tube --
- 9 Q Okay.
- 10 A -- the vectors that affect it on a structure always will
- 11 translate so that you have transverse, longitudinal and --
- 12 I'm trying to think of the correct name for --
- 13 Q Whatever. You've got a vector that would send the ball
- 14 forward?
- 15 A It's three dimensional. You're basically looking at the
- 16 longitudinal vector, so that's what engineers talk about
- 17 worst case scenario, because that's the G-forces that you
- 18 have to deal with the longitudinal.
- 19 Q If I have a tube that looks like this and the front of my car
- 20 is that way, is that the way it's set up?
- 21 A Right.
- 22 Q And I'll have my ball back here, and this car is struck from
- 23 here.
- 24 A That's a vector.
- 25 Q That's a vector. I'm going to have a certain amount of

1 vector going that way?

2 A Exactly.

3 Q Now, if I have this one on the front, this on the passenger's

4 side, this one on the driver's side and this one in the

5 center, each one of those balls, wouldn't it have the same

6 vector no matter whether it came --

7 A No.

8 Q It wouldn't.

9 Okay. Would this ball have the same vector for this

10 force --

11 A Each one of them --

12 Q -- and this one and this one?

13 A Each location is seeing a different vector.

14 Q Is it because of the twist of the car?

15 A Because of crushing of the vehicle.

16 Q That makes sense. That makes sense. I apologize. Okay.

17 So when Ford was dealing with the three ball and tubes

18 in a four-sensor system, when the car would initially touch

19 the object, let's say a pole for instance, the crush of the

20 vehicle may turn the tubes a little, it may change the

21 momentum, the twining of the car, a number of things, and

22 change the affect on the balls depending on where the sensor

23 is in the car?

24 A That's certainly a possibility.

25 Q And the three sensors were there to make sure that the



1 crushing -- the deceleration was picked up by the sensor?

2 A At each one of those areas.

3 Q Okay. Was there ever a problem with the sensors being in the

4 crush zone and the sensor being destroyed before the ball

5 ever closed the contact?

6 A You're asking a question that applies to everything, so I

7 can't answer that because -- the only way I can answer it is

8 I don't know. I'm not aware of anything like that. I seen

9 some very severe collisions, and because of the robust design

10 of this electromechanical sensor, we had taken -- I mean, in

11 a few collisions the vehicle was pretty well demolished and

12 the bracketry was bent up and the wires were ripped off the

13 sensor, and we'd take them back to the supplier, Breed in

14 this case. They still thrusted and met the engineering

15 specification.

16 Q Prior to adopting the SMART systems, had there been any

17 problems with the airbags in cars in frontal collisions

18 within the 30-degree angle not going off at high-speed

19 collisions because the sensors were getting destroyed before

20 the sensor went off?

21 A I thought I just answered that. I never seen a case where

22 even though the sensor was bent up and the bracketry was

23 destroyed that they still -- I think one -- one time maybe it

24 was not quite meeting the -- when we thrusted them -- when a

25 supplier thrusted these sensors, there were calibration

1 curves; three fire, three no-fire curves with threshold  
2 deployments, which translates back to that 14-mile-per-hour  
3 perpendicular barrier equivalent.

4 Q Okay.

5 A I've only seen one that was just outside of the  
6 specifications requirements. That's threshold requirements.  
7 I had seen it in the past on a few occasions of catastrophic  
8 collisions that airbags didn't deploy because of wiring  
9 issues, because of wires being cut, maintenance issues. When  
10 you have a product out there for a long period of time,  
11 people get fender-benders and they're not repaired properly.  
12 On a few occasions I had seen products where airbags did not  
13 deploy because of a loss of the power in the system; cut  
14 wires or some other issue.

15 Q But I'm not asking about maintenance stuff. I guess my  
16 question wasn't well-crafted. So let me ask it this way.

17 The specific occurrence with the electromechanical  
18 ball-and-tube systems, had you ever seen a situation with  
19 these multiple sensors that the front collision was so quick  
20 that it destroyed the sensors before they could fire and,  
21 therefore, the airbags did not go off?

22 A I said I know of no incident where the sensors were  
23 destroyed, because there was a couple times that we had to do  
24 a complete analysis of the product and we found out that the  
25 wiring harness was cut on one, on another one it was a

1 manufacturing issue that the wiring harness had come apart or  
2 was not put in place properly.

3 Q Those are maintenance or prewreck problems; is that correct?

4 A No. No. The cut wires was the result of a catastrophic  
5 collision.

6 Q Okay. So that the collision cut the wire before the signal  
7 could be sent?

8 A Right. The closure speed in the one incident I'm thinking of  
9 was so high between two vehicles that the radiator support  
10 rotated and cut the wiring harness, so it was not getting a  
11 signal within a period of time to deploy the airbag because,  
12 like I said, you have to have time for the ball to roll in  
13 the tube, and then you have to have that window of  
14 opportunity where you have the safing sensor and the crash  
15 sensor to overlap.

16 So by the time you add up all these numbers, it might  
17 have been in the range of, say, 20 milliseconds or so, and  
18 the wires had already been cut. Because if you go through a  
19 calculation and say how fast did this move to cut it -- I  
20 mean, you'd have to actually run a test to verify it, and we  
21 did not verify it.

22 But in my mind, when we went through that particular  
23 case, it was the rotation of the radiator support that  
24 actually cut the wiring harness so the airbag ignitors did  
25 not get a -- they might have been power transmitted. It's

1 impossible to tell. But there wasn't a long enough amount of  
2 power applied to those ignitors for it to activate the  
3 airbag.

4 Q Other than that one case, did you ever have any other cases?

5 A That's the only one that I can think of.

6 Q What was the speed of the vehicles in that case?

7 A There was two vehicles coming together in the range of a  
8 hundred-mile-an-hour closure, which you start talking about  
9 50-mile-per-hour barrier equivalent, probably 40, 50 mile per  
10 hour, because when you have two vehicles coming together, you  
11 have mutual crush. And it gets a little bit complicated  
12 versus a barrier, but -- usually the rule of thumb is, if you  
13 have two vehicles of a similar weight and matched up nose to  
14 nose, a 50-mile-per-hour vehicle coming in opposite  
15 directions will be equivalent somewhat to a 50-mile-per-hour  
16 barrier collision.

17 Q Okay. But in that case somehow the radiator support and the  
18 crushing before they were -- the sensors were actually  
19 supposed to fire came around and cut the wiring harness?

20 A That's correct.

21 Q And that would be a highly unusual case; is that right?

22 A It would be extremely unusual.

23 Q Had you ever seen that any other time?

24 A That's the only time I can recall it.

25 Q Okay.

1 A But, you know, maybe if I sat and -- sometimes cases come and  
2 cases go and you don't really get to do a full analysis, but  
3 in that case we went through complete analysis.

4 Q Had you ever seen any cases involving Ford where the airbags  
5 did not go off in a, say, 50-mile-an-hour head-on collision?

6 A That happened a few times. One other analysis that we did  
7 that we went through a complete tear down was this issue  
8 where we had a problem with the wiring harness not properly  
9 installed where the connectors weren't sitting nose to nose.  
10 And we'd done a lot of work with SEMs and optics and so forth  
11 that we could prove that -- in electrical connectors they're  
12 locking connectors and you have a male portion, female  
13 portion. When they go into the locking portion, if you look  
14 at these connectors, there's usually some kind of tang that's  
15 a little plastic thing that flips in the hole and locks it in  
16 place. And this particular vehicle, that was sheered off,  
17 and we were able to see the blistering on the SEMs, scanning  
18 electron microscope. You could see the nose-to-nose  
19 blistering, so it was never installed properly.

20 Because when you have a male and female connector come  
21 together, if you look at those electric connectors, they  
22 scratch the plating off. You can see it under high  
23 magnification. And we were allowed to go through an  
24 exhaustive project to establish what the issue was. And some  
25 people believed it to be one thing and other people believed

1 it to be other things, but I believed it to be a  
2 manufacturing issue with the supplier.

3 Q Other than the connector issue that you just described on a  
4 Ford vehicle, have you ever seen a Ford vehicle with either  
5 electromechanical or the new SMART systems electro --  
6 electronic accelerator where a 40-mile-an-hour collision  
7 head-on into an object failed to have the airbags go off  
8 other than this case and the one you described for the  
9 connector?

10 A When you say this --

11 Q The case that we're dealing with today.

12 A I explained to you about the other case where there was a  
13 car-to-car.

14 Q Yeah. It cut the wiring harness?

15 A Right. That's one.

16 Q That's one.

17 A The other one is this wiring harness issue. That's two.

18 Q Okay.

19 A And then there's this case.

20 Q That's three.

21 A The Schaeffer case.

22 Q Yes, sir. And those are the only three cases that you were  
23 aware of in Ford's history where a head-on collision of some  
24 sort, basically a head-on collision in the 40-mile-an-hour --  
25 let's say 40-mile-an-hour-or-above range has failed to have

1     airbags go off?

2   A   There was at least one, maybe two other cases that were back  
3     in that GSA fleet that had occurred. There was a case that I  
4     investigated down in -- I don't remember. It was southern  
5     Alabama not too far from Mobile. It's in the literature. A  
6     GSA vehicle impacted the front of a logging truck, and the  
7     nature of the collision was that this logging truck actually  
8     cut the car into about three pieces. And when it was all  
9     over, the airbag module was actually ripped out of the  
10    steering column and it did not deploy.

11  Q   Is that an '80s accident?

12  A   Yeah. That's about '86, '87 time frame, if you go back and  
13    look in some of the reported information within that Tempo  
14    GSA fleet -- and I believe there was another one that I  
15    looked at up in Maine that had that similar occurrence.

16  Q   Is it one of the GSA fleets?

17  A   Right.

18  Q   But let's just make sure we can get it right then.

19       Other than the GSA fleet that was back in the 1980s --

20  A   It was a 1985 Tempo.

21  Q   Yes, sir. That -- you guys were starting to get your feel  
22    for airbags, from, let's say, 1990 when airbags first went  
23    into the Taurus until today, the only accidents you were  
24    aware of where a -- let's back the speed down a little bit --  
25    30-mile-an-hour-or-greater collision has failed to have the

0095

1 airbags go off when the collision is basically a frontal  
2 collision was the one where the radiator support cut the  
3 wiring harness where you said the closing speed of the two  
4 cars was about a hundred miles per hour?

5 A That's correct.

6 Q A wiring harness that had failed to have the contacts made  
7 because of some manufacturing defect?

8 A That's correct.

9 Q And, No. 3, the Schaffer case that we have today?

10 A That's the ones that I recall.

11 Q The situation with the electronic sensors --  
12 electromechanical --

13 A Just to make the record clear, when you said you started  
14 backing off on the numbers, there were some issues when we  
15 went to dual-bag systems where we didn't get a driver's bag  
16 at threshold impact, but that was covered by -- when you look  
17 at this diagram -- and you never marked it as an exhibit --  
18 but it says dwell enhancing circuit.

19 Q Yes, sir.

20 (Mr. Kilpatrick exited deposition room)

21 A When we put the Continentals out that had a dual-bag system,  
22 we were all quite shocked to find a couple cases where we got  
23 passenger bags in threshold collisions and we didn't get the  
24 driver bag. And after we analyzed that whole situation, we  
25 found out that because of the slip ring and resistance in the



1 steering column, it was just slightly different for the  
2 driver's side than the passenger's side.

3 So the priority went to -- because you have a common  
4 sensing system, the priority went to the passenger's side,  
5 and the resistance was a little bit higher in the driver's  
6 side, so you didn't get a driver's bag.

7 So there are some of those that are reported, and you  
8 asked the question previously when you started coming less  
9 than 30, but those are threshold impacts, and they sometimes  
10 provided puzzling results. And that's why we added in this  
11 dwell enhancing circuit, so that once you had the threshold  
12 impact, it locked it in place so that you no longer had two  
13 bags go off.

14 Q Okay. Now, the question I asked a minute ago where you  
15 listed the three cases where no airbag had gone off on  
16 basically a frontal impact -- a frontal collision over  
17 30 miles an hour, we -- I had not limited my question to just  
18 the Taurus vehicle. Does that include all vehicles in the  
19 Ford line? You only know of three cases where the airbags --

20 A I'm only aware of three. In fact, when you talk about those  
21 different vehicles, the other two were both Tauruses --  
22 excuse me. I said that wrong -- both Tempos. The one with  
23 the wiring harness problem was a Tempo and the first one we  
24 talked about was an '85 Tempo in the GSA fleet.

25 (Mr. Kilpatrick reentered deposition room)

0097

1 Q I wish I knew -- there were three. There was one that had a  
2 radiator support problem.

3 A That was a Taurus. That was about a '91 Taurus.

4 Q That was about a '91 Taurus. Then there was the one that had  
5 the wiring harness problem.

6 A That was a Tempo.

7 Q What year was that?

8 A It was a production vehicle, so it might have been '87, '88,  
9 '89 time frame. I don't recall.

10 Q Okay. So let me narrow it again. Since 1990 in the entire  
11 Ford line of cars -- since 1990 -- you only know of two cases  
12 in which there was a frontal collision over 30 miles an hour  
13 where the airbags failed to go off, one of which occurred in,  
14 I think you said, '91?

15 A I don't know what year it occurred. I remember it was, like,  
16 a '90 or '91 Taurus.

17 Q '90 or '91 Taurus where there was a closing speed of about a  
18 hundred miles an hour between the two cars and the radiator  
19 support somehow cut the wiring harness?

20 A The wiring harness was cut.

21 Q Yes, sir. And the second case would be the Schaeffer case  
22 today?

23 A That's the one I'm aware of.

24 Q And do you know of how we would find out if Ford is aware --  
25 of course you're speaking for Ford today.

1 A Right.

2 Q Would you know whether they have any other information that

3 would be contrary to what you know?

4 A There may be other cases that I was not involved in that --

5 that are out there. I don't know.

6 Q Okay. How long have you been involved in the litigation side

7 of airbags -- litigation and claims side of airbags?

8 A Probably since the early '80s.

9 Q Okay.

10 A Just to make that clear, there was a period of time when

11 people were saying that we should have put airbags in and we

12 didn't have them.

13 Q Oh, I understand.

14 A So that goes back to what lawyers call a preemption motion

15 and all that business.

16 Q I've been there.

17 A Okay.

18 Q Were you, in the '90s, dealing with airbag claims at Ford?

19 A Yes.

20 Q Okay. When there was an airbag claim at Ford, either

21 litigation or something that resulted in a claim, did you

22 generally get involved in it?

23 A I wouldn't say I got involved with all of them, but I got

24 involved with a good deal of them.

25 Q Okay. Were there other people doing the same thing you were

1 doing?

2 A Initially I was doing most of it, and there was another  
3 person that I worked with. He's actually my manager. When  
4 you start talking about in the beginning, was it -- the GSA  
5 fleet that we were trying to assist the government with, most  
6 of the GSA fleet were not litigation but trying to get  
7 information from the field as to field performance. So when  
8 a vehicle was involved in an accident, GSA would notify us  
9 and then we would try to decide whether we wanted to do that  
10 kind of investigation.

11 And a lot of it was threshold impact, so it was just a  
12 misunderstanding of how the system operated. So sometimes  
13 you could handle them over the phone, but there was one other  
14 person that I recall that was working. And I probably did  
15 two-thirds of the first hundred investigations and he'd done  
16 some other ones when too many of them started coming in.

17 Q Other than the two of you then, would there be anybody else  
18 dealing with your positions with these airbag cases?

19 A In the early stages, that's it, but then as product, you  
20 know, expanded into many different car lines, different --  
21 lots and lots of issues, primarily about misunderstanding  
22 about threshold deployments or -- you know, either people  
23 expected an airbag or they got an airbag when they -- and  
24 then they had abrasions or issues of minor injuries that they  
25 didn't anticipate because people believed that if you have an

1     airbag you shouldn't become injured, so there was a lot of  
2     confusion about that.

3             There was a lot of litigation as airbags -- and  
4     claims -- as airbags were being phased-in because of a lack  
5     of understanding of how the system worked. And people  
6     thought, you know, they should be able to do whatever and  
7     still not get some abrasions, bruises, whatever.

8   Q   I understand that. Do you have a pretty high level of  
9     confidence that there had been other claims or litigation or  
10    occurrences where the airbags had failed to go off in a  
11    frontal collision over 30 miles an hour that you would have  
12    known about it at Ford throughout the '90s, early 2000s?

13   A   I would say more in the early period of time before the  
14    organization had changed and there were more people involved,  
15    because sometimes these cases would come in and we wouldn't  
16    be able to investigate. The vehicle was destroyed or  
17    whatever. So I -- I think probably as the '90s progressed, a  
18    number of cases and claims were coming in, and I certainly  
19    wouldn't have been aware of all of them.

20   Q   Excuse me just a second.

21   A   Sure.

22   Q   Mr. Wagner, I have a couple areas to kind of touch on this.

23             Category No. 20 talks about other legal causes of  
24    actions brought against Ford wherein passengers were severely  
25    injured or killed by the failure of airbags deploying. Have

0101

1 there been any -- any lawsuits filed against Ford for failure  
2 to have airbags deploy where people were injured other than  
3 the Schaeffer case? And let's say over 25 miles an hour.

4 A Yes.

5 Q Okay. How many?

6 A I don't know.

7 Q Okay.

8 A I explained to you the ones I knew about.

9 Q You mentioned there was a radiator case, and let's talk about  
10 from 1990 until now.

11 A Okay.

12 Q Other than the radiator case you mentioned and the Schaeffer  
13 case.

14 A Those are the only two I can recall that I was involved with.

15 Q Okay. What about for Ford Motor Company?

16 A I guess I have not seen that listing, so I don't know what  
17 the answer is. I don't know whether they supplied that to  
18 you or not.

19 MR. WELLS: Randy, can you follow up on that for us?

20 MR. BIBB: Well, you know, it depends on speed. If  
21 you're talking about high-speed impacts like the Schaeffer  
22 case, that's one thing, but, you know, low-speed cases --

23 MR. WELLS: Low speed -- I understand your problem with  
24 that, and I appreciate the education the public went through.  
25 I got a lesson in that myself.

1 Let's say 30 miles an hour and over. That should give  
2 you plenty of --

3 MR. BIBB: Well, you know, we certainly object to the  
4 discovery about the car lines and systems that are not  
5 similar to the one in this vehicle. I think we have answered  
6 for the 2000 Taurus, and if I recall reviewing some of the  
7 discovery -- but I'll -- you know, if you want to make a  
8 request of that, I'll make sure we'll respond.

9 MR. WELLS: I don't want to do it that way. You know,  
10 I've got a 30B6 --

11 MR. BIBB: Right. I would object to him to answer for  
12 all the car lines and all types of vehicles.

13 MR. WELLS: Well, let's break it down so we can have a  
14 clear understanding, and I've got three requests here. You  
15 can look at 20, you can look at 31, and you can look at 32.  
16 One has to do with SMART systems. One has to do with the  
17 limited Taurus. One has to do with causes of action. Let me  
18 see if I can make this simple for both of us so we don't have  
19 a problem.

20 The witness has already testified that the ball-and-tube  
21 systems were very similar configurations, basically the same  
22 type of systems, from 1994 -- and I haven't gotten into the  
23 length of electrical at this point. For those systems across  
24 the lines of the vehicles it shouldn't be a big matter,  
25 especially since what appears to be -- he may not have all

1 the cases -- but he seems to be in the area that knows.  
2 We're not talking about a lot. We're talking about just a  
3 couple of these that even occurred.

4 So my question is, is for all Ford vehicles from 1990  
5 until the present, those cases, those claims, those  
6 situations wherein airbags failed to deploy when there was a  
7 collision with a front end of a vehicle to be identified, and  
8 it appears as though this man with his massive amount -- and  
9 I'm not trying to blow smoke at you -- but massive amount of  
10 information with this particular subject since 1990, talking  
11 about all car lines, all vehicle lines, can only identify two  
12 right now. We're not talking about a burden.

13 MR. BIBB: Well, actually you are, because, No. 1, as he  
14 pointed out, you know, we get lawsuit complaints, and that's  
15 what we would have to be searching. People are going to  
16 say -- Ford Motor Company receives a lawsuit complaint. I  
17 was -- my airbag did not deploy in this severe accident.

18 That severe accident may have only been 12 miles an hour. I  
19 mean, there's a lot of nondployment, especially in the early  
20 1990s; in other words, I had as many cases that I personally  
21 worked on where people were mad because their bag didn't  
22 deploy, and they would --

23 MR. WELLS: I gotcha.

24 MR. BIBB: And in their allegations they would say I'm  
25 permanently disabled. What happened was they got their nose



1 broken.

2 MR. WELLS: What I want to know is where the allegation  
3 was 30 miles an hour or more at the point of impact. Now,  
4 the reason I say that -- and I will feel comfortable if you  
5 guys come back and say we know of none, and I will not  
6 complain if you ultimately find one after the litigation is  
7 over with. You just let me know if you ever find one.

8 But what I want to know is, I want to know kind of the  
9 environment here. The smaller the number the better for  
10 everybody concerned.

11 MR. BIBB: Let me say this. We will undertake to -- to  
12 do a reasonable inquiry into this.

13 MR. WELLS: Okay.

14 MR. BIBB: My hesitation, as I think would be  
15 Mr. Wagner's hesitation, is that, No. 1, there were a lot of  
16 nondeployment claims, especially in the early '90s.

17 MR. WELLS: Especially low impact.

18 MR. BIBB: And most of which were low speed, most of  
19 which never identified the delta V in the change of velocity  
20 in the accident. And even when there would be allegations  
21 that the change of velocity was above 30 miles an hour, in  
22 most cases a more serious look would determine that it was  
23 far less than that.

24 My -- I can inquire, but let me say this. To my  
25 knowledge we don't classify -- Ford Motor Company does not

1 classify lawsuits and claims by delta V. I mean, we can  
2 determine what component or system was involved. We can  
3 determine what vehicle line was involved. We can determine  
4 model years and dates of loss and dates of claims, but as far  
5 as determining speeds, it may be more, as Mr. Wagner -- it  
6 would be a matter of anecdotal information than any kind of  
7 hard-and-fast determination.

8 MR. WELLS: I'll go with that.

9 MR. BIBB: For instance, even in this accident there's  
10 going to be a difference of opinion about what the delta V  
11 was in this accident, and there is in practically every  
12 lawsuit that I've been involved in. Sometimes it's a big  
13 difference; sometimes it's only three or four miles an hour  
14 difference. Sometimes three or four miles an hour makes a  
15 big difference in where the bag should or should not have  
16 deployed.

17 I am -- I preface this long-stated objection to all of  
18 this stuff in explanation just to caution you, but I will be  
19 glad to go back and inquire of the company and report to you  
20 whether we can, A, even make that determination --

21 MR. WELLS: Okay.

22 MR. BIBB: -- other than just getting anecdotal  
23 information from people like Mr. Wagner.

24 MR. WELLS: That would be fine. That would be fine. I  
25 want to know whether your company is aware of it, and I

1 realize what your discussion is. But if -- if there is an  
2 epidemic problem, they would know it. I realize the  
3 low-speed impacts -- I realize those things. I understand  
4 that completely. I got my education on that too. But if  
5 there have been other situations where a Ford automobile with  
6 what Ford recognized to be a 30-mile-an-hour collision or  
7 higher -- Ford recognized it, not some doofus out there in  
8 yonderland who made an allegation.

9 MR. BIBB: Plaintiff's expert.

10 MR. WELLS: Yes. Or a defense slut. Not you. You've  
11 been very nice. I will give you that. That was being  
12 playful. I apologize.

13 MR. BIBB: And I take it all in the -- as I'm sure you  
14 took my comments about the plaintiff's expert.

15 MR. WELLS: Yes.

16 THE WITNESS: I thought I had a lawsuit going.

17 MR. BIBB: No defamation.

18 MR. WELLS: Now, let me back up.

19 Are we in agreement that you will perform an  
20 investigation to see whether or not -- a reasonable  
21 investigation -- to see whether or not Ford has since 1990  
22 other frontal collisions where the airbags failed to deploy  
23 in any of its vehicles, Ford cars, where it recognized that  
24 the collision velocity was about 30 miles an hour or over --  
25 or let's just say over 30 miles an hour?

1 MR. BIBB: With those caveats that your -- or  
2 limitations that you have placed on it, I will make inquiry  
3 of that --

4 MR. WELLS: Okay.

5 MR. BIBB: -- and advise you in writing as to whether we  
6 have made any such -- if we have any other information. I  
7 will tell you that I would expect that if there were a larger  
8 number of these, that it would also be the United States  
9 Government who would have taken a keen interest in that as  
10 they do in most high-speed nondeployment or high -- or  
11 high-speed nondeployment cases from whatever manufacturer it  
12 may be.

13 But I will make inquiry of it, but I must tell you that  
14 it will be largely anecdotal because of the limitations that  
15 we have on the determination of speed.

16 MR. WELLS: Anecdotal means you would be doing what,  
17 talking to people?

18 MR. BIBB: Talking to people and asking whether we have  
19 anybody -- anybody recalls anything like that. Because,  
20 frankly, that may be the only way to do something with a  
21 determination on the delta V like you've delineated it.

22 MR. WELLS: Okay.

23 MR. BIBB: Mr. Wagner, if you want to add anything to  
24 what I've said based on your experience --

25 THE WITNESS: Well, the only thing I can say is that

1 sometimes information comes in and -- I can recall a claim at  
2 one point in time where it was claimed that it was a  
3 15-mile-per-hour collision and there was no airbag. What  
4 wasn't described to us was that the vehicle was going  
5 15 miles per hour and ran into another vehicle that was going  
6 45, so you have to be very careful, unless you do a thorough  
7 investigation and analysis, to use data like that.

8 We were quite surprised to fly all the way to California  
9 to see a delta V of five mile per hour. It was somebody that  
10 was sensationalizing and believing that they were somebody  
11 that was involved in something that was of interest to us.

12 BY MR. WELLS, CONTINUING:

13 Q When you say they hit somebody that was going 45, it wasn't a  
14 head-on, they were going the same way?

15 A Right. And sometimes you have different types of collisions.  
16 I know that you've talked about the frontal barrier  
17 equivalent, but when you start getting into a wide variety of  
18 collisions, sometimes people, going back to those vectors,  
19 whether it's rollover, whether it's a 60-degree angular  
20 impact, those kinds of things affect performance.

21 Q What we're down to is we have two collisions since 1990 that  
22 you're aware of that were a frontal collision over 30 miles  
23 an hour where the airbags didn't go off across the Ford  
24 lines?

25 A Those are the ones that I can recall from my experience.

1 MR. WELLS: And then counsel will look to see whether or  
2 not they're aware of others based on the discussion we had  
3 and let us know that in writing; that's where we are?

4 MR. BIBB: That's where we are.

5 MR. WELLS: Okay. Thanks.

6 Let's take a quick break.

7 (Recess taken)

8 MR. WELLS: We just took a break a minute ago, and it is  
9 presently 2:15 in the middle of the 30B6 deposition. During  
10 the break counsel discussed whether or not we would continue  
11 this deposition into tomorrow, which we would be likely to do  
12 if we were going to end at 5, whether we would as a second  
13 alternative continue the deposition into the night, or as a  
14 third alternative, which is what we've agreed to, that we  
15 would finish today within the time frames that would let us  
16 make our flights back to Nashville and Jackson and have some  
17 sort of binding agreement between us so that we could finish  
18 the 30B6 at a later date within the discovery deadline.

19 For the purposes of the record and for the Court, the  
20 concern we have in making that agreement is that the  
21 discovery deadline is presently set for --

22 MR. KILPATRICK: August 6.

23 MR. WELLS: -- August the 6th. The deposition of  
24 Mr. Wagner as an expert has been noticed within the discovery  
25 deadline for August 1st. That notice was made because there

1 was some concern that the Court may not grant additional time  
2 to take his testimony out of time. Brad Smith is going to be  
3 requesting the Court on behalf of Ford to accommodate  
4 schedules to allow Mr. Wagner's deposition to be taken  
5 sometime in the next couple of weeks after the 1st of August.  
6 Of course, we're in agreement with that.

7 Our concern is that in the unlikely event that the Court  
8 wouldn't let us do that -- especially since we all agreed to  
9 it -- in the unlikely event the Court wouldn't let us do  
10 that, the plaintiff does not want to be caught in a position  
11 where discovery is closed, the 30B6 has not been completed,  
12 and Mr. Wagner's expert deposition has not been taken.

13 Taking all that and balling it up, we've reached an  
14 agreement that works for all of us as follows:

15 1. We will take this deposition and finish what we can  
16 between now and the time it's necessary to go get our  
17 flights, which would be sometime around 5 or 5:30, somewhere  
18 in that range.

19 2. We will continue the 30B6 deposition at a later date  
20 which will be on the same date that we take Mr. Wagner's  
21 expert deposition. That date will either be the date allowed  
22 by the Court after August 1 or it will be at a date that will  
23 be before this discovery deadline ends. And we'll work that  
24 out, but plaintiff will not be at risk as a result of this  
25 agreement of not being able to take the 30B6 deposition, the

1 deposition of Mr. Wagner.

2 Next, if Mr. Wagner -- we take his deposition in  
3 Nashville or Jackson or Detroit, the plaintiff will not be  
4 responsible for his -- Mr. Wagner's travel costs. The  
5 plaintiff will not be responsible for the hourly rates of  
6 Mr. Wagner in either traveling or preparation or attending  
7 the deposition.

8 There's the 30B6 deposition, but at the point in time  
9 that we finish the 30B6 deposition, the watch will be noted,  
10 the time, and as I then begin the expert deposition, I will  
11 be responsible for his hourly rate for the actual time in  
12 that deposition.

13 Is that our agreement?

14 MR. BIBB: That is. The only notes that I would make to  
15 that is:

16 No. 1, I think the actual discovery cutoff is the 6th of  
17 August. I think you may have -- you probably said the 1st in  
18 your statement.

19 No. 2, I am prepared to put Mr. Wagner -- or make  
20 Mr. Wagner available for his expert deposition, and we'd  
21 might as well try -- if we can agree on it now -- on either  
22 the 14th or 15th or 15th or 16th. It's a Thursday-Friday,  
23 the week after the discovery cutoff. I think that's the  
24 dates that you and I had talked about; is that not? Those  
25 are not? You're not available for trial on these two dates?



1 Off the record.

2 (Discussion held off the record)

3 MR. BIBB: The agreement is as stated with the exception  
4 I think, just to correct the record, I believe August 6th is  
5 the actual cutoff date. And the good news is that all the  
6 lawyers in this case are busy and so are all the witnesses,  
7 and we will work out an agreement as to a date or dates that  
8 Mr. Wagner's 30B6 deposition can be completed and that his  
9 deposition as an expert witness in this case can be  
10 completed. And we'll just finish -- we'll do that the same  
11 day. It makes sense.

12 MR. WELLS: And one thing, just so we understand, we all  
13 agree that this action in doing this deposition will cause no  
14 need whatsoever for a continuance of the trial?

15 MR. BIBB: We're certainly not asking for one as a  
16 result of these.

17 MR. WELLS: If we finish it by August -- the trial isn't  
18 until January as I understand it.

19 MR. BIBB: I agree.

20 MR. KILPATRICK: But Judge Nickels had already indicated  
21 at one time that he doesn't want to go too far off into the  
22 future.

23 MR. BIBB: Right.

24 MR. KILPATRICK: And if he says he's only going to grant  
25 the extension by bumping the trial date, I don't think we

1 would be agreeable any longer.

2 MR. WELLS: No, we can't do that.

3 MR. BIBB: Well, I don't -- I don't have any control  
4 over what the judge says, but all I'm saying is we're  
5 certainly not going to seek any continuance of the case. I  
6 don't -- I'm not sure that Mr. Wagner's 30B6 testimony is  
7 going to have any affect on this motion from either side's  
8 standpoint.

9 So why don't we -- let's go and get as far as we can get  
10 done today, and we've made an agreement we're going to  
11 provide it either by the discovery cutoff or by the extended  
12 discovery cutoff, and we'll make it work.

13 Okay. Let's do it then.

14 MR. WELLS: Okay. Let's go back to the testimony.

15 BY MR. WELLS, CONTINUING:

16 Q Mr. Wagner, this Ford Taurus we're talking about became the  
17 D186 with the 2000 model?

18 A That's correct.

19 Q Is there a number or a name for the sensor system -- airbag  
20 system that was in the 2000 Taurus model?

21 A Well, I'm sure there are part numbers, and there is a  
22 description someplace in the documents, which I don't recall,  
23 but there is a designation for the RCM module for this  
24 particular vehicle.

25 Q Now, there's a thing called an NGRCM. I think it stands for

1 next generation restraint control module. Is that the module  
2 that's in this case or is that a generic term?

3 A That's a generic term.

4 Q Okay. Now, with the 2000 model we went to this new system.  
5 I referred to it a couple of times as a -- as one involving  
6 electronic accelerometers. What would you refer to this  
7 system as? Is it the SMART system I've heard on the  
8 television?

9 A Right. In some cases it's been called a SMART. In some  
10 cases -- I think you've seen documents -- it's called an  
11 intelligent airbag, and there's Phase 1, Phase 2, Phase 3,  
12 depending on when things could be invented and put into  
13 production. But it's generally been called a SMART bag prior  
14 to 2000.

15 Q Okay. Well, with the 2000 Taurus system it has an RCM in it,  
16 it has certain sensors, and it has an ability to, I guess, do  
17 its computing. Is that system basically the same system that  
18 is in other Ford models that have the SMART system in it?

19 A We'd have to -- it would -- generically the answer would be  
20 yes, but each vehicle has to have a system that is tuned to  
21 that crash pulse, the structure of the vehicle. So if you  
22 look at a vehicle like a Windstar or, you know, one of the  
23 other products that have subsequently had this system put  
24 into it, it would have to be unique for that vehicle. It's  
25 not like you can say take the components from a Windstar and

1 put them in a Taurus or, even for that matter, the  
2 generations within a Taurus. I believe the Taurus now has a  
3 weight sensor, so it has different systems.

4 And even at this time there were two -- within a Taurus  
5 there were two different RCMs in 2000. One was a six loop  
6 and the other one was, I believe, an eight loop where you had  
7 side bags. This particular vehicle did not have side bags in  
8 it.

9 Q Okay. Now, is the difference between what you might have in  
10 the Windstar or in the Taurus basically the programming  
11 language to understand what the sensors say and what the  
12 response should be or is it the hardware?

13 A It's both.

14 Q Okay. Would the RCM be substantially different in other cars  
15 than it was in the Taurus?

16 A You said substantially different?

17 Q Yes, sir.

18 A I don't know what that means. I mean --

19 Q I understand. What kind of differences would you see between  
20 the RCM and the Taurus 2000 model and the other vehicles? Is  
21 that -- let me tell you what I'm getting to. Is this the  
22 cheap-o model in the Taurus or are they all pretty much the  
23 same cost there's just a little bit of difference in how many  
24 somethings it's going to have? Or does the Taurus get the  
25 cheap-o model and that's what happens when you buy a cheaper

1 car?

2 A I would hardly say that this was a cheaper model. I think if  
3 you look at the cost analysis in some of the documents, it  
4 says there was an incremental cost on this particular design.  
5 Now, whether -- you know, maybe they found ways of saving  
6 money. Sometimes they do after a period of time, but  
7 initially, I think, depending on what documents you want to  
8 read and what time it was, it's probably a 17- to 25-dollar  
9 penalty, so -- I mean, I don't know what the actual --

10 Q What do you mean penalty?

11 A Increased cost over the ball and tube.

12 Q Okay.

13 A So sometimes when you -- even though there were some  
14 predictions that said this was going to be cost saving  
15 because you're reducing, initially going into it the numbers  
16 I seen in some of the documents say it was somewhere in the  
17 high teens to low 20-dollar penalty.

18 Q Okay. Let's go back for a second then. This new system --  
19 the SMART system in the Taurus --

20 A By the way, those cost numbers are variable costs and those  
21 are predictions, and I know you've asked a lot of questions  
22 about costs and what -- when you talk about variable costs,  
23 it's not exactly what the consumer pays because there's a  
24 whole lot of other factors. That's why when you go out and  
25 buy service parts, when you look at some of these things,

1 they're quite expensive to replace.

2 Q I understand. We looked at some diagrams a minute ago, and  
3 those diagrams had a small drawing of a car and it had the  
4 various sensors located in different places. There was the  
5 five sensor, the four sensor, the three sensor. With the  
6 2000 Taurus, where were the sensors for the airbags?

7 A Well, again, it depends whether you want to talk about the  
8 one that had -- you don't want to talk about the one that had  
9 the side bags, do you?

10 Q No. Just the one that had the passenger and the driver.

11 A You had a satellite accelerometer that was out in front of  
12 the radiator support.

13 Q Okay.

14 A And then you had the safing system within the RCM.

15 Q Okay. Where was the RCM located?

16 A It was located near the center line of the vehicle up  
17 underneath the instrument panel, sort of like on the -- even  
18 though this is front-wheel drive, there's still sort of a  
19 hump in the floor pan, so it's up underneath the instrument  
20 panel near the center line of the vehicle in the occupant  
21 compartment.

22 Q Then the RCM, it had the ability to do some computing,  
23 interpret the signal that was coming and make decisions; is  
24 that correct?

25 A That's correct.

1 Q And it received the information by which it made a decision  
2 from the two sensors; one being at the radiator and one being  
3 inside the RCM itself?

4 A Right.

5 Q The sensor inside the RCM, was it called the safing sensor?

6 A There was a safing sensor within there, yes.

7 Q Was there a sensor other than the safing sensor in the RCM in  
8 the 2000 Taurus we deal with today?

9 A I guess I don't recall whether it did have an accelerometer  
10 within that or not, but I know there was an accelerometer up  
11 in the satellite sensor, and there was a safing sensor within  
12 the RCM. But I don't recall without going back and looking  
13 at some of those documents.

14 Q Our recollection was it was just the safing sensor and the  
15 accelerometer.

16 Would you define for me the difference between a safing  
17 sensor and an accelerometer?

18 A I'm not sure what they were using as far as the safing  
19 sensor, but it probably was an accelerometer, because  
20 electronically that's the easiest way to do it.

21 A safing sensor is usually just a different calibration,  
22 and when you're talking about electronic, I think for all  
23 technical purposes it was probably another accelerometer but  
24 it was calibrated differently than the crash sensor which was  
25 located up front on the front end of the vehicle -- satellite

1 sensor.

2 Q Back in the ball and tube days there was a thing called a  
3 safing sensor. What did that mean?

4 A That was just -- if you want to talk in terms of Gs or  
5 deceleration, crash sensors were a higher G deceleration, and  
6 if you looked at the safing sensor, it was a lower G,  
7 basically the same ball-and-tube design.

8 Q Okay. And both of them had to go off in order for there to  
9 be an airbag deployment?

10 A Right. Simultaneously.

11 Q Now, with the SMART systems like in the 2000 Taurus, what was  
12 the purpose of the sensor in the RCM safing sensor versus the  
13 one in the satellite sensor?

14 A Just to check on the system.

15 Q Okay. Now, was there a requirement in the 2000 Taurus in  
16 order for the airbag to deploy that a certain signal was  
17 received from both sensors?

18 A Yes.

19 Q And tell me what that was. Tell me how -- explain to me how  
20 that occurred. What happened?

21 A Well, the accelerometer started picking up a signal as soon  
22 as -- if you want to say T zero was a time, some event  
23 started, it starts feeding the signal back to the module  
24 where it's calculating to try to understand the algorithms  
25 that had been put into it to match it. And early on you want



1 to match to see if it's severe enough to actually require  
2 pretensioners, Stage 1, Stage 2, whatever. So it was trying  
3 to match some predetermined curves that had been put into the  
4 logic of the system to see if that was what was required from  
5 this particular incident.

6 Q Okay. Now, let's go to a frontal collision. When a frontal  
7 collision occurs, the safing sensor and the RCM and the  
8 accelerometer both start sending, as they decelerate, certain  
9 signals to the RCM; correct?

10 A Right.

11 Q And the RCM has to interpret what -- I don't know if they  
12 call it the safing sensor. The RCM has to interpret what the  
13 safing sensor is saying to it and what the accelerometer in  
14 the satellite sensor is saying?

15 A That's correct.

16 Q And in the case of the 2000 Ford Taurus, in order for the  
17 airbags to go off, a certain amount of information has to be  
18 received from the safing sensor and a certain amount of  
19 information has to be received from the satellite sensor that  
20 matches up the requirement for airbag deployment?

21 A That's correct.

22 Q Okay. In the 2000 Taurus, if the information necessary for a  
23 deployment came from the safing sensor but none came from the  
24 satellite sensor, would the airbag go off?

25 A I would think not.

0121

1 Q Okay. In the 2000 Taurus, if the required information for an  
2 airbag deployment came from the satellite sensor but did not  
3 come from the safing sensor, would the airbag go off?

4 A Again, I believe it wouldn't.

5 Q Okay. So it's your understanding of the 2000 Taurus that  
6 there are two sensors in the car, one in the RCM, the safing  
7 sensor, and the other is the accelerometer in the satellite  
8 under the hood ornament or at the radiator support?

9 A Right.

10 Q And the requirement of the RCM is the required data for a  
11 deployment has to come from both sensors?

12 A Right.

13 Q And is that for safety purposes?

14 A Well, sure. Because there are certain issues that you have  
15 to deal with. Not only do you have to have the right crash  
16 event for it to go off, but you don't want service people to  
17 be working under the hood where they might have the ignition  
18 on or vandalism and issues like that where you could  
19 inadvertently set off the airbag by just, you know, slamming  
20 the hood or maybe using some kind of tools or hammering on it  
21 or something like that. I mean, you have to be careful with  
22 the system. When you have a single-point sensor that - you  
23 would have what was called inadvertent actuations.

24 Q So there are multiple sensors in part to avoid accidental  
25 deployment?

- 1 A That's one factor. But it is also to determine what level  
2 the crash is, because you're trying to determine drive-size  
3 thresholds. Do you just need pretensioners? Are there  
4 belts? Are there not belts?
- 5 Q What's an X-Sensing accelerometer? I show you AAHC 8251,  
6 paragraph 3.2.1.
- 7 A Which paragraph? The ones that's highlighted here?
- 8 Q No. Here.
- 9 A Oh, I think we're talking about -- the way it's used here is  
10 X and Y, so I think you're talking about an X-Y-Z coordinate  
11 system. Yeah, you're talking about side impact as a Y  
12 sensing.
- 13 Q Okay.
- 14 A So you're talking X-Y-Z coordinate system. Again, usually  
15 when you measure things, you're looking at an axis that goes  
16 back to the vectors, because you're never sure what the angle  
17 of the vector is in a three-dimensional space.
- 18 Q Gotcha. Okay. Now, this sensor that's in the RCM, is it  
19 different in type from the sensor that's in the satellite  
20 sensor? Does it detect deceleration in the same method?
- 21 A I guess I don't know the answer to that. That's something  
22 that you'd have to go back to the Visteon people and ask that  
23 to make sure you've got the correct answer on that.
- 24 Q How does the accelerometer in the satellite system detect  
25 deceleration?

1 A The accelerometer -- I'm not sure how this one works, but  
2 generally an accelerometer change is a change in the voltage.

3 Q Okay. I understand. How does the satellite sensor in this  
4 vehicle detect deceleration?

5 A It's a change in voltage, usually like -- the ones that were  
6 originally used were called Peaseco [phonetic] Electric, and  
7 they would -- you could squeeze them and so forth and that  
8 would change the voltage. And then as you monitor the  
9 voltage, that's interpreted as a -- it's calibrated to  
10 acceleration levels.

11 Q But what is it that causes it? There's got to be some kind  
12 of switch or something. What happens to this thing to cause  
13 the voltage to change?

14 A I am not absolutely sure what this design is, but  
15 accelerometers usually are highly-mounted distortion of a  
16 material that changes the voltage passing through it.

17 Q Oh, okay. Like it might contort a balloon or something and  
18 that would change the resistance or something?

19 A I think that question should be asked of the Visteon people  
20 as to exactly what they were using.

21 Q But you're not sure?

22 A I am not sure.

23 Q Okay. But somehow as the car decelerates, a sensor in the  
24 front of the car changes the voltage, the change in the  
25 voltage is sent through the wire -- or the voltage is sent

1 through the wire and the voltage changes over time, and that  
2 information is recorded and interpreted in the RCM; is that  
3 correct?

4 A It's continuously recorded.

5 Q Okay. And, now, the RCM that was in this car, was it capable  
6 of multiple sensors? I think it was, what; two -- two  
7 multiple satellite sensors?

8 A No. No. I think you -- the side bags you actually would  
9 have had three sensors. You have to have three remote  
10 sensors. So this only had the one remote sensor.

11 Q I'm not talking about in the car. The RCM, was it designed  
12 that it could carry more remote sensors than just one?

13 A For this vehicle, no. This was a six loop.

14 Q Okay. If it had been an eight-loop system --

15 A Then you would have had the side system.

16 Q The side -- okay. Now, in any of the Ford -- any of the Ford  
17 vehicles, are there more than one satellite sensor in the  
18 front of the vehicle?

19 MR. BIBB: What model year are we talking about?

20 MR. WELLS: 2000 Ford.

21 THE WITNESS: I don't know.

22 BY MR. WELLS, CONTINUING:

23 Q Do you know of any that have more?

24 A That have more?

25 Q Yeah, more than one satellite sensor.

1 A I'm not aware of any.

2 Q Do you know --

3 A You mean for frontals?

4 Q Yes, sir. Do you know of any that have just one satellite  
5 sensor other than the Ford Taurus?

6 A Well, there were other vehicles that started getting phased  
7 in after this. Are you talking about the 2000 model year?

8 Q Well, let me ask that, and I didn't ask that. I skipped it.

9 In the 2000 model year do you know what Ford vehicles  
10 carried the SMART system airbag systems?

11 A I believe it was only the Taurus and Sable in 2000.

12 Q What about 2001?

13 A I'd have to go back and check some other documents. I don't  
14 recall. I know we started phasing in other products. My  
15 recollection is we started putting it in the Windstar in  
16 2001, but there could have been other products. I don't  
17 recall when we put it into some of the other ones.

18 Q Well, the ones that you do know about, were they all with the  
19 RCM somewhere behind the engine and one satellite sensor that  
20 was in front of the vehicle?

21 A Usually that was the design.

22 Q Do you sitting here know of any that had more than one  
23 satellite in the front?

24 A I do not.

25 Q Okay. Let me show you --

1 A See, the problem is with your questions, you're not asking --  
2 see, we have European products, and I'm not sure what they  
3 were doing on some of the Volvos and Jaguars and things like  
4 that, and you haven't restricted your question. We sell all  
5 those products, and I haven't studied all those different  
6 products, so --

7 Q Is Volvo you guys?

8 A Yeah, we own Volvo.

9 Q I didn't know that.

10 A Nonest [phonetic] and Martin, Mazda -- not outright but --

11 Q I'm looking at buying a Volvo. I may corner you and ask you  
12 a few questions during a break.

13 A But that's why it's tough to answer your questions, because  
14 there are a wide variety of products being sold in this  
15 market that's for, you know, some that Ford didn't design  
16 that I don't know what they did in 2000 or 2001 unless I  
17 looked at a lot of documents.

18 Q Then let me ask you this and restrict it somewhat and see if  
19 I can help you.

20 For the vehicles that carry the Ford name where you go  
21 and you buy it in the Ford lot with the Ford name on it, not  
22 buried somewhere in the little fine print that says Ford owns  
23 it; Ford vehicles, Windstar, Taurus, those, do you know of  
24 any that carried the SMART system that had more than one  
25 satellite sensor for the airbags on the driver and passenger

1 side?

2 A Not that I am aware of.

3 Q Now, let me show you what's marked AABC 7315, and it has a  
4 line that has on it the D186 Taurus, Sable. And it goes  
5 across and it's got the crash sensor and a number of things,  
6 and one of which is the external sensor. It has FSS, paren,  
7 1 or 2, closed paren. Let me see if you can read that there.

8 A I may have to borrow somebody's glasses.

9 MR. BIBB: Mine won't help. Mine are for long  
10 distances.

11 THE WITNESS: I think you need a secret decoder sheet to  
12 figure out some of this stuff. I don't see where there's a  
13 reference what that means.

14 BY MR. WELLS, CONTINUING:

15 Q You don't know what the one or two means?

16 A It's not clear to me.

17 Q Okay. Can you state today one way or the other that the RCM  
18 would accommodate more than one satellite sensor?

19 A Yes. Because we had -- in 2000 Taurus side bags, right and  
20 left, we had satellite sensors on different products.

21 Q Let me ask you this. Can you state today whether or not the  
22 RCM would or would not accommodate more than one satellite  
23 sensor in the front of the car?

24 A Our design did not have that, but if somebody thought it was  
25 necessary, I suppose you could do it, because we had the



1 eight-loop system with the side bags which had satellite  
2 sensors.

3 Q Now, with the eight-loop system with the -- for the side  
4 bags, that's one. But what was the other; a six-loop system?

5 A This -- well, when you start looking at these documents,  
6 you'll see four-loop system, six loops, and each loop fired  
7 something, so if you look at the 2000 Taurus involved in this  
8 case, it was the six loop. You had two buckle pretensioners.  
9 That's two loops. Then you had the driver's bag that was  
10 dual stage and a passenger bag that was dual stage, so that's  
11 the other four. That gets you the six. If you had side  
12 bags, then you had two more loops; one for the right and one  
13 for the left.

14 Q Okay. But with that -- my question is whether or not with a  
15 six-loop system; the two pretensioners and the two airbags  
16 with two stages, is that right?

17 A Right.

18 Q With a six-loop system could you have this RCM three sensors?

19 A No.

20 Q Why?

21 A You don't have enough firing loops.

22 Q Was there a 12-loop system?

23 A In 2000?

24 Q Yes, sir.

25 A I see no evidence of that.

1 Q Would a 12-loop system have allowed two satellite sensors in  
2 the front of the car and a safing sensor in the RCM?

3 A If there was a 12-loop system, then you'd have other firing  
4 circuits, but I'm not aware of anything like that.

5 Q Would it take a 12-loop system to be a -- with no side impact  
6 airbags -- would it take a 12-loop system in order to have  
7 two satellite sensors in the front of the car and one safing  
8 sensor?

9 A I don't know. I think you'd have to talk to somebody that  
10 has studied the logic, and I think that's a question for  
11 Visteon, because I think you're talking about something that  
12 doesn't exist, No. 1, and I'm not sure whether it was doable.  
13 To just be able to talk about loops and so forth, I don't  
14 know whether technology was available to do that.

15 Q All right. You don't know whether anybody in the market  
16 anywhere had two satellite sensors in the front of the car or  
17 not?

18 A I do not know that.

19 Q Okay. And you don't know whether people had considered it  
20 technically feasible or technically not feasible; is that  
21 correct?

22 A That's correct. I think that's a question that you should  
23 direct to Visteon.

24 Q Now, this -- this design with only one sensor in the front of  
25 the car, I want to ask you a couple other questions about it.

1 The system had some sort of battery back up, didn't it, the  
2 2000 airbag system?

3 A I thought it did, but, you know, there's a lot of documents  
4 that talk about different things, and in the past we used to  
5 always have some kind of capacitor that would have a backup  
6 power supply in the system. And I think it does, but I would  
7 have to check some documents to see if it did.

8 Q Okay. And sitting here today do you know whether it did or  
9 did not?

10 A Not without checking documents.

11 Q Okay. Is it your expectation that it did have one?

12 A We identified that as an issue, and we incorporated backup  
13 power supplies. And it shows that on that other chart that  
14 you had, I believe, starting in about '92 with the backup  
15 power supply, which was like a -- generally it was a  
16 capacitor within the diagnostic module, that if you lost a  
17 battery during the course of a collision, you still had power  
18 to fire it for some period of time before the capacitor would  
19 die.

20 Q Okay. And then there was also in the system a system for  
21 determining whether there was some fault with the system; is  
22 that right?

23 A Right. That was part of the recorded information. If there  
24 was some -- for example, a short in the wire or something was  
25 disconnected, it would give a -- a blinking to the readiness

1 indicator to warn the operator to seek some service, and  
2 these were coded to provide different information which you  
3 could interpret by the shop manual.

4 Q Okay. And it also had -- if the light didn't work, it had a  
5 buzzer as a back up?

6 A Well, I think it was a tone generator, wasn't it?

7 Q A tone generator, yes, sir.

8 A Tone generators are more user friendly than a buzzer.

9 Q Yes, sir. Well, in either event, if the RCM detected there  
10 was some fault in the system, there was either a light that  
11 would tell you that there was a problem --

12 A Or an audible tone.

13 Q -- or an audible tone or both if it wanted to?

14 A I guess I don't recall whether -- it being both. The audible  
15 tone --

16 Q Let me --

17 A Now, combined with that there are warning things that tell  
18 you to put your belt on, but I'm not sure if there was a  
19 fault -- that you had both.

20 Q Okay. Well, let's go back to it. The RCM was set up that a  
21 light -- at least a light would go on if there was certain  
22 faults to the system?

23 A That's correct.

24 Q And if the light was not working, the audible tone would  
25 alert you to a problem that it detected with the system?

- 1 A That's correct.
- 2 Q Okay. Let me show you a document that's AAHC 8243. Are you  
3 familiar with that document?
- 4 A I've seen various copies of this.
- 5 Q What is that?
- 6 A It's an engineering specification generally.
- 7 Q Is that the engineering specification for the airbag system  
8 on the 2000 Taurus?
- 9 A I wouldn't know that unless I seen a drawing, because the  
10 drawings always tell you what specification that you have to  
11 manufacture for it.
- 12 Q The drawing for the airbag system?
- 13 A Well, this is -- well, this is for the -- the RCM.
- 14 Q Okay. So the drawing for the RCM you'd have to see?
- 15 A If you had a drawing of the RCM, it would show you on the  
16 drawing what specifications it had to meet and whether this  
17 is this particular one or not, because there are different  
18 dates on the bottom. It says updated, Revision A and so  
19 forth.
- 20 Q Okay.
- 21 A Usually on a drawing you have to see what level for the  
22 release drawing for the part matches that.
- 23 Q And look at page 52 using the Bates number.
- 24 A Page 52?
- 25 Q Yes, sir.

1 A The one that has highlights on it?

2 Q Yes, sir. Let me see it a second.

3 There is a -- Paragraph 3.4, battery -- I'm sorry --  
4 backup power supply, BPS, requirements, loss of vehicle  
5 power. It says the system must provide crash discrimination  
6 and be able to supply sufficient power to deploy dual-stage  
7 frontal airbags and pretensioners, if applicable, for a  
8 minimum of 150 milliseconds after loss of total vehicle  
9 power. Do you know whether that paragraph was complied with  
10 in the 2000 Taurus for RCM?

11 A If this is the appropriate specification that's listed on the  
12 drawing, it would have been, yes.

13 MR. WELLS: Do you have a drawing for the RCM?

14 MR. KILPATRICK: Not with me.

15 BY MR. WELLS, CONTINUING:

16 Q Do you know any reason why the RCM for the 2000 Taurus would  
17 not have this sort of backup power?

18 A I do not know -- if that was the specification, it would have  
19 had it.

20 Q Since there is -- this engineering document that we just  
21 looked at, you as an engineer at Ford Motor Company, would  
22 you expect the RCM in the 2000 Ford Taurus to have some  
23 backup power?

24 A Yes. And that was an issue that -- if you go back and look  
25 at your other chart, we identified that as a problem on some

0134

1 of the earlier vehicles, and we incorporated that into the  
2 diagnostic module, which was sort of like an RCM on the more  
3 primitive ones.

4 Q Okay. But all the 2000 -- was that before 2000?

5 A Yes.

6 Q Okay.

7 A At one time, if you look at those charts, it was a separate  
8 capacitor. It was a separate part. And then it became  
9 integrated with the diagnostic monitor.

10 Q Now, there's a term I keep seeing called crash mode. What is  
11 that?

12 A Crash mode?

13 Q Yes.

14 A I guess I'm not sure what context it's being used in.

15 Q I've just seen it in places. There's some things they  
16 describe for a crash, some -- they use it by miles per hour  
17 or times or that sort of thing that says when the airbag  
18 should go off.

19 A I think you're talking about that long explanation of how the  
20 system worked, whether it was -- I think they talked in terms  
21 of low, mid and high; is that -- is that what you're talking  
22 about?

23 Q It may be.

24 A There was a long answer in one of the interrogatory responses  
25 that said the conditions where you would get Stage 1 or a

1 Stage 2 or --

2 Q Here's what I want to know. I want to know under what  
3 conditions should the airbags go off, not Stage 1 or Stage 2,  
4 any airbags in the 2000 Ford Taurus, driver and the  
5 passenger?

6 A Well, it depends upon the conditions, and I have not  
7 committed all the conditions to memory, so I would tend to  
8 refer you to that interrogatory response because it talks  
9 about 40 percent offsets, it talks about belted conditions,  
10 and speeds and so forth. Some are at 14, some are at 20, 25,  
11 and so forth. So there are different conditions, and rather  
12 than to get confused and try to give you a long story that  
13 doesn't match the official response, I refer you back to the  
14 interrogatory response.

15 Q Let's go back to it again. I'm going to try to box with it;  
16 one reason I don't have it here, and, two, I don't remember  
17 what it says, but bear with me a second.

18 When you refer to an offset, you're referring to offset  
19 of --

20 A Barrier.

21 Q Straight forward, a dissection of the middle of the car?  
22 What would you call it? What would your --

23 A I said the -- you talk about the center line of the vehicle.

24 Q Center line, yes, sir.

25 A Yeah.



1 Q So when you're referring to an offset, you're talking about  
2 angles -- collision angles off the center line of the  
3 vehicle; is that correct?

4 A No. An offset barrier -- maybe it's not clear to you. If  
5 you have a perpendicular barrier, it's a 35-ton wall-to-wall  
6 barrier that goes from one side to the other; okay? An  
7 offset barrier is when you have -- you're hitting the edge of  
8 it and you only have 40 percent overlap to whatever side of  
9 the car you're impacting.

10 Q Okay. I'm with you there. Okay. Let me ask you this.

11 If a car under the conditions that have been set by Ford  
12 2000 Taurus runs directly into a barrier straight on, the  
13 whole car hits --

14 A When you say barrier, you're talking about the SAE 35-ton  
15 barrier that's described in the Federal Motor Vehicle Safety  
16 Standards and so forth?

17 Q Let's hit one of those. That's good enough.

18 A Okay. Because, I mean, when you say barrier, I don't know  
19 what you're talking about.

20 Q I agree with you. Let's use your barrier. Basically a flat  
21 unmovable barrier.

22 A Right.

23 Q Do you agree with that?

24 A Okay.

25 Q A 2000 Taurus runs directly straight on into that, at what

1 speed at the point of impact should the airbags deploy?

2 A I think -- I haven't committed all those different scenarios  
3 back to memory, but I think I would refer you back to the  
4 interrogatory response so that -- it's different levels  
5 depending on belted conditions and seat position.

6 Q There you go. With a --

7 A Driver's seat position in this vehicle.

8 Q With a 50 percentile or larger male, belted, what should it  
9 go off at, about? Wait. I have the answer. I might be able  
10 to just save you some trouble. Bear with me a second.  
11 They're in the Request for Production.

12 MR. BIBB: The supplemental Response to No. 13 and 14 or  
13 14 and 15.

14 THE WITNESS: According to page 3, it says 25 miles an  
15 hour.

16 BY MR. WELLS, CONTINUING:

17 Q Okay.

18 A Well, it depends -- that's not -- I mean, that's for the high  
19 output. Yeah. Because this is dual-stage inflator. The  
20 logic -- I mean, let me go backwards here and tell you, I  
21 think you get Stage 1 at a lower speed. Right. Continuing  
22 on page 3 it says for the belted occupant the low output  
23 airbag supplemental restraint system in the 2000 model Taurus  
24 is designed to deploy when the sensors predict a crash  
25 velocity of 20 miles per hour. So the low output goes into

1 20; the high output comes into 25 miles per hour.

2 Q Okay. So let me go back to my question.

3 For a 2000 Ford Taurus driving head on into the barriers  
4 you described, the big heavy flat thing that doesn't move,  
5 the airbags for an unbelted occupant should deploy somewhere  
6 in the range of about 14 miles an hour?

7 A Right.

8 Q For a belted occupant the first stage of the airbag should  
9 deploy at about 20 miles an hour?

10 A That's correct.

11 Q And the second stage should deploy at about 25 miles an hour?

12 A That's correct.

13 Q Now, let me ask you this. If the same car went head on --  
14 this is a 2000 Taurus -- into the flat heavy unmovable  
15 barrier as you've described that they run tests with, should  
16 the airbags always deploy in a head-on collision at 40 miles  
17 an hour?

18 A I don't know.

19 Q Why?

20 A Because that's a condition that we never tested to because  
21 it's a very, very severe collision.

22 Q Okay. Tell me, Ford has never run a 40-mile-an-hour head-on  
23 collision for a car?

24 A I believe we have run some at 40 at some point in time. If  
25 you go back and you look at what was being done in the early

1 '70s, we -- the ESV project was supposed to be a 50 mile per  
2 hour, and that was beyond the realm of survivability. And  
3 there were other projects that I was trying to recall what  
4 they were called, but I don't know whether the RSV was at 40  
5 or 35, but there were some crash testing that was done at 40.

6 And that was still considered, back in those days, out  
7 of the realm of survivability, so basically from the early  
8 '70 time frame most people felt that 30 was the limit until  
9 improvements were made and the NCAP, which is not a  
10 requirement but that gives you star ratings, that can be  
11 handled if you are belted and you're doing things right. It  
12 doesn't say that it's a survivable collision, but the risk of  
13 fatality has been reduced somewhat. Because there are many  
14 factors that you have to consider about age, special  
15 conditions, you know, whether people are using the system  
16 properly and so forth.

17 Q But those tests that were over 40 miles per hour were in the  
18 '80s and before?

19 A I believe most of those were probably before the '80s. I  
20 don't recall. If we were running any 40 into a barrier after  
21 the '70s, I don't recall them.

22 Q Okay. As far as your knowledge is, Ford Motor Company has  
23 not run any barrier tests on any of its vehicles over what  
24 speed since 1980?

25 A There is always a plus or minus factor in these things, so 35

1 sometimes -- 36, 37 miles an hour. So I don't recall any,  
2 but -- I mean, you'd have to check the databases to see if  
3 there were tests, because sometimes tests are conducted just  
4 for research information. I do not recall any, so I would  
5 have to go back to honestly answer your question to say  
6 that -- you know, maybe there are one or two, but the  
7 practice of running those tests was dropped because of the  
8 lack of technology to make it a survivable impact.

9 Q I guess my question is, so I can understand the numbers, is  
10 it the policy and practice of Ford Motor Company since at  
11 least 1980 that in its crash tests it does not run crash  
12 tests on its vehicles over 35, 36 miles per hour?

13 A Into a barrier?

14 Q Yes, sir.

15 A Yes.

16 Q Does it run crash tests over 35, 36 miles an hour in any  
17 other crash tests?

18 A We use 50 mile per hour car-to-car crash tests.

19 Q Okay. And has it done that with the Ford Taurus?

20 A I believe there are crash tests that are 50 miles per hour  
21 car-to-car.

22 Q Has it done it with the Ford Taurus with the SMART airbag  
23 system in it?

24 A Again, I'd have to check. There's been an awful lot of data  
25 that's been produced, so -- you're asking me a question about

0141

1 25 boxes of material. I'd have to refer you back to what was  
2 produced to see whether they did or didn't. I believe they  
3 did, but I don't recall any, you know, crash tests  
4 specifically.

5 Q The car-to-car tests, why are those different than the  
6 barrier tests?

7 A Because there's mutual crush between the two.

8 Q And that decreases the acceleration?

9 A Well, the barrier equivalent. If you run two vehicles  
10 50 miles per hour nose to nose, that's like a 50-mile-an-hour  
11 collision. But some of these modes that they're crashing  
12 for, fuel systems and other things, so --

13 Q Okay. Has Ford Motor Company since 1980 run over a 35,  
14 36-mile-an-hour collision into a pole in doing its test of  
15 any sort?

16 A I wouldn't be able to answer that question unless I looked at  
17 all the data that's available, but most pole tests are low  
18 20s, high teen numbers, because we're looking at threshold  
19 kind of testing to make sure that you do get airbags from  
20 poles that may be a large penetration before you pick up hard  
21 objects. Poles are special cases, and you have to study each  
22 structure to try to determine where you would get pole  
23 penetration, where you may need an airbag. So it goes back  
24 to trying to figure out what is the relationship between a --  
25 say, a 14-mile-per-hour barrier equivalent and what is a pole

1 equivalent, and usually it comes out being, like, 19 to  
2 21 miles per hour, something like that -- in that range. I  
3 don't recall any pole tests that were in high ranges unless  
4 it was a special test.

5 Q Okay. Let me ask my question. You're sitting here today as  
6 the corporate representative testifying for Ford Motor  
7 Company. Since 1980 until today do you know of any crash  
8 tests that Ford Motor Company has run or had run for it where  
9 it ran a car of any sort, any model, into either a barrier or  
10 a pole in excess of 35, 36 miles an hour?

11 A I'm not aware of any testing like that. You'd have to go  
12 check the database to -- you know, there could be thousands  
13 of tests in that database.

14 Q But, I mean, you -- you're one -- you're their expert in this  
15 case. You're knowledgeable in their development of their  
16 airbags, of their safety systems. You've worked in lots of  
17 their litigation in the past ten years or so. You're the  
18 person they picked to talk here today. Do you know of any?

19 A I do -- I told you I wasn't aware of any. But when you ask  
20 that question, it could have been -- a test of that nature  
21 could have been done for litigation purposes, which is not  
22 the normal development kind of testing that you would do in  
23 order to determine the performance of an airbag system.  
24 Because pole tests, as I indicated, are normally conducted to  
25 make sure that you have airbag under threshold conditions.

1 And you're talking about something way over threshold. It  
2 wouldn't be a normal airbag design and development kind of  
3 test. It would be something that probably was a special case  
4 test for litigation or some other purpose.

5 Q What do you mean for threshold purposes? You used that word  
6 just then. Just to see if at the low speed it will actually  
7 go off?

8 A That's correct.

9 Q Here's what I'm trying to figure out. With those of us who  
10 buy Ford cars in the market we see all these videos on  
11 television of airbags going off and all these tests and all  
12 the dummies. Are you telling me those are all collisions  
13 that are lower than 40 miles an hour?

14 A Yes, generally.

15 Q What general range of speed are they?

16 A Well, the FMVSS is 30-mile-per-hour barrier. NCAP is 35.  
17 Now, again, there's plus or minuses, so we usually bias a  
18 little bit higher.

19 Q So you would expect them to be in the 30 to 35-mile-an-hour  
20 range or 36?

21 A It could be lower too depending on what -- I don't know what  
22 you're referring to, but sometimes marketing people take  
23 tests like offset frontals, they may use pole tests -- and I  
24 don't know what you're talking about, so if you had a number,  
25 we could go back and check and determine what it was, but



1 generally the testing would be the 30, 35 range.

2 Q And why doesn't Ford test for higher speeds than 30, 35 range  
3 when it does these barrier and pole tests? Tell me that.

4 A I think it's generally agreed once you get up to 40 miles per  
5 hour it's in a nonsurvivable range. We don't allow to get  
6 the injury criteria where the probability of death is going  
7 to occur in most people.

8 Q Well --

9 A That's the problem.

10 Q But we're talking about probability of death and most people.  
11 There's still a lot of people that will survive a  
12 40-mile-an-hour collision with airbags and seat belts; isn't  
13 that true?

14 A I don't know what you mean by a lot, but some -- some have  
15 survived under very severe collisions. I mean, it's not a  
16 certainty that just because somebody has a high-speed  
17 collision that you're going to die or be terribly injured.  
18 Sometimes things happen and they're very difficult to  
19 explain.

20 Q When Ford Motor Company puts in the marketplace automobiles  
21 with airbags and seat belts and pretensioners and all that,  
22 how does it know that its airbags are going to work in a car,  
23 in a new system, at 50, 40, 45 miles per hour if it hasn't  
24 tested them at that speed?

25 A I don't know what you mean by work. If it's something to

1 just go off, that's one matter. But if it's something that  
2 provides data that you have survivable injuries and they're  
3 treatable and so forth, that's another matter.

4 Q Let me ask it differently. I understand.

5 A We know that based on our previous testing back from ESVs and  
6 RSVs when we were running these tests that that's generally  
7 agreed that that's a nonsurvivable type of collision, because  
8 whether you get bags or no bags or whether you get good crush  
9 characteristics, you're talking about an unsurvivable human  
10 factors kind of situation.

11 Q Let me back up again. When a car from Ford Motor Company  
12 goes into the marketplace with a new airbag system, how is it  
13 that Ford Motor Company knows that their airbag system will  
14 deploy the airbags in a frontal collision at 40, 45, 50 miles  
15 an hour, 60 even, if it doesn't run tests on those -- crash  
16 tests?

17 A We don't know whether they're going to deploy or whether the  
18 system is going to function within the performance criteria  
19 because you're outside the design intent. Because it's  
20 generally agreed that it doesn't make any difference, most  
21 people are going to be fatally injured when you start getting  
22 into these high-energy collisions.

23 Q What about the people that aren't the most people, the other  
24 people leftover? There are some that are going to survive  
25 that need that airbag, isn't that true?

1 A I suppose there are some that might have that benefit, but  
2 when you start looking at human tolerance limits, you're  
3 not -- in a number of accidents that happen in that range,  
4 it's very difficult to design for those kinds of accidents.  
5 So whether you get an airbag at 50 miles per hour really  
6 doesn't matter too much.

7 Q But the airbag is intended to lessen the risk of death, isn't  
8 it?

9 A That's -- within the range it's designed for. It's designed  
10 to reduce the risk of injury and fatality in accidents less  
11 than 30 miles an hour. When you start -- even when you start  
12 talking about 35 or -- I've seen cases where you have  
13 threshold impacts, and I'm sure you've seen that too, where  
14 because you have children, you have elderly people, you have  
15 medical conditions, you have all kind of other issues  
16 involved, that survivability is not possible even under the  
17 conditions that you design the system for.

18 Q Okay. Is it then -- based on your statement -- that the  
19 airbags are not designed to save people's lives, so to speak,  
20 above 35 miles an hour because your experience is people are  
21 going to die anyway over that?

22 A That's essentially correct. You cannot design a system when  
23 you're talking about the human tolerance levels that you  
24 would experience at that level.

25 Q Okay. Now, with these airbags -- Ford Motor Company has not

1 designed these airbags to do any good over 35 miles an hour:  
2 because Ford Motor Company has determined that people will  
3 die anyway over 35 miles an hour, is that right? Is that  
4 what I understand you to say?

5 A I think maybe you want to read that question back, because I  
6 think you switched from 30 to 35, either that or I missed  
7 something.

8 Q I'll go to 40 just to get our tolerance --

9 A Okay.

10 Q What I understand you to say, and correct me if I'm wrong, is  
11 that Ford Motor Company has not designed its airbags to save  
12 people's lives in collisions from front collisions at  
13 40 miles an hour or more because Ford Motor Company is of the  
14 opinion that people will die anyway at collisions over  
15 40 miles an hour and that's the reason Ford Motor Company has  
16 not tested its airbags over 40 miles an hour?

17 A That's correct. There's a very high probability that  
18 regardless what you do when you get to that energy level that  
19 you're going to have a fatal collision.

20 Q But the airbags are still designed to deploy at 40 miles an  
21 hour and over, correct?

22 A That's certainly not part of any specification.

23 Q Well, are they supposed to deploy at 40 miles an hour in a  
24 head-on collision into a barrier or a pole?

25 A I think you'd expect most of the time that you would see an

1     airbag, but it's -- since you're talking about out of the  
2     design range and we talked about out of the testing and  
3     performance, it's -- basically you don't know whether they're  
4     going to deploy when you get into these high-speed,  
5     high-energy collisions.

6   Q   Why not?

7   A   Because it's out of the design range and it hasn't been  
8     tested to.

9   Q   Okay.

10  A   And the survivability -- just what I explained to you.

11  Q   Okay. The design range then is from what speed to what  
12     speed?

13  A   Well, depending upon the conditions --

14  Q   Head-on collision for the vehicle, barrier or pole.

15  A   It's exactly what's described in this -- what's the number of  
16     this?

17  Q   Request for Production No. 14.

18  A   Right.

19  Q   Tell me what that is. The design -- what's the level at  
20     which you're above the design range in miles per hour?

21  A   It depends upon the conditions, and it's outlined in this  
22     document; whether you're belted, whether you're unbelted --

23  Q   Okay. What I want to know is, if I run my Ford Taurus 2000  
24     directly into a barrier or a pole, at what speed have I  
25     passed the design range of that entire airbag system in the

1 opinion of Ford Motor Company?

2 A You're going to have to quantify what you're talking about,

3 because I think you've made that so broad that it's

4 impossible to answer that question.

5 Q Well, at 40 miles an hour I'm outside the design range of the

6 airbag system; is that right?

7 A That's correct.

8 Q Okay. And --

9 A Wait. When you -- let's step backwards. You're using --

10 see, the problem is you're using 40 miles an hour. I don't

11 know whether that's car to car. I don't know whether you're

12 talking about perpendicular and rigid barrier or exactly what

13 we're talking about.

14 Q Straight head-on, perpendicular -- straight head-on collision

15 into a barrier or to a pole.

16 A 40 miles per hour, it's not survivable, crash into a

17 perpendicular --

18 Q In most cases?

19 A That's right.

20 Q In all cases?

21 A I guess I'd defer to somebody that's collected that kind of

22 data, but I think the percentage of survivability has been

23 reduced. You know, I don't know whether 10 percent survive

24 or 1 percent at that speed, but people have collected that

25 information.

1 Q Okay. Now, when you were at Ford Motor Company, was that the  
2 general philosophy that you've described among the engineers  
3 and the safety people and those that work there, that because  
4 the opinion was that most people don't survive a  
5 40-mile-an-hour or more collision into a barrier or a pole  
6 that the airbags won't matter and we won't test those airbags  
7 at that speed or higher?

8 A The technology is not available to do that. That's the  
9 problem. I mean, if you had technology that you thought you  
10 could reduce the risk of injury at 40 miles per hour, and  
11 maybe someday there will be that technology, then you would  
12 test to that level, but the technology is not available. The  
13 limit to the technology that's available is up to 35 miles an  
14 hour belted.

15 Q My question is -- what you have just stated now, was that the  
16 philosophy of just you or was that the general philosophy of  
17 the engineers at Ford?

18 A I think it's the general philosophy of engineers that are  
19 familiar with automotive safety. I don't think it's just --  
20 I think it's Ford, not only that, but the industry.

21 Q Okay.

22 A Because if somebody had the technology, I think they'd be  
23 trying to sell it.

24 Q Miss Schaeffer survived this accident, didn't she?

25 A That's my understanding, yes.

0151

1 Q Okay. In all your years at Ford Motor Company, did anybody  
2 ever say words to the affect regardless of whether people  
3 will survivor let's see how fast we can make the car go  
4 before -- just to see if the airbags will go off?

5 A Some of that work was done, like I indicated, back in the ESV  
6 and RSV time frame when we were trying to figure out what the  
7 limits of technology was.

8 Q The 1970s -- let's say since 1980, did anybody at Ford Motor  
9 Company ever say let's run a faster than 35-mile-an-hour  
10 collision in these tests, pole test or barrier test, just to  
11 make sure the airbags will go off at 40, 50 or 60, just three  
12 tests?

13 A Not that I recall.

14 Q Did anyone ever discuss it? Say it? Mention it? Philosophy  
15 or just guess?

16 A Not -- I'm not aware of it. I mean, sometimes people talk  
17 about these things, but they have no solutions.

18 Q What does the government require the test to be at, what  
19 speed?

20 A 30 miles per hour.

21 Q Okay. And did anybody ever say let's run faster than the  
22 government requires -- 10 miles an hour more than the  
23 government requires?

24 A Well, 35 is NCAP. It was being proposed at one time, but  
25 it's never been a regulation. Most manufacturers try to meet



1 that because it's marketing that you have the different stars  
2 for different types of collisions.

3 Q But, I mean, did anybody ever say, hey, let's just run a  
4 40-mile-an-hour collision just for giggles or fun or  
5 curiosity?

6 A You're talking about some pretty costly propositions when you  
7 pretty much know what's going to happen when you run it at 40  
8 or 50, so when you're talking about running a hundred,  
9 150,000-dollar test, if you're using prototype or whatever, I  
10 mean, these tests are very expensive.

11 Q Well, I mean, you're putting out, you know, hundreds of  
12 millions of dollars in cars. Did anyone ever say just one  
13 time let's take any car, Ford, Taurus, Windstar, Volvo, any  
14 car, Jaguar, and let's just run one with an airbag system in  
15 it -- just one -- at 40 or 50 miles an hour and let's just  
16 see if the airbags go off then?

17 A We went through that exercise earlier.

18 Q Other than in the 1970s. I mean, with the SMART system in it  
19 even or the one with the ball and the tubes since 1980.

20 A I'm certainly not aware of anything like that, because I  
21 think it was generally agreed back in the earlier time frame  
22 that those collisions were so severe that they were beyond  
23 survivable limits with the technology that's available. And  
24 maybe people are thinking about 40 again, but -- you know,  
25 there may be documents talking about 40, because sometimes

1 when you get to 35, people talk about 40. But I think it's  
2 not the kind of test that you would run because you're beyond  
3 the survivable limits.

4 Q Okay. Now, who is it that has recorded that this is beyond  
5 the survivable limits, 40 miles an hour?

6 A Human factors people. There's lots and lots of documents in  
7 the past. Human factors people look at injury criteria and  
8 they look at accidents. These are very rare accidents when  
9 you look at the database of what's available in these.

10 Catastrophic collisions are very rare events and usually  
11 they're unsurvivable.

12 Q Okay. Have you ever seen the statistics on that?

13 A I have seen those kind of numbers that other people have  
14 pulled together. You have to go into your mass databases to  
15 look at those kinds of numbers to see what is going on in the  
16 world.

17 Q Let me ask you this. In all your years at Ford or among all  
18 the other engineers, you're testifying as a corporate  
19 designee, did anybody ever discuss the possibility that a  
20 center pole collision right where the satellite sensor is  
21 where the satellite sensor would be right in the crush zone  
22 might disable the satellite sensor before it can send its  
23 signal back to the RCM if the speed of the car is fast  
24 enough?

25 A Certainly people when they're designing things think about

1 those things, and then all the testing that we conducted we  
2 had not seen anything like that.

3 Q Okay. Prior to the 2000 Taurus going on the market, did  
4 anybody ever run a center pole collision on that vehicle to  
5 see at what speed the pole -- center pole collision would  
6 destroy the remote sensor before it could send its signal to  
7 the RCM? Does that make sense?

8 A To actually run a test?

9 Q Yes, sir.

10 A I don't -- there's no evidence that anybody ran a test to try  
11 to determine when you destroy the system.

12 Q Well, I mean, from a logic standpoint, if you've got the  
13 remote sensor right under the hood ornament and you hit a  
14 pole that is just perfect, and I realize we're talking about  
15 perfect here, right there at the sensor, that pole could  
16 disable the sensor somewhere in the crash; is that right?

17 A I don't know.

18 Q Okay. Has anybody ever done any studies, any tests, any  
19 computer modelling, any doodling, I don't care what they did,  
20 to determine whether or not the pole that you hit on a center  
21 pole collision could destroy the satellite sensor before it  
22 sent its signal to the RCM?

23 A I'm not aware of anything like that, and I didn't see any  
24 work like that that was done in the documents that I  
25 reviewed.

1 Q Was it ever discussed as a possibility at Ford?

2 A Sometime -- you know, I'd have to speculate and I'd have to  
3 go back and look at documents, and I shouldn't do that. But  
4 usually when people go through failure mode and affects or  
5 faulty analysis, those kinds of things, they look at those  
6 issues and speculate. And after they've thought about that  
7 and maybe they've done some other work on it, they've come to  
8 the conclusion that it's certainly not a high-probability  
9 event.

10 Q That what?

11 A Well, when you're doing paper studies for failure mode and  
12 affects or faulty analysis, you try to put probabilities --  
13 especially faulty analysis -- you're trying to put a  
14 probability, an event, and whether it's very common or very  
15 unusual -- I mean, you have to solve the most common  
16 problems. And when you start looking at some of these  
17 unusual events, they're very difficult to solve. Nobody  
18 knows how to solve them.

19 Q I mean, just from the logic standpoint, the fact that cars  
20 are going to hit poles, they're going to hit -- they're going  
21 to hit light poles, they're going to hit other type poles,  
22 they are going to hit things that look like poles, like a  
23 bridge abutment, they're going to hit those things, and  
24 occasionally they're going to hit them right dead on center,  
25 aren't they?

1 A It's certainly a possibility when you look at all the  
2 different infinite possibilities.

3 Q Yes, sir. Did anybody look at the fact that with the Ford  
4 Taurus -- did anybody look at the Ford Taurus to see whether  
5 or not a front pole collision would harm the sensor if it was  
6 a pole that hit right at the sensor and to see whether or not  
7 it would affect whether the sensor would send its signal to  
8 the RCM?

9 A We ran pole tests. We ran offset barrier tests. We ran  
10 30-mile-per-hour barriers. We ran 35-mile-per-hour barriers.  
11 We ran many, many different tests, and we never seen  
12 something like this that would occur in the ranges we were  
13 testing.

14 Q But did you ever run a frontal pole test?

15 A Yes.

16 Q Did you ever run one to see at what speed the pole would  
17 destroy the sensor?

18 A I don't recall seeing any kind of test of that nature. If  
19 you ran a vehicle into a pole at, say, 50 miles per hour,  
20 there's no evidence that they ran any testing like that.

21 Q Do you know the fastest they ran a car into a pole -- frontal  
22 pole -- at Ford Motor Company since 1980, any car?

23 A Into a pole?

24 Q Yes, sir.

25 A I -- I don't know the answer to that without checking all the

1 crash tests.

2 Q You don't know of any over 35 miles an hour sitting here, do  
3 you?

4 A It would not be a usual kind of development test, if it was  
5 conducted. And I answered your question. I don't know of  
6 any.

7 Q Do you know of any pole tests -- frontal pole collision tests  
8 that Ford Motor Company has ever run that the airbags did not  
9 fire?

10 MR. BIBB: At any speed?

11 BY MR. WELLS, CONTINUING:

12 Q Go ahead. I'm sorry. Let me ask the question again.

13 Do you know in the history of Ford Motor Company since  
14 1980 whether Ford has ever run a test in which it crashed a  
15 car into a pole head-on and the airbags did not go off? Of  
16 course, I'm assuming we're over 15 miles an hour or so, and  
17 I'm talking center pole.

18 A I really can't answer that question unless I looked at  
19 everything in the database. I mean, we're talking about  
20 thousands of crash tests.

21 Q You don't know of any sitting here today?

22 A No, I don't.

23 Q Do you know of any offset poles where it didn't go off?

24 A I don't know of any, but I could see where people -- when  
25 people run development tests it could have been a possibility

1 if they ran the test at something that was below the  
2 threshold that caused -- because, like I said, depending upon  
3 the structure of the vehicle, the threshold for -- that was  
4 equivalent to a 14-mile-per-hour barrier sometimes got up to  
5 17 to 21 range.

6 Q Okay.

7 A If you ran a -- if you ran a vehicle that -- if you ran a  
8 pole into it at 19 and it was one of those where the  
9 threshold was up at 21, then you would not have bags because  
10 you wouldn't get sensor closure.

11 Q Now, is it the position of Ford Motor Company that for its  
12 SMART system airbags if the Ford Taurus 2000, 2001, 2002  
13 even, is run 40 miles an hour straight into a pole -- center  
14 pole collision -- that the airbags are supposed to go off?

15 A I don't think you know what's going to happen, because it's  
16 out of the range of the design and development of the system.

17 Q Ford Motor Company doesn't have a position either way at that  
18 speed?

19 A At 40 miles per hour into a pole?

20 Q Yes, sir.

21 A You didn't quantify what kind of pole it was.

22 Q It's a big, hard, round pole that's not going to move, just  
23 like you run in your crash test.

24 A Oh, well, we usually run an eight-inch steel pole.

25 Q How about an eight-inch steel pole?

0159

1 A I don't know what happens because it's a catastrophic  
2 collision.

3 Q What about a telephone pole?

4 A Sometimes those are different because they sheer off. There  
5 are different soil conditions.

6 Q What if the telephone pole doesn't break?

7 A It depends upon soil conditions.

8 Q What about straight into the corner of a bridge?

9 A Again, what kind of bridge? See, most bridges along the  
10 highways have protective devices on them.

11 Q Let's talk about one that doesn't, that is rigid, that is  
12 pointed, and you run just into it just like it's a pole that  
13 doesn't move.

14 A I don't know whether the bag will deploy or not.

15 Q Okay. Now, with the standard tests that you run, the 8-inch  
16 steel pole that doesn't move, is it the position of  
17 Ford Motor Company that its 2000 Taurus airbags should deploy  
18 at 40 miles an hour into that pole?

19 A Again, I don't know whether it should or shouldn't. It's out  
20 of the design range of this system.

21 Q Anywhere in the -- can you tell me anywhere in the owner's  
22 manual, the documents given to the public, the  
23 advertisements, or anywhere else, that Ford Motor Company  
24 tells the public that the airbags are not designed for above  
25 the limits you've told me, which I believe were about 35,



1 36 miles an hour?

2 A I don't recall where in any owner's manual it tells you what  
3 the upper limits are, but we do tell the customer that we  
4 meet the NCAP. And I'm not sure how much information that we  
5 provide what the NCAP and the five-star information is about  
6 and whether they really know all the details of that, but  
7 there usually is advertising information that talks about a  
8 35-mile-per-hour barrier and so forth. There is some details  
9 through the advertising, and I'd have to go back and look at  
10 the owner's manual and this book to see whether it talks  
11 about whether this meets the 35 NCAP.

12 Q Well -

13 A In order to sell it, you have to put your - you don't have  
14 to test it, but part of meeting FMVSS 208 you have to meet  
15 the injury criteria with the dummy under the conditions of  
16 208.

17 Q I'm thinking of my own experience listening to Ford  
18 advertisements over the years and also thinking about the  
19 other car companies it owns, Jaguar, Volvo, that sort of  
20 thing, and I can't think of any advertisement or any written  
21 documents I've ever seen where they have discussed their  
22 safety features, where there's been any mention that the  
23 airbags are not designed for over 35 miles an hour. Do you  
24 know of any?

25 A I don't.

1 Q There is a designation I saw somewhere that is D186 airbag.

2 What is that?

3 A That's this vehicle.

4 Q Okay. I'm sorry. Airbag for a D186?

5 A Right, 2000 Taurus.

6 Q I apologize.

7 The Ford Taurus that was in the United States had the

8 RCM and the satellite sensor, correct? I know that to be --

9 A This vehicle has.

10 Q The same vehicle that was shipped that was either -- that was

11 in the European market, what did it have?

12 A I'd have to determine the export information to see what we

13 were exporting to that market and whether we ever sold the

14 Taurus in Europe.

15 Q Let me show you AADE 5765, which is the model year 2000

16 DW 186 European export for the U.K. in Germany. It's a

17 document produced by Ford in this case. Does that help you

18 answer that question?

19 A It sounds like a similar system. There's one item on here --

20 you didn't ask the question, but it says seat belt buckle

21 pretensioners. It says TBD, and -- I don't know. It could

22 have been some early stage. I don't see a date on this

23 document.

24 Q Okay. But the document that you have in your hand, does that

25 show a sensor -- the sensors for the seat belt -- not the

1 seat belt -- but for the airbags?

2 A Yes.

3 Q Okay. Where are those sensors for the airbags?

4 A Well, it does not show -- you know, the diagram does not show  
5 a satellite sensor. It says uses front crash single-point  
6 sensor. I think at this stage from whenever this document  
7 was produced or put together it probably was a proposal that  
8 they thought they could put a true single-point system in.  
9 Because it says buckle pretensioners to be determined, and it  
10 does say uses front crash single-point sensor.

11 There was a point in time where we thought we could put  
12 a single-point sensor in because this program was being  
13 developed from '93 to, you know, when it finally went into  
14 production in 1999.

15 Q Now, that's what I was going to get to. Do you know whether  
16 or not the European model was a single-point sensor?

17 A This is an export version. This was still built in the same  
18 plants, and I don't know whether this was -- this was  
19 actually exported without checking the records. Usually we  
20 exported vehicles of that type to other parts of the world  
21 that wanted them, like the Gulf nations or other places like  
22 that. Because we had other products that were similar to the  
23 Taurus that were already being produced in Europe.

24 Q Yes. But my question is, do you know whether or not the  
25 European version, wherever it was created, shipped from,

1 et cetera, was a single-point sensor or a dual-point sensor?

2 A. I don't know the answer to that unless I looked at the final  
3 program assumptions that would say what it was. I would  
4 think it would be very difficult to have two different  
5 systems on the same vehicle that was being produced in  
6 Chicago and Atlanta.

7 Q Can you find that out?

8 A Can I find that out?

9 Q Yes, sir. I think it's officially covered in the 30B6 as to  
10 know what the systems were that were being put into the  
11 2000 Ford Taurus. It doesn't talk about European versus  
12 American.

13 MR. BIBB: I just now was going to say -- I was going to  
14 object to this whole line of questions because there's  
15 nothing in here about vehicles sold outside the  
16 United States. I'm not even sure the Taurus was sold outside  
17 the United States, or at least not in Europe.

18 MR. WELLS: Well, here's the reason I have an interest  
19 in it. He alluded to it, and I was going to go into in a  
20 minute. There was some problems with the single-point  
21 sensor. It's all through the documents. They were having  
22 all sorts of problems with single point, and I'm betting,  
23 much like he alluded to, that the document we're looking at  
24 was probably an early-stage document that went to Europe --  
25 if I was a betting man -- that would probably say it was also

1 a two-point system, but I don't have a date on this document.

2 MR. BIBB: I'll take your bet, because I bet they never  
3 exported a Taurus to Europe.

4 MR. WELLS: So my question is, we have 40 categories  
5 about 2000 Taurus and the design and the details and how they  
6 worked and didn't work. It's from the same plant. I think  
7 that's sufficiently covered with a 30B6. It's a simple  
8 matter of can I ask you guys to let me know whether or not  
9 the one shipped to -- if there was one shipped to Europe  
10 whether it was a single point or a dual point?

11 MR. BIBB: I will be glad to -- I'll find that out.  
12 That's not a very difficult question to answer. We do not --  
13 the witness was not prepared to discuss foreign sold  
14 vehicles.

15 MR. WELLS: And that's reasonable. Just let me know.

16 MR. BIBB: I will.

17 MR. WELLS: Okay.

18 MR. BIBB: We have a bet though. We have a little wager  
19 on whether it was actually sold in Europe, because I feel  
20 real confident about my answer on that.

21 MR. WELLS: I thought we were betting on the single  
22 versus the dual?

23 MR. BIBB: No.

24 MR. WELLS: Okay. Thank you.

25

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2 What is that?

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23 Taurus that were already being produced in Europe.

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12 That's not a very difficult question to answer. We do not --  
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14 vehicles.

15 MR. WELLS: And that's reasonable. Just let me know.

16 MR. BIBB: I will.

17 MR. WELLS: Okay.

18 MR. BIBB: We have a bet though. We have a little wager  
19 on whether it was actually sold in Europe, because I feel  
20 real confident about my answer on that.

21 MR. WELLS: I thought we were betting on the single  
22 versus the dual?

23 MR. BIBB: No.

24 MR. WELLS: Okay. Thank you.

25

1 BY MR. WELLS, CONTINUING:

2 Q Now, you mentioned something, and I guess I'll kind of skip  
3 ahead to it. In the early stages of the development of the  
4 SMART system for the airbag system for the 2000 Taurus there  
5 was an effort originally to have a single-point sensor?

6 A That's correct.

7 Q And the sensor would just be in the RCM?

8 A That is correct.

9 Q And then there was some problems that caused you to go -- you  
10 at Ford to go to a remote sensor -- satellite sensor in  
11 addition to the one in the RCM; is that right?

12 A That's right.

13 Q Tell me what the problems were.

14 A It didn't work.

15 Q Why not?

16 A You couldn't -- you couldn't get the right timing on the  
17 system, and you had issues that other manufacturers were  
18 having in that time frame with single points, that if you  
19 had -- if you would hit a rock or raccoon or something on the  
20 road, you thump the floor pan and you trick the system. So  
21 the fact is that you have two different positioned sensors  
22 that gets rid of what's called the inadvertent actuations  
23 where you don't want those.

24 There's lots and lots of conditions in the world that  
25 would produce a bag when you don't want it. And those are

1 much more frequently occurring events than something that's  
2 way out in the, you know, 40, 50-mile-per-hour barrier.

3 Q Are there any other reasons?

4 A I'm sure there are, but that's -- that is one of the primary  
5 things that when you have a single point you've got a  
6 go-no-go kind of situation, where you don't have a check on  
7 it.

8 Q Okay. And from the perspective of determining acceleration,  
9 they both work the same? Or they both give you the same  
10 sorts of things; one is not better than the other in terms of  
11 determining accelerations?

12 A Well, it could be, because the location and timing is  
13 certainly important. So if you're going to make a decision  
14 early on and you have to make a decision very early on in the  
15 crash sequence, you want to be able to get the data as soon  
16 as possible so that the RCM is looking at that data and  
17 saying what should I do; should I just fire the pretensioner  
18 if the belts are on or should I do a Stage 1, is this a small  
19 person that the seat's forward. It has to look at all that  
20 information very, very early on and make a prediction as to  
21 whether this is the kind of crash that would require  
22 one-stage, two-stage pretensioners, whatever.

23 Q But the reason you guys put in two sensors, one in the RCM  
24 and one in the satellite, is so they can check each other?

25 A That's right.

1 Q And what the computer wanted to do to avoid just the  
2 inadvertent situation where the airbags would go off where  
3 you, like you said, hit a rock or hit a raccoon is it  
4 requires both of the sensors to say yes, go?

5 A That's right.

6 Q Now, the single-point system, was it also very risky due to  
7 pole impact performance?

8 A That's -- depending on the structure of the vehicle, you  
9 can -- a pole can hit a soft point in a vehicle and you can  
10 get a lot of penetration before you hit a hard object. Say  
11 you're between some kind of structure and the pole would  
12 penetrate and then all of a sudden it would get into the  
13 engine or some other hard point in the front end, so you have  
14 to watch those kind of conditions because it tends to trick  
15 systems if you don't have one system checking on the other to  
16 make sure this is an event where you would have a bag  
17 required.

18 Q Okay. You lost me there. Why would that be a problem with a  
19 pole for a single point?

20 A If you located a single point, you might not have enough time  
21 to get the bag up because you're getting a lot of  
22 penetration, and then you have something being rigidly  
23 impacted and then you don't have enough time to get the bag  
24 up and provide the protection that you need.

25 Q What do you mean get the bag up?

1 A Well, there's inflation time. Once you make the decision,  
2 you have to get the bag fully deployed before the head and  
3 neck of the occupant moves very far.

4 Q Okay.

5 A And if you have -- where it's a soft collision where not much  
6 is happening and then all of a sudden late in the sequence  
7 you get a spike in the curve, you're not going to be able to  
8 deploy the bag where it's going to provide the protection  
9 you'd like to have.

10 Q Because the person would already be against the steering  
11 wheel?

12 A That's correct.

13 Q Okay. Let me tell you what I'm mentally thinking as you're  
14 saying that. The slow collision may be throwing the person  
15 forward, the slow part of the collision, the soft part -- the  
16 soft part of the collision may be throwing the person  
17 forward, the airbag doesn't have enough -- the tester doesn't  
18 have enough deceleration to say hit the airbag, and then it  
19 has the deceleration where the person is already up forward  
20 and bang, it goes off; is that right?

21 A That's probably one of the possibilities.

22 Q Okay. Let me read you something and see if I understand.  
23 This is a memo. Let's see who this is. It's to Dave. What  
24 is Dave's name? It's from Christopher Carrooso [phonetic] to  
25 U-S-F-M-C-X, somebody at IBM mail dot com something. It

1 says: Hi, Dave. And it talks about missing a conference.

2 It says, No. 2, PN 96 -- does that mean anything?

3 A That's a truck.

4 Q Okay. The single-point approach is very risky due to pole

5 impact performance. The pole impacts provide very little

6 energy to the passenger compartment by the desired triggered

7 time and, as a matter of fact, for the 19 and

8 21-mile-per-hour poles it is unlikely we would not be able to

9 provide a robust deployment decision until about

10 85 milliseconds, which would miss your goal times; therefore,

11 we're abandoning the single-point approach for PN 96 and

12 focusing on the crush zone sensing. Does that all make any

13 sense to you?

14 A It makes sense because you're talking about a truck product

15 that's rigid, and one of the major issues with trucks is,

16 like, in this part of the world you put snowplows on them and

17 you don't want bags to be popping off when snowplows are

18 pushing stuff around. And trucks are used for a lot of

19 different purposes, so trucks tend to be a little bit more

20 ridged, so that makes it more difficult to sort this

21 information out.

22 Q Okay. It says the ESI, what is that? And it says, paren,

23 crush zone sensing, closed paren.

24 A I'm not sure what ESI means.

25 Q Okay. Let me go to this. It says a general comment about

1 the ESI approach for DN 101. DN 101 is the Taurus?

2 A That's correct. That's the previous one to 2000.

3 Q Okay. Let's talk about pole tests. Is it -- there were

4 observed many accelerometer failures in these test events.

5 This indicated that the sensor locations are in a very

6 volatile region of the structure. The lack of accelerometer

7 data which is valid leads to two concerns; one, being able to

8 set threshold reliability where there is -- where there is

9 unknown beyond the accelerator failure point. It sounds like

10 it's missing a word. Are you sure we did not set a threshold

11 too high or too low? 2, the viability of the ESI itself is

12 now vital. Do you know what that all means?

13 A I'm trying to figure out what they're talking about, ESI.

14 Q It says he had ESI --

15 MR. BIBB: Could the witness see the document?

16 MR. WELLS: Sure.

17 BY MR. WELLS, CONTINUING:

18 Q The ESI -- it says crush zone sensing. Let me show you what

19 I'm looking at right here.

20 (Discussion held off the record)

21 (Recess taken)

22 BY MR. WELLS, CONTINUING:

23 Q Okay. I've got this AAGQ 1102, and there was the discussion

24 on 1104 about certain things, one of which was a general

25 comment about the ESI approach for DN 101, the Taurus, is

1 that there were observed many accelerometer failures in these  
2 tests. I believe they were talking about the pole tests, but  
3 you've read it. This indicated the sensor locations are in a  
4 very volatile region of the structure.

5 A That's what it says.

6 Q What does that mean?

7 A I guess they're concerned about the location at that  
8 particular time of where the sensors were located. This is a  
9 1997 document. It appears that this is some kind of sales  
10 pitch that was from Delco, if you look at the E-mail  
11 address. So it must have been some kind of Delco proposal to  
12 Ford because we were looking at anybody that had the  
13 information. So it's unclear whether those are Delco systems  
14 on those products or what they are.

15 Q Okay. It says here the survivability of the ESI itself is  
16 now vital. It appears there may be a high probability of ESI  
17 contact in crash events and, thus, the ability to transmit  
18 the vital information before a wire gets cut or the sensor  
19 gets destroyed may become critical. Is this E-mail talking  
20 about the fact that if you put the sensor in certain areas of  
21 the structure it's possible that the sensor may be destroyed  
22 or one of its wires cut before it actually goes off?

23 A That's what that document says, but we don't know what design  
24 that is or what that's all about. It's -- certainly with all  
25 the E-mails it's clearly from Delco Electric in Coocoma,



1 Indiana.

2 Q Okay. But before the 2000 Taurus came out there were  
3 concerns about single-point systems and there were some  
4 concerns about how to deal with pole crashes, weren't there?

5 A Yes.

6 Q Okay. And the concerns about the single-point system  
7 resulted in a dual-point system -- dual-sensor system?

8 A That's correct.

9 Q And the concerns about pole tests wiping out the sensors, was  
10 that something that was discussed and resulted in a change in  
11 any design?

12 A Again, I don't know the answer to that without, you know,  
13 rereading all those 25 boxes of documents to see whether  
14 there was something in some of those documents that addressed  
15 that.

16 Q We will discuss that when we come back for the continuing  
17 deposition.

18 A Okay.

19 Q Would you look for that? But sitting here today -- can you  
20 look for that?

21 A It would take me a long time to read 25 boxes.

22 Q Well, let me put it this way. You are the Ford  
23 representative, and I have asked about design and all kinds  
24 of things in the notes. My question to you is, as the  
25 representative of Ford, whether or not the concerns about --

1 the expressed concerns at Ford when the 2000 Taurus went into  
2 production that a collision with a pole may cause the sensor  
3 to be destroyed, did that concern result in any design  
4 changes?

5 A I don't know.

6 Q Okay. And did that concern with the pole destroying the  
7 sensor result in any warnings, actions, studies, discussions,  
8 or anything that you know of?

9 A I'm not aware of anything like that other than the design was  
10 tested with poles and it was tested with barriers, it was  
11 tested with offset, car-to-car, all those tests we talked  
12 about previously, and we didn't see anything like that.

13 Q But those were at lower than 35 -- 35 miles and hour or  
14 lower?

15 A That is correct.

16 Q As an engineer sitting here thinking about this system, with  
17 the sensor sitting -- the satellite sensor sitting -- it's  
18 basically directly under where the hood ornament would be,  
19 isn't it?

20 A It's in that area.

21 Q With the sensor in that location, with a center pole  
22 collision do you think it is possible that the sensor could  
23 be cut or destroyed in a center pole collision before it  
24 sends a signal to the RCM?

25 A Under any conditions?

1 Q Yes, sir.

2 A I think that's a possibility if you're talking about the  
3 severe high-speed collision, yes.

4 Q Do you have any ranges that you think of as severe high  
5 speed?

6 A I could not give you a number without, you know, running a  
7 whole series of development tests to determine that.

8 Q And then your development test would involve some simulations  
9 of some sort, wouldn't it?

10 A Well, you could do simulations. Sometimes, you know,  
11 since -- if you're talking about computer-aided modelling and  
12 so forth, if you have your models correct and so forth, then  
13 you might be able to get some ballpark to determine what  
14 range you may want to run some actual tests that prove out  
15 your computer modelling.

16 Q Would you sitting here be able to venture any range that you  
17 would expect that to start being a problem?

18 A I don't know. I mean, you wouldn't -- you wouldn't be able  
19 to answer that question without doing a big research project.

20 Q Could you answer that question simply by running one of the  
21 cars into a pole at -- pick a speed -- 60 miles an hour and  
22 then it didn't -- if the airbags didn't go off you could just  
23 back the speed down and run a few more tests, couldn't you?

24 A Well, that's certainly one way of doing it, but you may or  
25 may not get reliable results from doing something like that.

1 Q Okay. The thing is you could run some computer simulations,  
2 you could run a variety of other things and try to figure  
3 that out, couldn't you?

4 A That's correct. If you actually were able to model  
5 everything properly, you may have some useful information.

6 Q Has anybody done that at Ford for the 2000 Taurus or any  
7 other car that's using the SMART airbag system?

8 A I'm not sure what your question is. There certainly was  
9 computer modelling done, because that's -- that's part of the  
10 process today. What I mean, today, probably the last five  
11 years or so, computer modelling has been able to do some fine  
12 tuning to be part of a development program where you actually  
13 can run tests and simulations. I mean, computer modelling  
14 has certainly been around for 20 years or more, but the  
15 supercomputers that we have and the techniques that have been  
16 developed, there certainly is computer modelling as far as  
17 crash testing that's been done to give preliminary  
18 information.

19 Q Has that computer modelling and computer modelling for the  
20 crash tests been done to determine at what speed a center  
21 pole frontal collision the car would have to be going before  
22 it destroyed the sensor before it would send a signal to the  
23 RCM?

24 A I'm certainly not aware of anything like that. It's  
25 usually -- the computer modelling is done to determine

1 occupant kinematics and system performance under the test  
2 conditions that you're trying to meet, such as FMVSS 208 or  
3 35-mile-per-hour NCAP.

4 Q You agree it's possible that there's a speed at which a  
5 center pole collision would destroy a front sensor -- the  
6 satellite sensor before it sends the signal to the RCM; is  
7 that right?

8 A I think that's a possibility.

9 Q Okay. Would a second sensor in the car -- second satellite  
10 sensor in the car remedy that problem if it's not at the same  
11 place as the center pole collision?

12 A I don't know. It depends really on the type of collision  
13 you're talking about.

14 Q Well, let's just say it's a center pole collision into your  
15 testing for what Ford uses as the eight inch, real hard  
16 nonmovable pole, and the collision is straight into the pole  
17 right at the hood ornament. Let's assume whatever speed it  
18 is sufficient to wipe out, destroy the sensor before it sends  
19 the information to the RCM. If we have a second satellite  
20 sensor somewhere in the front of the car, even that it would  
21 pick up a front collision, would that remedy the problem --  
22 assuming it's not hitting the pole -- would that remedy the  
23 problem of the first satellite sensor being destroyed?

24 A I -- that would only be speculation. I don't know whether  
25 you could answer that question. You don't have to have a

1 direct impact on something like this. You could have induced  
2 damage to it; in other words, if it's closed, it may cause it  
3 to fail as well. I mean, if you're talking about a  
4 60-mile-per-hour collision or something like that -- I'm not  
5 sure what you're talking about, but you don't have to have a  
6 direct impact. You could have sensors on the front of the  
7 vehicle and maybe hit one with the pole, if that's what you  
8 wanted to do, and the other one may still be destroyed by  
9 induced damage.

10 Q But it would lessen the likelihood of a problem by having two  
11 sensors, wouldn't it?

12 A I don't know.

13 Q Okay. Now, why is the remote sensor for the 2000 Taurus all  
14 the way up under the hood ornament as opposed to somewhere  
15 else in the car?

16 A I think you asked a question that you'd have to ask the  
17 people that have done the calibration, the Visteon people.  
18 The timing is so critical in determining whether you get a  
19 fire of a bag or pretensioner in the very, very beginning  
20 milliseconds, and when you start looking at when these  
21 systems are actually being -- from T zero -- from the start  
22 of a collision in a 30-mile-per-hour collision, you're  
23 talking about pretensioners have to -- the decision has to be  
24 made within about 10 milliseconds. Stage 1 for a 30,  
25 35-mile-per-hour collision has to be made 17 milliseconds or

1 so. Stage 2 has to be made within about 22 milliseconds in  
2 order to get the bag up within the 80-millisecond  
3 requirement.

4 Because you're talking about ranges -- a lot of these  
5 things vary a little bit, but probably if you add  
6 50 milliseconds on top of that, that's the time it takes to  
7 burn the propellant to inflate the bag so that you can  
8 provide the protection. So these decisions have to be made  
9 very early on and have to be made with some degree of  
10 confidence that the system is going to provide the protection  
11 to the occupant that you intended it to do.

12 Q Okay. The decision to fire the pretensioner is made first?

13 A Yes.

14 Q Okay. And then the decision to fire the first stage and  
15 second stage are made after it?

16 A That's correct.

17 Q Okay. Do the same sensors decide to fire the pretensioners?

18 Is it both the RCM and the satellite sensor that determine  
19 that the pretensioners should be fired?

20 A Yes.

21 Q Okay.

22 A It's taking information and -- and looking at what the  
23 characteristics of this data is to determine whether you need  
24 it. I mean, No. 1, to fire the pretensioner it has to say is  
25 the belt on --

1 Q Okay.

2 A -- so you have to check the buckle switches to see whether

3 the belt is on, because if the belt isn't on, then the

4 pretensioners won't fire.

5 Q Okay. So going back to -- what documents do we have that say

6 what the sequence is of making decisions and what's required

7 for that decision? Are they in the documents, the 22 boxes?

8 A Yes, they are in that collection.

9 Q Okay. Can you identify those documents?

10 A I can't identify them by number, no. But they are in the

11 collection. I've seen them.

12 Q Okay. Would you do me a favor and make a note of what they

13 are for our next meeting? I think your attorney -- could you

14 do that for us? Do you need a reminder?

15 A To go back through and read 25 boxes of documents, I think

16 we're talking about 40, 50 hours maybe to do that again,

17 and --

18 Q Ford can afford it.

19 MR. BIBB: Well, there is that summary in the

20 interrogatory response.

21 BY MR. WELLS, CONTINUING:

22 Q Let me go back then.

23 The computer receives information from the two sensors

24 and then makes decisions and then sends out its commands;

25 correct?



- 1 A That's correct.
- 2 Q Does it send out the command to fire the pretensioner before  
3 it sends out the command to burn the airbag?
- 4 A Before the different stages are kicking, yes.
- 5 Q Yes. So that's what I'm getting to. The actual signal is  
6 sent to the pretensioner before a signal is sent to the  
7 airbags; is that correct?
- 8 A Right.
- 9 Q Okay. Then that is a sequence that it is trying to fire the  
10 various mechanisms; correct?
- 11 A Well, the more input data, you have a great -- when you look  
12 at the beginning of a time zero, you have very limited data  
13 early on. As time goes by, even though you're talking about,  
14 you know, 15, 17, 20 milliseconds, the longer you can put off  
15 the decision-making process, you're going to have a more  
16 reliable prediction.
- 17 Q Okay.
- 18 A Because you got to be careful about looking at data too early  
19 on because it's very hard to distinguish between a fire and  
20 no-fire characteristic early on. The longer you can look at  
21 it, then you can have a higher degree of confidence that you  
22 need the bag, you need Stage 1, you need Stage 2.
- 23 Q I got you. Let me see if I can do this, and I'm being a  
24 little sloppy and I'll consolidate this in a minute once I  
25 figure it out.

1 The decision whether to fire the pretensioners is made  
2 earlier than the decision to fire the airbags?

3 A Right.

4 Q And the actual firing of the pretensioners fires before the  
5 airbags fire?

6 A That is correct.

7 Q And the airbags are fired later for -- one of the reasons is  
8 that it wants to receive more data to increase the  
9 reliability --

10 A Exactly.

11 Q -- before firing the airbag?

12 A That's correct.

13 Q So what happens is -- let me get to this.

14 Is one of the reasons that occurs is because an airbag  
15 firing is a big event and the pretensioner firing, well, it's  
16 not going to kill anybody -- hurt anybody, and it needs less  
17 data?

18 A Well, it's easier to determine because you're checking is the  
19 belt on, does this look like this is an event that requires  
20 it.

21 Q And then the airbags want to really know it's required?

22 A And do you need Stage 1; do you need stage 2.

23 Q Okay. So let me walk through it.

24 At time zero you start colliding with something, the car  
25 does -- and I realize how fast this occurs. You start

1 colliding with something. The sensors, one in the RCM, one  
2 in the satellite, start detecting something is going on and  
3 sends -- initially sends some limited data followed by more  
4 data and more data --

5 A That's correct.

6 Q -- as this is occurring?

7 The first data that comes in may be enough to order the  
8 pretensioners to fire but not enough to order the airbags to  
9 fire because you're waiting on more information to confirm  
10 this before the airbags fire?

11 A That's correct.

12 Q Okay. So as the data comes in from the two sensors, the  
13 decision can be made based on the limited data that we  
14 presently have that the pretensioners should fire?

15 A Right.

16 Q And they go off?

17 A That's correct.

18 Q And then the RCM waits to get more reliable data to make the  
19 decision?

20 A It's not exactly waiting. It's a continuous calculation of  
21 what's occurring.

22 Q Yes, sir.

23 A It's accumulating information.

24 Q It accumulates more information to make a more reliable  
25 decision to fire the airbags and fire at the appropriate

1 stage?

2 A That's correct.

3 Q Now, with that is it possible that the information could be

4 coming in as the wreck occurs, the automobile makes the --

5 the RCM makes the decision to fire the pretensioners, then

6 the information is such that it's not reliable enough

7 information to shoot off the airbags?

8 A That's certainly a possibility.

9 Q Okay. Is it also possible that in a center pole collision at

10 sufficient speed that the information from the initial impact

11 could be sufficient to fire the pretensioners but then before

12 sufficient information is transmitted to fire the airbags the

13 front satellite sensor is wiped out and can't send the

14 available information for airbags?

15 A That's certainly a possibility too.

16 Q Okay. Now, this data that is sent that says, ah-ha, fire the

17 pretensioners, is that recorded in the RCM?

18 A It should be, yea.

19 Q Okay. The data that is sent to the RCM before the front

20 satellite sensor is destroyed, should that be stored in RCM?

21 A It should be, but this is a continuous process, so the system

22 is continuing to acquire information, so it's -- it's like

23 the first hundred milliseconds and then it's going back over

24 it. So it writes on top of it.

25 Q That was going to be my question. How much data does it

1 store?

2 A It depends. Generally I think the specification is -- you  
3 know, some of it says -- I think that document you just had  
4 say 150 milliseconds, but -- people have told me it's  
5 117 milliseconds, but it's generally about a hundred  
6 milliseconds.

7 Q Okay. So every tenth of a second it writes information and  
8 then rewrites it?

9 A That's correct.

10 Q Okay. So if I wanted to know what was the last second  
11 recorded by the RCM, I can't have it; I can have the last  
12 tenth of a second, I can't have more than that?

13 A That's correct.

14 Q Okay.

15 A And that's also -- that previous document talked about some  
16 of the problems with the storage and how much you could  
17 really put in there.

18 Q Okay. Now, in this case the RCM was taken out of the vehicle  
19 and there was an attempt to read it?

20 A Right.

21 Q What did the information say?

22 A It said that it didn't -- the information that was available  
23 really didn't provide anything that made any sense.

24 Q What information -- what was the information that it should  
25 have provided? I mean, like deceleration? It's underwater.

1 not underwater. I don't know what it is.

2 A Once you retrieve the data -- the raw data, you can use the  
3 software that's available that we have, and I think we  
4 provided it to some of the investigative people now, that you  
5 can actually get a deceleration versus time characteristic  
6 which would show what's happening plus any stored fault codes  
7 and some other information that's in there that's described  
8 in the documents.

9 Q Okay. Did the RCM in this case show any fault codes that  
10 occurred?

11 A I don't know the answer to that because I think it was --  
12 Visteon was trying to interpret some of that information.

13 Q What was told to you that they determined from the RCM?

14 A I never heard whether there were fault codes in it or not.

15 Q Did the RCM record anything other than deceleration over time  
16 and the fault codes? Are those the only two things that it  
17 records?

18 A That was some of the information. I'm not sure what else was  
19 recorded in there.

20 Q Those were the two that you looked for to determine whether  
21 the airbags should go off?

22 A We were looking for the deceleration versus time curve.

23 Q Okay. And in this case when the RCM was read, was there any  
24 information regarding deceleration over time?

25 A There was some information, but it was certainly not

1 meaningful.

2 Q What do you mean there was some information not meaningful?

3 A I don't remember what the curve looked like, but it certainly

4 was not what we would expect. It was basically data that

5 didn't make any sense.

6 Q Did you get some report of that data?

7 A I seen a printout of that data at one time.

8 Q Okay. Did you see an interpretation of that data?

9 A Yes, we had interpretation of the raw data.

10 Q Can we get that?

11 MR. BIBB: I'm working on that.

12 MR. KILPATRICK: You're trying?

13 MR. BIBB: I'm working on that.

14 BY MR. WELLS, CONTINUING:

15 Q But you have seen that in written form?

16 A It was plotted.

17 Q Okay. It was given to you?

18 A I don't know whether I ever had a copy of it or not. Once I

19 seen it was meaningless data, I wasn't really interested in

20 it.

21 Q What did it look like?

22 A I don't recall. I know it was just nonsensical information.

23 Q This is just one of the crash tests. Well, this would have

24 been -- would it have just been something that was a graph of

25 deceleration versus time?

- 1 A Right.
- 2 Q A two-dimensional graph?
- 3 A That's correct.
- 4 Q It would have deceleration on the right -- it says
- 5 probably -- time on the -- probably the X axis -- my guess?
- 6 A I believe that's what -- eventually once you take the raw
- 7 data and run it through the software, that's what you get.
- 8 Q And you would expect some sort of curve that would be as the
- 9 result of the data; right?
- 10 A That would be correct.
- 11 Q Okay. Did you have any curve?
- 12 A There was something, but it was just not -- it didn't have
- 13 any meaning. It was -- certainly indicated that whatever was
- 14 in there might have been something that occurred way at the
- 15 end of the event because of the continuous monitoring of the
- 16 system.
- 17 Q Did it look like it had erased everything?
- 18 A It was overwriting stuff I think, because it seemed to me
- 19 they only had a small portion of some kind of curve that
- 20 didn't seem to make any -- like a -- you know, less than
- 21 20 milliseconds.
- 22 Q This machine that only reads for a hundred milliseconds and
- 23 then writes over it again, when you have a wreck, you're
- 24 wanting that information to determine what happened, aren't
- 25 you? Don't you?



1 Let me ask that question. What is the purpose for it  
2 retaining any information?

3 A You would like to see what happens during the part of the  
4 event where you have the system sensing the collision and  
5 firing the bags or the pretensioners.

6 Q Yes.

7 A You want that information.

8 Q Yes, sir. But what in the system says, ah-ha, quit  
9 recording, don't write over yourself?

10 A I think that's a question you have to ask Visteon.

11 Q But it is in there?

12 A I believe so, because I've seen it where you can get that  
13 curve from the collision.

14 Q Okay. Something happens, maybe the airbags fire, and it says  
15 don't record anymore and preserve that information?

16 A That may be what occurs.

17 Q Okay. But in this case did Visteon give any explanation as  
18 to the reason why the RCM did not have good information?

19 A I'm not aware of what Visteon said about that.

20 Q Okay. Have you seen any report from Visteon as to why their  
21 little gizmo didn't do its thing?

22 A No, sir.

23 Q Who runs the crash tests for Ford? Do they do that in-house?

24 A We usually do them in-house. We have contracted other  
25 people. We have a barrier -- in fact, there's two barrier

1 facilities. If you want names, you have to look at  
2 organizational charts or look at the crash test reports.

3 Q When they do a crash test, they run some sort of a report  
4 that they put into a crash test package of some sort; it's  
5 got photographs, graphs --

6 A That's correct.

7 Q Where are those kept?

8 A I'm not sure where they're kept.

9 Q Okay. Do you know who is --

10 A They may be kept at the barrier crash test facility. Maybe  
11 it's -- a lot of this stuff is put onto the computer system,  
12 so the barrier test facility would have the information for  
13 the test.

14 Q You mentioned something about to look at the crash test you'd  
15 have to go to the database. What's the database?

16 A There's a database that -- all crash tests you can get from  
17 that, and in recent years -- it used to be there was no  
18 database that you could access directly, so if you want the  
19 photographs, if you want the information that's in those  
20 reports, you can call it up out of the databases, and I'm not  
21 sure what the acronym for that database is.

22 Q Okay. Is that just a Ford database or is that something you  
23 share among all the car companies?

24 A No, that's a Ford database.

25 Q Who chose the location of the satellite monitor for it to be

1 where it was in the 2000 Taurus, under the hood, did Ford or  
2 Visteon?

3 A I think it was a collaborative effort, because it always has  
4 to be -- the suppliers certainly make suggestions, and since  
5 Ford Motor Company had the ultimate responsibility for the  
6 performance of this system, you would have to look at the  
7 system and see whether it was the kind of thing that you  
8 could manufacture and put together and service and those  
9 other characteristics.

10 Q But it is a location that was approved at least or concurred  
11 in by Ford?

12 A Yes. It's a collaborative effort.

13 Q Okay. Were there any alternative locations considered for  
14 the location of the satellite sensor?

15 A Sure. I think when you look through the documents there were  
16 all kind of different proposals made. You showed one from  
17 Delco to me that you didn't mark as an exhibit, so --

18 Q Well, we didn't need to because of the numbering. That  
19 serves our purpose. Let's see which one you're talking  
20 about.

21 MR. BIBB: It's the hi, Dave, memo.

22 BY MR. WELLS, CONTINUING:

23 Q In the hi, Dave, memo, we know that Dave -- in the hi, Dave,  
24 memo, where did he suggest it be placed?

25 A Well, it's not exactly clear other than being up front, but I

1 would suspect that there were drawings. There were proposals  
2 as to exactly where it was. It's not clear where it is from  
3 the document other than it says it's in the crush zone.

4 Q When I refer to the SMART system airbag system for the  
5 2000 Taurus, is there a number that I should call that? I  
6 know there's a number for the RCM. I know there's a number  
7 for the sensor, but is there something that --

8 A You mean a part number?

9 Q Well, like we've got the DN 101 or the D 186 for the car. Is  
10 there something about this system that would identify it?

11 A Sure. There's a part number.

12 Q For the airbag system itself?

13 A No. It's not the airbag system. Each component has a part  
14 number.

15 Q Okay. Now, you mentioned that there were some costs analysis  
16 done as to how much this system in the 2000 Taurus cost, the  
17 SMART system versus the system that was the electromechanical  
18 ball in a tube system. Do you recall what the difference in  
19 cost was to the company?

20 A It looked to me like it was about a 17- to 20-some-dollar  
21 penalty.

22 Q To go to the SMART system?

23 A That's correct.

24 Q How much did the SMART system cost versus the  
25 electromechanical?

1 A I didn't see anything like that in the documents. Usually  
2 what people are interested in is is it going to cost more or  
3 is it going to cost less, exactly what's happening here to  
4 the difference.

5 Somebody in the system would know exactly what -- if you  
6 took component by component -- what it cost to pay Visteon or  
7 whoever for those pieces when they were ordered by Ford, but  
8 that's -- that's usually a purchasing document that if you  
9 can backtrack from a part number you can understand what it  
10 is.

11 Q Do you recall what the RCM cost?

12 A I don't know.

13 MR. WELLS: Do you have that list?

14 MR. KILPATRICK: I'm looking.

15 THE WITNESS: I don't recall ever seeing in any of the  
16 documents exactly what the cost was. It showed what the  
17 incremental cost was.

18 BY MR. WELLS, CONTINUING:

19 Q What is that?

20 A The difference between what the system was before; in other  
21 words, they would compare the '99 system against the 2000.

22 Q All right. Now, the -- was the -- the effort over the years  
23 to develop this electronic accelerometer, meaning the RCM and  
24 the SMART system that was in the Ford Taurus and other cars,  
25 was that a project that had a name at Ford Motor Company?

1 A I think it was generally called the SMART airbag, but, again,  
2 there are documents that talk about the intelligent airbag  
3 Phase 1, 2 and 3, so it's one or the other. I think  
4 generally people were talking about the SMART bag --

5 Q Okay. With that --

6 A -- or the advanced airbag, I mean, depending on which  
7 document you look at. I think people were putting names on  
8 it, but the SMART bag was supposed to give you all this  
9 feedback information, so that's why I think they talked about  
10 the intelligent airbag, Phase 1, 2 and 3, because they  
11 couldn't get things invented in time.

12 Q Yeah. Is this Phase 1?

13 A I believe it is.

14 Q What happens in Phase 2?

15 A I think that's where they were trying to get the weight  
16 sensors in.

17 Q In the seat for how large a person?

18 A Right.

19 Q What's Phase 3?

20 A I think they were talking about -- which hasn't come about  
21 yet -- they were looking at proposals to try to understand  
22 proximity kind of locations for child restraints to determine  
23 whether -- whether there was a child restraint and what  
24 position it was in and so forth.

25 Q Okay. Now, with these systems, the SMART airbag system and

1 the intelligent airbag system, were those mandated by the  
2 federal government?

3 A I think there's a phase-in Mandate 208 that covers some of  
4 these issues up in -- it's something that's being phased in,  
5 and whether they're still sticking with that -- sometimes  
6 they issue rules and then they backtrack on them too. So I  
7 think my recollection was that there was a phase-in  
8 requirement that you had to have some of these advanced  
9 airbag restraint systems being phased in up to 2010 or  
10 something like that, 2008.

11 Q Okay. But this SMART airbag system that was in the 2000  
12 Taurus was something that the feds were mandating at some  
13 point in time?

14 A Well, it certainly wasn't mandated for 2000.

15 Q But it was coming in the next several years?

16 A That's what it appeared, yes.

17 Q So this was one of the early stages to phase it into your  
18 line because it was a requirement of the federal government  
19 that a system of this nature start going into the cars in the  
20 United States?

21 A I think you would probably say it was a potential  
22 requirement, because sometimes when the government says you  
23 must have it in 2004, 2006, whatever, sometimes when you get  
24 closer to the date, then they change their rules again. So I  
25 think it was a potential requirement.

1 Q But as of the year 2000 model year, Ford Motor Company was  
2 aware that the existing requirements required to get these  
3 type of SMART systems to go in cars, and absent a change in  
4 the rules, they had to get these systems implemented; is that  
5 right?

6 A Well, the -- you probably read the rules. The rules aren't  
7 exactly that way. They talk about injury criteria usually  
8 and they talk about different-sized dummies, and the only way  
9 you can meet that criteria is to put a system like this in,  
10 where you have feedback and controls where you can cut it off  
11 if you have the child restraint or, you know, the  
12 50th percentile, the female being too close to it. So it's a  
13 rule-making proposition that talks about the performance  
14 criteria. So this is certainly one way of doing that.

15 Other manufacturers may choose other ways to do it.  
16 They usually don't mandate a way of designing a vehicle or a  
17 system, but rather they tell you what the performance for the  
18 injury criteria is for different dummies.

19 Q Let me back up. And I recognize your difference. I was  
20 being somewhat sloppy.

21 Is it correct to say that the SMART system -- SMART  
22 airbag system that Ford Motor Company put into the  
23 2000 Taurus was placed in the 2000 Taurus in order to meet  
24 the then stated requirements of the federal government for  
25 airbags and certain safety systems that were in affect and



1 were going to be requiring these systems in the next several  
2 years? Not that it required that particular airbag or that  
3 particular result, but the requirements of the federal  
4 government were being met by putting in this sort of system.

5 A Essentially that's correct. I would say it's more like  
6 advancing the technology to meet those requirements.

7 Q Okay. Now, the -- let me show you what we've marked AAEC --  
8 actually, your attorney or somebody marked it -- AAEC 7588.

9 There is an -- it's called ECS module variable cost targets.

10 What does that mean?

11 A What was your question?

12 Q What does that mean?

13 A I'm not sure what ECS means other than I think it's  
14 electronic control. That's my guess. I think we're talking  
15 about the -- what was called the RSM.

16 Q Okay. It has a place that says the mechanics and then it has  
17 certain model years and it has a cost. And it says  
18 accelerometer 2000 model year, \$4.23. What is the  
19 accelerometer?

20 A It's a part of the system.

21 Q Is that the remote sensor, the satellite sensor, the thing  
22 that's under the hood?

23 A Well, it may or may not be, because you've got a document  
24 dated here '94, and they were still looking at the

25 single-point system, so the way this is worded I think

1 it's one system that had everything in it rather than the  
2 satellite. So I think this is talking about a single-point  
3 system just because of the data, so it's an accelerometer  
4 that would have been in the single-point system.

5 Q Okay. Well, let me ask you this then. Category No. 8 is,  
6 the cost of the airbag and restraint system implemented in  
7 the 2000 Ford Taurus. What was that?

8 A Repeat the question please.

9 Q Category No. 8 here, it says, the cost of the airbag and  
10 restraint system implemented in the 2000 Ford Taurus -- how  
11 much did the airbag and restraint system cost in the 2000  
12 Ford Taurus?

13 A I did not see any numbers like that in the documents, but  
14 that's something that probably could be determined from  
15 purchasing. I mean, these are variable costs, and you have  
16 to be careful about looking at fixed and variable costs.  
17 Sometimes it's -- it's meaningless in reality. I mean, you  
18 have to understand what the basis of these costs are. I  
19 mean, it's certainly important for making an analysis  
20 internally, but just because something says \$32 does not mean  
21 that you're buying it for \$32, because on top of variable  
22 costs you always have to look at your fixed costs.

23 Q Like what?

24 A Manufacturing.

25 Q The cost to get it into the car?

1 A Well, that's part of it. I mean --

2 Q What do you mean by variable and fixed? I know a little  
3 economics, but I'm trying to figure out how you're using  
4 them.

5 A My understanding of variable costs is what the actual pieces  
6 costs.

7 Q Okay.

8 A Now, to put it together to buy the equipment and machinery  
9 and so forth you have to add fixed costs on it. Any  
10 manufacturer, whether it's Visteon, whether it's Delco, they  
11 would look at the components and see what it costs and then  
12 they would also add numbers in for brick or mortar or  
13 whatever it would take to manufacture it.

14 Q Let me ask you this. If I went to Visteon and I said sell me  
15 an RCM and I got the same price you guys got for that RCM put  
16 together, would that be the variable cost and then you guys  
17 have to add from a cost analysis what it costs to have  
18 somebody take it out of the box, go over to a car, put it in  
19 the car, the building that covers me, the pension benefits  
20 and all that kind of stuff? I'm just trying to get to this  
21 variable-fixed cost understanding.

22 A The cost that you pay is not the variable cost because you're  
23 buying a service part I would suspect.

24 Q Assume I got it at the same price you guys do. You guys have  
25 a deal. You can get RCMs at --

1 A It certainly wouldn't be this number.

2 Q Okay. Why wouldn't it be that number?

3 A It's some number -- I don't know whether it's doubled or

4 tripled or whatever, but you have to go back and look for

5 purchasing documents on the final-end item that was

6 purchased, and that's -- that's not that difficult to find

7 out. You go back and say, what was purchasing paying Visteon

8 for an RSM that was put into this vehicle based on that part

9 number. I don't know what that is.

10 Q But you don't know the cost of the airbag and restraint

11 system in the 2000 Ford Taurus?

12 A I have not seen that number.

13 Q That would be an accumulation of the various parts, the cost

14 of the parts; is that right?

15 A That would be correct.

16 Q And continuing on No. 8, and the cost of the airbag and the

17 restraint system in the '99 Taurus, you can't tell me that.

18 That would also be a collection of the various parts and what

19 they cost?

20 A That would be correct.

21 Q All you can tell me is the difference of the two costs which

22 is, what did you say, 17, \$20?

23 A Depending on what estimate they were making at what level and

24 what time frame. There's lots of those documents that

25 reflect those kinds of numbers, and I was giving the

1 estimate, kind of the numbers that I seen in some of the  
2 documents.

3 MR. WELLS: Okay. Randy, can you -- Category No. 8,  
4 what I'm wanting to know is what the cost is on an RCM and  
5 the cost is of the satellite sensor.

6 MR. BIBB: Then we will attempt to do the cost analysis  
7 that Mr. Wagner described, which is just a part cost which is  
8 not necessarily an accurate number. Costs are a real --  
9 they're real variable based on what you mean by costs. Like  
10 if you went and bought one at your neighborhood Ford store,  
11 that's the cost of the part.

12 MR. WELLS: I want to know what Ford paid for a --

13 MR. BIBB: Just for the RSM --

14 MR. WELLS: Yes.

15 MR. BIBB: -- or the satellite sensor?

16 MR. WELLS: I want the satellite sensor.

17 MR. BIBB: And for the wiring and for the wiring harness  
18 and for all those components?

19 MR. WELLS: In order to -- according to him, in order to  
20 get the cost of the airbag and restraint system in the  
21 2000 Taurus you would have to give me the parts in that  
22 system and the cost of all the individual parts. If you give  
23 me that, then there's no confusion between us.

24 MR. BIBB: But that would only cover the part cost --

25 MR. WELLS: I'm okay with that.

1 MR. BIBB: -- as opposed to the labor cost or the fixed  
2 cost.

3 MR. WELLS: Yeah, there's all kinds of costs to get it  
4 into the car.

5 MR. BIBB: Right.

6 MR. WELLS: I understand that. Right. I understand  
7 that when somebody --

8 MR. BIBB: We will endeavor to get you a number.

9 MR. WELLS: Okay. I understand that when the food  
10 arrives at the restaurant, it's not on the plate.

11 MR. BIBB: That's true.

12 BY MR. WELLS, CONTINUING:

13 Q Okay. That's what we're talking, fixed and variable; is that  
14 correct?

15 A Yes.

16 Q And the cost accounting people, what they have to do is  
17 figure out what to charge -- what the cost is of that car in  
18 the end, and it's just not the sum of the parts sitting on  
19 the shelf?

20 A That's correct.

21 MR. BIBB: That's correct.

22 MR. WELLS: But you'll get me the cost of what they paid  
23 for the parts -- for all the parts in the 2000 airbag and  
24 restraint system?

25 MR. BIBB: I will endeavor to get that information.

1 BY MR. WELLS, CONTINUING:

2 Q Okay. Now, let's see. Now this fixed cost, does anybody  
3 calculate that somewhere?

4 A It has to be calculated otherwise you don't know how to price  
5 the vehicle.

6 Q Has anybody calculated what it would cost to put another  
7 remote sensor on the 2000 Taurus as a backup safing sensor?

8 A I haven't seen anything like that.

9 Q Okay. When the single-point system was thought about doing,  
10 you guys thought about a single-point system as opposed to a  
11 remote, was there a team that was actually working on the  
12 single-point, testing it to see if it worked and that sort of  
13 thing?

14 A Sure. You can see it in the documents, if people were  
15 working on it. And it wasn't necessarily the Taurus. It was  
16 looking at other programs too.

17 Q What was the name of the team?

18 A I don't think they had an official name. I think it was  
19 different people; restraints engineering, automotive safety  
20 office. Suppliers that we had talked about were  
21 participating in the design and development of these systems,  
22 from, you know, Siemens to Bosch to Delco, Visteon, if --  
23 they were looking at all different sources of designs and  
24 components to try to understand which was the appropriate one  
25 for the vehicle.

1 Q Okay. As I look at the documents today, and I've been  
2 messing with them, I don't find a study that says -- both you  
3 guys may correct me -- the reason we're putting the satellite  
4 sensor under the hood ornament as opposed to other locations  
5 is 1, 2, 3, 4. Is there such a document that you've seen?

6 A Usually there's not a document that clearly says that. When  
7 you go through the development process and you look at  
8 designs, there -- at some point in time when you're talking  
9 about sensor development, people are looking at different  
10 locations. And whether it's a computer simulation or whether  
11 it's an actual crash test, they look at locations of sensors  
12 and structure and so forth that you may see some tests -- I  
13 know when you look at old mechanical sensors, they used to  
14 put some threshold test where they would put, you know,  
15 20 sensors in the engine compartment at different locations  
16 to try and record data. Sometimes it's just simply  
17 accelerometers.

18 (Interruption on the record)

19 BY MR. WELLS, CONTINUING:

20 Q Now, the sensors, are they -- these teams that are doing  
21 it -- are they just working on one car or are they kind of  
22 working on all the cars? Do I have one great big  
23 Taurus-Sable group and I've got a Ford Expedition group?

24 A There's different teams of people because the  
25 characteristics -- if you're looking at an F-series truck,



1 you've got different criteria than you would for a Taurus,  
2 for example. You've seen some of that. Trucks are different  
3 than cars and big cars are different than small cars, so  
4 you've got different groups of people. But there certainly  
5 can be some cross-over people that are working on all  
6 products because of what their expertise is.

7 Q. Does the Ford Expedition have a SMART system in it?

8 A. Today?

9 Q. Yeah.

10 A. I don't know the answer to that. I would suspect it does,  
11 but I don't know.

12 Q. Okay. Are sensor development tests run after the car gets on  
13 the market?

14 A. No. That is done well -- well -- long before the vehicle is  
15 ever manufactured because you have to sort out different  
16 alternatives. With computer-aided design you -- you do some  
17 fine tuning with the computer-aided modelling and design so  
18 that you have an idea, and then you run development tests and  
19 then you would run certification in some cases. You run  
20 verification tests to see if you're still meeting  
21 certification requirements.

22 Q. I'm just curious. I've got document No. CRTS 0012068 that is  
23 a test report, and it's a whole bunch of pages. It goes  
24 through 1, 2 --

25 MR. KILPATRICK: They're all numbered.

1 MR. BIBB: That's a crash test number.

2 MR. WELLS: It's a crash test number, oh.

3 CRTS, does that mean crash test?

4 MR. BIBB: I bet it does, CRTS.

5 MR. WELLS: I bet it does.

6 MR. BIBB: Yeah, there's generally a number up here.

7 THE WITNESS: Right here.

8 MR. BIBB: There's 12068, and that's what it corresponds  
9 to.

10 BY MR. WELLS, CONTINUING:

11 Q It says objective to obtain development data relative to  
12 airbag sensor systems for the 2000 Taurus run at the end of  
13 2000; do you know why that test would be run?

14 A This appears to be a document where they had a number of  
15 different sensors on it, but they were looking at different  
16 locations and different types of sensors for some future  
17 development, I would say, because this is a production  
18 vehicle. It says it's a production vehicle in here. That's  
19 run after the start of 2000 production.

20 This does not mean that this is a 2000 production  
21 vehicle. This is a modified 2000 vehicle with sensors  
22 that -- if you go to the second to last page, it shows  
23 locations of where the different sensors were placed, and  
24 some of them are Visteon sensors. And I don't know what  
25 RCM 1, 2, 3, 4, 5, 6, 7, 8 -- it says some triaxial

1 accelerometers were placed in different locations. And  
2 there's a map here that says sensor map of where these are  
3 located. So this has to be development for some future  
4 program. Maybe this is for, you know, the next generation --

5 Q Let me see it a second.

6 A -- Taurus.

7 Q Is this a -- is this a test other than the airbag SMART  
8 system that was in the 2000 Taurus vehicle in this case?

9 A Yes. This is an evaluation of a different -- an array of  
10 sensors of different types, which I can't tell you what they  
11 are, but it's described on that second to last page, the  
12 locations and what they are.

13 Q Okay. This one -- let's look at the end to last page. Is  
14 this showing where the sensors were located in this car  
15 during this test?

16 A Yes.

17 Q Okay. There was a -- Sensor No. 1 is LC, front radiator  
18 support; what does that mean? What does that LC mean?

19 Located? No, that couldn't be.

20 A It almost sounds like --

21 Q Left?

22 A -- left center, but I don't know where -- if there's a mark  
23 on this diagram that shows where number one is, maybe that  
24 would help us. I can't tell whether that shows a one in  
25 there or not, but these other ones are blocks.

1 MR. BIBB: Yeah, that is.

2 THE WITNESS: It looks like the number one is located  
3 near the hood latch. That looks like --

4 MR. KILPATRICK: Oh, yeah, I see it.

5 THE WITNESS: -- like a number one here. These other  
6 ones are blocks. I see two and three and so forth over here.

7 MR. BIBB: One is boxed too.

8 MR. WELLS: Yeah.

9 MR. BIBB: It's hard to pick up on that copy.

10 BY MR. WELLS, CONTINUING:

11 Q I gotcha. So No. 1 would be at the radiator support?

12 A Obviously near the center line.

13 Q Okay. So then No. 2 -- No. 1 would be an accelerometer.

14 Does that mean it's a satellite sensor?

15 A Yes.

16 Q Okay. No. 2 would be at the dash, which would be an

17 accelerometer?

18 A That's correct.

19 Q Number --

20 A But also there's different types. It says output

21 longitudinal and the other one is triaxial, which means X, Y,

22 Z.

23 Q Okay. Then you would have a variety of Visteon RCMs in this  
24 car?

25 A Whatever that means.

1 Q Okay. Then you would have on the No. 5 at the left -- at the  
2 floor pan, wherever that is, at No. 2?

3 A I think it means left front floor pan.

4 Q There was an accelerometer?

5 A Triaxial.

6 Q Which would be X, Y, Z?

7 A That's correct.

8 Q Okay. And then you had an accelerometer in the floor pan,  
9 dash, and then one behind the front seats?

10 A That's correct.

11 Q Now, what is the difference between the -- well, in the  
12 2000 Ford Taurus the accelerometer -- or the satellite sensor  
13 in the front of the car, was it a longitudinal or a triaxial?

14 A I think that's a question you have to ask Visteon. I've  
15 never seen a document to say what it was. There may be in  
16 the collection of 25 boxes defining what it is, but I don't  
17 recall what it was.

18 Q Can you tell me whether it was of the type that's on this  
19 second to last page of 12068 crash test?

20 A I couldn't with this information.

21 Q Okay.

22 A I think maybe somebody at Visteon may be able to answer that.

23 Q Well, the problem is I've got a Ford test. I would hope that  
24 they would know.

25 I'm going to go through a couple of these graphs to see

1 if I understand what they are. Can you tell me what that  
2 graph is graphing? I know it's inches and time, but is that  
3 how much crush and time?

4 A This says the right shoulder of the passenger with respect to  
5 the right rocker at the B pillar longitudinal displacement;  
6 in other words, there's targets that they track on a computer  
7 to say how much movement there would have been versus time.  
8 And there's a plot that goes from zero up to approximately --  
9 it goes beyond 80 milliseconds, and it shows that that  
10 displacement is about 12 inches.

11 Q That's on a dummy?

12 A Right.

13 Q Okay. I'm looking for the graphs of the accelerometers.

14 Well, when you look at this one, the second one -- is  
15 this where you were looking to tell what this second one is?

16 A Yeah. Sometimes you have to look at them and try to  
17 interpret -- well, it's -- it looks like it says center line  
18 tunnel behind front seat SM No. 9. I don't know whether that  
19 corresponds to one of those other graphs, but this is a  
20 deceleration versus time graph.

21 Q Okay. I'm not going to go through these because we're being  
22 squeezed for time. Let me ask you what this one is.

23 A It says left center front radiator support, SM No. 1,  
24 longitudinal. I think that, from what I recall, may be that  
25 first accelerometer trace.

1 Q Okay. But that was left center?

2 A Well, left, slash --

3 Q That didn't seem to fit.

4 A -- center front.

5 Q Is this crash test we're looking at something you're just not  
6 familiar with and can't testify as to it?

7 A As to what?

8 Q As to what happened in this crash; why they did it, where the  
9 sensors were, that sort of thing.

10 A Well, it's a develop crash test.

11 Q Can you testify whether the sensors in this case are the same  
12 sensors that were in the 2000 Ford Taurus?

13 A I cannot without doing some additional work.

14 Q Okay. Can you testify whether or not this crash test has  
15 anything to do with our case? Do you know why it was run?

16 A You'd have to look at the test request, which you don't have,  
17 and sometimes that doesn't tell you.

18 Q All right.

19 (Discussion held off the record)

20 BY MR. WELLS, CONTINUING:

21 Q Mr. Wagner, this test that we're looking at -- this crash  
22 test 12068, you don't know as you sit here today whether the  
23 monitors -- sensors in this car were the same or different  
24 from the ones that were in the 2000 Ford Taurus involved in  
25 this case?

1 A That is correct.

2 Q Okay. You don't know why this test was actually run as you  
3 sit here today?

4 A It's not obvious by looking at that other than it is a  
5 development test. It was -- people were looking at something  
6 into the future.

7 Q And you don't know whether this test was using placements  
8 that were -- placements of sensors that were the same or  
9 different than the ones that were in the Ford Taurus that  
10 were in the wreck we're discussing today?

11 A Some may have been the same, but clearly there was a lot more  
12 sensors on this testing than there were on the 2000  
13 production Taurus.

14 Q Okay. And in the accelerometer -- I'm sorry -- not the  
15 accelerometer. In the RCM there has got to be a manual or  
16 something that goes with it for the purpose of doing  
17 something at your place. Let me back up. That's a bad  
18 question.

19 Is there a manual that goes with the RCM?

20 A A manual?

21 Q Yes, sir.

22 A Not to my knowledge.

23 Q Okay. Are there specifications that are made for the RCM  
24 that you send to Visteon that says this thing has got to do  
25 the following?



1 A Exactly. You have to -- to make any component you have to  
2 have a drawing and you have to have a specification.

3 Q Are those drawing specifications in the 22 boxes?

4 A I did not see those.

5 Q Now, the --

6 A There may be some other documents out there that have been  
7 produced that I haven't seen, but I have not found those  
8 documents in those boxes.

9 Q Now, the RCM specifications, would those specifications  
10 detail under what circumstances the RCM should send a signal  
11 to the airbags to fire?

12 A I guess I don't know without looking at the actual  
13 specification. I know in the old systems there was always  
14 clearly-defined threshold requirements because you had to  
15 have the supplier certify that the system met certain  
16 requirements. So it was carefully outlined. And I would  
17 suspect that the same kind of information was in this,  
18 because these components have to be certified and there has  
19 to be some kind of test at whatever temperatures and  
20 conditions to show that they meet the threshold performance  
21 of fire, no-fire conditions.

22 Q Okay. So then in sitting here talking about the design of  
23 the airbag system, in this case you cannot tell me what the  
24 specifications were for the RCM; is that right? You'd have  
25 to go back and look at the specification?

1 A The specification you had here earlier could very well have  
2 been that specification, but you have to look at the drawing  
3 and say what specification that release drawing that was put  
4 into production requires. I don't know whether it was that  
5 one or not without looking at the drawings.

6 Q That one being the one that was here for the -- for the what?

7 A Earlier you had a specification for the module, and it said  
8 Revision A.

9 MR. BIBB: It was about 20 pages long.

10 MR. WELLS: This thing?

11 MR. BIBB: No. I don't think that was it.

12 THE WITNESS: Well, that doesn't look like the same  
13 cover sheet, but it does look similar. I mean, this is  
14 another one, but --

15 BY MR. WELLS, CONTINUING:

16 Q We have a couple of copies of this thing.

17 A But, see, each one of these -- some of them say draft copy.  
18 This doesn't say draft copy, but this is a marked up one, and  
19 this is not a final copy when somebody has it marked up like  
20 this.

21 Q We've got here --

22 MR. BIBB: It's AAHC 8243 I believe.

23 BY MR. WELLS, CONTINUING:

24 Q And here is the 8243 that you looked at. AAHC 8243, are  
25 these the specifications for the RCM that would have been

1 given to Visteon for the manufacture of the RCM?

2 A I told you a couple two or three, maybe half a dozen times, I  
3 don't know unless I looked at a drawing. The drawing would  
4 say that this specification number, the changed level and so  
5 forth, would be what was the requirement for that.

6 Q This may be an interim draft of some sort?

7 A It could be, but it could be the final. I don't know.

8 Q Is this kind of the form -- the sort of the look of the  
9 document that you would expect it to be?

10 A Yes.

11 Q You just want to know if it's the final one?

12 A That's correct.

13 Q Have you seen the final one in the 23 boxes?

14 A I don't know.

15 MR. WELLS: Randy, can you check to see if you all  
16 produced this final?

17 MR. BIBB: I'll be glad to. I mean, what you have to do  
18 is just check the drawing.

19 THE WITNESS: Yeah. If it's on the drawing -- if you  
20 have the drawing, you can find the spec number on it.

21 MR. WELLS: Well, I don't have the drawing. Could you  
22 guys produce to us the drawing?

23 MR. KILPATRICK: I may have the drawing.

24 MR. BIBB: I would expect there are hundreds of drawings  
25 in the boxes that we've produced.

1 MR. KILPATRICK: Can we go off the record a second?

2 MR. BIBB: Sure.

3 (Discussion held off the record)

4 MR. BIBB: We'll look through the production log and see  
5 where the -- where the drawing should be and identify what  
6 revision level specification goes with the drawing and  
7 identify that and may be able, though I'm not promising, to  
8 give you an alphanumeric bates number for it.

9 MR. WELLS: Okay. And if we can't find it in the boxes,  
10 we'll let you know and you can then produce us the final?

11 MR. BIBB: When the documents were produced -- and,  
12 again, as I have mentioned while we were off the record -- I  
13 didn't have anything to do with these document productions.  
14 It was done by our Jackson office. But those documents are  
15 generally organized when originally produced by request  
16 number that they go with, so that if you went back and looked  
17 at -- if you asked for, for instance, the specifications, you  
18 should be able to go and find that.

19 MR. WELLS: We're going to ask Bradley where it is.

20 MR. BIBB: Don't do that.

21 MR. KILPATRICK: I got no numbers. I got a big box of a  
22 mess.

23 MR. WELLS: Do you want to keep going? It's 5:26.

24 MR. BIBB: Are you at a stopping point?

25 MR. WELLS: Yeah, because I was about to get into the

1 documents over here, and I got -- if you miss your plane, we  
2 finish.

3 MR. BIBB: Well, we won't do that.

4 MR. WELLS: You tell me what to do. We hit 5:30.

5 MR. BIBB: I can go -- I think, you know, we can go for  
6 another 15 to 30 minutes.

7 MR. WELLS: Okay.

8 (Discussion held off the record)

9 MR. BIBB: We were just discussing -- plaintiff's  
10 counsel has reached a logical break in the deposition. He's  
11 got a number of documents that he wants to inquire Mr. Wagner  
12 about. So at 5:30ish on the afternoon of July 17th the  
13 deposition will be adjourned to be reconvened at a time,  
14 place, and date to be determined, but it will probably be the  
15 same day that Mr. Wagner will offer his expert witness  
16 deposition.

17 MR. WELLS: Consistent with our discussions earlier?

18 MR. BIBB: Consistent with our discussion several hours  
19 ago.

20 MR. WELLS: Okay. That sounds good, and I will see you  
21 at the next one and we'll talk about getting it organized.

22 (Deposition adjourned at 5:31 p.m.)

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VERIFICATION OF DEPONENT

I, ROGER C. WAGNER, do hereby certify that I have read the foregoing deposition taken on July 17, 2002 and that, to the best of my knowledge, said deposition is true and accurate (with the exception of the changes/corrections as attached hereto, if any).

\_\_\_\_\_

ROGER C. WAGNER

Subscribed and Sworn before me this \_\_\_\_\_

day of \_\_\_\_\_, 2002

\_\_\_\_\_

Dora L. Doletzky, Notary Public  
County, Michigan

My Commission expires:  
September 17, 2005

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1                   **CERTIFICATE OF NOTARY PUBLIC**

STATE OF MICHIGAN )

2                   ) SS.

COUNTY OF WASHTENAW)

3

          I, Dora L. Doletzky, Certified Shorthand Reporter and  
4   Notary Public in and for the State of Michigan, do hereby  
certify that the witness whose attached deposition was taken  
5   before me in the above cause was first duly sworn or affirmed  
to testify to the truth, the whole truth, and nothing but the  
6   truth; that the testimony contained herein was by me reduced  
to writing in the presence of the witness by means of  
7   Stenography; afterwards transcribed by means of  
computer-aided transcription; and that the deposition is a  
8   true and complete transcript of the testimony given by the  
witness to the best of my ability.

9

          I further certify I am not connected by blood or  
10   marriage with any of the parties, their attorneys or agents;  
-that I am not an employee of either of them; and that I am

11 not interested, directly, indirectly or financially, in the  
matter of controversy.

12

IN WITNESS WHEREOF, I have hereunto set my hand and  
13 affixed my Notarial Seal this \_\_\_\_\_ day of

14

15

16

\_\_\_\_\_  
Dora L. Doletzky, CSR-6110

17 Notary Public, Washtenaw County, Michigan

My Commission Expires: 9-17-2005

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<b>A</b>	174:13	100:2,12	152:24	195:13	118:9,10
AAA 56:2	174:16	100:23	152:25	196:15	118:15
AACG 39:18	174:18	101:8,9	153:1,25	197:2,16	118:17
40:7,12	175:4,11	101:15	154:14	202:9,10	118:19
AACQ 89:8	208:22	101:21	155:6	202:20	118:23
80:14	215:7,18	102:4	157:19	203:9	119:21
AADH	about 1:15	103:2,2	158:25	209:10	120:8,13
161:15	3:3 6:15	103:11	159:3,8	212:22	121:7
AADV 40:18	6:17	103:12	159:11	213:9	122:5,24
AAEC 127:3	13:14	105:10	159:25	215:25	123:1,2
196:7,8	14:20,22	106:14	160:5,7	216:12	170:4,6
AAGQ 40:17	15:3	106:24	160:11	216:21	171:1
170:23	23:17	108:16	160:18	above	192:23
AAHC 122:5	26:22	111:24	163:11	104:21	196:18
132:2	27:10	113:16	163:15	146:20	196:19
213:22	30:14,18	116:22	164:5,20	148:20	197:3
213:24	32:24	116:22	169:1,9	159:24	207:13
AAHI 40:18	33:9,12	117:7,8	169:14	218:5	207:17
abando...	35:7,18	118:22	169:25	abrasions	208:4,8
169:11	38:25	122:9,10	170:3,13	99:24	208:12
ability	43:1,18	122:11	170:24	100:7	209:25
35:13	48:11,22	124:11	170:25	absent	211:14
54:6,11	49:9,11	124:19	171:2,7	195:3	211:15
59:14	49:13,13	125:7,12	171:20	absolu...	accele...
60:25	50:3	125:18	171:24	71:25	114:6
68:4,8	55:11	129:11	172:3,4	123:14	123:15
68:24	56:3,4	129:13	172:6,9	absorb	203:17
75:4,6	58:8,18	129:25	172:23	62:23	206:1
114:16	60:16	130:4,14	172:25	absorp...	209:13
117:22	63:6	134:19	173:12	45:12	accept
171:17	69:25	134:22	173:16	abutment	42:10
218:8	70:6,10	135:9,9	174:2,11	155:23	Accepted
able 11:21	71:6,25	135:23	176:13	accele...	41:13
14:14	72:2,10	136:1,14	177:3,5	24:11	access
24:7,10	72:19	136:19	177:23	58:24	189:18
24:10	75:6	137:9	177:24	123:10	accident
31:9	76:25	138:6,9	178:1,4	141:8	8:22
53:1	79:15	138:11	179:16	166:8	21:22
77:19	81:22,24	139:14	180:13	accele...	22:14
92:17	86:16	140:25	180:18	166:11	61:1
100:6,16	89:15	143:1,24	184:5,15	accele...	94:11
110:25	91:8	144:10	188:19	93:6	99:8
129:13	93:12	145:9,23	189:14	170:9	103:17
133:6	94:8,12	146:12	190:20	accele...	103:18
137:9	95:4	146:23	191:10	39:17	104:20
141:16	96:20,24	148:1,2	191:20	63:10	105:9,11
166:15	97:3,4	149:2,12	193:2,4	69:4,13	150:24
168:7	97:17	149:13	193:9,20	69:18	accide...
169:8	99:4,21	151:17	193:20	85:4	121:24
170:7	99:22	152:6,8	195:7,8	117:11	accidents



**A RECORD OF EXCELLENCE**

Troy  
248-244-9700  
Detroit  
313-961-5560

Lansing  
517-337-7337  
Ann Arbor  
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616-456-6300  
Kalamazoo  
616-552-4438

9:6	127:5	171:22	20:3	104:6	20:25
20:10	acting	175:4,12	58:20	110:5,22	32:17
48:5	21:6	177:21	193:6	111:23	agents
55:9	action	185:5	194:8	116:6	218:10
57:3	102:17	196:8	advanc...	125:7	aggre...
94:23	112:13	202:11	51:20	133:8	54:23
146:3,4	actions	211:2	advancing	139:20	56:20
146:10	28:18	actuati...	196:6	155:6	ago 58:3
153:8,8	100:24	121:23	advert...	178:15	61:16
accomm...	173:7	165:22	160:20	204:12	96:14
110:3	activate	add 90:16	advert...	205:19	109:9
127:18	91:2	107:23	159:23	afternoon	117:2
127:22	active	178:5	160:18	216:12	216:19
according	26:6	198:9,12	advert...	afterw...	agree 55:2
137:14	45:22	198:17	160:7,9	218:7	111:21
200:19	activi...	added	advice	again 13:8	112:13
Accoun...	28:14	96:10	56:11	14:23	112:19
28:19	activity	addition	advise	31:24	136:20
accoun...	36:18	165:11	107:5	60:10	136:23
201:16	actual	additi...	aerospace	62:4	176:4
accumu...	111:11	18:3	49:16	63:1	agreeable
55:17	111:16	24:2	affect	83:25	113:1
accusu...	112:5	110:1	86:10	97:10	agreed
182:24	116:9	210:13	87:22	117:7	23:6
accusu...	174:14	address	108:20	121:4	27:1
182:23	180:5	38:8,11	113:7	122:14	76:21
accusu...	181:4	38:19	151:2	135:15	109:14
199:13	198:5	39:7,10	156:7	140:24	110:8
accurate	203:11	171:11	195:25	143:17	144:4
200:8	212:12	addressed	affects	145:11	145:7,20
217:6	actually	172:14	155:4,12	152:24	152:21
acquire	6:15	addresses	affirmed	157:12	agreement
11:1	10:2,10	26:20	3:18	159:9,19	106:19
16:23	15:3	adjourned	218:5	172:12	109:17
31:17	46:2,22	216:13	affixed	179:16	109:20
39:23	46:23	216:22	218:13	187:23	110:6,14
183:22	62:22	adjust	afford	193:1	110:25
acquired	76:3	61:13	179:18	194:24	111:13
15:1,20	83:17	adjusted	afraid	215:12	112:3,7
acronym	90:20,24	49:23	43:20	against	113:10
189:21	91:18	adjuster	after 11:4	100:24	agreen...
across	94:7,9	21:6	16:4	101:1	14:3
23:24	99:3	Admini...	19:7	168:10	ahead
62:1	103:13	10:6	23:17	192:21	72:16
80:12,22	120:1	admit	25:22	age 139:14	78:17
81:9,16	124:8	42:21	28:1	agencies	82:15
83:7	143:6	adopting	29:20	20:14	157:12
84:7,14	154:8	88:16	35:22	23:15	165:3
102:23	162:19	advanced	38:13	31:10	ah-ha
108:23	164:19	19:25	95:24	agency	183:16

  
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 RELOCATION SERVICES

**A RECORD OF EXCELLENCE**

<b>Troy</b> 248-244-9700	<b>Leaning</b> 517-337-7337	<b>Grand Rapids</b> 616-496-6300
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air 45:10	125:10	60:1	157:8, 15	almost	153:17
65:12	130:2	64:7	158:12	43:19	189:23
airbag	132:7, 12	69:11	158:14	206:20	amount
14:23	134:17	70:8, 22	159:17	along 41:6	42:22
33:16, 25	137:23	74:9	159:24	58:17	50:12
34:21	138:8	75:17, 17	160:23	159:9	86:25
43:22	140:22	77:11	162:1, 3	alpha...	91:1
44:16	141:23	88:17	167:2	215:8	103:8, 9
45:7, 20	142:23	89:8, 12	174:22	already	120:17
46:14, 15	142:25	89:21	180:7	90:18	120:18
47:17	143:2	92:4	181:2, 5	102:20	and South
51:13, 17	145:12	93:7	181:7, 21	112:20	1:20
51:22	145:13	94:1, 22	182:8, 10	162:23	analogy
53:5	145:25	94:22	182:25	168:10	59:18
55:6	146:5, 7	95:1	183:7, 12	168:19	75:23
56:5, 6	148:1, 25	96:19	183:14	altera...	analysis
56:13, 14	149:6	97:13	185:21	109:13	5:24 6:1
56:20	152:14	98:7, 7	188:14	109:14	9:10
57:17	161:1, 4	98:11	195:25	190:13	30:23
60:25	165:4	100:3, 4	212:11	altern...	35:12
63:25	168:17	100:10	airport	48:14, 19	44:25
65:4	168:18	100:25	26:15	77:13	85:19, 25
66:22, 25	175:7	101:2	Alabama	204:16	89:24
67:10, 11	180:3	103:6	94:5	always	92:2, 3, 6
67:16	181:11	106:22	alert	18:6	108:7
69:9	181:14	108:23	131:25	22:19	116:3
70:19, 20	191:4, 12	117:6	algori...	26:5	155:5, 12
71:9	191:13	120:17	58:23	29:21	155:13
74:4	193:1, 2	126:25	119:24	47:24, 24	191:15
75:2, 2	193:6, 10	128:15	allega...	53:15	197:19
75:10	193:25	129:6	104:2	58:10	198:17
76:4	194:1, 9	133:7	106:8	60:23	200:6
77:5	194:11	135:3, 4	allega...	72:16	analyzed
90:11, 24	195:22	137:1	103:24	76:19	35:22
91:3	196:2	138:5, 16	104:20	77:2, 17	95:24
94:9	197:6, 9	141:19	Allied	78:18	Anderson
96:15	197:11	142:16	14:11, 13	86:10	38:23
98:18, 20	199:10	143:11	35:1	130:5	and/or 6:6
99:18, 23	199:16	144:12	46:17	132:10	anecdotal
99:23	200:20	144:21	allow	138:16	105:6, 22
100:1	201:23	144:22	65:13	139:25	107:14
103:17	205:12	145:14	110:4	190:3	107:16
108:3	206:7	146:19	144:5	197:22	angle
113:19	212:23	146:25	allowed	212:13	88:18
114:11	airbags	147:1, 11	92:23	America	122:16
119:9, 16	6:6 15:2	147:16	110:21	73:23	angles
120:20	43:19	147:20	129:1	American	136:2, 2
120:24	45:11	150:6, 6	alluded	163:12	angular
121:2, 3	54:9, 23	151:4, 11	163:19	among	60:17
121:19	59:12	152:16	163:23	150:2	83:4



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616-456-6300  
Kalamazoo  
616-552-4438

108:19	<b>answers</b>	154:2,23	205:14	<b>around</b>	31:18
<b>angula...</b>	40:1	169:2	<b>applic...</b>	14:15	<b>assigned</b>
61:22	<b>anthro...</b>	173:8,9	78:15	56:19	16:17
<b>another</b>	55:19	173:12	133:7	72:11	40:23
25:15	<b>antici...</b>	175:24	<b>applic...</b>	91:19	42:13
34:16	99:25	184:23	64:15	110:17	<b>assist</b>
51:8	<b>anybody</b>	185:15	<b>applied</b>	169:18	21:24
73:21	32:5	192:1	91:2	175:14	99:5
89:25	33:5,11	202:8	<b>applies</b>	<b>arrang...</b>	<b>assist...</b>
94:14	35:8,15	210:15	88:6	41:19	20:7
99:2	35:25	215:13	<b>apprec...</b>	42:1	<b>assisted</b>
108:5	99:17	<b>anytime</b>	101:24	<b>array 60:2</b>	9:22
118:23	107:19	9:4	<b>apprised</b>	60:7	20:19
145:3	107:19	<b>anyway</b>	9:5	206:9	<b>assisting</b>
202:6	129:15	11:21	51:20	<b>arrives</b>	20:24
213:14	151:1,8	27:3	<b>approach</b>	201:10	35:9
216:6	151:21	146:21	58:25	<b>Arrow</b>	<b>assume</b>
<b>answer</b>	152:3	147:3,14	169:4,11	48:11	25:3
14:14	153:19	<b>anywhere</b>	170:1,25	<b>Arthur</b>	29:1
88:7,7	154:4,10	129:16	<b>approp...</b>	38:23	61:8
101:17	154:18	159:21	47:18	<b>articles</b>	84:11
102:11	156:3,4	159:21	48:8,15	13:2	176:17
114:19	171:12	159:23	48:19	<b>articu...</b>	198:24
122:21	175:6	<b>apart 90:1</b>	74:24	45:5	<b>assuming</b>
122:23	181:16	<b>apologize</b>	78:7	<b>asked 6:16</b>	157:16
126:13	181:16	32:1	133:11	8:15	176:22
134:24	202:2,6	70:5	182:25	16:23	<b>assump...</b>
137:9	<b>anymore</b>	87:16	202:24	18:2	36:20
140:5	188:15	106:12	<b>approp...</b>	20:17	37:11
141:16	<b>anyone</b>	161:6	14:4	24:25	<b>assump...</b>
149:4	151:14	<b>appalled</b>	<b>approval</b>	30:4	163:3
156:25	152:12	56:18	48:7	35:17	<b>Atlanta</b>
157:18	<b>anything</b>	<b>appare...</b>	<b>approved</b>	41:24	153:6
161:18	6:23 7:1	20:9	190:10	96:8,14	<b>attach 3:8</b>
163:2	7:16	26:25	<b>approx...</b>	116:21	<b>attached</b>
164:12	10:1,2	77:10	209:8	123:19	4:14
164:20	10:20	82:10	<b>apron 83:2</b>	172:23	217:7
172:12	11:7,8	<b>appear</b>	<b>area 46:25</b>	177:16	218:4
174:19	11:23	37:8	50:14,15	215:17	<b>attempt</b>
174:20	13:3	<b>appear...</b>	74:9	<b>asking</b>	23:7
176:25	21:6	72:24	81:17	40:17	184:19
185:11	22:2	<b>APPEAR...</b>	83:15,19	88:6	200:6
204:10	28:11	1:16	103:1	89:15	<b>attempted</b>
208:22	32:18,19	<b>appeared</b>	173:20	107:18	4:24
<b>answered</b>	40:18	194:16	<b>areas</b>	112:15	42:21
88:21	88:8	<b>appears</b>	59:16	126:1	<b>attend</b>
102:5	107:19	26:3	84:22	140:25	47:1
157:5	107:23	102:25	88:2	<b>aspect</b>	<b>attending</b>
<b>answering</b>	129:4	103:8	100:22	7:18	111:6
53:8	152:20	171:9,16	171:20	<b>aspects</b>	<b>attention</b>

  
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 Ann Arbor  
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Grand Rapids  
 616-456-6300  
 Kalamazoo  
 616-552-4438

70:4	111:20	B 48:24	108:18	133:23	75:11
attorney	111:25	83:21	109:16	202:7	85:12
23:4	129:14	209:5	113:14	backwards	86:8,13
28:25	141:17	Bacina	116:18	47:11	86:22
29:3	150:8,12	5:16,20	118:12	48:22	87:9,17
31:24	150:13	6:6,25	119:2,23	137:20	88:4
179:13	152:23	7:11	122:16	149:9	90:12
196:8	153:9	35:9,25	122:22	bad 15:23	116:11
attorneys	183:14	back 4:23	125:13	211:17	119:2
218:10	184:22	8:15	130:1	bag 67:19	152:19
audible	185:3	9:11	131:5,20	67:20	191:18
131:12	avoid	13:12	133:24	95:15,24	balling
131:13	121:24	14:19	135:13	96:6	110:13
131:14	167:1	16:13	135:15	103:21	balloon
131:24	aware	18:6	137:3,3	105:15	123:17
August	51:24	21:15	138:2,25	114:13	ballpark
21:17	54:21	24:14,14	139:6	128:9,10	174:13
23:10	58:9	25:7	140:5	159:14	balls
109:22	88:8	27:20	141:1,23	165:25	65:17
109:23	93:23	37:5	143:25	167:16	87:5,22
109:25	94:24	38:2	145:5,11	167:21	ball-a...
110:5,22	96:20	42:8	147:5	167:23	53:21
111:17	97:23,24	47:21	151:5	167:25	59:21,24
112:4,17	100:19	49:16	152:21	168:2,8	60:1
authority	105:25	50:16	153:23	177:19	63:7
24:1	108:22	52:9,11	155:3	178:2,7	64:11
Autoliv	109:2	52:18,25	160:9	180:22	71:10
15:1	125:1	53:11	172:16	193:4,8	76:6
34:22	127:2	58:11,14	174:23	bags 95:23	77:7
46:15	129:4	60:4,10	179:5,15	96:13	89:18
automo...	142:11	62:4	179:22	115:7,7	102:20
57:15	142:19	64:7,21	183:23	117:9	119:7
106:5	151:16	64:21	195:19	124:8	bang
183:4	152:20	66:6	199:4,7	127:19	168:20
automo...	154:23	67:6	211:17	128:1,4	bar 14:17
144:20	173:9	72:5	212:25	128:12	barrier
automo...	175:24	74:25	215:16	145:8,8	89:3
11:8	188:19	76:5,10	backgr...	158:9	91:9,12
27:17,20	195:2	81:25	5:6 7:25	169:17	91:16
32:8,9	away 24:25	83:14	11:12	188:5	108:16
32:13,18	65:11	84:22	86:3	Baker 1:23	135:20
33:5	awful 5:2	86:22	backing	ball 63:20	136:4,5
51:16	140:24	88:13	95:14	64:3,14	136:6,7
150:19	axis	89:2	backtrack	64:16,24	136:12
202:19	122:15	94:2,12	192:9	65:1,6,6	136:14
available	187:5	94:19,24	194:6	65:10,23	136:15
35:14	a.m. 1:15	98:14	backup	66:17,18	136:18
55:20	3:3	104:5	130:5,12	69:5	136:20
59:19,20		105:19	130:14	74:19,20	136:21
76:13,14		106:18	133:4,17	74:21,22	138:15

  
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616-456-6300  
Kalamazoo  
616-552-4438

139:23	82:18	62:23	217:10	151:24	213:22
140:13	85:15	76:14	218:5	162:12	believed
141:6,9	93:24	becoming	began 37:5	162:23	92:25,25
141:25	95:1	58:20,21	begin	163:5,10	93:1
142:9	96:16	before	111:10	167:22	99:25
143:16	102:21	4:10	beginning	170:7	believing
144:3	114:17	8:16,23	8:15	174:17	108:10
147:24	115:10	9:23	19:6	176:23	below
148:14	119:7	10:2	31:1	177:21	158:1
148:24	136:20	17:5,19	38:10	180:23	belt 13:22
149:12	139:7	22:22	47:7	190:25	14:9
149:15	148:3	30:5,6	60:14	194:4,9	22:25
150:5	173:18	52:4	61:16	195:12	35:2
151:10	186:4	60:8	65:21	195:20	49:8
156:9	basin 56:3	63:24	99:4	196:4	131:18
158:4	197:18	67:19,21	177:19	209:21	161:20
160:8	bate 39:19	67:22	180:12	213:6	161:25
166:2	bates	69:19	behalf 1:5	beings	162:1
188:25	39:15,20	70:7	4:6	55:20	178:25
188:25	39:21	88:4,19	110:3	believe	179:3,3
189:10	132:23	89:20	behind	8:23	181:19
189:12	215:8	90:6	83:24	17:10	belted
barriers	battery	91:18	84:3,5,9	21:16	135:9
60:19	130:1,17	100:13	84:15,22	26:1	137:5,8
138:3	133:3	110:23	125:19	33:18,22	137:22
156:10	bear	130:18	208:9	37:2	138:8
156:10	135:17	134:4	209:18	39:23	139:11
173:10	137:10	139:18	being 8:25	46:10	148:22
based 78:2	Bearman	139:19	14:12	47:22	150:14
107:24	1:23	141:20	16:4	48:15	belts 6:6
109:2	became	151:4	17:3	50:23	14:2,12
145:5	19:13	153:22	22:5	55:21	34:12
146:18	35:1	154:6,21	28:21	59:5,15	45:22
182:13	37:6	167:10	46:12	70:25	46:17
199:8	46:18	168:2	51:19	73:5	49:7
200:9	53:11	171:18	55:24,25	94:14	57:5
basically	55:5	171:22	58:22	112:4	77:14
4:23	70:25	172:2	65:22	115:2,6	122:4,4
6:20	71:1	173:23	76:24	121:4	144:12
31:17	76:23	175:21	88:3,4	125:11	144:21
32:16	113:16	175:22	89:9	130:14	166:18
44:9	134:8	176:6,18	100:4	138:24	benefi...
50:17	become	180:2,4	106:11	139:19	1:5
54:5	30:4	180:6	110:25	140:20	benefit
56:4	62:21	181:4,11	118:2,2	141:2	51:4
63:19	100:1	182:10	126:14	159:25	146:1
64:25	171:19	183:11	131:14	171:2	benefits
69:14	becomes	183:19	134:14	187:6	198:19
74:18,20	13:25	192:20	138:25	188:12	bent 88:12
74:21,22	56:15	204:14	142:1	193:13	88:22

  
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 616-552-4438

<b>best</b> 30:12	7:12	201:25	130:25	131:13	<b>Brad</b> 37:17
57:2	9:24	205:1,4	<b>bliste...</b>	131:14	110:2
59:24	37:17,18	205:6,8	92:17,19	131:19	<b>Bradley</b>
67:15,15	40:22	207:1,7	<b>blocks</b>	166:9,9	215:19
217:5	41:10,14	207:9	206:25	167:4	<b>brain</b>
218:8	41:18	213:9,11	207:6	178:18	80:20
<b>bet</b> 164:2	42:1,5	213:22	<b>blood</b>	203:2	<b>brains</b>
164:2,18	42:12	214:17	218:9	<b>bottom</b>	54:12
205:4,5	43:15	214:24	<b>blow</b> 65:5	132:18	<b>branch</b>
<b>better</b>	46:6	215:2,4	75:2,17	<b>bought</b>	32:14
57:23,24	101:20	215:11	103:9	200:10	<b>break</b>
61:14,14	102:3,11	215:20	<b>blue-s...</b>	<b>bounce</b>	43:14,21
104:9	103:13	215:24	49:15	67:6	65:11
166:10	103:24	216:3,5	<b>board</b>	<b>box</b> 18:16	102:13
<b>betting</b>	104:11	216:9,18	20:16	18:25	109:6,8
163:22	104:14	<b>big</b> 30:23	<b>body</b> 33:23	23:2,23	109:10
163:25	104:18	62:11,18	34:8,10	24:5	126:12
164:21	105:9,22	69:15	44:3,8	43:11	159:6
<b>between</b>	106:9,13	79:21	44:19	50:8,9	216:10
32:14,16	106:17	102:24	45:1	80:24	<b>Bread</b>
44:18	107:1,5	105:12	48:9	135:15	14:12,14
62:18	107:18	105:15	82:25	198:18	35:1
63:16	107:23	138:4	<b>body-f...</b>	215:21	46:18
69:12,15	109:4	158:22	82:22	<b>boxed</b>	64:11
90:9	111:14	174:19	<b>bolster</b>	22:24	74:21
97:18	112:3,15	181:15	34:13	23:2	77:7
109:17	112:19	203:22	<b>bolsters</b>	207:7	88:13
110:16	112:23	204:3	45:11	<b>boxes</b> 5:1	<b>brick</b>
115:9,19	113:3	215:21	<b>book</b> 12:15	6:18	198:12
118:16	124:19	<b>binding</b>	48:22	36:22	<b>bridge</b>
141:7,24	127:9	109:17	160:10	37:9	155:23
167:11	137:12	<b>bit</b> 35:5	<b>borrow</b>	39:13	159:8,9
180:19	157:10	53:7,25	82:11	41:4	<b>bridges</b>
192:20	163:13	62:3	127:8	42:20	159:9
200:23	164:2,11	66:20	<b>borrowing</b>	43:10	<b>brief</b> 5:16
208:11	164:16	70:17	65:20	80:21	<b>bright</b>
<b>beyond</b>	164:18	71:23	<b>Bosch</b>	81:3	69:12
10:12	164:23	74:19	48:11	141:1	<b>broad</b>
31:16	170:15	91:11	53:12	172:13	149:3
139:2	179:19	94:24	202:22	172:21	<b>broken</b>
152:22	186:11	96:5	<b>both</b> 8:9	179:7,15	104:1
153:2,4	186:13	115:23	66:16,17	208:16	<b>brought</b>
170:9	190:21	143:18	67:4	212:3,8	23:21
209:9	200:6,13	169:19	78:3,4	214:13	24:3
<b>bias</b>	200:15	178:5	96:21,22	214:25	100:24
143:17	200:17	<b>bits</b> 44:1	102:18	215:9	<b>bruises</b>
<b>biasing</b>	200:24	<b>blink</b> 59:4	115:13	<b>BPS</b> 133:4	100:7
65:11	201:1,5	68:14	119:8,17	<b>bracketry</b>	<b>buckle</b>
<b>Bibb</b> 1:23	201:8,11	<b>blinking</b>	120:8	79:2	45:23
3:12	201:21	68:13	121:11	88:12,22	49:10

  
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 DEPOSITION SERVICES

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<b>Troy</b>	<b>Leasing</b>	<b>Grand Rapids</b>
248-244-9700	517-337-7337	616-456-6300
<b>Detroit</b>	<b>Ann Arbor</b>	<b>Kalamazoo</b>
313-961-5560	734-769-7808	616-552-4438

54:7	buying	83:20	120:23	135:21	31:11
128:8	126:11	98:14	121:2	136:9,11	carries
161:20	197:21	120:12	172:2	136:13	72:3
162:9	198:23	135:22	capabi...	138:13	Carrooso
179:2	busser	189:20	49:4,5	138:23	168:24
Budget 1:9	131:5,8	191:5	capable	142:9	carry 83:6
10:13	C	called	124:5	144:22	124:12
19:7,9	CI:13 2:9	25:14	capacitor	145:11	126:20
19:11	3:17,23	34:8,10	130:5,16	149:11	carry-...
22:22	48:24	37:4	130:18	149:11	82:1
25:15	83:21	44:3,4,8	134:8	151:3	cars 44:18
Buffalo	217:3,9	46:3,4,5	capacity	152:13	64:2
23:19	cabinets	46:12	58:14	152:14	74:17
build	18:17	54:12	captive	153:23	82:18
62:10	calculate	56:5	46:9	156:21	83:7
building	202:3	64:5	car 10:3	156:22	88:17
198:19	202:4,6	65:8	10:15,18	157:15	95:4
built	202:4,6	68:2	10:19	160:19	97:11,18
162:17	119:24	72:5	13:11	175:7,21	106:23
bumping	119:24	75:3	20:22	176:9,10	115:14
112:25	calculus	76:7	21:1	176:20	143:10
bunch	90:19	83:2,18	22:12	177:15	152:12
204:23	182:20	113:25	29:17	181:24	155:19
burden	86:6	114:9,10	33:24	189:23	174:21
80:15	Caldwell	114:13	44:7,7	191:9	192:24
103:12	1:23	118:5	56:12	197:25	194:19
buried	calendars	119:2	59:16	198:18	195:3
126:22	26:23	121:23	69:19	198:19	203:22
burn 178:7	calibr...	123:6	72:25	201:4,17	204:3,3
180:3	118:24	134:10	73:1,25	203:21	204:3
burner	123:9	139:4	80:12	204:12	car-to...
14:19	calibr...	165:22	84:8,21	206:14	93:13
business	71:15	193:1	85:17	207:24	140:18
5:5 12:6	83:25	196:9,15	86:19,22	208:13	140:21
16:19	88:25	calling	87:14,18	210:23	141:5
20:24	118:21	14:10	87:21,23	care 46:8	173:11
22:3	177:17	calls 18:7	94:8	73:3	case 1:7
25:12	Calife...	28:17	99:20	154:19	7:7,11
58:18	108:8	came 16:14	102:4,12	careful	7:13
98:15	call 6:18	19:8	103:11	38:25	8:10,24
busy 23:11	15:15	20:6	116:1	108:6	10:1
112:6	18:22	23:19	117:3	121:21	11:22
button	19:11	27:5	121:6	180:18	12:23
52:7	24:17	37:1,2,3	123:23	197:16	14:7
buy 72:25	39:19	37:10	123:24	carefully	15:4,14
115:25	44:5,6	40:14,24	124:5,11	212:16	16:4,17
116:25	56:16	54:23	127:23	carried	17:14,16
126:21	77:23	87:6	129:2,7	125:10	17:19
143:10		91:19	129:16	126:24	18:2,18
198:8		120:23	129:25	carriers	18:20,23

  
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 DEPOSITION SERVICES

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 313-961-5560

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 Ann Arbor  
 734-769-7808

Grand Rapids  
 616-456-6300  
 Kalamazoo  
 616-552-4438



19:1,4	91:4	causes	14:6	102:3	74:19,19
25:9	92:1,2,4	20:20	16:20	112:15	78:8
26:1	93:22	100:23	22:20	113:5	81:25
27:6	94:2	102:17	26:6,7	147:22	87:20,22
28:5	95:22	123:11	37:21	152:20	104:19
32:6	96:15,19	caution	38:12,18	153:25	104:21
33:13	97:11	105:18	43:5	155:8	123:2,2
35:8,22	98:4	caveats	46:22	156:1	123:5,8
36:22	99:18	107:1	50:12,20	166:13	123:13
37:14	100:15	CDW 73:24	59:13	171:24	123:18
39:6	100:18	center	62:8	174:24	123:24
42:17,19	101:22	1:24	71:25	175:8,14	172:10
65:4	103:1,5	61:25	86:25	175:16	194:24
86:17	103:20	80:6,7	114:16	175:24	195:3
88:14,21	104:22	80:24	119:16	183:8,15	changed
90:23	107:11	81:4,13	120:8,17	185:25	19:7,13
91:4,6	114:9,10	85:10	120:18	186:3	29:10
91:17,21	141:21	87:5	121:14	187:13	34:9,10
92:3	146:12	117:16	131:21	190:4	44:2
93:8,11	149:18	117:20	170:24	194:14	65:18
93:12,19	149:20	135:23	171:20	195:14	79:2
93:21	204:19	135:24	195:25	197:19	81:14
94:3	catant...	136:2	196:17	199:1	100:14
95:9	89:7	153:20	212:15	204:4	214:4
97:21,21	90:4	154:4,5	certainly	certainty	changes
101:3,9	153:10	154:20	7:4,17	144:16	14:13
101:12	159:1	155:24	11:1	CERTIF...	58:13,24
101:13	catago...	157:17	13:4	218:1	63:15
101:22	4:15,19	158:13	20:1,2	certif...	72:12
112:6,9	4:20	173:21	30:13,20	204:19	79:4
113:5	164:4	173:23	31:1,16	204:21	123:16
114:2	category	175:20	34:6	certified	123:24
120:16	73:22	176:5,11	35:9	2:2	124:1
128:8	100:23	176:14	36:3	212:18	173:4
142:15	197:5,9	183:9	38:2	218:3	change...
143:3	200:3	206:22	40:2	certify	217:6
161:17	caught	207:12	45:10	212:15	changing
184:18	110:10	209:17	48:3	217:3	14:25
185:9,23	cause	209:23	53:10,14	218:4,9	43:21
188:17	56:15	210:1,4	53:20	cetera	55:23
206:8	65:1,16	centers	57:13	163:1	58:13
210:11	65:24	44:6	58:7	change 6:2	chaos
210:15	112:13	central	60:20	9:7	49:21
210:25	123:12	50:13	61:7	39:21	character
212:23	173:2	80:24	62:12	41:7	38:12
cases	177:2	centra...	64:13	60:23	charac...
19:15	218:5	49:22	77:13	62:2	180:20
20:19	caused	CEO 52:15	81:25	65:1,7	185:5
31:20	158:2	certain	87:24	69:21	charac...
66:18	165:9	7:23	100:18	72:23	6:9

34:18	167:15	claims	75:12	colliding	168:16
45:12	181:18	15:15	88:5	181:24	173:2,22
54:7	Chemical	19:15	110:11	182:1	173:23
71:15	14:11,13	21:6	127:7	collision	174:3
72:11	chemistry	28:18	169:23	24:13	175:21
73:23	86:4	30:11,20	177:2	61:23	176:5,11
81:14	chest	98:7,18	closer	65:7	176:12
84:2	67:19	100:4,9	194:24	67:18	176:14
145:9	78:12	100:18	closing	89:19	176:16
178:23	Chicago	103:5	95:3	90:5,6	176:21
190:9	163:6	104:16	97:17	91:16	177:4,22
203:25	child 56:7	105:1,4	closure	92:5	177:22
charac...	56:15,16	clarify	90:8	93:6,23	177:25
31:17	56:17	34:1	91:8	93:24	183:9
charge	57:10	class	158:10	94:7,25	188:4,13
201:17	193:22	73:22	Cocoma	95:1,2	collis...
chart	193:23	classify	171:25	96:16	88:9,11
81:22	195:11	104:25	code 39:22	97:12	88:17,19
82:12,15	children	105:1	40:23	100:11	89:8
130:13	55:4	clean	54:16	103:7	95:23
133:25	56:12,19	48:22	68:9,23	106:6,24	106:22
charts	146:14	clear 25:3	73:12	108:3,22	108:15
52:12	choose	26:4	75:11	120:6,7	108:18
134:7	195:15	64:3,14	80:16	130:17	108:21
189:2	chose	81:20	coded	136:2	143:12
chassis	189:25	95:13	131:2	138:16	144:15
44:24	Christ...	98:10	codes 68:8	138:21	145:22
cheaper	168:24	102:14	69:1	138:23	147:12
115:25	circuit	127:16	75:7	139:12	147:12
116:2	32:4	136:4	185:6,9	141:11	147:14
cheap-o	67:9	190:25	185:14	141:14	148:5
115:22	68:6	191:2	185:16	144:12	152:2,22
115:25	95:18	clearly	collab...	144:17	153:10
check	96:11	171:25	190:3,12	145:7,14	column
16:10	circuitry	203:6	collar	147:19	45:14,18
60:19	45:20	211:11	79:21,23	147:24	46:20
119:14	circuits	clear...	collected	148:14	94:10
125:13	129:4	212:14	37:7	149:14	96:1
130:7	circum...	click 28:3	40:24	150:5	com 39:4,8
140:2,24	24:12	close 64:9	42:14	151:10	168:25
142:12	35:22	65:14	149:21	152:4	combin...
143:25	67:15	66:4,9	149:24	153:20	64:16
166:6,24	212:10	67:9	collec...	154:4,5	combined
179:2	claim	70:4	42:6	154:21	131:17
214:15	19:14	74:23	collec...	156:5	come 19:15
214:18	21:11	75:20	37:8,10	157:7	24:14
checking	98:20,21	195:12	48:13,20	158:14	27:4
130:10	108:1	closed	179:8,11	159:2	35:4
156:25	claimed	67:5	199:18	168:5,14	41:9
162:19	108:2	74:24	208:16	168:15	45:13

  
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 Ann Arbor  
 734-769-7808

Grand Rapids  
 616-456-6300  
 Kalamazoo  
 616-552-4438

68:10	<b>commit</b>	151:1,9	133:9	204:16	148:13
90:1	52:16	156:22	<b>comply</b>	204:17	148:21
92:1,20	<b>committed</b>	157:8,13	56:21	218:7	159:5,7
100:15	135:7	158:11	77:19	<b>computing</b>	160:15
104:5	137:2	158:17	<b>component</b>	58:14	165:24
121:3,11	<b>common</b>	159:17	46:9	59:7,14	167:14
155:7	96:3	159:23	54:10	114:17	173:25
172:16	155:14	190:5	105:2	117:22	176:2
193:20	155:15	191:19	191:13	<b>concept</b>	212:20
<b>cases</b>	<b>community</b>	192:25	192:6,6	54:17	212:21
49:22	9:11,14	195:1,22	212:1	<b>concepts</b>	<b>conducted</b>
50:16	30:22,24	<b>compare</b>	<b>compon...</b>	53:20	140:3
73:6	31:4	192:21	14:25	55:2	142:24
108:1	<b>companies</b>	<b>compar...</b>	34:20	<b>concern</b>	154:1
138:1	64:12	44:22	44:24	60:20	157:5
142:1	77:4	63:5	46:1,20	109:20	<b>confer...</b>
182:7,12	160:19	66:7,7	62:23	110:1,7	56:2
<b>comfort</b>	189:23	83:3,15	114:25	173:3,6	169:1
49:24	<b>company</b>	83:16	198:11	<b>concerned</b>	<b>confer...</b>
<b>confor...</b>	1:9 3:6	84:2	200:18	104:10	56:1,3
104:4	4:7,18	117:21	202:24	171:7	<b>confid...</b>
<b>coming</b>	5:8,12	169:6	212:18	<b>concer...</b>	48:4
26:21	15:1,17	203:15	<b>compress</b>	30:17	51:3
55:17	22:13	<b>compet...</b>	65:14	<b>concerns</b>	60:6,21
58:17	31:5	72:12,23	<b>computer</b>	60:16	76:2,18
77:17	32:10,17	<b>complain</b>	58:18	170:7	77:6
91:7,10	33:11	104:6	59:15	172:3,4	78:22
91:14	46:12,13	<b>complaint</b>	67:23	172:6,9	79:3
96:8	48:8	103:16	69:7,7	172:25	100:9
99:16	52:23	<b>compla...</b>	75:1	173:1	178:10
100:18	65:20	103:14	154:19	<b>conclu...</b>	180:21
117:23	101:15	<b>complete</b>	167:1	155:8	<b>confident</b>
183:4	103:16	39:3	174:15	<b>concurred</b>	164:20
194:15	104:25	89:24	175:1,9	190:10	<b>config...</b>
<b>command</b>	105:19	92:3,7	175:11	<b>condition</b>	102:21
180:2,3	105:25	218:8	175:13	138:20	<b>confirm</b>
<b>commands</b>	133:21	<b>completed</b>	175:16	<b>condit...</b>	26:14
179:24	139:22	110:11	175:19	45:10	182:9
<b>commen...</b>	140:10	112:8,10	175:19	<b>condit...</b>	<b>conflict</b>
1:15	141:13	<b>comple...</b>	175:25	60:25	27:3
<b>comment</b>	142:7,8	7:24	179:23	134:25	<b>conform</b>
169:25	144:20	106:4	189:11	135:3,6	9:16
170:25	145:11	<b>complex</b>	203:10	135:7,9	<b>confused</b>
<b>comments</b>	145:13	59:10,10	209:6	135:11	135:12
106:14	146:25	<b>compli...</b>	<b>computers</b>	136:11	<b>confusing</b>
<b>Commerce</b>	147:2,11	32:15	58:15	137:5	12:12
1:24,24	147:13	<b>compli...</b>	<b>comput...</b>	139:15	56:4
<b>Commis...</b>	147:15	66:12	44:14	142:25	<b>confusion</b>
217:14	149:1	91:11	62:5	146:15	14:22
218:17	150:1	<b>complied</b>	174:11	146:17	42:3

  
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734-769-7808

Grand Rapids  
616-456-6300  
Kalamazoo  
616-552-4438

100:2	88:5	170:17	55:8	153:18	143:8
200:23	171:17	170:22	58:21	Corpor...	146:22
conjun...	contacted	172:16	195:10	1:11	147:10
34:12	14:23	179:21	contro...	14:12	147:17
connected	20:6	183:22	218:11	correct	147:21
218:9	33:14	186:14	conver...	6:22	149:7
connector	contacts	190:22	5:16	16:5	161:8
92:20	64:23	192:18	6:21	17:7,18	165:6,8
93:3,9	65:15,16	199:16	35:19	19:4	168:12
connec...	74:24	201:12	conver...	21:2,4,5	170:2
92:9,11	75:14,16	202:1	5:13	22:4	172:8
92:12,14	95:6	203:19	32:7	25:8,24	173:15
92:21	contained	205:10	33:1	31:22	174:12
conser...	65:12	207:10	convol...	32:3	175:4
61:18,18	218:6	210:20	62:6	36:19	178:16
61:19	context	213:15	coordi...	39:3	179:25
76:2	6:20	213:23	29:18	50:19	180:1,7
consider	31:6	contin...	122:10	53:5,7	180:10
139:14	134:14	182:20	122:14	59:22,23	181:6,12
consid...	Contin...	183:21	coordi...	61:12,15	182:5,11
78:18	51:23	187:15	59:17	63:6,10	182:17
consid...	Contin...	contin...	copies	63:17,23	183:2
129:19	95:21	124:4	15:19	64:1,25	184:9,13
139:6	contin...	contort	17:25	67:1,2	187:3,10
190:13	112:14	123:17	18:7	69:10	189:6
Consis...	113:5	contract	24:21	73:15,17	191:23
216:17	continue	19:21,21	25:18	77:24	195:21
216:18	76:17	contra...	27:23,25	80:22	196:5
consis...	109:10	188:24	38:22	81:12	199:15
43:21	109:13	contra...	132:4	82:20	199:20
consol...	110:19	19:23	213:16	84:10,24	201:14
180:24	continued	contrary	copy 3:8	86:12	201:20
constant	18:19	98:3	10:12	90:3	201:21
60:24	76:16	control	13:5	91:20	203:3
constr...	contin...	4:18	15:23,25	95:5,8	207:18
44:19	7:14	13:15	25:1	112:4	208:7,10
consul...	37:22	34:5	27:6	113:18	211:1
25:22	42:15	54:12	32:20	117:24	214:12
consumer	43:17	113:3	186:18	117:25	corrected
9:13	47:9	114:1	207:9	120:9,15	9:3
116:23	56:3	196:14	213:17	120:21	corres...
consumers	108:12	contro...	213:18	122:23	42:13
31:8	113:15	62:8,16	213:19	124:3	corres...
contact	124:22	65:14	corner	129:21	26:11,13
29:18,20	127:14	77:5	126:11	129:22	27:5,12
45:13	133:15	contro...	159:8	131:23	28:9
64:9	137:16	27:2	corporate	132:1	corres...
65:2	137:21	controls	7:8	136:3	205:8
74:24	157:11	45:16,16	30:21	138:10	209:19
75:12	165:1	54:18	142:6	138:12	corrode



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Grand Rapids  
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Kalamazoo  
616-552-4438

65:24	197:15	110:5	59:8	166:21	8:8
corrosion	197:16	114:5	60:2,11	171:17	cross-...
65:23	197:18	129:25	62:17	175:17	204:5
cost 49:6	197:22	208:25	63:1	175:20	Crown
115:23	197:22	213:16	64:8,17	186:23	82:22
116:3,4	198:5,6	214:2	65:25	188:23	CRTS
116:11	198:9,11	course	66:8,16	189:2,3	204:22
116:14	198:17	14:7	68:10	189:4,10	205:3,4
116:20	199:21	16:19	71:10,14	189:14	crush 62:8
191:16	200:8,9	20:24	74:5,6	189:16	62:25
191:19	201:3	22:3	74:23	203:11	66:3
191:24	counsel	35:23	78:3	205:1,2	87:19
192:2,3	14:20	39:1	79:11,12	205:3	88:4
192:6,11	15:16	97:25	79:14	208:19	91:11
192:16	16:1,23	110:6	80:1,13	210:5,9	141:7
192:17	16:25	130:17	80:25	210:10	145:8
196:9,17	18:2	157:16	81:7,10	210:14	153:21
197:6,9	24:16	Court 1:1	82:24	210:21	169:12
197:11	25:11	109:19	83:9	crashed	169:23
197:25	26:12	110:1,3	84:7,14	157:14	170:18
198:16	27:8,15	110:7,9	84:20	crashes	191:3
198:17	27:24	110:22	85:3,7	9:12	209:3
198:21	29:1,2	cover	90:14	60:17	crushable
198:22	36:8,13	200:24	114:21	172:4	62:17
198:22	36:16	213:13	118:24	crashing	crashed
199:10	109:1,10	covered	119:5	66:2,23	62:25
199:13	216:10	95:16	121:15	141:11	crashing
199:16	Counsel's	163:9	122:2	created	87:15
199:19	15:14,19	164:7	127:5	162:25	88:1
200:4,5	16:8	covers	133:5	credits	91:18
200:6,7	17:6,20	194:3	134:10	70:22	CSR-6110
200:11	17:24	198:19	134:12	criteria	2:2
200:20	18:12	cowell	134:16	50:10	218:16
200:22	19:3	83:19	137:24	54:24	curiosity
200:24	25:17,19	Co-Cou...	139:5	55:25	152:5
201:1,2	28:23	1:17	140:11	56:22,24	curious
201:16	count 5:2	co-wor...	140:11	78:10,12	204:22
201:17	counted	5:20	140:16	78:13,14	current
201:22	81:3	cram 62:20	140:17	144:6	6:4
202:2,6	County	crash 8:18	140:18	145:18	currently
costly	217:13	13:6,20	140:20	153:7	5:21,24
152:6	218:2,17	16:21	141:3	160:15	curve
costs	couple	23:20	142:7	195:7,9	168:7
47:14	26:20	24:11	145:15	195:14	185:22
58:8	42:9	41:22	149:16	195:18	186:3
111:4	84:11	42:25	154:16	204:1	187:8,11
116:20	89:23	43:4	157:1,20	critical	187:19
116:22	95:22	44:12,17	158:23	171:19	188:13
116:22	100:22	44:24	162:5,10	177:18	curves
191:15	103:3	56:2	166:15	crossing	43:3

  
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248-244-9700	517-337-7337	616-456-6300
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313-961-5560	734-769-7808	616-552-4438

120:3	207:16	140:2	30:8	1:6	178:14
cushion	208:9	153:14	dead 62:15	decele...	179:7
45:4	data 24:6	189:20	155:24	120:8	181:1,2
customer	24:8,9	date 12:15	deadline	decele...	182:13
160:3	24:10,13	12:16	109:18	123:23	182:19
cut 89:9	25:1	23:9,12	109:21	decele...	182:25
89:13,25	68:24	26:24,25	109:25	65:8	183:5
90:4,6	108:7	82:6,12	110:23	66:4	decisi...
90:10,18	121:10	109:18	deal 4:25	69:6	52:5,6
90:19,24	140:24	110:19	6:6 7:5	78:12	decisions
91:19	141:17	110:20	21:22	88:1	47:12
93:14	145:2	110:21	29:1	119:5,5	49:23
94:8	149:22	110:21	30:1	122:20	53:18
95:2	166:15	110:22	37:9	122:25	59:6
97:19,20	166:16	112:5,7	44:11	123:4	117:23
171:18	170:7	112:25	45:9,11	168:18	178:8
171:22	178:23	161:22	45:20,22	168:19	179:6,24
173:23	180:11	164:1	51:16	184:25	decisi...
195:10	180:12	194:24	64:12	185:5,15	180:15
outoff	180:18	216:14	65:19	185:22	decoder
111:16	181:8,17	dated 3:6	86:18	185:24	127:11
111:23	182:3,4	196:24	98:24	186:25	decreases
112:5	182:4,7	dates	118:8	187:4	141:8
113:11	182:12	16:15	121:15	209:20	defama...
113:12	182:13	26:18	172:4	December	106:17
cycle 73:4	182:18	27:3	198:25	5:9	defect
82:3	183:16	82:6	dealing	decide	95:7
cycles	183:19	105:4,4	4:7	99:9	Defend...
68:16,21	183:25	111:24	20:25	178:17	1:12,22
C-class	185:2,2	111:25	21:20	decided	defense
73:25	186:4,6	112:7	25:23	14:20	106:10
	186:7,8	132:18	26:10	23:9,11	defer
	186:9,19	Dave	29:3,16	43:24	149:21
	187:7,9	168:23	30:10,11	50:6	define
D 2:7	197:3	169:1	32:5	decision	118:16
73:13,14	203:16	190:21	43:19	24:22	defined
73:22	205:11	190:23	53:3	37:12	54:25
191:9	database	190:23	60:15	49:3	defining
dah-da...	142:12	190:23	87:17	52:17	208:16
28:2	142:13	Dave's	93:11	59:2	deflect
daily	153:9	168:24	98:18	67:25	64:9
28:15	157:19	day 112:11	99:18	69:8	degree
damage	189:15	216:15	Dearborn	75:25	8:22
177:2,9	189:15	217:11	23:6	118:1	53:23
dampered	189:16	218:13	24:4	166:13	55:8
64:11	189:18	days 62:11	36:16,20	166:14	86:4
dampering	189:21	64:7	death 1:5	168:1	178:9
65:13	189:22	119:2	144:6,10	169:9	180:21
Darwinism	189:24	139:6	146:7	177:23	degrees
57:21	databases	day-to...	deceased	178:12	61:25
dash					

  
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 248-244-9700  
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Lansing  
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 Kalamazoo  
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85:8	193:6	99:22	113:22	7:7	183:20
delay	199:23	DEPOSIT	design	design...	destro...
76:14	depends	217:1	5:24 6:1	41:3	173:6
delays	41:23	deposi...	7:22 9:7	72:8	destru...
50:2	75:3	1:13	9:10	113:23	14:1,16
Delco	101:20	2:16 3:5	15:6	161:1	detail
171:10	117:7	3:15 4:9	30:9,23	design...	43:13
171:11	135:6	4:22	31:19	74:2	212:10
171:13	137:18	5:10 7:1	33:15,22	designed	details
171:25	148:21	7:4 9:25	35:12	43:23	11:19
190:17	159:7	95:20	43:19	47:5	19:22
198:10	176:12	96:25	45:6	62:7	160:6,8
202:22	184:2	109:9,11	47:15,19	73:25	164:5
decline...	deploy	109:13	48:15	124:11	detect
107:21	67:19	109:23	51:18	137:24	122:20
delta	89:8,13	110:4,12	52:1	146:9,9	122:24
104:19	90:11	110:15	53:21	146:19	123:4
105:1,10	94:10	110:19	62:5	147:1,11	detected
107:21	101:2	110:21	72:2,10	147:20	131:9,25
108:9	103:6,17	110:25	73:8,24	159:24	detecting
demoli...	103:22	111:1,2	88:9	160:23	182:2
88:11	106:22	111:7,8	116:4	designee	determ...
demoted	119:16	111:9,10	119:7	4:9 7:15	105:7,20
38:14,16	133:6	111:12	123:14	153:19	107:15
depart...	137:1,24	111:20	125:21	designing	107:21
5:25 6:1	138:5,9	112:8,9	126:15	153:25	determine
19:19	138:11	112:13	127:24	195:16	13:16
33:17	138:16	172:17	129:24	designs	20:20
40:24	145:14	216:10	143:2	202:23	31:13
depart...	145:17	216:13	145:19	203:8	78:6
43:23	147:20	216:16	146:4,17	desire	104:22
depending	147:23	216:22	146:22	48:16	105:2,3
30:13	148:4	217:4,5	148:2,7	desired	105:3
36:17	159:14	218:4,7	148:11	169:6	122:1,2
52:10	159:17	dpower	148:19	destroy	141:22
58:24	168:8	55:3	148:20	154:6,11	142:23
59:5	deployed	56:8	148:25	154:21	143:25
66:1	105:16	describe	149:5	156:17	154:11
67:18	168:2	134:16	158:16	176:5,18	154:20
68:3	deploying	described	159:20	destroyed	161:12
75:6	100:25	93:3,8	164:5	88:4,19	174:7,13
82:20	deploy...	108:4	171:23	88:23	175:20
87:22	119:9	136:15	172:11	89:20,23	175:25
114:12	120:20	138:4,15	172:23	100:16	178:18
116:7	120:23	149:15	173:3,9	171:19	178:23
137:5	121:2,11	150:2	202:21	171:21	181:18
143:21	121:25	185:7	204:16	173:3,23	185:20
148:13	169:9	200:7	204:17	175:22	187:24
158:2	deploy...	206:11	212:22	176:23	193:22
167:8	89:2	descri...	design...	177:8	determ...

  
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 REPOSITION SERVICES

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4:23	49:12	46:20,21	195:18	189:18	160:21
147:2	55:21	48:12	202:19	218:11	172:10
162:9	159:10	49:9	202:23	<b>disable</b>	<b>discus...</b>
185:13	<b>diagno...</b>	54:7,18	203:9,15	54:15	23:22
197:14	75:3,4	55:3	203:24	68:4,6,7	211:10
216:14	130:16	57:3,12	204:1,2	75:5	216:9
<b>determ...</b>	134:2,9	59:13	204:3,4	153:22	<b>discus...</b>
69:6	<b>diagram</b>	62:13	204:15	154:16	14:19
105:5	95:17	63:22	205:15	<b>disabled</b>	69:12
130:21	162:4	64:5,10	205:15	54:15	106:1
166:8,11	206:23	68:2	205:16	103:25	109:2
177:18	<b>diagrams</b>	69:2,15	205:23	<b>disabling</b>	112:2
<b>detona...</b>	117:2,3	70:7,17	206:1,9	69:2	170:20
67:10	<b>dis</b> 130:19	71:15	206:10	<b>discarded</b>	170:23
<b>Detroit</b>	144:17	72:1,13	207:20	28:1	210:19
111:3	146:21	73:8,8,8	210:23	<b>disclo...</b>	215:3
<b>develop</b>	147:3,14	74:1	211:9	41:15	216:8,18
48:1	<b>differ...</b>	76:4	<b>differ...</b>	<b>discon...</b>	<b>discus...</b>
54:1	105:10	77:14	118:24	130:25	33:9
192:23	105:13	79:24	145:4	<b>discount</b>	173:7
210:10	105:14	80:8	<b>differ...</b>	44:25	216:17
<b>developed</b>	105:15	81:22	195:8	<b>discovery</b>	<b>displa...</b>
162:13	115:9,23	82:23	<b>difficult</b>	4:24	209:5,10
175:16	118:16	83:1	14:1	6:25	<b>dissec...</b>
<b>develo...</b>	145:20	87:13	48:1	7:10	135:21
48:5	191:18	96:1,21	65:19	8:14	<b>distance</b>
51:12,15	192:4,20	99:20,20	144:18	16:22	65:11
54:4	195:19	108:15	146:4	17:4	<b>distances</b>
55:14,19	199:21	115:3,5	155:17	37:15	127:10
142:15	208:11	115:14	163:4	102:4,7	<b>distin...</b>
142:22	<b>differ...</b>	115:16	164:12	109:18	180:19
143:2	44:18,19	117:4	169:20	109:21	<b>distor...</b>
157:4,25	115:19	118:21	199:6	109:24	123:15
158:16	<b>diferent</b>	122:19	<b>digits</b>	110:11	<b>DISTRICT</b>
165:3	6:2 7:18	126:5	38:18	110:23	1:1,2
174:7,8	7:24	127:20	<b>dimens...</b>	111:16	<b>divided</b>
175:12	11:20	130:4	86:15	111:23	79:16
202:21	14:24	131:2	<b>direct</b>	113:11	80:2
203:7,9	18:5,18	132:17	129:23	113:12	<b>division</b>
204:12	23:14,15	135:11	177:1,6	<b>discri...</b>	1:3 34:4
204:18	28:21	137:2,4	<b>direction</b>	133:5	46:7
205:11	29:20	141:5	35:10	<b>discuss</b>	<b>divisions</b>
205:17	31:18,20	152:1,2	85:13,16	151:14	46:9
206:3	34:2,2	156:2,11	<b>direct...</b>	153:19	<b>DN</b> 73:6,16
211:5	34:20,23	159:4,5	91:15	164:13	73:19
<b>device</b>	34:23	163:4	<b>directly</b>	172:16	74:10
13:22	35:3	165:21	136:12	<b>discussed</b>	170:1,1
39:20,21	36:3,18	169:19	136:25	36:2	170:25
68:1	44:10	180:4	148:24	109:10	191:9
<b>devices</b>	45:3	190:16	173:18	155:1	<b>DNS</b> 72:6

  
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49:18	28:7	212:6,8	8:12	43:22	68:3
50:4	36:21	215:11	10:17,25	48:21	132:10
58:21	37:9,14	215:14	11:13	60:7	191:1
129:12	37:15	216:1,11	14:4,6	71:4	213:5
<b>document</b>	39:13,23	<b>doing 9:8</b>	16:3	80:16	214:24
36:5	40:3,17	11:11	17:18	83:5,18	<b>drive 1:14</b>
37:8	41:4,23	12:20	18:3	83:19,20	56:19
40:4,23	41:24	14:1,7	20:18	83:22	117:18
41:9	42:6,19	16:2	28:11	92:7	<b>driver</b>
52:9	47:21	20:22,23	30:4,6	94:4,24	46:16
79:5	48:10,13	21:11,20	47:2	102:13	75:8
82:8	50:11,20	22:5	92:10	108:21	95:24
132:2,3	51:10	25:12,12	99:15	174:23	117:10
133:20	52:15,18	26:22	113:10	<b>download</b>	126:25
148:22	52:19	29:12,16	138:25	23:7	135:4
161:17	53:1	29:18	139:5	24:15	<b>driver's</b>
161:23	54:1	30:1,22	140:19	<b>downlo...</b>	45:15
161:24	57:10	30:22	140:22	8:20	57:6
162:6	71:21	32:11	142:21	24:5	87:4
163:23	72:5	35:10,19	151:5	35:13	95:15
163:24	113:22	35:20	154:18	<b>dozen</b>	96:2,5,6
164:1	114:10	39:6	154:24	214:2	128:9
170:15	116:3,7	42:7	155:7	<b>Dr 4:2</b>	137:7
171:9,23	116:16	43:24	175:6,9	<b>draft</b>	<b>driver...</b>
184:3,15	118:13	77:10	175:17	213:17	70:20,22
191:3	125:13	98:25	175:20	213:18	71:8,9
192:8	126:17	99:1,2	175:25	214:6	74:4
193:7	128:5	107:16	177:17	<b>draw 69:12</b>	77:5
196:23	130:3,7	112:13	191:16	<b>drawing</b>	<b>drive-...</b>
203:5,6	130:10	126:3	204:14	117:3	122:2
204:22	152:25	139:11	215:14	132:9,12	<b>driving</b>
205:14	153:6	141:14	<b>Donelson</b>	132:14	138:3
208:15	154:24	155:11	1:23	132:15	<b>drop 77:22</b>
214:9	155:3	174:19	<b>dodling</b>	132:16	<b>dropped</b>
215:13	159:22	174:24	154:19	132:21	73:12
<b>documents</b>	160:21	174:25	<b>doofus</b>	132:22	74:7
4:25 5:1	163:21	195:14	106:7	133:12	140:7
5:4,5	172:13	202:9	<b>Dora 2:2</b>	133:13	<b>Drummond</b>
6:12,18	172:14	203:20	217:13	212:2,3	33:15
6:25 7:9	179:5,7	210:13	218:3,16	213:2,3	34:16
7:20	179:9,15	211:16	<b>dot 39:4,8</b>	214:3,3	35:6,24
8:14	185:8	<b>Doletsky</b>	168:25	214:18	<b>dual 8:7</b>
9:24	190:15	2:2	<b>doubled</b>	214:19	74:8
10:2,20	192:1,16	217:13	199:3	214:20	128:10
13:3	193:2	218:3,16	<b>down 12:14</b>	214:21	128:10
15:7,13	197:13	<b>dollars</b>	14:1	214:22	164:10
16:20	199:5,24	47:15	17:1	214:23	164:22
17:13	200:2	152:12	19:17	215:5,6	<b>dual-bag</b>
21:15	202:14	<b>done 7:1</b>	20:22	<b>drawings</b>	51:23
26:2	203:1	7:11 8:9	21:7	16:20	71:5

  
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616-456-6300  
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<b>dual-p...</b>	3:17	<b>easier</b>	110:21	50:4	205:12
163:1	171:10	30:3	111:6,21	51:13	206:13
172:7	<b>each</b> 36:5	181:18	113:7,11	53:8	<b>endeavor</b>
<b>dual-s...</b>	43:4,9	<b>easiest</b>	131:9,10	54:5	201:8,25
172:7	43:13	118:20	142:9	57:18	<b>ended</b>
<b>dual-s...</b>	54:10	<b>easy</b> 37:20	147:6	63:9,10	14:11
54:8,20	74:1	<b>econoline</b>	158:17	63:21	38:19
59:12	78:23	53:9	161:10	69:4,13	46:12
133:6	87:5,11	<b>economic</b>	218:10	69:18	<b>ends</b> 80:5
137:19	87:13	29:10	<b>ELD</b> 46:4,5	93:6	110:23
<b>due</b> 24:12	88:2	<b>economics</b>	<b>elderly</b>	95:11	<b>energy</b>
167:6	114:20	198:3	146:14	114:6	45:12
169:4	128:6	<b>ECS</b> 196:9	<b>electric</b>	118:22	62:23
<b>duly</b> 3:18	141:21	196:13	92:21	192:23	147:18
218:5	166:24	<b>edge</b> 83:2	123:6	196:14	169:6
<b>dummies</b>	191:13	83:19,22	171:25	<b>electr...</b>	<b>engine</b>
55:13,15	213:17	136:7	<b>electr...</b>	53:17	46:10
55:16,19	<b>earlier</b>	<b>educated</b>	33:20	118:20	62:20
55:24	134:1	4:19	65:2	<b>electr...</b>	66:7
143:12	152:17	<b>education</b>	66:24	33:15,23	83:2,6
195:8,18	152:21	56:18	67:1	33:24	83:16,24
<b>dummy</b>	181:2	101:24	92:11	34:4,17	84:3,5,9
160:15	213:1,7	106:4	102:23	45:25	84:15,23
209:11	216:17	<b>effect...</b>	<b>electro</b>	46:3,4,7	125:19
<b>duplic...</b>	<b>early</b> 8:19	78:6	93:5	53:18	167:13
25:16	37:6	<b>effort</b>	<b>electr...</b>	68:19	203:15
<b>during</b>	64:7	22:6	53:15	<b>elimin...</b>	<b>engineer</b>
9:12	70:1	46:22	57:16	80:7	5:7,22
21:17	71:16	165:5	63:7,19	<b>employed</b>	5:23,24
39:5	98:8	190:3,12	63:25	5:21 9:9	30:9,10
55:23	99:19	192:22	64:2,17	9:20	35:12
62:13	100:12	<b>eight</b>	64:19	29:13	133:21
71:12	100:13	72:11	66:22	<b>employee</b>	173:16
109:9	103:19	115:6	67:23	5:8 16:3	<b>engine...</b>
126:12	104:16	176:15	69:14	16:4,6	7:21
130:17	119:25	<b>eight-...</b>	71:9	21:7	<b>engine...</b>
188:3	138:25	158:24	73:7	23:19	5:4 6:1
206:15	139:7	158:25	74:16	218:10	9:4,11
<b>DW</b> 161:16	161:22	<b>eight-...</b>	77:7	<b>employees</b>	9:14
<b>dwell</b> 67:3	165:3	124:14	84:6,25	5:11	23:7
67:6	166:14	128:1,3	88:10	<b>end</b> 8:8	30:24
95:18	166:14	<b>either</b>	89:17	38:20	31:3,13
96:11	166:20	15:15	93:5	79:16	31:22
<b>D186</b>	178:9	56:8	95:12	80:2,6	33:18,23
113:17	180:13	66:6	191:17	103:7	34:8,10
127:4	180:18	74:23	191:25	109:12	34:15
161:1,4	180:20	85:9	<b>electron</b>	118:25	41:23
	194:17	93:4	92:18	167:13	44:3,8
	<b>early-...</b>	98:20	<b>electr...</b>	187:15	44:15
<b>E2:7</b> 3:17	163:24	99:22	28:4,14	201:18	46:3



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47:2	108:17	European	events	17:18	10:15,18
48:10	141:9,25	126:2	153:10	47:5	examining
49:5	142:1	161:11	155:17	50:9	10:19
50:13	158:4	161:16	166:1	57:20	example
88:14	erased	162:16	170:4	67:17	16:13
132:6,7	187:17	162:25	171:17	88:6	40:6
133:20	escalated	163:11	eventu...	157:19	42:25
202:19	19:15	evaluate	15:23	175:5	64:24
engineers	26:8	22:21	35:1	187:17	66:17
65:10	ESI 169:22	evalua...	77:4	197:1	67:6
86:16	169:24	24:2	187:6	evidence	73:24
150:2,17	170:1,11	206:9	ever 4:9	12:25	130:24
150:18	170:13	even 24:20	40:13	22:20	204:2
153:18	170:14	37:3	71:1	128:25	examples
enhancing	170:18	44:24	84:25	154:10	51:11
95:18	170:25	49:10	85:1	156:20	exception
96:11	171:15	52:6	88:3,5	evolution	112:3
enough	171:16	55:18	89:18	55:23	217:6
12:21	especi...	56:11,11	91:4,23	evolut...	excess
43:13	102:25	56:17	92:4	57:25	142:10
65:15	103:19	58:9	93:4	60:13	excess...
67:3,4,9	104:16	64:7	104:7	evolut...	61:18
91:1	104:17	70:22	151:2,9	69:2	excuse
120:1	110:8	88:22	151:14	evolved	96:22
128:21	155:13	103:3	151:21	55:24	100:20
136:17	essent...	104:20	152:3,12	68:24	exercise
153:24	49:25	105:9,20	153:12	69:20	152:17
167:20	65:6	115:1,4	153:19	evolves	exhaus...
167:23	82:20	116:13	154:4,18	61:14	92:24
168:17	146:22	117:17	155:1	exactly	exhibit
168:18	196:5	145:15	156:14	87:2	2:16 3:8
182:7,8	establish	146:11	156:16	116:23	3:15
183:6	22:21	146:16	157:8,14	123:20	4:14
Earon	92:24	152:19	160:21	148:15	40:7
38:23	establ...	158:13	161:13	149:12	95:17
entar	55:25	163:16	186:18	181:10	190:17
44:24	estimate	176:20	192:15	182:20	EXHIBITS
entire	199:23	180:13	204:15	190:25	2:15
42:20	200:1	event	every	191:2	exist
97:10	ESV 139:1	75:10	72:22	192:3,5	129:12
148:25	151:5	110:7,9	105:11	192:16	existing
enviro...	ESVs 145:5	119:22	184:7	195:7	195:2
104:9	et 163:1	121:16	everybody	212:1	exited
epidemic	Europe	131:9	12:10	Exam...	95:20
106:2	161:14	155:9,14	23:11	2:10	exotic
equipment	162:23	167:16	59:23	3:20	65:18
198:8	163:17	181:15	64:12	examine	expanded
equiva...	163:24	181:19	104:10	19:17	99:20
89:3	164:3,9	187:15	everyt...	examined	expect
91:9,15	164:19	188:4	11:21	3:18	107:7



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734-769-7808

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Kalamazoo  
616-552-4438

133:22	204:6	eye 59:4	fail 177:3	fastar	56:21
143:19	expert's	E-mail	failed	151:9,21	61:24
147:25	8:1,2	38:8,11	93:7,25	fastest	77:19
174:17	37:16	38:11,19	94:25	156:21	136:15
186:4	expires	38:22	95:6	fatal	194:2,18
187:8	217:14	39:6	97:13	147:19	195:24
214:9,24	218:17	171:19	100:10	fatality	196:3
expect...	explain	E-mails	103:6	139:13	feds
72:24	9:1	27:10,10	106:22	146:10	194:12
130:11	119:19	27:11,12	failure	fatally	feedback
expected	144:19	27:13,20	21:22,23	145:21	9:3
99:23	explained	27:23,25	100:25	fault	30:24
Expedi...	73:5	28:9	101:1	54:16	31:3
203:23	93:12	32:19	155:4,11	68:8,9	34:18
204:7	101:8	38:24	170:9	68:23	53:16
expensive	148:10	171:25	failures	69:1	54:6,18
72:19	explan...	F	170:4	75:7,10	55:8,23
117:1	105:18	facili...	171:1	130:21	57:4
152:10	134:19	23:7	familiar	131:10	58:25
experi...	188:17	189:1	11:19	131:19	60:24
54:1	export	facility	79:7	185:6,9	75:7
57:24	161:12	10:14	132:3	185:14	193:9
76:9	161:16	22:23	150:19	185:16	195:10
77:9	162:17	24:4	210:6	faults	feeding
79:3	exported	71:2	families	131:22	119:23
107:24	162:19	189:10	70:7	faulty	feel 94:21
108:25	162:20	189:12	family	155:5,12	104:4
146:20	164:3	fact 6:17	70:6,12	155:13	164:19
146:24	exporting	41:14	72:25	favor	follow
160:17	161:13	55:16	74:17	179:12	33:3,14
experi...	expressed	59:25	far 5:3	fax 15:23	felt 78:21
59:14	173:1	96:20	6:24 7:3	faxed	139:8
61:11,13	extended	155:19	10:1	10:12	female
expert 7:8	113:11	156:3	17:2	feasible	55:10
7:15,17	extension	165:21	67:20	129:20	92:12,20
8:10	112:25	169:7	94:5	129:20	195:12
12:2,3	extensive	171:20	104:23	features	fear
25:22	12:13,18	188:25	105:4	160:22	78:13
37:21	12:21	factor	112:21	federal	fender
106:9,14	external	122:1	113:9	9:17	82:25
109:24	11:7	139:25	118:18	19:23	83:5
110:12	127:6	factorn	139:22	20:12,15	fender...
110:21	extract	116:24	168:3	21:9	89:11
111:10	24:7	139:14	175:16	24:1	few 5:13
111:20	extracted	145:10	fast 90:19	27:1	32:4
112:9	24:9	153:6,7	151:3	29:17,24	64:15
142:14	extremely	facts	153:23	30:11	88:11
216:15	91:22	31:14	181:25	38:4	89:7,12
expertise	ex-police	35:21	fastened	54:24	92:6
31:21	22:14		57:5	55:2	126:12

  
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174:23	25:19,21	95:22	212:11	108:9	<b>FMVSS</b>
<b>few-mi...</b>	26:8,10	97:24	212:21	117:5	70:21
43:14	26:12	104:6,7	<b>fired</b>	175:10	78:14
<b>field</b> 9:16	27:8,15	163:7,8	128:6	<b>five-s...</b>	160:14
9:7 20:4	27:24	164:11	178:19	60:2,7	176:2
27:18	28:23	199:6	181:7	71:7,9	<b>focusing</b>
61:21	36:8,10	203:2	<b>fires</b>	77:20	169:12
76:20	36:16	214:20	181:4	78:24	<b>folder</b>
78:3	37:23,23	215:9,18	<b>firing</b>	82:17,17	18:20,25
79:3	39:24	<b>fine</b> 10:9	54:19	83:7	<b>folders</b>
99:7,7	41:9	55:25	128:21	84:6	18:17
<b>figure</b>	<b>filed</b> 9:20	62:4	129:3	<b>five-star</b>	<b>folks</b> 14:3
41:2	17:4	105:24	181:4,11	160:5	32:21
67:14	19:8,14	105:24	181:15	<b>fixed</b>	<b>follow</b>
127:12	21:3,18	126:22	181:15	197:16	40:6,8
141:24	21:19	175:11	188:5	197:22	73:1
143:9	22:1,5	204:17	<b>firm</b> 49:19	198:2,9	79:23
151:6	25:25	<b>finish</b>	<b>first</b> 3:18	201:1,13	101:19
170:13	26:3	109:15	9:18	202:2	<b>followed</b>
175:2	32:5	109:17	11:4	<b>flat</b>	182:3
180:25	101:1	110:15	20:3	136:20	<b>following</b>
198:3	<b>files</b> 18:5	111:9	37:5	138:4,14	211:25
201:17	25:9,21	112:10	38:10	<b>fleet</b> 1:10	<b>follows</b>
<b>figured</b>	26:5	112:17	53:4,9	70:9	3:19
62:22	28:4	216:2	60:1	76:22,25	73:9
67:14	36:18	<b>fire</b> 75:10	68:5	77:5	110:14
<b>file</b> 11:22	<b>fill</b> 67:11	89:1,20	70:8,19	94:3,14	<b>food</b> 20:9
12:2,4	<b>final</b>	91:19	94:22	94:19	<b>foot</b> 55:10
12:10	163:2	130:18	96:23	96:24	56:24
13:3,8,9	213:19	157:9	99:15	99:5,6	<b>force</b>
15:9,11	214:7,11	166:17	138:8	<b>fleets</b>	65:11
15:11,14	214:13	177:19	176:23	94:16	87:10
15:19	214:16	178:12	178:12	<b>flights</b>	<b>Ford</b> 1:9
16:7,8,9	215:10	178:14	178:14	109:16	3:6 4:7
16:10,12	<b>finally</b>	178:17	182:7	110:17	4:18 5:8
17:6,9	49:3	178:24	183:23	<b>flips</b>	5:9,12
17:11,15	60:8	179:4	209:25	92:15	5:21,22
17:20,23	76:18,21	180:2,9	218:5	<b>floor</b>	9:10,21
17:24	162:13	180:19	<b>fit</b> 210:3	72:19	11:7,8
18:2,4	<b>final-end</b>	181:1,2	<b>fits</b> 73:22	117:19	11:24
18:12,16	199:5	181:5	79:20	165:20	13:8,9
18:17,17	<b>finance</b>	182:8,9	<b>five</b> 55:10	208:2,3	13:23
18:20,25	47:12	182:10	56:24	208:8	15:9,11
19:3,11	48:7	182:14	60:22	<b>Florida</b>	15:11
19:12	<b>financ...</b>	182:25	61:19,20	26:20	16:3,4,6
20:13	218:11	182:25	74:4	<b>flush</b> 51:5	17:5,13
21:11	<b>FINANCING</b>	183:5,11	75:23	<b>Fly</b> 108:8	17:15,19
24:15,16	1:10	183:12	78:6,21	<b>Flynn</b> 1:14	18:12,14
25:10,14	<b>find</b> 22:6	183:16	80:10,11	<b>FMVSS</b>	18:18
25:15,17	41:8	188:14	80:21	143:16	19:23



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20:12,24	104:25	158:11	14:2	116:5	13:15
21:7	106:5,6	158:12	23:11,24	212:7	14:14
22:3,6	106:7,21	158:17	23:25	four 60:8	15:24
24:16	106:23	159:17	26:9	60:22	17:13,23
25:11,22	108:23	159:23	27:20	61:5	18:11
25:25	110:3	160:17	36:2	74:7	19:2
26:10	113:16	161:7,17	39:22	75:24	23:19
27:14	114:18	163:11	43:3	78:7	24:7,9
28:25	120:16	165:10	44:22	80:22,24	24:11
29:10,11	124:16	171:12	48:24	83:8	26:17,19
29:12,12	124:16	172:22	51:18	105:13	29:21
29:13,15	124:20	172:25	53:23	105:14	31:22
29:18,22	125:5,9	173:1	55:13	117:5	34:18
30:8,14	126:15	175:6	58:17	128:11	37:1,3
32:6,10	126:20	176:15	92:10	fourth	37:10,17
33:11,12	126:21	179:18	123:7	22:19	40:25
34:4	126:21	188:23	129:13	four-loop	41:9
35:22	126:22	189:22	132:19	128:6	44:2
38:8	126:23	189:24	135:10	four-s...	47:6
39:4,8	133:21	190:1,5	135:11	71:13,17	48:23
43:19	133:22	190:11	136:16	77:21	51:14
46:1,3,9	135:4	192:7,24	139:16	78:24	53:1,25
46:13,23	136:11	192:25	145:3	84:13	54:6
51:19	138:3,22	195:1,22	160:8	87:18	58:1
52:3	139:22	197:7,10	174:12	frame 44:4	59:16
53:4	140:10	197:12	174:12	44:19	60:15
57:14	140:19	199:11	193:24	47:22	61:25
58:6	140:22	200:10	198:9	71:5	65:11,20
63:8,13	141:13	200:12	203:12	94:12	68:25
64:14	142:6,8	203:23	207:6	97:9	71:19
69:19	143:10	204:7	214:5	139:8	72:2
74:2	144:2,20	208:12	forward	151:6	74:13,17
77:25	145:11	208:23	23:16	152:21	75:23
81:23	145:13	210:12	26:25	165:18	76:4
82:22	146:25	210:24	39:22	199:24	77:20
83:7	147:2,11	211:9	65:1	frames	78:24
84:13,17	147:13	Ford's	66:3	109:15	79:24
84:25	147:15	13:9	75:11	frankly	80:3
85:3	148:23	18:14	79:20	107:20	83:4
87:17	149:1	93:23	85:16	freque...	86:22
92:4	150:1,17	foregoing	86:14	47:25	94:5,22
93:4,4	150:20	217:4	135:21	166:1	99:7
96:19	151:1,8	foreign	166:19	friendly	101:10
97:11,24	152:13	15:1	168:15	131:8	102:22
97:25	153:17	164:13	168:17	friends	103:4
98:18,20	155:1	form 8:2	168:19	73:1	105:23
100:12	156:3,4	186:15	found	from 5:9	107:11
100:24	156:22	214:8	32:25	6:2 8:20	108:25
101:1,15	157:8,13	forth 9:25	89:24	10:7	113:7
103:4,16	157:14	12:16	95:25	11:4	114:25

  
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118:2	81:4,9	145:14	65:14	12:24	171:18
119:17	81:16	156:14	67:11	13:17	171:19
120:4,18	83:6,9	156:21	gather	28:11	204:12
120:19	83:21	157:7	31:12	30:9	getting
120:23	84:7,8	175:21	59:16	32:22	38:24
120:23	84:14,21	frontals	gathered	36:17	88:19
121:2,3	86:19	125:3	8:12	37:4	90:10
121:11	87:3	143:23	17:6	39:19	105:22
122:19	89:19	front-end	36:6,24	44:8	108:17
136:6	94:6	44:21	gauges	47:7	115:21
139:7	103:7	front-...	45:10	83:8	125:6
141:19	117:11	117:18	gave 32:21	98:22	145:21
145:5,11	118:25	FSS 127:6	32:23	114:13	167:21
147:6,12	118:25	fuel	38:11	123:2	180:5
148:11	123:24	141:12	39:10	130:15	216:21
154:12	124:18	full 92:2	40:15	132:6	giggles
155:19	125:20	fully	44:1	143:14	152:4
162:6,13	125:23	168:2	56:11	144:1,4	give 6:13
162:25	127:23	fun 152:4	82:4	145:6,20	11:17,17
164:6	129:2,7	function	general	152:21	11:18
166:8	129:15	9:9,14	7:5,13	184:2,5	30:12
168:24	129:24	145:18	15:14,16	193:1,4	39:3
171:10	147:12	funding	15:19	205:6	43:21
171:25	156:5	19:21	16:1,8	215:15	47:8
174:25	162:5,10	further	16:22	generated	51:7
177:21	167:13	66:5	17:6,20	8:5	54:16
177:21	176:5,20	218:9	17:24	27:25	58:25
179:23	176:21	fuse 68:5	18:2,12	genera...	68:16
182:12	177:6	68:6	19:2	79:24	69:21
183:10	183:13	Fusilier	24:16	114:1	73:21
185:13	183:19	1:19	25:11,17	206:4	102:1
188:13	190:25	future 9:7	25:19	genera...	106:11
188:20	206:17	61:2	26:11	115:2	130:25
189:16	208:3,9	112:22	27:7,15	generator	135:12
190:16	208:13	205:16	27:24	131:6,7	166:9
191:2	209:18	206:3	28:23	genera...	174:6
192:9	209:23	211:6	29:1	131:8	175:17
197:14	210:4	F-series	36:7,13	generic	188:17
198:17	frontal	203:25	36:16	81:21	193:8
202:22	61:23		48:12	82:16	200:21
209:8,24	88:17		58:6	114:2,3	200:22
210:24	95:1		143:15	generi...	215:8
front	96:16,16	3:17,17	150:2,16	34:10	given
56:12	97:12	119:5,6	150:18	114:19	159:22
60:2,3	100:11	gap 41:6	169:25	Germany	186:17
62:1,21	106:22	gaps 41:5	170:24	161:16	214:1
68:10	108:16	gas 64:11	genera...	gets 49:23	218:8
79:14,16	108:22	65:13	25:8	91:11	gives
80:2,12	120:6,6	67:12	generally	128:11	139:10
80:22	133:7	74:19	11:10	165:22	giving
		gases			


  
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199:25	81:25	165:9,10	215:6	147:19	64:11,12
<b>gismo</b>	85:1	167:2,4	<b>going 8:8</b>	148:4	70:5
188:21	89:21	169:25	10:13	149:2	74:3
<b>glad</b>	90:18	174:22	13:11	152:7	75:23
105:19	92:2,5	179:15	18:9	153:15	81:8
164:11	92:13,23	179:22	19:18	154:3	98:24
214:17	93:7	182:16	21:7	155:20	112:5
<b>glasses</b>	94:1,12	185:21	24:14	155:20	136:17
82:12	95:1	189:15	26:14	155:20	145:8
127:8	96:13	191:22	41:8	155:21	147:1
<b>glean 53:1</b>	97:13	195:3	47:13,15	155:22	188:18
<b>gleaned</b>	100:10	198:18	48:4	155:23	216:20
53:25	105:8,19	199:4,7	50:14,15	155:24	<b>gotcha</b>
<b>go 8:15</b>	108:23	203:7	50:21	158:15	17:1
10:19	110:16	205:22	51:6,21	158:22	18:11
11:3	112:21	208:25	52:23	162:15	34:25
16:6,23	113:9,14	209:21	59:12	163:13	51:12
18:4,13	116:18	212:25	61:21	163:13	82:2
21:15	116:24	215:1,16	75:22,23	163:19	103:23
23:6	119:8	215:18	77:18	166:13	122:18
25:16	120:6,17	216:5,5	80:14	168:7,8	207:11
35:5	120:24	<b>goal 47:25</b>	82:13	175:21	<b>gotten</b>
38:2	121:3,16	169:10	86:25	178:10	102:22
41:6,10	122:22	<b>goals</b>	87:1	179:5	<b>govern...</b>
41:19	125:13	50:25	88:18	180:15	19:23
42:1,8	126:20	51:8	103:15	181:16	20:4,13
42:20	131:20	<b>God 6:4</b>	105:10	182:2	20:15,25
43:4,24	131:21	<b>goes 22:8</b>	106:16	183:23	21:9,9
48:17,22	133:24	47:21	108:4,5	183:25	21:21,22
49:1,16	134:18	60:10	108:13	192:2,3	22:3,6
50:14,15	135:3,15	68:18	108:14	194:19	23:14,16
51:1,9	137:6,9	72:2	108:18	196:1	23:25
51:19	137:20	73:4	109:12	208:25	24:2,24
52:7,8,9	138:2,25	75:21	110:2	209:21	25:6
52:10,18	140:5	79:20	112:24	215:19	27:1
52:25	142:11	83:4	113:5,7	215:23	29:17,24
53:11	143:7,25	98:14	113:10	<b>gold 65:19</b>	30:11
56:1	145:1	122:15	115:24	<b>gold-p...</b>	31:3
57:4,20	147:8	127:4	116:14	65:17,21	32:10,11
58:11,14	151:3,4	136:6	116:15	<b>gone 5:10</b>	32:14
60:22	151:11	137:25	118:12	8:11	55:2,12
62:4	152:16	141:23	135:15	17:11	61:25
64:21	153:14	145:12	143:11	27:7	76:11
65:1	155:3,4	168:20	144:6,17	96:15	99:5
66:25	157:12	171:22	144:22	<b>good 4:24</b>	107:9
67:13,16	157:15	180:13	145:17	11:16	151:18
67:25,25	157:23	204:23	145:18	32:1,20	151:22
72:5,16	158:14	209:8,9	145:21	37:9	151:23
76:10	160:9	211:16	145:24	50:8,18	194:2,18
78:16,17	163:19	211:19	146:21	59:18	194:22

  
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196:4	48:9	214:22	185:6	163:21	helped
govern...	204:4	G-forces	192:3	165:18	17:4
32:17	Ga 119:4	86:17	happens	177:10	20:14
go-no-go	GSA 70:8		9:5 47:7	head 67:19	helping
166:6	77:3		115:25	68:18	21:9
grabbed	94:3,6	habit	123:12	78:11	22:6
39:17	94:14,16	12:20	159:1	138:3,13	31:2
grant	94:19	half 71:17	181:13	168:2	Henderson
110:1	96:24	74:7	188:3,14	headli...	1:19
112:24	99:4,6,8	81:8	193:14	79:19	hereto
graph	guess	214:2	hard 27:25	head-on	217:7
186:24	24:17	hammering	36:14	92:5	herunto
187:2	37:2	121:20	141:20	93:7,23	218:12
209:2,20	38:6	hand	158:22	93:24	harnet...
graphing	41:16	161:24	167:10	108:14	65:22
209:2	64:22	218:12	167:13	138:16	hesita...
graphs	73:3	handle	176:15	138:22	104:14
189:5	89:15	99:13	180:19	147:24	104:15
208:25	101:16	handled	207:9	148:14	hey 68:10
209:13	114:16	139:11	hardly	149:14	152:3
209:19	118:9	hands-on	15:24	149:14	hi 169:1
great 6:15	122:21	51:15,17	116:2	157:15	190:21
7:5	131:14	51:25	hardware	hear 14:5	190:23
29:25	134:14	hang 71:23	115:12	14:5	190:23
51:16	140:9	happen	hard-a...	heard	NIC 78:11
62:14	149:21	31:7	105:7	29:14	hierarchy
180:11	151:15	59:13	harm 156:5	114:7	43:22
203:22	165:2	61:8,21	harness	185:14	high 47:12
grill	171:7	144:18	89:25	hearsay	47:14
79:19	187:5	146:3	90:1,10	29:14	48:8
84:21	196:14	152:7	90:24	heavy	49:5
grossly	212:12	158:15	91:19	138:4,14	90:9
56:8	Gulf	happened	92:8	held 65:7	92:22
62:18	162:21	14:11	93:14,17	112:2	100:8
group	guy 38:21	25:5	95:3,6	170:20	107:10
23:20	52:8	33:8	96:23	210:19	116:17
31:5	guys 59:11	38:13	97:5,19	215:3	134:21
33:20	61:17	49:7	97:20	216:8	137:18
34:8,14	67:14	64:25	200:17	help 6:16	138:1
34:16	94:21	92:6	harnesses	7:22	141:18
35:12	104:5	103:25	46:19	8:17 9:7	142:3
44:3,11	126:7	119:20	hats 8:8	16:22	147:17
44:20	164:8	187:24	23:15	19:19	170:11
45:24	166:23	210:8	having	20:11	171:16
46:2	198:15	happening	3:18	31:14	174:4
203:23	198:16	9:12	10:4	43:5	higher
203:23	198:24	14:13	33:14	126:19	51:5
groups 6:2	198:24	27:21	53:7	127:9	96:5
44:10	202:10	77:25	57:4	161:17	106:7
46:1	203:3	168:6	76:19	206:24	119:5

  
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143:18	59:25	hopefully	151:20	idea 30:12	167:23
144:2	69:21	61:14	151:22	50:9	impacting
150:7	93:23	horns	152:15	57:3	136:9
180:21	157:13	45:17	153:5	58:10	impacts
highli...	hit 67:5	horse	156:19	68:17	96:9
122:7	108:13	79:21,23	157:2,16	204:18	101:21
highli...	136:17	hour 91:10	158:13	ideas 50:1	106:3
133:1	154:13	95:4	158:19	58:12	146:13
highly	154:20	96:17	159:18	identi...	169:5
91:21	155:20	97:12,18	160:1,23	3:16	implem...
highly...	155:20	100:11	173:13	identi...	38:10
123:15	155:21	101:3	174:21	55:5	195:4
Highway	155:21	102:1	hourly	103:7	197:6,10
10:5	155:22	103:18	111:5,11	104:19	important
highways	155:23	104:3,21	hours 42:9	130:12	54:9
159:10	155:24	105:13	179:16	133:25	85:13
high-s...	156:6	105:14	216:18	identify	166:13
145:22	165:19	106:24	huge 41:5	103:11	197:19
148:5	167:3,3	106:25	human	179:9,10	import...
high-1...	167:9,10	108:5,9	55:20	191:10	45:11
52:22	168:18	108:23	58:22	215:5,7	impose...
high-p...	177:7	134:16	145:9	if-come	91:1
155:8	216:4	137:15	146:2,23	15:15	149:4
high-s...	hits	137:25	153:6,7	igniters	impressed
88:18	136:13	138:1,6	hump	67:10	58:10
101:21	hitting	138:9,11	117:19	ignition	improp...
107:10	136:7	138:17	hundred	121:17	54:14
107:11	176:22	139:2,17	43:4	igniters	56:16
144:16	hole 92:15	140:1,12	55:11	90:24	improve
148:4	holes 62:6	140:16	68:21	91:2	48:15
174:3	honest	140:18	77:16	ignored	improv...
high-tech	15:8	140:20	95:4	68:23	60:24
47:25	honestly	141:10	97:18	illust...	improv...
high-v...	140:5	142:2,10	99:15	11:17	53:20
76:19	hood 62:6	143:13	152:8	impact	139:9
him 6:8,16	70:16	144:5,23	183:23	95:16	impulse
25:4,7	79:17,18	145:15	184:5	96:12,16	66:24
102:11	83:3	146:5,11	187:22	99:11	inadve...
200:19	121:8,17	146:20	hundreds	104:3,17	121:23
hired	121:20	147:1,3	152:11	108:20	165:22
22:11	154:13	147:13	214:24	122:11	167:2
histor...	173:18	147:15	hundre...	129:5	inadve...
73:21	176:17	147:16	91:8	137:1	121:19
histor...	177:14	147:21	hurt	140:8	INC 1:10
52:11	190:1	147:23	181:16	167:7	inch
history	196:22	148:20	hybrid-3	169:5	176:15
47:8	203:4	149:5,10	55:16	177:1,6	inches
52:25	207:3	149:16		183:10	209:2,10
53:25	hope	150:10		impacted	incident
54:3	208:23	150:14		94:6	71:3

  
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89:22	49:16	37:21,23	184:24	145:21	69:5
90:8	58:2,16	38:1	185:7,12	<b>injuries</b>	<b>instru...</b>
120:5	64:10	43:2,5	185:18	55:9	34:13
<b>incidents</b>	150:20	55:16	185:24	57:2	45:9
9:10	<b>infinite</b>	57:19	185:25	99:24	63:3
<b>include</b>	61:3	59:16	186:2,22	145:2	83:17
96:18	156:2	68:15	187:24	<b>injury</b>	117:17
<b>incorp...</b>	<b>inflat...</b>	69:7,8	188:2,7	48:4	117:19
57:19	33:18	75:1,7	188:15	55:15,24	<b>instru...</b>
<b>incorp...</b>	45:19	76:20	188:18	56:15,22	24:5
130:12	<b>inflate</b>	77:20	189:12	63:2	<b>insurance</b>
134:1	178:7	82:4	189:19	78:11	31:11
<b>increase</b>	<b>inflated</b>	94:13	193:9	144:6	77:4
181:8	67:21,22	98:2	201:25	146:10	<b>integr...</b>
<b>Increased</b>	<b>inflation</b>	99:7	208:20	150:10	134:9
116:11	54:8,20	103:10	212:17	153:7	<b>Intel</b>
<b>increm...</b>	168:1	105:6,23	<b>informed</b>	160:15	48:11
116:4	<b>inflator</b>	107:6	27:21	195:7,18	58:17
192:17	61:3	108:1	<b>infrared</b>	<b>input</b>	<b>intell...</b>
<b>indep...</b>	137:19	118:1	49:13	180:11	56:6
16:18	<b>inform...</b>	120:17	56:9	<b>inquire</b>	114:11
22:11	4:17,17	120:19	<b>initial</b>	104:24	193:2,10
46:13	5:3,7	120:22	3:23	105:19	194:1
<b>Indiana</b>	6:13,22	121:1	21:16	216:11	<b>intended</b>
172:1	7:25 8:7	124:2	23:18	<b>inquiries</b>	146:7
<b>indicated</b>	8:19,20	130:23	41:15,15	13:18,24	178:11
17:16	9:11,22	131:2	54:23	14:9	<b>intent</b>
32:7	9:23	140:4	183:10	<b>inquiry</b>	145:19
46:15	10:23	149:25	<b>initially</b>	104:12	<b>interest</b>
50:23	11:2,4	160:4,5	6:10	107:2,13	8:25
70:7	11:12,18	160:7	15:23	<b>inside</b>	23:16
112:20	11:18	161:12	19:13	62:15	27:16
142:24	13:7,15	166:20	20:6	118:3,5	51:18
151:5	15:17,18	169:21	22:9	<b>inspect</b>	56:5
170:5	16:12,18	171:13	29:4	7:6	107:9
171:3	16:24	171:18	43:23	<b>inspected</b>	108:11
187:13	21:25	175:5,18	49:12	7:3	163:18
<b>indicator</b>	22:7,8	176:19	56:6	<b>inspec...</b>	<b>intera...</b>
34:19	23:8	178:22	61:20	7:10	20:2,4
131:1	24:18,21	179:23	65:17,21	<b>inspec...</b>	26:19,21
<b>indire...</b>	24:23,25	182:9,23	68:14	26:21	43:1
218:11	25:10	182:24	71:6	38:3	53:11
<b>indivi...</b>	27:19	183:3,6	87:18	<b>installed</b>	54:5
200:22	29:14	183:7,10	99:2	92:9,19	76:19
<b>indivi...</b>	31:9,11	183:12	116:7,15	<b>instance</b>	186:19
1:4	31:13,18	183:14	182:3	66:23	192:2
<b>induced</b>	32:8	183:22	<b>injured</b>	87:19	218:11
177:1,9	34:24	184:7,21	100:1,25	105:9	<b>interface</b>
<b>industry</b>	36:19	184:22	101:2	215:17	32:9
11:8	37:7,17	184:24	144:17	<b>instead</b>	<b>interim</b>



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214:6	<b>inverted</b>	23:4	20:8	<b>Jet</b> 48:11	64:3,14
<b>interior</b>	64:8	27:6,13	29:10	<b>job</b> 31:12	65:3
6:5 45:3	<b>invest...</b>	28:5	30:17,20	60:7	69:21
<b>interiors</b>	19:24	29:4,23	30:21	<b>Jon</b> 33:3,4	70:2,10
6:5	100:16	30:4,19	31:19	33:6,10	73:21
<b>internal</b>	<b>invest...</b>	31:20	32:16	33:13	79:17
11:7	20:9,10	32:11	43:6	35:7,24	81:20,23
59:15	94:4	33:12	45:6,23	<b>JOHN</b> 1:6	84:5
<b>intern...</b>	<b>invest...</b>	35:8	46:8	1:23	88:21
197:20	16:2	37:6	51:2	<b>Jonas</b> 29:7	89:5
<b>interpret</b>	20:13,25	44:14	55:14	29:11,14	93:3
75:1	<b>invest...</b>	51:12,16	65:22	29:20,21	94:18
117:23	8:16,18	98:4,6	89:9,9	29:22	95:13
120:11	13:6,21	98:22,23	95:14	31:25	96:1,17
120:12	15:12	98:24	99:21,24	32:2,6	98:10
131:3	17:8	99:8	121:14	33:13	99:11
185:12	21:8,10	100:14	121:18	35:7,24	100:20
209:17	21:16,21	101:14	146:15	36:12	103:2
<b>interp...</b>	23:18,20	105:2,3	155:6	<b>JR</b> 1:23	104:7
186:8,9	24:1	105:12	165:17	<b>judge</b>	105:18
<b>interp...</b>	27:22	108:11	169:15	112:20	105:22
77:21	29:5,23	128:7	194:4	113:4	106:25
123:9	31:15,21	146:16	<b>item</b>	<b>July</b> 1:15	109:8
124:2	32:12	210:24	161:19	3:2,7	112:4,10
<b>interp...</b>	36:6	<b>involving</b>	199:5	216:12	112:12
67:24	99:10	28:4	<b>items</b>	217:4	115:23
<b>interp...</b>	106:20	92:4	47:25	<b>just</b> 3:8	117:10
69:7	106:21	114:5		4:4,4	118:14
<b>interr...</b>	108:7	<b>in-house</b>	<b>J</b>	5:23	118:21
9:21	<b>invest...</b>	14:20	<b>Jack</b> 52:15	6:13	119:4,14
37:13	25:12	188:23	52:21	7:13 8:8	121:19
42:16	27:18	188:24	<b>Jackson</b>	11:9	122:3
<b>interr...</b>	31:10	<b>isolated</b>	1:3,20	12:13	124:12
16:13	99:15	47:4	109:16	19:11	125:4
40:1	<b>invest...</b>	<b>issue</b>	111:3	21:19	129:13
134:24	185:4	13:20	215:14	22:2	133:20
135:8,14	<b>invita...</b>	14:15	<b>Jaguar</b>	25:3,18	134:15
137:4	41:12	23:13	152:14	26:14	137:10
179:20	42:11	31:19	160:19	28:1,10	140:3
<b>Interr...</b>	<b>invited</b>	56:13	<b>Jaguars</b>	29:25	143:6,6
203:18	27:4	89:14	126:3	30:12	144:16
<b>invent</b>	<b>involve</b>	90:1	<b>January</b>	31:17	145:1
50:1	174:8	92:7,24	112:18	39:3,10	147:8
<b>invented</b>	<b>involved</b>	93:2,3	<b>JAY</b> 1:19	39:12,22	148:10
58:2,3	8:17,19	93:17	<b>JB</b> 33:15	40:22	150:15
114:12	8:24	130:12	33:19	42:13	150:16
193:11	19:10	133:24	34:16	46:14	150:19
<b>invention</b>	20:13,17	194:6	35:6,24	54:8,19	151:4,10
48:6	22:10,13	<b>issues</b>	<b>jelly</b>	57:20	151:11
50:21	22:18,19	17:14	66:21	62:19	151:15

  
**ESQUIRE**<sup>™</sup>  
 DEPOSITION SERVICES

**A RECORD OF EXCELLENCE**

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313-961-5160

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Ann Arbor  
734-769-7808

Grand Rapids  
616-456-6500  
Kalamazoo  
616-552-4438

152:12	<b>keeping</b>	39:25	203:21	25:4	79:12,24
152:14	19:2	40:3,14	212:17	26:6,24	86:3
152:15	<b>kept</b> 12:5	42:23	212:19	27:1,16	88:8
152:15	12:6	43:2,8	214:8	30:2,13	92:1
154:14	17:23,25	49:20,22	<b>kinds</b>	30:17,21	96:19
155:19	18:11,16	50:13	28:10	31:6,8,9	97:11,15
158:22	25:1,14	51:4,4,9	38:5	31:16	97:24
159:12	27:21	52:5	108:20	32:20	98:2,3,5
159:12	36:10	53:19	146:4	35:2	99:20,22
163:13	41:22	54:3	153:15	36:1,9	100:6
164:15	189:7,8	57:25	155:5	36:25	101:6,16
165:7	189:10	58:6,20	172:23	37:1,2,3	101:17
166:17	<b>key</b> 64:18	60:10,19	199:25	38:4,16	101:20
167:1	68:16,21	69:11,20	201:3	38:18	101:22
174:22	<b>keys</b> 50:3	73:3	<b>kinema...</b>	39:24	102:3,7
176:14	<b>kick</b> 83:20	74:2	45:7	40:13	102:9
184:3	<b>kicking</b>	76:21	176:1	41:18	103:14
186:22	180:4	81:21	<b>knee</b> 34:12	42:6	104:2,5
186:23	<b>kill</b>	83:4	45:11	43:1,10	104:7,8
186:24	181:16	85:18	<b>know</b> 13:4	43:11,18	104:8
187:12	<b>killed</b>	92:14	20:17,18	44:5	105:25
189:22	100:25	99:10	30:1	47:14,22	106:2
197:3,20	<b>Kilpat...</b>	100:22	59:23	50:3	108:16
198:20	1:19	104:8	60:15	51:3,7,7	109:3
200:7,13	95:20	105:6	73:2	51:10,20	114:22
201:18	96:25	115:19	77:16	51:22	115:18
203:16	109:22	121:20	89:22	52:10,12	116:5,9
203:21	112:20	123:11	97:1	52:15,16	116:21
204:22	112:24	130:5	101:8	52:19,21	118:10
210:5	133:14	141:19	<b>know</b> 4:4	52:22	120:11
214:11	186:12	142:22	4:25 5:3	53:10,13	121:19
214:18	192:14	143:2	6:18 7:2	54:22	122:21
216:9	204:25	145:10	7:3 8:6	56:1	124:21
	207:4	146:15	8:6,9,11	57:23	124:23
<b>K</b>	214:23	149:21	10:11,23	58:4,4	125:2,4
<b>keen</b> 107:9	215:1,21	153:2,13	12:16,19	58:12,18	125:9,14
<b>keep</b> 9:5	<b>kind</b> 5:5	156:18	13:9,13	59:6	125:18
11:22	7:24,25	157:4	13:20,21	60:4,15	125:22
16:12	9:17	158:21	14:21	60:18	126:9,15
18:7	11:1,16	159:9	15:20,23	61:3,6	126:16
24:3,21	11:18	165:2	16:10	61:17,22	126:23
25:4	14:18	166:6,21	18:14,17	62:12,13	127:15
28:4,8	15:15	167:11	19:4,9	62:18,25	129:9,14
41:20	20:18	167:14	19:14,21	64:3	129:15
61:3	26:16	171:9,11	19:22,23	65:20	129:18
72:12,17	28:15	187:19	22:10,12	68:10	129:19
72:22	30:1,8	190:7,16	22:16,20	69:22	130:3,8
85:20	31:15	193:22	22:25	70:15	132:9
134:10	33:20	198:20	23:3,4	72:12	133:9,16
215:23	37:7	200:1	24:8	77:1,11	133:18

  
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<b>Detroit</b> 313-961-5560	<b>Ann Arbor</b> 734-769-7808	<b>Kalamazoo</b> 616-552-4438

135:2,2	176:24	known 13:6	207:3	leap 69:15	192:3
136:18	177:12	100:12	latches	learned	lessen
138:18	180:14	known 6:4	79:18	23:23	146:7
139:4,15	181:21	61:2	late 37:6	51:14	177:10
140:6	184:3,10	103:1	46:11	learning	lesson
141:3	185:1,11	145:13	168:6	57:15,17	47:8
142:7,12	186:18	155:18	later 3:9	least 77:3	73:22
142:18	186:22	Kuechler	15:24	94:2	101:25
143:21	187:20	22:13	21:13,14	131:21	let 11:5
143:24	189:9	26:17	25:15	140:11	13:11
144:14	190:23		40:21	163:17	28:15
144:22	191:6,6	L	46:18	190:10	47:8
144:25	192:5,12	L1:18 2:2	61:11	leaving	80:14
145:5,17	195:11	217:13	68:8,15	17:19	82:4
148:3,23	198:2	218:3,16	109:18	left 13:9	89:16
149:11	199:3,9	label 3:9	110:19	15:10	97:10
149:11	199:10	labor	181:7	17:5	102:17
149:23	200:4,12	201:1	Lawrence	18:12,14	104:7,11
149:23	202:4,22	labors...	23:19	22:22	104:24
152:7,11	203:13	60:16,19	24:24	23:3,5	106:18
152:24	203:14	61:9	25:6	25:22,25	109:3,15
154:17	204:10	lack 100:4	lawsuit	29:9	110:8,9
155:2	204:11	140:8	19:14	33:12	115:21
156:21	205:13	170:6	21:3,12	80:17	125:8,25
156:25	205:24	language	21:17,19	85:10,11	126:18
157:2,5	206:4,22	115:11	22:1,5	85:17,23	127:3,7
157:7,13	208:24	lap 40:16	26:9	127:20	127:21
157:21	209:2,18	large 44:7	32:4	128:13	131:16
157:23	210:15	141:20	103:14	206:21	132:2
157:24	210:22	193:17	103:15	206:22	133:2
158:15	211:2,7	largely	105:12	208:1,3	136:10
159:1,14	212:12	107:14	106:16	209:23	137:20
159:19	212:13	larger	lawsuits	210:1,2	138:2,13
160:6,24	213:4	107:7	19:16	leftover	142:5
161:8,21	214:3,7	137:8	30:20	145:24	145:4,11
162:4,13	214:11	last 5:13	101:1	legal 29:2	153:17
162:15	214:14	26:2	105:1	30:17	157:12
162:18	215:10	30:15,16	lawyers	31:15	161:15
162:24	216:5	37:19	28:19	100:23	164:8,15
163:2,10	knowledge	39:2,5	98:14	legible	168:13
164:8,15	7:5 8:13	52:4	112:6	15:25	168:22
166:2	20:21	175:10	layperson	lending	169:25
170:12	35:21	184:10	62:7	31:21	170:18
171:23	61:21	184:11	LC 206:17	length	172:22
172:12	104:25	205:22	206:18	102:23	179:22
172:12	139:22	206:11	lead 59:15	less 96:8	180:23
173:5,8	211:22	206:13	76:3	104:23	181:13
174:6,10	217:5	208:19	leads	146:10	181:23
174:18	knowle...	latch	170:7	181:16	188:1
176:12	142:15	79:17	leaf 43:8	187:20	195:19

  
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 DEPOSITION SERVICES

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248-244-9700	517-337-7337	616-456-6300
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196:7	206:13	28:15	130:15	likeli...	lines
197:5	level	30:19	134:2	177:10	83:12
198:14	34:11, 15	32:2, 11	141:10	likely	99:20
206:5	47:12, 14	32:19	142:1, 2	109:11	102:4, 12
209:22	47:17	34:20, 21	142:11	limit	102:24
211:17	48:8	36:11	143:23	139:8	103:11
215:10	49:6, 24	39:25	151:5	150:13	103:11
letter	51:3, 21	40:6	152:20	limita...	108:24
26:17	100:8	44:1, 7	154:2, 23	68:17	list 35:20
letters	122:1	44:21	154:24	limita...	35:23
32:19	132:21	46:15	155:22	53:15	192:13
42:12	146:24	48:25	155:22	57:16, 17	listed
letter...	147:18	50:8, 23	156:12	107:2, 14	96:15
40:23	148:19	51:24	156:20	limited	133:11
let's 8:15	150:12	52:16	158:2, 23	76:8	listening
18:22	199:23	53:19, 21	159:12	96:17	160:17
52:25, 25	214:4	55:18	161:19	102:17	listing
64:24	215:6	58:7, 19	162:21	180:12	101:16
70:10	levels	58:22	162:21	182:3, 13	litera...
77:23	123:10	62:10, 11	163:23	limiting	94:5
85:15	137:4	66:21	167:3	13:22	litiga...
87:19	146:23	68:20	168:9	14:18	4:7 5:11
93:25	liaison	69:1	169:16	limits	8:17, 24
94:18, 22	31:5	71:12	170:9	146:2	9:19
94:24	32:13, 16	72:9	173:9, 12	151:7	17:3
101:3, 9	library	73:2	174:25	152:23	19:8, 10
102:1, 13	41:21	75:5	175:24	153:3, 5	22:2
106:25	life 30:1	76:2	177:1, 4	159:25	25:25
109:6	51:16	79:21	181:19	160:3	30:6, 10
113:9, 13	81:24	80:2, 4	183:22	Lincoln	30:25
113:14	light 68:9	81:21	184:25	76:7	38:24
116:18	68:13, 14	82:22	186:3, 21	82:23	98:6, 7
120:6	75:20, 21	86:19	187:17	line 62:1	98:21
131:20	131:4, 10	88:8	187:20	69:12	99:6
135:15	131:21	90:12	188:3	80:25	100:3, 9
136:17	131:21	97:15	191:9, 20	81:4, 13	104:6
136:20	131:24	101:21	192:1	83:7	142:17
149:9	155:21	105:23	194:10	96:19	142:21
151:3, 8	Lighting	107:19	195:9	97:11	143:4
151:9, 21	46:6, 7	107:21	196:5	105:3	little
152:3, 13	like 6:5	108:7	197:13	117:16	35:5
152:14	10:22, 24	114:22	197:23	117:20	40:21
152:15	11:6, 9	114:25	200:9	127:4	47:8
159:11	12:15	117:17	202:8	135:23	53:7, 18
168:23	15:5	119:11	206:20	135:24	53:25
170:3	16:21, 25	121:18	207:2, 3	136:2	66:11, 20
176:14	17:16	121:21	207:5	163:14	70:17
176:17	18:8	123:5, 17	209:17	194:18	71:23
190:19	20:20	126:3	213:12	207:12	74:19
202:2	21:6, 16	129:4	213:19	209:17	80:16, 21

  
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 616-456-6300  
 Kalamazoo  
 616-952-4438

82:19	173:21	134:24	59:9,25	203:13	29:17
87:20	189:25	135:12	61:23	206:13	36:6
91:11	190:10	172:21	62:25	209:14	42:19,22
92:15	190:14	204:14	70:17	209:16	43:5,6
94:24	locations	213:9	72:5	210:16	49:15
96:5	18:6	longer	73:11	212:25	53:14
115:23	25:10	29:11,15	76:10	213:2,12	56:9
126:22	80:9	96:12	79:16	213:13	57:6
143:18	170:5	113:1	81:4	214:8	58:22,23
164:18	171:3	180:14	83:21	215:4	58:23
169:5,19	190:13	180:20	92:13,21	looked 4:4	60:11
178:5	193:22	longit...	94:13	8:12,13	61:4,24
180:24	203:4,10	85:25	95:16	10:3	76:3,6
188:21	203:11	86:11,16	102:15	11:10	76:17,25
198:2	203:15	86:18	102:15	12:23,25	78:13
live 43:12	205:16	207:21	102:15	13:11,12	85:25
lives	205:23	208:13	104:22	15:9	86:15
146:19	206:1,12	209:5,24	109:1	16:13	118:12
147:12	locked	longit...	114:22	23:10	122:15
load 13:22	96:12	85:21	116:3,25	36:21	126:11
14:18	locking	86:8	128:7	37:14	128:5
loading	92:12,13	long-s...	132:23	41:5	141:18
55:17	looks	105:17	133:24	42:16	146:2
loads	92:15	look 5:6,7	134:7	43:2,3	155:16
78:13	locomo...	7:21 8:3	138:25	49:2,2	163:23
LOBB 1:4	62:11	9:10,24	153:7,8	50:5	166:16
local	log 28:13	10:1,19	153:9,15	53:13	170:19
16:24	28:15	10:22	155:3,5	57:8	171:12
locate	215:4	11:3,15	155:22	76:4	177:20
83:1	logging	11:16	156:1,3	94:15	178:22
located	94:6,7	12:22	156:4	117:2	180:18
36:16	logic	14:17	160:9	119:6	185:22
66:2	120:4	21:7,15	166:19	126:17	192:14
79:6,13	129:10	23:1	171:10	133:21	193:21
79:14,15	137:20	25:16	172:19	141:16	196:24
80:1	154:12	38:2	172:20	157:18	197:16
82:25	155:19	41:20	180:11	163:2	202:16
117:4,15	logical	42:1,20	180:20	185:20	202:23
117:16	76:23	43:9	181:19	186:3	203:9,25
118:25	216:10	44:15	186:21	191:20	205:15
167:20	long 27:1	45:15	187:17	213:24	209:13
171:8	42:24	48:25	189:1,2	214:3	209:15
206:3,14	43:13	50:1,19	189:14	215:16	210:5,21
206:19	65:15	51:1,5	190:6,15	looking	211:4,5
207:2	67:12	52:9,18	193:7	6:11	212:12
location	89:10	54:10,21	197:22	7:25	213:5
82:18	91:1	55:1,4	198:11	15:3,7	looks 3:12
87:13	98:6	57:1	199:4	17:2	62:14
166:12	127:9	58:1,2	203:1,7	20:22	72:13
171:7	134:19	58:11,15	203:11	26:2	86:19

  
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Kalamazoo  
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207:2,3	167:21	37:11	169:15	151:3,11	195:16
209:17	169:18	40:7	make 3:10	154:7	mandated
loop 115:5	178:4	41:15	12:9,9	156:13	194:1,14
115:6	189:11	42:23	12:24,24	166:14	mandating
124:13	211:11	46:20	13:2	166:20	194:12
128:6,8	lots 31:7	47:12	14:3,9	167:16	manual
loops	53:2	49:3,23	22:6	168:1	11:6,15
128:6,9	63:18	52:17	25:3	169:12	131:3
128:12	99:21,21	53:12	32:12,15	179:12	159:22
128:21	142:16	84:1	35:4	182:18	160:2,10
129:13	153:6,6	95:6	37:10	182:24	211:15
loss 89:13	155:24	106:8	39:12	186:5	211:19
105:4	165:24	107:6	41:18,19	187:20	211:20
133:4,8	199:24	109:25	42:1	190:4	manuals
lost 24:13	low 52:13	113:10	51:6	212:1	10:23
38:13	52:13,20	118:1	52:23	makes	11:16
130:16	low 101:23	139:9	53:18	12:10	13:2,12
167:18	104:17	149:3	54:17	13:17	15:3,4,5
lot 5:2	104:18	177:24	57:20,23	69:8	15:6,6,6
14:24	116:17	177:25	57:23	72:21	17:13
20:10	134:21	178:1,8	59:2,6	74:2	manufa...
27:25	137:22	178:9,12	60:22	77:22	7:23
28:19	137:25	178:15	61:4	87:16,16	47:16
29:9	141:17	181:1	62:7,8	105:14	58:4
30:3	143:6	182:13	62:11	112:11	132:11
42:3	170:11	184:23	64:3,14	169:14	190:8
43:11	lower	190:16	65:2	169:20	198:13
48:5,5	83:20	211:23	75:24	179:24	214:1
49:17	119:6	magnet	77:18,23	183:4,5	manufa...
56:17	137:21	65:7,12	78:7	making	47:5
57:9,12	143:13	magnif...	79:4	35:20	204:15
60:20	143:21	92:23	81:20	67:25	manufa...
62:1,4	173:13	magnif...	87:25	71:3	14:23
64:2	173:14	82:11	94:18	109:20	107:11
77:8	low-speed	mail	95:13	179:6	198:10
81:22	101:22	168:25	98:10	197:19	manufa...
92:10	106:3	171:10	102:7,8	199:23	49:8
99:11		Maine	102:18	male 54:25	57:15
100:1,3	N	94:15	105:20	56:23	58:7
103:2,19	M1:19	maintain	107:2,13	92:12,20	77:10
104:15	machine	23:22	109:16	137:8	151:25
116:21	187:22	28:13	111:14	man 103:8	165:17
116:24	machinery	mainte...	111:19	163:25	195:15
126:17	198:8	89:9,15	113:12	manage...	manufa...
126:21	mad 103:21	90:3	117:23	51:5	49:4
130:3	made 12:9	major	122:23	manager	71:2
140:24	13:18,24	50:22	140:8	35:17	90:1
144:11	17:3,11	56:15	141:19	99:3	93:2
144:14	29:4	66:4	142:25	mandate	95:7
167:10	35:23	72:10	145:20	194:3	197:24

  
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 Kalamazoo  
 616-552-4438

many 11:20	33:3,4	25:23	188:16	13:17	169:2
30:5	33:10,13	27:6,13	189:10	15:5,11	171:6
43:10	35:7,24	28:5	195:15	16:10	174:18
44:19	Martin	32:6	196:23	28:15	175:10
67:13	126:10	33:12	196:23	39:4	175:13
68:16	Mass 20:3	35:7	203:3,12	41:21	177:3
69:20	53:22	39:6	208:15	42:24	178:24
74:13	153:14	mixed	208:22	43:9	184:25
78:15,16	massed...	68:20,22	209:24	44:10,24	186:2
99:16,20	20:1	may 10:25	211:11	47:24	191:8
101:5	massive	10:25	212:6	48:12,21	193:6
103:20	37:8	12:14	214:6,23	49:25	196:10
115:23	42:21	13:12	215:7	50:6	196:12
139:13	48:20	15:19	maybe	58:9	197:15
156:11	103:8,9	23:8,8	22:24	61:5	197:17
156:11	match	28:8,9	23:21	62:9	197:19
170:4	119:25	29:12,13	38:12	64:7,21	197:20
171:1	120:1,3	40:4	46:24	69:25	198:1,2
map 206:2	135:13	61:17	58:3	70:7,15	200:9
206:2	matched	65:4	60:21	74:1	205:3,20
MARGORIE	91:13	66:16,17	61:2,5	78:9,18	206:18
1:4	matches	68:2	62:6	81:22	206:18
mark 3:8	120:20	87:20,20	70:4	88:10	207:14
190:17	132:22	98:4	79:24	90:20	213:13
206:22	material	102:25	82:19	103:19	214:17
marked	18:1	103:18	83:9,10	105:1	meaning
3:15	19:1	105:5	88:23	115:18	187:13
95:17	42:22	107:12	92:1	116:9,10	192:23
127:3	123:16	107:20	94:2	119:3	meanin...
196:7,8	141:1	110:1	116:5	121:21	6:23
213:18	materials	111:17	121:20	125:3	186:1,2
213:19	36:6	126:11	136:4	136:18	meanin...
market	41:22	127:8	140:6	137:18	186:19
126:15	42:14	134:23	147:5	137:20	197:17
129:15	matter	141:20	150:11	140:2	means
143:10	26:10	141:23	152:24	142:14	73:23
154:3	53:16	143:23	155:7	143:5	107:16
161:11	79:3	152:25	177:7	144:14	115:18
161:13	83:25	168:14	179:16	144:15	127:13
204:13	87:6	168:16	188:14	144:25	127:15
marketing	102:24	171:16	189:10	150:9	169:24
143:22	105:6	171:19	206:4,23	151:16	170:12
152:1	115:1	171:21	208:22	152:3,10	196:13
market...	145:1,3	173:2	214:2	152:11	207:21
144:20	146:6	174:14	Madsa	152:18	207:25
145:12	150:6	174:24	126:10	154:12	208:3
marks 53:2	164:8	174:25	mean 6:19	155:15	218:6,7
marriage	169:7	175:5	7:2,5	155:19	measure
218:10	218:11	177:2,8	9:3 11:5	157:19	13:22
Marsch	matters	182:7	11:5	167:25	122:15

  
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616-552-4438

<b>mechan...</b>	81:9	71:12	138:16	177:25	<b>misund...</b>
64:18,22	135:7	<b>mid-80s</b>	139:17	178:1,6	99:12,21
203:13	137:3	53:13	140:1,12	180:14	<b>misuses</b>
<b>mechanics</b>	<b>mentally</b>	<b>might 8:20</b>	140:16	183:23	56:10
196:16	168:13	14:19	140:20	184:4,5	<b>mitigate</b>
<b>mechan...</b>	<b>mention</b>	21:18	141:10	184:6	63:1
180:10	151:14	24:15	142:2,10	187:21	<b>Mobile</b>
<b>medical</b>	160:22	26:16	143:13	187:22	94:5
146:15	<b>mentioned</b>	35:21	144:4,23	209:9	<b>mode</b>
<b>meet 48:1</b>	61:16	36:10	145:14	<b>mind 30:18</b>	134:10
50:9,25	101:9,12	43:3	146:5,11	32:3	134:12
51:8	165:2	68:17	146:20	35:20	155:4,11
54:24	189:14	70:16,17	147:1,3	59:20	<b>model</b>
56:24	191:15	75:12	147:13	90:22	71:12
78:10,11	215:12	82:1	147:15	<b>None 127:9</b>	72:4
78:12,14	<b>Mercedes</b>	85:16	147:16	127:9	74:7
132:16	53:12	90:16,25	147:20	<b>minimize</b>	81:13
151:25	<b>Mercury</b>	97:8	147:23	57:2	105:4
160:4,14	70:11	111:21	148:20	<b>minimum</b>	113:17
176:2	<b>merely</b>	115:9	149:5,10	133:8	113:20
195:9,23	25:18	121:17	149:16	<b>minor</b>	114:4
196:6	<b>mess</b>	123:17	150:10	99:24	115:20
212:20	215:22	137:9	150:13	<b>minus</b>	115:22
<b>meeting</b>	<b>messing</b>	146:1	151:20	61:24,25	115:25
88:24	203:2	153:22	151:22	85:8,23	116:2
160:14	<b>met 88:14</b>	167:20	152:15	139:25	124:19
179:13	196:4	174:13	153:5	<b>misuses</b>	125:7,9
204:20	212:15	187:14	156:19	143:17	137:23
<b>meetings</b>	<b>metal</b>	<b>mile 91:9</b>	157:2,16	<b>minute</b>	142:9
36:2	65:19	108:9	158:13	35:5	161:15
47:1	<b>method</b>	139:1	158:19	43:12	162:16
50:22	122:20	140:18	159:18	61:16	175:4
51:19	<b>Michigan</b>	<b>miles 95:4</b>	160:1,23	96:14	195:1
<b>meets</b>	1:14 3:1	96:17	173:13	109:8	196:17
160:11	217:13	97:12,18	174:21	117:2	196:18
<b>self 68:7</b>	218:1,4	100:11	<b>million</b>	163:20	<b>modelling</b>
<b>members</b>	218:17	101:3	51:8	180:24	154:19
35:3	<b>micros...</b>	102:1	<b>millions</b>	<b>minutes</b>	174:11
<b>memo</b>	92:18	103:18	47:14	216:6	174:15
168:23	<b>mid 47:21</b>	104:3,21	152:12	<b>miss</b>	175:9,11
190:21	134:21	105:13	<b>millis...</b>	150:24	175:13
190:23	<b>middle</b>	105:14	53:18	169:10	175:16
190:24	3:23	106:24	59:3,4,5	216:1	175:19
<b>memorize</b>	50:16	106:25	59:6	<b>missed</b>	175:19
11:20	109:9	108:5,22	67:4,8	147:6	175:25
<b>memorized</b>	135:21	134:16	90:17	<b>missing</b>	204:17
6:3	<b>midseat</b>	137:14	133:8	169:1	<b>models</b>
<b>memory</b>	54:25	137:25	169:10	170:10	114:18
6:10,14	56:23	138:1,6	177:20	<b>Missin...</b>	174:12
52:16	<b>mid-year</b>	138:9,11	177:24	1:2,20	<b>nodes</b>

  
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141:11	40:21	99:2,5	156:22	89:19	NANCY 1:4
modified	41:2	104:18	157:8,13	121:24	narrow
205:21	45:10	104:18	158:11	124:6,7	97:10
module	61:18	104:22	158:17	multip...	narrowed
8:21	62:19	107:10	159:17	53:19	60:7
13:15	75:12	139:8,19	159:23	museum	NASA 52:7
25:4	82:6	141:17	190:5	79:25	Nashville
34:6	85:3,16	144:7,10	192:25	must 26:3	1:25
75:3	85:17,17	145:20	195:1,22	38:17	10:3,14
94:9	100:13	145:23	Motorolas	107:13	10:15
113:23	100:14	147:25	58:17	133:5	17:2
114:1,1	104:3,22	149:18	Motors	171:11	19:18
119:23	105:5	150:4	58:6	194:23	20:22
130:16	124:12	151:25	mount 86:8	mutual	22:22
134:2	124:17	155:15	mouth	91:11	109:16
196:9	124:23	159:9	72:17	141:7	111:3
213:7	124:24	mostly	move 65:13	myself	Nassar
modules	124:25	30:10,11	90:19	82:16	52:14,15
45:20	125:22	31:12,22	138:4	101:25	52:21
46:15	126:24	motion	158:22	M-a-r...	National
54:12	127:18	98:14	159:13	33:3	10:5
moments	127:22	113:7	159:16	N	20:15
55:18	128:12	Motor 1:9	movement	N2:7 3:17	nations
momentum	131:8	3:6 4:7	209:7	73:12,23	162:21
65:1	134:2	4:18 5:8	moves	name 3:22	nature 7:4
87:21	147:13	5:12	67:19,21	6:3 10:8	7:22
money	150:5	9:17	67:22	23:23	10:20
47:18	151:22	32:10	168:3	25:15	12:17
48:9	166:1	33:11	moving	31:24	14:16
116:6	169:19	38:4	14:15	33:3,14	28:12
monitor	169:20	56:21	nuch 10:13	35:17	45:17
75:4	174:23	101:15	14:17	37:20	56:20
123:8	175:14	103:16	30:18	38:20	62:19
134:9	180:11	104:25	49:14	86:12	67:18
189:25	180:15	133:21	67:12	113:19	94:7
monito...	181:8	136:15	70:15	126:20	142:20
187:15	182:3,4	139:22	115:22	126:21	156:18
monitors	182:9,18	140:10	146:6	168:24	194:19
210:23	182:24	141:13	152:7	192:25	NCAP 139:9
month	182:24	142:6,8	160:4	202:17	143:16
23:17	184:12	144:20	163:23	202:18	151:24
26:2	192:2	145:11	166:1	202:18	160:4,5
months	196:5	145:13	168:5	names 6:2	160:11
5:13	211:11	146:25	183:25	32:1	176:3
more 7:20	mortar	147:2,11	184:16	34:9	near
9:23	198:12	147:13	191:16	44:2	117:16
10:13,17	Morton	147:15	191:24	68:2	117:20
15:25	15:2	149:1	197:11	73:12	207:3,12
26:6,6	most 30:16	150:1	209:3,7	189:1	needs...
31:15	60:9	151:1,8	multiple	193:7	9:15

  
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30:25	52:16	109:13	218:17	104:9	197:13
40:9	58:12	nine 56:24	notations	107:8	198:12
81:20	88:21	nines	12:24	113:19	199:25
200:8	92:19	38:25	note	127:5	200:1
202:15	95:17	nobody	179:12	132:23	215:21
necessary	104:19	48:21	notebook	143:24	numeric
110:16	122:16	61:7	40:16	146:3	38:17
120:22	138:20	73:2	noted 33:9	148:15	39:8
127:25	138:22	155:17	111:9	174:6	
neck 55:17	151:25	Nonst	notes	179:10	0
55:18	156:11	126:10	11:22	191:5,6	03:17
168:3	164:2	nondep...	12:1,7,8	191:6,8	object
need 8:6,9	185:14	103:19	12:9,10	191:11	87:19
31:5,8	208:15	104:16	12:10,13	191:14	93:7
32:3	new 8:25	107:10	12:18	192:9	102:3,11
57:5	9:4	107:11	17:3,11	199:1,2	163:14
60:6,21	19:25	none 104:5	28:9	199:3,9	167:10
112:14	38:21	120:23	36:11	199:12	objection
122:3	53:4,9	nonlit...	111:14	200:8	105:17
127:11	58:12	31:2	172:24	201:8	objective
141:23	63:20	nonmov...	nothing	205:1,2	205:11
145:25	72:25	176:16	163:15	205:6,14	object...
167:24	73:1,6	nonsen...	218:5	206:23	48:1
178:23	93:5	186:22	notice 3:6	207:2,5	objects
179:14	114:4	nonsur...	3:10	207:19	141:21
180:22	116:18	144:5	4:14	214:4,20	observed
180:22	144:23	145:7	109:25	215:8,16	170:4
180:22	145:12	normal 9:3	noticed	216:11	171:1
181:22	news 112:5	14:7	109:24	numbered	obtain
181:22	next 23:6	20:12	notify	4:16	13:15
190:18	40:4	25:12	99:8	204:25	24:20
needed	51:21	142:22	no-fire	numbering	31:11
20:21	57:4	143:2	89:1	190:18	205:11
50:6	110:5	normally	180:20	numbers	obtained
59:15	111:2	142:24	212:21	18:18	22:7
78:21	114:1	North	number 5:1	39:14,19	32:20
needs	179:13	73:23	13:7	39:21	obtaining
181:16	194:15	nose 91:13	19:24	40:15	10:23
negoti...	196:1	91:14	28:18	41:6	16:18
51:9	206:4	92:9,9	33:9	42:10,12	79:3
neighb...	216:21	103:25	38:17,18	42:12	obvious
200:10	NRCH	141:10	40:2,5	90:16	211:4
neighbors	113:25	141:10	48:17,18	95:14	obviously
72:25	NRTH 8:17	nose-t...	49:15	113:21	45:2
never 6:3	10:5	92:18	52:19	116:15	207:12
12:19	nice	Notarial	59:3,11	116:20	ocasi...
13:24	106:11	218:13	68:20	140:9	155:24
19:22	Nickels	Notary	76:8,8	141:18	occasions
37:19	112:20	217:13	87:21	153:13	30:5
38:20	night	218:1,4	100:18	153:15	89:7,12

  
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<b>occupant</b>	188:16	170:20	135:18	49:2	114:4,15
44:22	<b>off</b> 3:10	171:22	135:18	52:25	115:9,14
45:7	27:10,14	174:22	136:1,4	53:24	116:12
63:4	28:9	180:14	136:7	54:5	116:18
66:6,7	46:11	182:16	143:23	56:10	117:13
67:21,22	50:14,15	183:7	156:9	59:19	117:15
84:2	56:8	185:21	157:23	61:16	119:8,15
117:20	59:12	195:10	173:11	63:12,24	120:6,22
137:22	65:4	210:19	<b>offsets</b>	64:2	121:1,5
138:5,8	66:24,25	215:1,3	135:9	65:9	122:13
168:3	67:10,13	215:12	<b>ob</b> 21:14	66:10	122:18
176:1	67:16	216:8	26:16	68:21	123:3,17
178:11	68:16	<b>offer</b>	30:7	69:4,11	123:23
<b>occupants</b>	71:22	215:15	38:2	69:18	124:5,14
45:2,12	74:11	<b>office</b>	98:13	70:14	124:16
67:19	77:9	15:14,16	122:9	72:7	125:25
<b>occur</b> 9:6	88:12,18	15:19	123:17	73:10	127:17
9:13	88:20	16:1,8	158:24	74:3	128:14
10:22	89:21	16:22	205:2	75:19	129:19
144:7	92:5,16	17:6,20	207:4	76:13	130:8,11
156:12	92:22	17:24	<b>okay</b> 3:13	77:25	130:20
<b>occurred</b>	93:7	18:2,11	3:14,22	78:2,5	131:4,20
8:21 9:1	94:1	19:2	3:25 4:2	79:1,5,9	132:2,14
12:22	95:1,14	25:11,17	4:4,12	81:2,6	132:20
14:18	96:13,15	25:19	4:14,22	81:15	134:4,6
19:16	97:13	26:11	5:8,10	82:15	136:6,10
35:2,23	100:10	27:7,15	5:17,25	84:20,25	136:10
54:2	108:23	27:17,20	6:8,13	85:3,12	136:18
75:11	112:1,2	27:23	6:24 7:7	85:15	136:24
94:3	112:21	28:23	10:1,15	86:5,8,9	137:17
97:13,15	119:8	29:1	10:19	87:9,16	138:2,22
103:3	120:17	32:8,9	11:14,25	88:3	139:22
119:20	120:24	32:13,19	12:7,23	89:4	140:19
185:10	121:3,16	33:5	15:22	90:6	141:13
187:14	121:19	36:7,13	16:9,11	91:17,25	142:5
<b>occur...</b>	134:18	36:16	17:8,23	93:18	146:18
89:17	135:3	37:24	19:5,17	96:14	146:25
94:15	136:2	46:24	22:1	97:10	147:9
<b>occur...</b>	137:9	202:20	24:8,14	98:6,9	148:9,11
100:10	143:7,11	215:14	24:19	98:17,20	148:23
<b>occurring</b>	145:1	<b>officer</b>	25:8	98:25	149:8
78:2	151:4,11	22:14	31:24	101:5,7	150:1,21
166:1	152:16	<b>official</b>	32:3	101:11	151:1,21
182:6,21	157:15	15:25	35:20	101:15	153:4,12
<b>occurs</b>	157:23	135:13	38:8	104:13	154:3,18
72:3	158:14	202:18	39:9	105:21	158:6
120:7	159:4	<b>offici...</b>	41:21	107:4,22	159:15
181:14	167:2	163:9	43:15	109:5	161:4,24
181:25	168:20	<b>offset</b>	44:13,23	113:13	162:3
183:4	169:17	60:18	47:10,13	113:14	164:17



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164:24	206:17	47:22	102:17	166:23	125:18
166:8	207:13	49:19	104:6,7	166:24	134:3
167:18	207:16	50:3,9	108:2	167:15	206:25
168:4,13	207:23	52:6	112:12	168:21	207:6
168:22	208:1,8	53:9	112:15	169:15	210:24
169:4,22	208:21	54:20	112:21	170:2,7	211:9
169:25	209:13	56:10	114:5,22	170:24	one-stage
170:3,23	209:21	58:13	115:5,6	171:22	166:22
171:15	210:1,14	59:4	117:8,8	174:20	one-third
172:2,6	211:2,14	63:6,18	117:10	174:24	80:3
172:18	211:23	64:4	118:2,2	177:7,8	only 5:18
173:6	212:22	67:5	119:13	181:7,14	10:18
175:1	215:9	71:16	121:6	182:1,1	15:8
176:9	216:7,20	74:1,8	122:1	186:7,23	40:13
177:13	old 57:21	76:1	123:1	190:16	85:10
178:12	62:11	78:19,20	124:10	190:19	88:7
178:14	203:13	78:23	124:12	193:3	89:5
178:17	212:13	79:10,11	124:17	194:17	91:5,24
178:21	olds 55:11	79:12	124:25	195:14	93:22
179:1,5	once 10:17	80:5,25	125:4,19	197:1	94:23
179:9,12	10:17,18	81:1,7,7	125:22	200:10	96:19,20
180:9,17	18:12	81:11,16	126:24	202:24	97:11
181:23	24:20	83:9,14	127:6,15	203:21	101:14
182:12	25:2	84:7,8	127:17	203:22	103:11
183:9,16	30:2	84:14,22	127:18	206:13	103:18
183:19	32:10	85:3,16	127:22	206:23	105:13
184:7,10	57:21	85:17,17	128:4,12	206:24	107:20
184:14	60:21	85:22	128:12	207:2,5	107:25
184:18	72:9	87:3,4,4	129:7,24	207:7,21	111:14
185:9,23	96:11	87:5,11	130:11	208:9	112:24
186:8,17	144:4	87:12,12	132:17	209:14	121:15
187:11	168:1	88:2,23	133:1	209:14	124:10
188:14	180:24	88:23	134:7,24	209:15	125:11
188:17	185:2	89:5,25	135:16	209:19	129:24
188:20	186:18	89:25	136:6,17	209:22	136:8
189:9,22	187:6	90:8	140:6	213:5,6	150:20
190:13	one 3:12	91:4,5	142:14	213:6,14	176:24
191:15	5:18,20	92:6,25	145:1	213:17	185:16
193:5,25	7:2,6	93:8,15	151:24	213:18	187:19
194:11	19:25	93:16,17	152:12	214:11	187:22
196:7,16	20:2	94:2,14	152:14	214:13	195:8
197:5	24:16	94:16	152:15	216:21	200:24
198:7	26:17	95:2	152:19	ones 68:5	onto
199:2	30:22	96:22,23	156:16	95:10	189:11
200:3,25	31:1	97:1,4	158:8	99:16	open 22:19
201:9,13	38:9,13	97:13,23	159:11	101:8	51:2
202:2,9	38:23	99:13	161:19	108:25	62:5,14
203:1	39:16,25	101:22	164:9,9	122:7	83:3
204:12	40:4,16	102:5,16	165:11	123:5	opened
206:13	43:13	102:16	166:4,10	125:17	21:11

  
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opening	182:7,8	20:1,10	118:7	211:4	139:6
24:4	195:23	20:19	121:7	212:6	141:24
operated	200:19	24:23	125:5,6	others	142:1
99:12	200:19	30:20	125:13	14:3	143:9
operat...	ordered	32:5	125:14	36:1,14	148:1,2
30:8	192:7	33:6,13	125:16	64:13	148:7
operator	ordinary	34:13,21	125:17	109:2	151:6
75:8	20:24	35:16	127:17	otherwise	152:11
131:1	22:3	36:3	128:4,11	75:22	158:16
opinion	organi...	38:17	129:3,25	202:4	159:19
105:10	10:8	40:5	130:13	out 9:5	163:7,8
147:14	41:3	46:14,18	133:25	16:14,23	164:11
149:1	43:18	50:5,10	136:6	18:4,10	166:2
150:4	44:21	51:14	139:3	22:7	169:21
opinions	50:12	56:2	140:17	26:23	170:13
8:2	100:14	57:1,9	141:12	37:2	172:2,9
opport...	organi...	57:14	143:4	39:16	174:14
90:14	52:11	63:2,8	145:23	41:2,8	175:3
opposed	189:2	64:4,10	146:15	48:3,14	176:18
82:8	organi...	64:17	152:18	48:18,18	179:24
177:14	34:9	65:18	153:13	54:23	180:2,3
201:1	organized	68:9	153:18	55:17	180:25
202:10	17:19	72:23	155:7,21	56:13	183:13
203:4	41:22	77:9,13	160:19	57:10,12	184:18
opposite	49:20,20	77:14	162:20	57:22	189:20
91:14	49:21	80:8,8	162:21	59:17,25	198:3,18
optics	215:15	82:18	162:22	60:1	199:7
92:10	216:21	89:14	165:17	61:3	201:17
optional	original	91:4,4	166:3,10	62:22	204:15
71:1	27:7	91:23	166:24	67:14	212:6
options	51:17	92:6,25	167:13	68:11,20	outboard
57:19	origina...	93:1,3,8	167:15	68:22	80:3
order 8:1	25:14	93:12,17	173:9	71:2	outlined
14:17	123:6	94:2,19	175:2,7	73:6	148:21
16:21	165:5	96:21	177:2,8	76:20	212:16
37:21	215:15	98:2,4	185:7,15	77:8,17	output
38:19	ornament	98:25	188:24	78:2	137:19
47:11	121:8	99:13,16	190:9,25	81:12	137:22
48:6	154:13	99:17	191:3	89:10,24	137:25
55:4	173:18	100:9,23	192:20	94:9	138:1
56:25	176:17	101:2,12	192:24	95:21,25	207:20
57:18	177:14	103:20	193:3	97:24	outright
59:2	203:4	105:22	195:15	98:5	126:10
78:21	other 1:5	106:5,22	195:15	103:14	outside
119:8,16	5:4,23	107:6	196:13	106:7	22:11
120:16	6:13 7:9	114:18	202:16	110:2,24	58:1
129:6	9:12	114:23	203:4	112:7	72:13
142:23	13:7,19	115:6,14	206:7,25	116:24	89:5
160:13	15:17	115:20	207:5,21	117:11	145:19
178:2	18:1	116:24	209:6,19	127:12	149:5

  
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163:15	<b>overlap</b>	<b>palladium</b>	54:9,17	116:25	198:22
163:16	90:15	65:18	63:3	162:20	<b>paying</b>
<b>out-of...</b>	136:8	<b>pan</b> 117:19	83:21	199:13	70:4
56:7	<b>overse...</b>	165:20	113:21	199:14	199:7
<b>over 8:8</b>	27:17	208:2,3	121:24	199:18	<b>pays</b>
49:23	<b>overwr...</b>	208:8	130:23	200:21	116:23
53:20	187:18	<b>panel</b>	132:22	200:22	<b>PCs</b> 58:15
57:14	<b>over-r...</b>	34:13	134:8	201:18	<b>peaks</b>
76:16	60:17	45:9	147:22	201:23	76:15
77:11	<b>own</b> 46:8	83:17,20	160:14	201:23	<b>Passero</b>
82:9	126:8	117:17	168:15	<b>passed</b>	123:6
94:9	160:17	117:20	168:15	148:25	<b>penalty</b>
96:16	<b>owner's</b>	<b>panels</b>	168:16	<b>passenger</b>	116:9,10
97:12	15:5,6	63:3	169:16	46:16	116:17
99:13	159:21	<b>pans</b> 72:19	175:9,12	57:8	191:21
100:11	160:2,10	<b>paper</b> 27:5	188:3	81:17	<b>pendulum</b>
101:3	<b>owns</b>	43:11	191:8,11	83:15	64:8
102:1	126:22	155:11	191:13	95:23	<b>penetrate</b>
104:7	160:19	<b>paragraph</b>	192:9	117:10	167:12
106:24		122:6,7	196:20	126:25	<b>penetr...</b>
106:25	<b>P</b>	133:3,9	198:1,23	129:10	141:20
108:22	<b>package</b>	<b>params...</b>	199:8	135:5	141:23
113:4	58:21	50:23	200:7,11	169:6	167:10
116:11	189:4	<b>paren</b>	200:24	209:4	167:22
124:1	<b>packaging</b>	127:6,7	<b>partic...</b>	<b>passen...</b>	<b>Penny...</b>
139:17	34:17	169:22	47:6	100:24	26:19
139:23	84:1	169:23	<b>partic...</b>	<b>passen...</b>	<b>pension</b>
140:12	<b>page</b> 2:8	<b>park</b> 10:10	202:21	70:23	198:19
140:16	2:15	10:11	<b>partic...</b>	87:3	<b>Pentium</b>
141:13	3:11	<b>part</b> 4:5	14:25	96:2,4	58:19
143:1	42:23,24	5:11 6:1	57:7	<b>passing</b>	<b>people</b>
146:21	42:25	8:15,17	90:22	123:16	5:14
147:1,3	43:9	9:8,18	92:16	<b>passive</b>	8:18
147:14	132:23	15:13	103:10	37:4,5	10:6,7
147:16	132:24	23:20	113:24	42:7	12:13,19
147:21	137:14	24:22	115:7	76:12,24	13:6,19
157:2,16	137:22	25:18	116:4	77:14	13:21
160:18	205:22	33:18,23	120:5	<b>past</b> 20:19	14:15,15
160:23	206:11	34:5,14	132:17	89:7	15:24
183:23	206:13	34:16,22	171:8	130:4	16:22,23
185:15	208:19	36:12	196:2,3	142:17	16:25
185:24	<b>pages</b>	38:22	<b>parties</b>	153:7	19:19
187:23	17:13	39:10	22:19	<b>patents</b>	20:1,7
188:9	40:6	44:12,20	24:23	58:11	20:15,16
192:22	43:4,10	45:6	218:10	<b>patrol</b>	20:16,17
198:18	204:23	46:11,14	<b>parts</b>	10:10	23:10,14
207:6	213:9	46:25	15:17	<b>Paul</b> 5:16	26:23
216:1	<b>paid</b>	47:3	22:24	5:20	28:8,19
<b>overco...</b>	200:12	48:20	24:2	35:9,25	30:2,2
60:14	201:22	51:19	72:20	<b>pay</b> 192:6	32:8

  
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34:2,20	145:23	150:10	50:1	perspe...	43:7
34:21,23	145:23	151:20	51:8	31:22	189:5,19
35:16,21	145:24	156:19	60:14	166:8	physic...
36:3,5	146:14	158:19	63:16	<b>pertinent</b>	46:23
39:23	146:20	<b>percent</b>	<b>period</b>	17:14	<b>physics</b>
44:1,14	147:2,14	30:19	30:13	31:14	86:6
45:1,3,9	149:24	77:16,16	52:20,21	<b>phase</b>	Ph.D 4:3
45:14,19	150:3,4	135:9	59:24	114:11	<b>pick</b> 41:16
45:21,25	151:2,16	136:8	67:3,3,7	114:11	85:10,18
46:14,18	152:24	149:23	67:8	114:11	141:20
46:24	153:1,6	149:24	70:21	193:3,10	174:21
47:18	153:7,13	<b>percen...</b>	71:4	193:12	176:21
48:7	153:25	149:22	76:11,17	193:14	207:9
49:24	155:4	<b>percen...</b>	89:10	193:19	<b>picked</b>
52:3,6	157:24	30:18	90:11	194:17	88:1
53:14	157:25	<b>percen...</b>	98:10	<b>phased</b>	142:18
56:11,18	177:17	54:25	100:13	125:6	<b>picking</b>
57:10	177:17	55:10	116:6	194:4,9	119:21
58:1	184:4	56:23	130:18	<b>phased-in</b>	<b>pictures</b>
61:3	185:4	137:8	<b>periodic</b>	100:4	20:23
62:12,15	188:25	195:12	28:17	<b>phase-in</b>	<b>piece</b> 27:5
62:22,24	192:2	<b>perfect</b>	<b>periods</b>	194:3,7	<b>pieces</b>
64:4,10	193:4,7	154:14	50:20	<b>phasing</b>	44:1
65:20	201:16	154:15	58:25	77:15	94:8
72:23,24	202:14	<b>perform</b>	<b>perman...</b>	125:14	192:7
73:3	202:19	106:19	103:25	<b>philos...</b>	198:5
75:7	203:9,24	<b>perfor...</b>	<b>perpen...</b>	150:2,16	<b>pillar</b>
77:14	204:4,5	20:5	89:3	150:16	209:5
83:20	211:5	31:19	136:5	150:18	<b>pillars</b>
89:11	<b>people's</b>	34:13	149:12	151:14	83:21
92:25,25	50:5	50:10	149:14	<b>phone</b> 18:7	<b>pitch</b>
98:11,25	146:19	60:25	149:17	28:17	171:10
99:22,25	147:12	78:10,18	<b>person</b>	99:13	<b>place</b> 8:23
100:5,14	<b>per</b> 43:11	99:7	4:16	<b>phonetic</b>	12:6
101:2	91:9	108:20	31:15	52:14	14:17
103:15	95:4	142:23	56:10	123:6	47:20
103:21	108:5,9	145:18	68:19	126:10	48:6
105:23	134:16	148:3	76:1	168:24	65:24
107:17	137:25	167:7	99:3,14	<b>photo</b>	77:12
107:18	138:1	169:5	142:18	12:15	90:2
108:18	139:1,17	176:1	166:19	<b>photoc...</b>	92:16
121:16	140:12	190:6	168:10	13:2	96:12
122:22	140:18	195:13	168:14	<b>photog...</b>	176:11
123:19	140:20	195:17	168:16	10:2,4	196:16
129:19	141:10	212:20	168:19	12:14,20	211:17
139:8,15	142:2	<b>perhaps</b>	193:17	17:8,25	216:14
143:22	144:4,23	11:15	<b>personal</b>	18:8	<b>placed</b>
144:7,10	146:5	20:16	58:15	23:1	107:2
144:11	148:20	22:9	<b>person...</b>	32:23	190:24
145:21	149:16	49:16,21	103:20	38:3	195:23

  
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205:23	139:25	141:17	174:21	84:1	36:10
206:1	143:17	141:22	175:21	110:10	<b>pounds</b>
<b>placem...</b>	185:6	141:25	176:5,11	137:5,7	55:11
211:7,8	<b>plumber</b>	142:3,10	176:14	158:11	56:24
<b>places</b>	70:16	142:24	176:16	158:17	<b>power</b>
36:18	PW 169:2	143:23	176:16	159:16	65:16
62:13	169:11	144:3	176:22	193:24	66:10
117:4	<b>point 7:2</b>	147:24	177:7	<b>positi...</b>	72:18
134:15	19:10	148:14	183:9	165:21	73:18,19
162:21	21:3	148:24	<b>poles</b>	<b>positi...</b>	75:19,22
<b>plaintiff</b>	47:5,6	149:15	60:18	55:5	89:13
110:10	48:23,24	150:5	141:20	<b>positions</b>	90:25
110:24	49:3	151:10	141:21	31:12	91:2
111:3,5	56:10	153:20	155:20	79:2	130:6,13
<b>Plaint...</b>	60:16	154:4,5	155:21	99:18	130:15
1:7,17	75:4	154:5,14	155:21	<b>posses...</b>	130:17
<b>plaint...</b>	82:10,13	154:15	155:22	23:3,5	133:4,5
106:9,14	102:23	154:20	157:23	23:21,22	133:6,9
216:9	104:3	154:21	169:8	24:3	133:17
<b>plane</b>	108:2	156:5,6	173:10	25:5	133:23
216:1	111:8	156:9,14	<b>police</b>	27:2	<b>practical</b>
<b>plant</b>	137:1	156:16	10:7	<b>possi...</b>	70:17
164:6	138:24	156:19	13:5	156:2	72:18
<b>plants</b>	162:11	156:21	15:20,21	168:21	82:1
46:8	163:22	156:22	20:14	<b>possi...</b>	<b>practi...</b>
162:18	164:10	156:23	31:10	87:24	105:11
<b>plastic</b>	164:10	157:7,7	32:20	153:19	<b>practice</b>
92:15	166:5	157:15	38:3	155:1	18:7
<b>plate</b>	167:9,13	157:17	76:8	156:1	140:7,10
201:10	167:19	158:8,13	<b>policy</b>	157:25	<b>precisely</b>
<b>platform</b>	167:20	158:14	140:10	174:2	71:19
72:10	170:9	158:19	<b>popping</b>	176:8	<b>predates</b>
<b>plating</b>	194:13	158:21	169:17	183:8,15	73:20
92:22	203:8	158:22	<b>portion</b>	<b>possible</b>	<b>predet...</b>
<b>play 45:1</b>	215:24	158:24	33:16	27:19	120:3
<b>playful</b>	<b>pointed</b>	158:25	34:17	36:12	<b>predict</b>
106:12	80:17	159:3,6	45:22	146:16	137:24
<b>Plan 1:20</b>	85:12,16	159:12	46:3	166:16	<b>predic...</b>
<b>please</b>	85:20	159:16	83:22	171:21	166:20
3:22	103:14	159:18	92:12,13	173:22	180:16
197:8	159:12	167:7,9	92:13	176:4	<b>predic...</b>
<b>plenty</b>	<b>points</b>	167:11	187:19	183:3,9	116:14
102:2	26:6	167:19	<b>position</b>	<b>Possibly</b>	116:21
<b>plot 209:8</b>	36:3	169:4,5	5:23	28:17	<b>preemp...</b>
<b>plotted</b>	52:14	170:3	28:22	<b>potential</b>	98:14
186:16	79:16	171:2	29:22	21:23	<b>preface</b>
<b>plus 34:6</b>	80:1	172:4,9	45:15	61:6	105:17
55:16	165:18	173:2,6	54:25	194:21	<b>prefixed</b>
61:24,25	<b>pole 87:19</b>	173:21	56:23	194:25	41:7
85:8,23	141:14	173:23	57:6	<b>Potent...</b>	<b>preinf...</b>

  
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Grand Rapids  
616-456-6300  
Kalamazoo  
616-552-4438

77:17	59:12	pre-19	155:14	71:2	76:16
prelim...	120:2	85:4	171:16	88:3	175:10
11:18	122:3	pre-2000	probably	92:8	180:15
175:17	128:8,15	85:4	10:21	96:23	183:21
prepar...	162:9	price 58:5	13:4,7	97:2,5	203:7
5:10	166:22	198:15	13:16,18	101:23	processes
7:19	177:23	198:24	14:6	102:19	49:19
111:6	178:17	202:4	26:8	106:2	59:2
prepare	178:19	primarily	29:25	126:1	proces...
7:1 9:25	179:4	30:16	32:21,23	131:11	28:7,8
77:18	181:1,4	54:21	36:19	131:25	produce
prepared	182:8,14	99:21	43:12	133:25	15:2
7:17	183:5,11	primary	46:4	144:9	165:25
22:2	183:17	166:4	47:20	149:10	214:22
36:5	188:5	primitive	49:8	150:9	215:10
57:13	preten...	53:12	53:11	167:18	produced
111:19	49:10	58:16	56:13	174:17	4:23 5:3
164:13	54:8	68:24	57:9	176:10	5:5 7:10
preparing	133:7	134:3	76:16	176:21	8:14
7:4,12	144:21	princi...	79:15	176:23	20:3
7:18	161:21	33:10	82:12	177:10	36:21
21:12	pretty	42:25	91:9	208:23	37:15
37:16	11:16	45:17	98:8	problems	42:19
presence	49:14	55:4	99:14	20:20	140:25
218:6	58:16	principle	100:17	42:4	141:2
present	62:21	57:21	111:17	47:2	161:17
5:8	67:1,2	princi...	116:8	54:21	162:7,23
103:5	70:15	73:2	118:19	65:23	163:5
presently	88:11	print 28:9	118:23	82:3	212:7
109:9,21	100:8	126:22	139:19	85:24	214:16
182:14	115:22	printed	143:3	88:17	214:25
preserve	152:6,7	27:14,23	162:7	90:3	215:11
188:15	previous	28:14	163:24	155:16	215:15
president	53:21	printout	163:25	163:20	product
52:20	57:17	186:7	168:21	163:22	8:25 9:5
presid...	145:5	prior	175:10	165:9,13	9:13
52:12	170:2	10:13	178:5	184:16	14:11
press 52:7	184:15	22:5	187:5,5	procedure	15:1
preten...	previo...	50:24	194:21	13:17	20:8
54:19	45:25	69:23	195:6	55:3	35:4
166:17	53:6	88:16	197:14	proced...	48:6,15
177:19	80:5	114:13	216:14	10:23	52:22
178:12	96:8	154:3	problem	process	53:20
178:24	173:12	priority	53:7	4:24 9:4	56:25
180:2,6	prewreck	96:3,4	54:11,13	17:4	57:7
181:15	90:3	probab...	54:14	46:11	58:5
preten...	pre-el...	155:12	55:5	48:21	60:10
34:19	85:4	probab...	56:15	51:1	62:8
49:10	pre-se...	144:6,10	62:15,24	57:25	72:9,13
57:5	49:14	147:17	65:24	60:13	76:23

  
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**Grand Rapids**  
 616-456-6300  
**Kalamazoo**  
 616-552-4438

99:19	76:25	152:6	46:15,17	143:4	120:3
169:14	77:3	protec...	46:18	188:1	125:17
produc...	162:12	55:8	96:10	190:19	131:18
7:23	163:3	70:23	184:25	211:16	155:12
37:13	175:12	167:24	185:4	purposes	155:13
43:24	206:4	168:8	providas	69:12	160:13
48:7	progra...	178:8,10	46:14	70:18	162:7,8
49:1	115:10	protec...	145:2	109:19	162:11
53:10	programs	159:10	providing	118:23	163:10
79:5	51:17	protocol	21:24	121:13	166:23
97:8	202:16	14:2	31:3	142:21	169:16
114:13	progre...	protocols	proximity	143:5	171:20
137:11	100:17	22:21	49:12	169:19	172:22
148:17	project	prototype	193:22	pursuant	180:14
162:14	46:2	152:9	public	3:6	184:17
173:2	92:24	prove	70:9	push 23:16	189:4,11
205:17	139:1	92:11	101:24	pushed	190:8
205:18	174:19	174:14	159:22	26:25	195:9,22
205:19	192:25	provide	159:24	pushing	198:8,15
205:20	projects	6:22	217:13	169:18	198:18
211:13	30:22	8:19	218:1,4	put 3:9	199:8
213:4	31:2	9:11	218:17	7:23 9:4	202:6
215:4	139:3	16:24,25	public...	10:24	203:14
produc...	promising	24:22	11:5	12:15	203:14
215:13	215:7	30:24	public...	13:3	213:3
products	promoted	32:21	10:20	14:18	puts
7:23 9:7	38:16	34:23	11:3,7	17:20	144:20
11:20	propel...	47:13	pull 23:16	27:15	putting
31:8	178:7	48:16	39:16	40:3	125:15
49:1	properly	54:6	pulled	44:16	152:11
58:6	89:11	55:8	153:14	48:3	193:7
61:20	90:2	63:4	pulse	50:8,24	196:4
66:19	92:8,19	66:10	24:11	51:7	203:3
77:18	139:16	67:10,20	44:12,17	56:12,12	putting
83:18	175:5	75:7	44:25	58:5,21	96:10
89:12	property	113:11	60:11	60:1	p.m. 216:22
114:23	18:14	131:2	62:17	66:2	
125:14	proposal	133:5	63:1	71:1	g
125:16	162:7	160:5	114:21	74:9	quantify
126:2,5	171:11	167:24	purchased	76:21	149:2
126:6,14	proposals	168:8	199:6	77:3,8	158:21
127:20	190:16	169:5,9	parcha...	83:18,23	quantum
162:22	191:1	178:8,10	192:8	90:2	69:15
171:14	193:21	184:23	197:15	95:21	question
204:6	proposed	provided	199:5,7	98:11	18:3,9
program	76:24	10:5,7	purely	111:19	41:24
50:2	151:24	15:17,18	53:17	114:12	50:18
51:22,23	propos...	24:21	purpose	114:23	52:1
76:3,5,7	195:13	32:7	19:18	115:1	53:2,8
76:18,19	propos...	37:20	119:12	119:25	63:17



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616-552-4438

70:2	<b>quick</b>	156:21	<b>rather</b>	154:7,22	168:22
78:15,16	89:19	158:1,7	18:9	156:8	171:3
85:6	109:6	158:7,7	61:5	161:8	172:21
88:6	<b>quit</b> 188:8	<b>RANDOLPH</b>	135:11	165:7,11	179:15
89:16	<b>quite</b> 5:1	1:23	195:17	166:16	184:19
96:8,14	7:18	<b>random</b>	197:1	166:23	185:23
96:17	20:4	39:17	<b>ratings</b>	173:24	195:6
103:4	47:25	40:5,14	139:10	175:23	217:3
123:19	50:24	40:23	<b>rational</b>	176:6,19	<b>readiness</b>
126:4	62:3	<b>Randy</b>	75:23	178:18	34:19
128:14	88:24	101:19	<b>raw</b> 185:2	182:1,18	130:25
129:10	95:22	200:3	186:9	183:5,17	<b>reading</b>
129:22	108:8	214:15	187:6	183:19	6:18
138:2	117:1	<b>range</b>	<b>RCM</b> 22:7	183:20	37:4
140:5,9		55:10	22:23	184:11	39:23
140:25	<b>*</b>	90:17	23:8	184:18	41:10
141:16	<b>R3</b> :17,17	91:7	24:11	185:9,13	42:2
142:5,20	3:17	93:25	34:19	185:15	<b>randju...</b>
147:5	38:17,20	110:18	113:23	185:23	80:7
149:4	<b>raccoon</b>	138:6	114:15	188:18	<b>reads</b>
150:15	165:19	142:2	115:14	191:6	187:22
157:5,12	167:3	143:15	115:20	192:11	<b>ready</b> 4:22
157:18	<b>radiator</b>	143:20	117:14	192:23	<b>real</b> 31:6
161:18	79:15,17	144:1,2	117:15	198:15	31:7,7
161:20	79:18,20	144:5	117:22	198:15	164:20
162:24	80:2,6	146:3,9	118:3,5	200:4	176:15
164:4,12	90:9,23	148:2,7	118:7,12	205:25	200:8,9
172:24	91:17	148:11	119:12	211:15	<b>reality</b>
174:19	95:2	148:20	120:7,9	211:19	197:17
174:20	97:2,18	148:25	120:11	211:23	<b>realize</b>
175:8	101:9,12	149:5	120:12	212:9,10	63:15
176:25	117:12	158:5,16	121:6,10	212:24	74:18
177:16	118:2	159:20	122:18	213:25	106:1,2
183:25	121:8	174:14	124:2,5	214:1	106:3
188:1,10	206:17	174:16	124:11	<b>RCMs</b> 115:5	154:14
196:11	207:11	<b>rangers</b>	125:19	198:25	181:25
197:8	209:23	10:11	127:17	207:23	<b>realising</b>
208:14	<b>radiat...</b>	<b>ranges</b>	127:22	<b>reached</b>	57:18
211:18	84:21	142:3	128:18	110:13	<b>really</b> 5:5
<b>questions</b>	<b>radios</b>	156:12	129:2	216:10	6:15
6:16	45:10	174:4	131:9,20	<b>reacts</b>	19:8
20:11	<b>ran</b> 62:13	178:4	132:13	60:12	22:1
35:18	108:5	<b>rapport</b>	132:14	<b>read</b> 15:24	42:12
42:10	142:9	30:3	132:15	16:1	61:22
51:4	154:10	<b>rare</b> 153:8	133:10	42:24	63:22
116:21	156:9,9	153:10	133:13	43:13	68:23
126:1,12	156:9,10	<b>rate</b> 65:14	133:16	76:16	73:21
126:13	156:11	111:11	133:22	116:8	76:6
129:25	156:19	<b>rates</b> 62:8	134:2	127:7	92:2
163:14	156:20	111:5	153:23	147:5	146:5

  
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157:18	19:16	receives	215:12	136:1	170:8
160:6	21:14	103:16	216:8	143:22	181:9
176:12	23:11	179:23	recorded	reflect	reliable
181:21	24:23	recent	124:2,4	199:25	49:6
184:17	25:1,24	189:17	130:23	refresh	50:5
184:23	27:11	recently	153:4	6:10	55:15,21
186:19	28:6,11	9:23	183:17	refreshen	66:15
realm	32:22	Recess	184:11	73:11	174:25
139:2,7	33:7,11	43:16	185:19	refres...	180:16
real-w...	35:18	109:7	recorders	6:14	182:18
9:10	36:4	170:21	12:19	72:3,12	182:24
61:10,13	38:1	recliners	recording	regard	183:6
rear 66:6	67:7	45:5	28:17	4:18,19	reliably
66:6	85:2	recognize	188:9	8:9 79:9	78:20,22
83:16	91:24	195:19	records	regarding	relied
reason	95:10	recogn...	162:19	32:6	28:22
47:23	97:9	106:6,7	185:17	35:21	38:7
73:13	99:14	106:23	redesign	42:10	remedy
104:4	101:14	recoll...	50:22	185:24	176:10
133:16	102:6	16:18	reduce	regard...	176:21
135:16	108:1,25	19:20	48:4	147:18	176:22
147:15	113:22	20:9	55:9	151:2	remember
163:18	118:9,12	22:17	63:2	region	6:20
166:23	125:14	26:4,7	146:10	170:6	12:16
188:18	125:17	71:19	150:10	171:4	14:7,10
203:3	131:14	74:11	reduced	regula...	15:7
reason...	139:3,20	79:14	139:13	76:15	33:1,14
58:5	139:21	85:19	149:23	77:15	37:19,20
104:12	140:1,4	118:14	218:6	151:25	48:12
106:20	141:3	125:15	reducing	regula...	81:24
164:15	142:3	194:7	116:15	32:15	94:4
reasons	151:13	recons...	reentered	55:12	97:15
166:3	156:18	52:11	96:25	76:10,24	135:16
181:7,14	160:2	recons...	refer	regula...	186:3
recali...	186:22	22:14	17:21	32:14	rememb...
78:23	191:18	reconv...	18:9	relate	6:11
recali...	192:11	216:13	38:6	40:22,24	reminder
78:25	192:15	record	114:6	related	179:14
81:13	208:17	80:15	135:8,13	25:9	remote
recall	209:24	95:13	135:18	relati...	124:9,10
5:18 6:9	recalls	109:19	137:3	30:25	124:12
6:16	107:19	112:1,2	141:1	141:24	154:6,13
9:19	receive	112:4	191:4	relative	165:10
10:4,21	181:8	170:20	reference	44:17	177:13
10:25	received	185:15	127:13	205:11	196:21
11:2,9,9	10:11,11	188:15	referred	release	202:7,11
11:12	118:1	203:16	19:6	52:1	removed
13:1,8	119:17	203:18	114:5	132:22	22:23,25
15:3,8	120:18	210:19	referring	213:3	rental
17:16	120:19	215:1,3	135:18	reliab...	22:12

  
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<b>Rent-a...</b>	142:6	195:2,24	<b>respon...</b>	76:12,24	42:23
1:10	172:23	196:3,6	34:3	193:22	reviewed
10:13	172:25	204:21	44:9	202:19	6:24
19:7,9	<b>repres...</b>	212:14	<b>respon...</b>	<b>restrict</b>	154:25
19:11	23:5	212:16	33:15,22	126:18	reviewing
22:23	<b>repres...</b>	<b>requires</b>	34:7,11	<b>restri...</b>	7:9
25:15	25:6	59:8	34:15	126:4	102:6
<b>repair</b>	<b>request</b>	151:22	35:3	<b>result</b>	<b>reviews</b>
75:8	29:4	151:23	52:1	10:19	52:10,13
<b>Repair...</b>	37:12	167:4	190:5	59:20	52:14,22
62:23	102:8	181:19	<b>respon...</b>	67:1	<b>revision</b>
<b>repaired</b>	137:11	213:4	56:25	90:4	132:18
54:15	148:17	<b>requiring</b>	111:4,5	110:24	213:8
89:11	210:16	196:1	111:11	112:16	215:6
<b>Repeat</b>	215:15	<b>rereading</b>	<b>respon...</b>	173:3,7	<b>rewrites</b>
197:8	<b>requested</b>	172:13	37:12	187:9	184:8
<b>repeat...</b>	9:22,24	<b>research</b>	41:24	196:3	<b>Rich</b> 23:19
55:15,21	19:20	50:1	<b>restau...</b>	<b>resulted</b>	24:24
<b>repeat...</b>	37:13,16	140:4	201:10	98:21	<b>Rick</b> 35:17
78:20,22	<b>reques...</b>	174:19	<b>restrain</b>	172:7,10	<b>rid</b> 165:22
<b>replace</b>	110:3	<b>resist...</b>	56:16	<b>results</b>	<b>ridged</b>
117:1	<b>requests</b>	68:12	<b>restraint</b>	24:15	169:20
<b>report</b>	102:14	95:25	13:15	96:10	<b>right</b> 8:10
7:18 8:1	<b>require</b>	96:5	19:25	174:25	8:13
8:2,10	120:1	123:18	20:3	<b>retaining</b>	10:16
10:7	151:18	<b>resolve</b>	34:5	188:2	18:24
13:5	166:21	47:1	37:4	<b>retesting</b>	21:9
15:20,21	<b>required</b>	<b>resolved</b>	42:7	50:21	22:9
23:15	60:10	13:24	44:9,16	<b>retired</b>	25:18
32:20	120:4	32:16	47:17	5:9 9:23	34:1
37:16,21	121:1,10	51:3	48:16	29:21	36:15
38:2,3,6	167:17	<b>respect</b>	54:12	<b>retiring</b>	41:8
105:19	179:6	6:10	114:1	16:4	46:5
186:6	181:21	7:12	137:23	<b>retractor</b>	52:11
188:20	195:2	43:6	193:23	45:23	57:20,21
189:3	196:2	209:4	194:9	49:9	63:11
204:23	<b>requir...</b>	<b>respond</b>	195:11	<b>retrac...</b>	64:3
<b>reported</b>	119:15	102:8	197:6,10	13:23	65:6
2:1	120:20	<b>response</b>	197:11	22:25	67:17
94:13	121:10	41:15	199:10	<b>retrieva</b>	68:10,12
96:7	139:10	59:17,19	199:17	185:2	70:13
<b>Reporter</b>	178:3	115:12	200:20	<b>retune</b>	71:18
2:2	194:8,18	135:8,13	201:24	60:23	74:3
218:3	194:22	135:14	<b>restra...</b>	<b>retuned</b>	81:18
<b>reports</b>	194:25	137:4,12	31:4	71:12	82:7,9
8:3	214:5	179:20	33:18	<b>review</b>	83:13,16
189:2,20	<b>requir...</b>	<b>responses</b>	34:14	4:24	83:25
<b>repres...</b>	77:19	16:14	37:5	7:20	84:4,16
7:9	89:6,6	42:16	45:19,21	12:22	85:10,10
81:21	133:4	134:24	45:24	39:17	85:11,17



85:23	184:20	rocker	138:15	R-o-g-e-r	84:14,22
86:21	187:1,4	209:5	138:22	3:23	90:14
90:8	187:9	Roger 1:13	138:24	r-w-a-...	117:14
91:21	192:22	2:9 3:23	139:23	38:12,14	118:5,6
93:15	193:18	217:3,9	140:11	39:8	118:7,11
94:17,18	195:5	Rolanite	140:16		118:14
98:1	199:14	64:5,15	141:9,13		118:16
102:11	201:5,6	66:19	142:8,8	Sable	118:18
103:12	205:7	role 45:1	145:15	27:18	118:21
108:15	209:4,5	roll 53:22	148:23	70:10,16	119:3,6
112:23	209:12	65:10	151:9,21	70:18	119:12
114:9	210:18	66:21	152:3,7	125:11	120:7,12
118:4	212:24	90:12	152:14	127:4	120:13
119:10	rigid	rolled	153:2	SAE 136:14	120:18
120:10	62:21	75:11	154:4,8	Safely	120:23
121:9,12	149:12	roller	156:14	9:17	121:3,6
121:15	159:11	108:19	156:16	safety	129:2,7
127:19	169:15	Romulus	157:8,14	10:5	202:7
128:12	rigidity	1:14 3:1	157:25	20:15	sales
128:16	44:15	room 37:5	158:13	27:17,20	171:9
128:17	rigidly	39:23	158:23	30:9	same 3:10
129:15	167:22	41:10,21	158:24	32:8,9	3:12
130:22	ring 95:25	42:2	159:12	32:13,18	18:1
130:23	rings	95:20	159:15	33:5	45:1
136:22	46:19	96:25	174:14	38:5	46:24,25
137:21	ripped	Ross 52:13	174:23	51:16	49:7
138:7	88:12	52:13,20	175:1,2	56:22	58:19
139:11	94:9	rotated	175:13	121:13	63:14
147:3	risk 48:4	90:10	187:7	136:15	66:24
148:18	51:4	rotation	189:3	142:16	67:14
149:6,19	55:9	90:23	204:12	150:3,19	68:1
153:20	57:2	round	204:18	160:22	74:18,25
153:21	63:2	158:22	204:19	195:25	82:18,18
154:13	110:24	RAM 196:15	204:19	202:19	87:5,9
154:15	139:12	199:8	205:12	safing	98:25
154:16	146:7,10	200:13	205:13	60:3,3	102:21
155:24	150:10	RSV 139:4	205:19	66:1,2,5	108:14
156:6	risky	151:6	210:15	66:8,16	110:20
161:5	167:6	RSVs 145:6	211:2	66:19,23	112:10
165:11	169:4	rule 3:5	running	71:10,16	114:17
165:12	road 85:20	4:9	139:20	74:5,6,7	115:23
165:16	165:20	91:12	140:7	74:8,23	119:7
166:25	ROBERT	rules	145:6	79:10,12	122:20
167:5	1:18	32:14	152:8	80:11	138:13
168:20	robust	194:6,24	174:6,20	81:1,7	161:10
170:19	88:9	195:4,6	runs	81:11,12	162:17
176:7,17	169:9	195:6	136:12	81:16	163:5
180:8	rock	rule-m...	136:25	83:9,14	164:6
181:3	165:19	195:13	188:23	83:23	166:9,9
182:15	167:3	run 90:20	Ruth 35:17	84:7,8,8	176:10

  
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616-552-4438

178:17	183:13	132:18	<b>Schaffer</b>	<b>sent's</b>	120:1,4
198:15	183:20	133:5	95:9	166:19	126:1,2
198:24	189:25	134:17	<b>schedules</b>	<b>second</b>	126:18
210:11	190:14	135:17	23:10	52:25	127:7,12
210:23	196:21	137:14	110:4	59:4	128:6,25
211:8,11	197:2	137:22	<b>SCI 15:24</b>	97:21	130:7
212:17	200:5,15	161:20	20:7	100:20	132:14
213:12	200:16	161:21	23:14,20	109:12	132:21
216:15	203:3	162:5,9	<b>scratch</b>	116:18	133:2
<b>sat 92:1</b>	207:14	169:1,2	92:22	133:2	140:2
<b>satellite</b>	208:12	169:22	<b>script</b>	135:17	141:2
22:23	<b>satisfied</b>	169:22	48:23	137:10	143:6,10
34:6	50:7	169:25	<b>Seal</b>	138:11	147:25
50:6	<b>Saunders</b>	170:14	218:13	176:9,9	149:10
117:11	29:7,11	170:18	<b>sealed</b>	176:19	151:3,4
118:11	31:25	171:5,15	23:2,23	178:15	152:16
118:25	32:6	171:23	65:12,22	184:7,10	153:15
119:13	33:13	183:16	81:4	184:12	154:5,23
120:14	35:7,24	184:3	<b>searching</b>	205:22	156:4,6
120:19	<b>save 42:9</b>	187:4	103:15	206:5,11	156:16
120:24	137:10	188:8,14	<b>sent 6:6</b>	208:19	157:24
121:2,7	146:19	191:3	13:22	209:14	159:9
122:19	147:11	194:22	14:2,9	209:15	160:10
122:24	<b>saving</b>	196:16	14:12	215:1	161:12
123:3	116:5,14	196:17	22:24	<b>secret</b>	161:22
124:7,17	<b>saw 50:11</b>	197:9,20	34:11	127:11	168:22
124:25	63:9	203:2,6	35:2	<b>section</b>	168:23
125:4,19	161:1	205:11	45:4,5	5:25	170:15
125:23	<b>saying</b>	205:18	45:22	<b>see 9:2</b>	172:13
126:25	14:5	205:25	46:17	12:22	173:12
127:18	79:23	206:2	49:7,8	32:24	179:2
127:20	98:11	207:20	56:12,14	38:6	180:23
127:22	113:4	209:4,17	57:6	41:10	186:8
128:1	120:13	209:23	137:5,7	49:17	188:3
129:1,7	120:14	211:24	144:12	50:20	190:7,19
129:16	166:17	<b>scanning</b>	144:21	56:18	192:1
153:20	168:14	92:17	161:20	59:13	197:13
153:21	<b>says 26:14</b>	<b>scenario</b>	161:25	62:6	198:11
153:22	28:1	86:17	162:1	73:24	202:2,12
154:21	50:14	<b>scenarios</b>	193:17	80:17	202:14
161:8	52:8	137:2	209:18	82:12	203:12
162:5	73:12,13	<b>Schaeffer</b>	<b>seating</b>	83:4	204:20
165:10	78:16	1:4,6	45:4	92:17,18	206:5
166:24	80:17	18:22	<b>seats 45:2</b>	92:22	207:4,6
173:17	82:9	19:1,4	45:5	102:18	208:25
176:6,9	95:18	93:21	56:12	106:20	212:4
176:19	112:24	97:21	57:11	106:21	213:17
176:23	113:4	101:3,12	63:3	108:9	214:15
178:18	116:4	101:21	70:16	109:1	215:4
182:2	126:22	150:24	208:9	115:19	216:20

  
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<b>seeing</b>	203:5	67:22	83:23	153:21	208:12
57:22	204:2	72:21	84:9,15	153:22	<b>sensors</b>
87:13	208:15	74:2	84:22	154:6,13	53:21
134:10	212:7	77:22	85:3	154:15	56:9
156:18	214:13	84:1	87:22	154:16	57:7
192:15	<b>sell</b> 56:25	87:16,16	88:1,4	154:21	59:24
<b>seek</b> 54:16	58:6	112:11	88:10,13	156:5,6	60:1,2
113:5	126:4	154:7	88:20,22	156:7,17	60:22,22
131:1	150:23	169:13	90:14,15	158:10	61:19,20
<b>seen</b>	160:13	169:14	113:19	161:8,25	64:8,17
187:20	198:14	184:23	115:3	162:5,6	64:22
210:3	<b>SEMS</b> 92:10	186:5	117:5,5	162:10	65:25
<b>seeded</b>	92:17	<b>sensing</b>	117:5	162:12	66:1,3
187:18	<b>send</b> 16:24	49:12,13	118:5,5	162:16	66:16
<b>seems</b>	26:11	51:13,24	118:6,7	163:1,1	67:13
103:1	32:18	53:5,8	118:7,11	163:21	69:20,21
<b>seen</b> 16:15	38:24	60:17,17	118:11	165:5,7	71:6,10
47:20	59:16	76:5	118:14	165:10	71:10,11
48:10	65:3	96:4	118:17	165:10	71:14
49:8	66:24	122:12	118:19	170:5	73:7
52:14	74:25	169:12	118:21	171:3,18	74:4,7
57:9	75:2	169:23	118:24	171:20	74:13,18
68:5	77:17,20	170:18	119:1,3	171:21	75:23,24
79:8	86:13	188:4	119:6,12	173:2,7	75:24
88:8,21	153:22	<b>sensor</b>	119:12	173:17	76:6
89:5,7	154:6	22:24	119:13	173:17	77:6,8
89:12,18	156:7	34:6	120:7,12	173:21	78:7,7
91:23	175:22	39:17	120:13	173:22	78:16,16
92:4	180:2	43:2	120:14	175:22	78:21,23
93:4	183:13	50:6,7	120:18	176:5,6	79:6,10
101:16	211:24	60:3,4,8	120:19	176:9,10	79:11,14
114:10	212:10	60:8	120:23	176:18	80:1,10
116:16	<b>sending</b>	63:19	120:24	176:20	80:11,12
132:4,9	120:8	64:18	121:2,3	176:23	80:13,21
134:15	<b>sends</b> 69:6	66:2,5,8	121:7,22	177:13	80:25
146:12	69:8	66:8,16	122:18	178:18	81:5,9
146:13	75:16	66:16,19	122:19	183:13	81:10,15
153:12	173:24	66:23,23	122:20	183:20	82:24
153:13	176:6,18	68:11	123:3,23	190:14	83:8
154:2	179:24	69:14	124:10	191:7	84:7,14
156:11	180:3	71:13,16	124:17	196:21	84:20,20
160:21	182:3,3	74:15,23	124:25	196:21	85:7
179:11	<b>sensat...</b>	77:22	125:5,19	200:5,15	87:25
186:7,15	108:10	78:19,21	126:25	200:16	88:3,19
186:19	<b>sense</b>	79:9,10	127:5,6	202:7,7	88:25
188:12	13:17	80:16,22	127:18	203:4,9	89:19,20
188:20	42:23	80:25	127:23	204:12	89:22
199:12	54:10	81:1,11	129:2,8	205:12	91:18
200:1	61:22	81:12,16	129:24	206:2,17	95:11
202:8	62:7	81:25	153:20	207:14	114:16

  
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115:11	183:16	136:11	131:3	96:2,2,4	161:19
117:4,6	183:19	170:8,10	short 32:4	96:6	162:22
118:2	separate	218:12	58:25	98:6,7	213:13
119:5,17	17:23	setting	65:11	115:7,7	simple
121:6,11	18:11	24:5	67:13	117:9	36:12
121:24	19:2	several	68:5	122:11	73:21
124:6,7	25:14	38:10	130:24	124:8,15	102:18
124:9,10	36:10	194:15	shorted	124:16	164:7
124:12	134:7,8	196:1	68:11	127:1,19	simply
127:20	September	216:18	Shorthand	128:1,3	174:20
128:2,18	23:9,12	severe	2:2	128:11	203:16
129:1,7	26:22,24	24:13	218:3	129:5	simula...
129:16	52:17	88:9	shoulder	136:6,8	203:10
137:24	217:15	103:17	209:4	sides	simula...
161:25	sequence	103:18	show 71:21	83:18	174:8,10
162:3	40:4,8	120:1	72:25	side's	175:1,13
165:21	40:10	138:21	80:14	113:7	simult...
166:23	50:22	144:15	122:5	Siemens	75:15,16
167:4	72:14	152:22	125:25	48:11	simult...
171:8	166:15	174:3,4	127:3	49:2	66:9
172:9	168:6	severely	132:2,15	202:22	67:5
177:6,11	179:6	100:24	161:15	sign 23:23	75:21
178:17	180:9	shaft 64:9	161:25	signal	119:10
179:23	sequen...	share	162:4,4	35:1	since 8:6
182:1,12	40:2	28:24	170:18	46:17	16:17
193:16	series	189:23	185:6,9	65:3	29:9
203:11	4:15	sheer	196:7	67:1	37:5
203:13	72:1	159:4	212:20	74:25	41:7
203:15	174:7	sheered	showed	75:16,18	97:10,11
203:20	serious	92:16	190:16	75:19	98:8
205:15	104:22	sheet	192:16	90:6,11	102:25
205:16	serves	127:11	showing	117:23	103:10
205:21	190:19	213:13	77:11	119:16	106:21
205:23	service	shelf	206:14	119:21	108:21
205:24	1:10	201:19	shows 79:5	119:23	110:8
206:10	54:14,16	shipped	130:13	153:23	133:20
206:14	75:9	17:6	205:22	154:6,22	139:24
210:9,11	116:25	36:7	206:23	156:7	140:10
210:12	121:16	161:10	206:24	173:24	141:13
210:23	131:1	162:25	209:9	175:22	142:7
211:8,12	190:8	164:9,9	shut 71:4	176:6	148:1
sent 13:5	198:23	shocked	72:17	180:5,6	151:8
16:14	set 32:23	95:22	shuttle	212:10	152:19
17:9,14	41:25	shoot	52:7	signals	156:22
25:10	42:4	183:7	side 31:13	120:9	157:13
90:7	67:9	shop 10:22	50:13	similar	174:11
123:25	86:20	11:6,15	57:8	70:15,18	190:4
123:25	109:21	11:16	70:23	91:13	single
154:22	121:19	13:2,12	85:9	94:15	82:10,13
180:6,6	131:20	15:6	87:4,4	102:5,21	163:22

  
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164:10	174:1	slab	192:24	12:7,9	59:14,15
164:21	182:22	210:2	193:1,4	12:11,12	59:17
165:18	188:8,22	slightly	193:8,25	12:19,24	60:10
166:5	211:21	96:1	194:11	12:24,25	61:4
167:19	sit 46:23	slip 46:19	195:3,21	13:7,12	62:2,18
167:20	46:24	95:25	195:21	13:25	62:22
single...	210:22	slipped	204:7	14:9,12	63:15
50:4,7	211:3	47:24	206:7	14:22	64:4,15
121:22	site 48:21	sloppy	Smith	16:2,3	65:18,22
162:5,8	sitting	180:24	37:18,19	16:14	65:23
162:10	8:6	195:20	110:2	17:1	66:18,19
162:12	67:24	slow	snake	19:7	66:25
162:16	92:9	168:14	103:9	20:8,10	67:8
163:1,20	125:22	168:15	snowplow	20:11,21	68:4,24
165:5	130:8	slut	169:16	21:15	68:24
167:6	142:5	106:10	169:17	23:9,13	70:16
169:4,11	157:2,21	SN 209:18	soft 167:9	23:16	71:21,21
172:3,6	172:19	209:23	168:5,15	26:2,5	72:19
196:25	173:16	small 44:7	168:16	26:16,18	73:12,24
197:2,4	173:17	44:18	software	26:24	75:9
202:9,10	173:17	58:21	35:14	28:7	76:19
202:12	174:16	59:3	185:3	31:5	77:13
sir 3:22	201:18	76:8	187:7	33:20	78:6
4:8,11	212:22	117:3	soil 159:5	34:9	82:3,11
4:21 5:9	situation	166:18	159:7	35:9,13	82:24
12:4	56:7	187:19	sold 70:9	36:5,6	83:4,5
17:22	89:18	204:3	77:19	38:17	83:17,20
25:13,20	95:11,24	smaller	126:14	39:24	85:13
31:23	145:10	55:4	161:13	40:5,5,6	88:9
40:20	166:6	104:9	163:15	40:8,14	89:14
42:18	167:2	SMART 56:5	163:16	42:8	92:14,24
69:24	situat...	63:20	164:13	43:3,4	93:23
70:1,3	57:1	88:16	164:19	43:21	94:13
82:15	103:6	93:5	solution	44:1	95:7,14
93:22	106:5	102:16	55:7	47:21,23	96:7
94:21	six 55:11	114:7,9	solutions	49:14	99:16
95:19	115:5	114:13	151:17	50:11,13	100:7
97:21	124:13	114:18	solve 42:3	51:10,10	102:6
115:17	128:6,8	116:19	54:22	51:14,17	106:7
125:4	128:11	119:11	155:15	51:23	109:16
128:24	six-loop	125:10	155:17	52:9,13	110:1
131:7,9	128:4,15	126:24	155:18	52:14,20	114:9,9
132:25	128:18	140:22	some 5:4	53:1,2	116:3,13
133:2	skip 165:2	152:18	5:13 6:9	53:12,15	116:16
135:24	skipped	158:12	6:11	53:23	116:25
140:14	125:8	165:4	8:22	54:23	117:2,22
154:9	skipping	175:7	9:21,22	55:1,8	118:13
156:3,24	82:15	191:4,17	10:11	55:15,25	119:22
158:20	slamming	191:22	11:1,11	57:15,17	120:3
163:9	121:19	191:24	11:16,18	58:7,11	121:20

  
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123:11	187:8,19	<b>somehow</b>	145:1	96:9	<b>sonar</b>
125:13	189:3,4	23:13	147:7	99:12	49:14
125:17	191:15	50:16	156:12	100:15	<b>soon</b>
126:3,15	194:3,8	91:17	158:1	105:12	119:21
127:12	194:12	97:19	165:2,19	105:13	166:15
130:1,5	199:3	123:23	166:1	105:14	<b>sorry</b>
130:7,18	200:1	<b>someone</b>	167:22	108:1,15	72:16
130:21	203:8,12	28:25	168:22	108:18	80:20
130:24	203:14	<b>someplace</b>	169:25	116:6,13	133:3
131:1,10	204:2,5	26:3	172:10	140:1,3	157:12
133:22	204:16	66:7	172:14	143:22	161:4
133:25	204:19	84:19	174:25	144:18	211:14
134:15	205:16	113:22	177:1,4	151:16	<b>sort</b> 12:11
134:16	205:24	<b>something</b>	181:24	152:25	28:13
135:10	205:25	6:5 9:2	182:1,2	158:4	32:9
135:10	206:3	10:10,21	186:24	159:4	34:22
137:10	210:13	12:23	187:12	174:10	43:21,24
138:24	211:11	16:21	187:14	194:5,22	48:13,25
138:24	212:6,19	18:20	188:14	194:23	49:18
139:3	213:17	20:23	189:14	197:17	57:10
141:11	214:6	21:12,13	189:22	203:16	59:17,21
143:4	<b>somebody</b>	32:11	191:7,10	209:16	66:25
144:14	6:8,19	36:11	194:4,10	210:17	78:6
144:14	15:16,20	38:13	194:12	<b>somewhat</b>	93:24
145:24	18:2,6,8	43:18	197:14	81:14	109:17
146:1	18:18	44:5	197:20	91:15	117:17
151:5	22:10,13	50:24	210:5	126:18	117:18
152:6	26:7,14	51:13	211:5,16	139:13	130:1
155:7,16	28:1	53:14,20	211:17	195:20	133:17
160:8	58:10	57:22	<b>some...</b>	<b>somewhere</b>	134:2,17
161:22	68:9,23	61:11	115:24	12:9,24	141:15
163:20	77:23	65:2	<b>sometime</b>	16:7	142:9
165:9	108:9,10	68:11,13	21:17	74:9	160:19
167:11	108:13	68:18	84:17	75:11	169:20
167:13	127:24	69:6	110:5,17	77:22	174:9
171:9,11	129:9	77:25	155:2	81:16	187:8
172:3,14	144:16	98:21	<b>sometimes</b>	83:14,24	189:3,4
174:8,9	149:21	107:20	12:12	84:3,9	196:4
174:13	150:22	108:11	18:5	84:15,21	202:12
174:14	168:25	121:21	19:15	84:23	204:15
175:1,5	192:5	122:21	26:4	110:17	210:9
175:11	196:8	123:12	44:24	116:16	214:6,8
178:9	198:18	123:17	56:11	125:19	<b>sorting</b>
182:3	201:7	123:18	58:1	126:22	48:18
184:3,15	208:22	128:7	65:8	138:5	<b>sorts</b>
185:4,7	213:19	129:11	70:5	154:16	163:22
185:12	<b>somebo...</b>	130:24	72:13	161:1	166:10
185:18	127:8	142:2	79:2	176:20	<b>sounds</b>
185:25	<b>someday</b>	143:1,3	80:20	177:14	50:8
186:2,6	150:11	144:25	92:1	202:3	66:11

  
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 Kalamazoo  
 616-552-4438

161:19	213:1,2	158:18	178:1,14	146:2,11	163:17
170:9	213:3,7	174:5,21	178:15	146:11	194:20
206:20	214:4	174:23	180:22	155:16	statis...
216:20	215:6	175:20	180:22	174:17	77:2
source 8:7	specif...	176:4,17	181:22	177:20	statis...
8:13	7:22	183:10	181:22	177:21	77:1
40:22	9:15	speeds	183:1	181:24	statis...
42:13	38:4	59:7	stages	181:25	78:2
51:14	59:9	105:5	99:19	182:2	153:12
sources	61:24	135:10	128:16	194:19	stay 72:10
202:23	78:10	144:2	165:3	205:19	72:11
southern	89:6	spend 43:9	180:4	started	stayed
1:2 94:4	132:16	43:12	194:17	9:21	65:15
space 52:7	211:23	spent	stamp	21:11	steel
62:19	212:3,9	29:25	39:19,20	26:1	158:24
122:17	212:9,24	51:15	39:21	40:17	158:25
speak	213:25	spike	stamped	42:7	159:16
146:19	215:17	168:7	39:15	46:1,11	steering
speaking	speculate	spinning	stand	55:12	34:12
97:25	37:3	46:11	40:12	72:8,8	45:14,14
spec	155:2,6	spoke	standard	76:6	45:16,18
214:20	specul...	33:11	56:22	95:13	45:18
special	15:8	spring	159:15	96:8	46:19
8:18	82:13	66:20	standards	99:16	94:10
13:6,20	specul...	square	9:17	119:21	96:1
139:14	82:10	80:21	38:5	119:23	168:10
141:21	176:24	85:20	78:6,9	125:6,14	Stenog...
142:4	speed 90:8	squash	136:16	125:15	218:7
143:3	91:6	123:7	standing	starting	step 23:6
specific	94:24	squeezed	56:17	83:21	149:9
35:19	95:3	209:22	standp...	94:21	Stepping
89:17	97:17	SS 218:2	113:8	130:14	47:11
specif...	101:20	staff 56:2	154:12	starts	stick
5:2	101:23	stage	155:19	119:23	65:24
10:25	104:18	54:20	stands	state 3:22	sticking
11:10,13	107:15	57:4	113:25	127:17	194:5
17:17	137:1,21	61:5,5	star	127:21	stiff
32:22	139:24	68:3	139:10	218:1,4	62:11
141:4	143:6,15	120:2,2	stars	stated	stiffness
specif...	144:24	128:10	152:1	112:3	44:11,17
68:12	148:11	128:10	start 6:17	150:15	still 5:21
88:15	148:12	134:25	10:22	195:24	9:20
132:6,7	148:24	135:1,3	57:22	statement	16:3
132:10	149:24	135:3	68:13	111:18	17:15
133:11	150:7	137:21	91:8	146:18	25:11
133:18	151:19	138:8,11	99:4	States 1:1	29:8,12
147:22	153:23	161:22	108:17	25:6	29:13,22
184:2	154:5	162:6	120:8	107:8	55:14,20
212:2,13	156:16	166:18	128:5	161:7	56:1,18
212:25	157:10	177:24	145:21	163:16	64:22



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Grand Rapids  
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616-552-4438

71:14	65:2	70:15	74:21	26:19	139:2,7
73:6	<b>struck</b>	<b>subcom...</b>	101:17	32:12,15	146:16
88:14,23	86:22	62:19	<b>supplier</b>	33:7	148:10
100:7	<b>structure</b>	<b>subgroups</b>	46:13	35:16,17	149:22
117:18	44:17,21	45:21	88:13,25	39:12,16	171:15
130:17	45:1,4	<b>subject</b>	93:2	52:23	<b>surviv...</b>
139:6	60:12	103:10	212:15	54:17	63:4
144:11	62:2,17	<b>Subscr...</b>	<b>suppliers</b>	71:1	139:12
147:20	73:7	217:10	13:25	77:18	140:8
162:17	82:24	<b>subseq...</b>	14:9	78:9	145:2
177:8	83:4,5	11:25	34:21,22	87:25	149:16
194:5	85:24	17:3	46:21,23	94:18	152:23
196:24	86:10	<b>subseq...</b>	47:3	100:21	153:3,5
204:20	114:21	114:23	190:4	102:8	<b>survive</b>
<b>stopping</b>	141:22	<b>substa...</b>	202:20	106:13	62:10
215:24	158:3	14:14	<b>supplies</b>	113:6,21	144:11
<b>storage</b>	167:8,11	<b>substa...</b>	130:13	118:18	145:24
18:10	170:6	115:14	<b>supply</b>	121:14	149:23
184:16	171:4,21	115:16	9:22	122:16	150:4
<b>store</b>	203:12	<b>sudden</b>	130:6,15	122:23	<b>survived</b>
36:19	<b>struct...</b>	77:11	133:4,6	123:1,14	144:15
68:8,24	44:20	167:12	<b>support</b>	123:21	150:24
75:6	<b>struct...</b>	168:6	47:19	123:22	<b>survivor</b>
184:1	31:4	<b>suffic...</b>	79:15,17	126:2	151:3
200:10	44:11	133:6	79:18	129:12	<b>suspect</b>
<b>stored</b>	83:1	176:18	80:2	131:18	191:1
8:20	<b>studied</b>	183:10	90:9,23	134:14	198:23
18:5	126:5	183:11	91:17	141:19	204:10
37:7	129:10	183:12	95:2	142:25	212:17
68:15	<b>studies</b>	<b>suffic...</b>	97:2,19	146:13	<b>suspected</b>
183:20	154:18	164:7	117:12	151:11	72:16
185:6	155:11	<b>suggest</b>	121:8	160:4	<b>suspen...</b>
<b>stories</b>	173:7	190:24	206:18	163:16	83:6
62:12	<b>study</b>	<b>suggen...</b>	207:11	166:4	<b>switch</b>
<b>story</b>	67:13	190:4	209:23	167:16	67:5
135:12	141:21	<b>suit 9:20</b>	<b>supports</b>	169:24	123:12
<b>straight</b>	203:2	<b>Suite 1:24</b>	80:7	170:10	<b>switched</b>
135:21	<b>stuff 17:4</b>	<b>sun 201:18</b>	<b>suppose</b>	170:16	147:6
136:12	23:2	<b>summaries</b>	127:25	175:8	<b>switches</b>
136:25	55:18	32:19	146:1	177:5	75:20
149:14	63:2	<b>summary</b>	<b>supposed</b>	185:18	179:2
149:14	79:19	179:19	91:19	189:8,21	<b>sworn 3:18</b>
158:13	89:15	<b>superc...</b>	139:1	190:15	217:10
159:8	105:18	175:15	147:23	191:11	218:5
176:16	127:12	<b>supple...</b>	158:14	196:13	<b>system</b>
<b>Street</b>	169:18	137:12	193:8	202:14	11:11
1:24	187:18	137:23	<b>sure 3:10</b>	215:2	33:8,16
<b>strictly</b>	189:11	<b>supplied</b>	14:3	<b>surprised</b>	33:25
64:21	198:20	14:24	20:14	108:8	39:24
<b>strike</b>	<b>styling</b>	16:12	24:23	<b>surviv...</b>	43:7,22



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44:9,16	105:2	148:25	197:11	125:10	172:21
45:7	113:19	149:6	199:11	141:12	187:6
46:14,20	113:20	152:14	199:17	142:16	198:13
47:16,17	114:4,7	152:18	200:20	163:5,10	198:18
48:3,16	114:7,15	154:11	200:22	167:15	taken 1:14
51:13	114:17	158:12	201:24	171:13	3:6
53:5	114:17	158:16	202:9,10	172:3	14:17
54:2,4	114:18	159:20	204:7	177:21	42:24
54:10,11	114:20	161:19	206:8	193:25	43:16
54:13,15	114:23	162:8	212:15	194:9	81:12
54:18	116:18	164:1	212:23	195:3,4	88:10
55:7	116:19	165:4,4	systems	195:25	107:9
56:5,11	117:14	165:17	1:10	196:1	109:7
57:2,4	119:14	165:20	6:10	202:21	110:4,12
57:18	120:4	167:6,15	19:25	205:12	170:21
59:10,25	121:22	172:6,7	20:3	212:13	184:18
60:9,23	122:11	172:7	34:11,15	S-a-n-...	217:4
61:14	122:14	173:16	50:5	31:25	218:4
63:4,6	122:24	175:7	53:8,12		takes
63:14,18	124:14	176:1	54:5,24		178:6
64:11	124:15	178:10	55:3,22	T119:22	taking
65:13	125:10	183:21	55:24	177:21	20:23
66:10	126:24	187:16	57:16,17	tailor	55:12
67:23	128:1,3	188:4,8	59:7,21	44:16	110:13
68:4,6,7	128:4,6	189:11	60:9	45:7	178:22
69:5,18	128:15	190:6,7	61:6	60:25	talk 6:8
71:5,7,8	128:18	191:4,4	63:1,21	tailored	30:18
71:13,14	128:22	191:10	63:25	65:25	33:5
71:17,20	129:1,3	191:12	64:2,10	take 12:13	35:7
71:25	129:5,6	191:13	65:25	13:10	49:9,11
74:2,3	130:1,2	191:16	66:14,22	23:6	49:13
74:10,14	130:6,20	191:17	68:2,15	24:2	56:3,4
74:23	130:20	191:17	68:23	40:16	58:18
75:5,22	130:21	191:18	69:13,14	41:12	70:10
77:21,21	131:10	191:22	74:22	43:14	71:6
78:24,24	131:22	191:24	76:4,5	47:20	72:2,18
79:4	131:25	192:5,20	76:17	53:22	72:19
80:16	132:7,12	192:21	82:17	62:9	86:16
81:25	133:5	192:24	84:6	88:13	96:20
82:17,18	134:20	193:25	85:5	106:13	101:9
83:8	137:23	194:1,11	88:16	109:6	116:22
84:13,17	139:15	194:19	89:18	110:2,15	117:7,8
84:25	140:23	195:9,17	93:5	110:20	119:4
85:1,15	142:23	195:21	95:15	110:25	129:9,13
87:18	144:23	195:22	102:4,16	111:2	130:4
89:13	145:12	196:4,20	102:21	114:25	135:23
95:21	145:13	196:25	102:22	129:5,6	142:18
96:4	145:18	197:1,3	102:23	143:22	151:16
99:12	146:17	197:4,6	115:3	152:13	153:1
100:5	146:22	197:10	119:11	164:2	159:11

  
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163:11	125:7	tape 12:19	120:16	206:6,8	150:13
170:3	129:11	23:24	120:22	208:12	150:22
193:2	134:19	targeting	121:1,5	210:12	151:7
195:7,8	134:21	47:23	125:5,11	210:24	152:23
216:21	136:1,14	50:23	126:23	211:9,13	196:6
talked	136:19	51:6	127:4,19	Taurus	teen
5:11	143:1,24	targets	128:7	96:21	141:18
6:25	144:10	196:9	132:8	Taurus...	teens
26:22	145:9	209:6	133:10	70:10	116:17
33:2,10	146:12	Taurus	133:16	203:23	telemetry
35:6,6	146:23	27:18	133:22	TSD 161:21	53:19
81:24	148:1	33:24	135:4	team 1:10	telephone
96:24	149:2,12	46:2	136:12	8:18	33:1
108:16	149:13	47:16	136:25	34:22,23	159:3,6
111:24	152:6,8	52:5	137:23	35:3	televi...
134:20	152:25	53:4	138:3,14	46:22,25	114:8
148:2	154:14	54:2,4	140:19	47:3	143:11
173:11	157:17	63:8,13	140:22	202:11	tel 14:22
184:15	157:19	63:24,24	148:23	202:17	5:15
193:9	169:14	69:19	152:13	teams	32:25
202:20	170:13	70:6,6	154:3	203:20	38:23
talking	171:2,19	70:18,19	156:4,4	203:24	40:18
3:10	174:2,11	71:5,6	158:12	tear 14:1	48:23
6:17	176:13	71:13	159:17	92:7	61:11
7:10	177:3,5	72:2,4,9	161:5,7	technical	62:12
13:14	177:23	73:5,14	161:14	5:7	68:15,19
30:14	178:4	74:17	162:23	118:23	69:19
49:13	179:16	80:8	163:11	techni...	71:19
50:3	180:13	81:21,23	163:16	129:20	84:12
53:17	190:19	82:6,17	164:3,5	129:20	91:1
63:6,16	193:4,20	94:23	165:4	techni...	107:7,13
69:25	196:14	96:18	170:1,25	175:15	115:21
70:6	197:2	97:3,3,4	172:2	techno...	119:19
75:6	201:13	97:16,17	173:1	57:12	119:19
81:22	203:8	102:6,17	175:6	techno...	131:11
91:8	212:22	113:16	177:13	47:19	131:17
99:4	talks	113:20	190:1	49:17	132:10
101:21	48:11	114:15	191:5,16	50:2,4	137:20
103:2,2	100:23	115:1,2	192:24	51:20,24	138:22
103:10	135:8,9	115:2,4	194:12	51:25	144:3
103:12	160:7,10	115:10	195:23	52:24	148:19
107:17	169:1	115:15	195:23	54:9	159:21
107:18	195:13	115:20	197:7,10	58:12,20	160:3
113:16	tall 55:10	115:22	197:12	60:24	165:13
118:22	tampering	115:24	199:11	76:13	168:13
122:9,10	23:25	116:19	199:17	129:14	195:17
122:11	tang 92:14	117:6	200:21	140:8	199:17
122:14	tank 62:14	118:8	202:7,15	150:8,9	199:21
124:11	tanks	119:11	204:1	150:11	206:10
124:19	62:13	119:15	205:12	150:12	206:24

  
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Kalamazoo  
616-552-4438

208:18	141:14	168:17	140:20	46:8	211:24
209:1,15	142:4,20	testified	141:3,5	57:17	213:10
210:17	143:3,4	3:19	141:6,17	61:13	213:16
212:23	144:2	102:20	142:3,8	62:2	things
216:4	150:6,12	testify	142:13	103:21	7:17,21
telling	151:10	4:6,17	142:24	103:24	7:22 9:6
43:20	151:10	210:6,11	143:11	103:25	9:12,16
143:12	151:18	210:14	143:23	142:14	9:18,21
tells	152:9	218:5	143:23	142:15	10:24,24
61:25	153:2	testif...	144:3	142:15	12:3,15
159:24	154:8,10	7:8	145:6,15	142:16	12:17
160:2	156:14	142:6	145:16	142:17	14:6,8
temper...	156:18	153:18	151:10	145:13	14:25
212:19	157:4,14	testimony	151:12	160:21	15:15,16
Tempo	158:1,23	12:2	152:10	188:20	17:2
51:22	160:14	110:2	154:18	194:24	18:1,8
70:8	170:4	113:6,14	156:9,9	204:6	18:11
76:2,23	174:8	218:6,8	156:11	218:10	20:20
94:13,20	176:1	testing	157:1,7	thane...	21:20
96:23,24	189:2,3	9:16	157:7,20	44:5	22:21
97:6	189:4,10	50:22	157:25	they'd	28:10,18
Tempos	189:12	62:14	159:15	76:13	29:9,16
96:22	189:13	139:5	170:3	150:22	30:5,23
ten 72:11	189:14	141:19	171:2,2	thing 7:24	31:7,19
142:17	203:11	142:11	172:9	14:1	35:10,10
tead 12:17	203:14	142:22	173:11	20:12,23	38:5
135:7	204:23	144:1	174:7,14	28:16	42:23
169:19	205:1,2	145:5	174:23	40:13,14	43:20
tends	205:3,13	148:2	175:13	43:25	44:7
167:14	206:7,15	154:1	175:20	49:7	45:17
Tennessee	208:19	156:13	186:23	51:4	47:20
1:25	208:23	156:20	188:23	52:4	49:14
tena 38:25	210:5,10	175:17	189:16	59:21	50:10
tenth	210:14	176:15	203:12	92:15,25	51:10,11
184:7,12	210:16	202:12	204:12	98:25	51:24
term 114:2	210:21	211:12	204:18	101:22	53:17,19
114:3	210:22	tests	204:20	107:25	57:9
134:10	211:2,5	16:21	Thank 39:9	112:12	58:11,13
terms	211:7	41:22	42:4	113:25	58:19
119:4	212:19	43:1	164:24	119:2	59:11,13
134:20	tested	78:3	Thanks	123:12	60:18,19
166:10	7:21	138:15	109:5	134:17	61:4
terribly	138:20	139:17	their	138:4	62:24
144:17	144:24	139:23	12:10	160:20	67:12
test 42:25	147:16	140:3,3	14:11	175:1	69:1,15
43:4	148:8	140:7,11	18:4,5	188:21	72:12
47:15	173:10	140:12	21:10	190:7	77:14
55:3,21	173:10	140:16	24:3	196:21	84:11
55:22	173:11	140:17	26:23	202:13	87:21
90:20	tester	140:18	29:2	210:9	93:1

106:3	26:18,20	129:9,10	209:24	164:21	85:15
108:20	27:3	129:11	213:11	202:9,10	three-...
114:12	28:22	129:22	216:5	thousand	55:13
116:25	29:4,25	130:6	thinking	43:11	threshold
122:15	30:2,4	131:6	50:13	59:3	89:1,6
126:3	31:16	134:19	58:22	thousands	95:16,23
127:5	33:1,7	134:20	90:8	142:12	96:9,11
130:4	36:19	137:2,3	152:24	157:20	99:11,22
131:17	38:11	137:21	160:17	three	141:18
134:15	39:19,25	144:4	160:18	25:10	142:25
139:11	41:8	147:5,6	168:13	41:6	143:1,5
139:25	44:1,6	147:25	173:16	60:2,8	146:13
141:12	48:18	149:3,22	third	61:5	158:2,3
144:18	49:11,17	150:18	22:19	67:8	158:9
151:17	50:3,17	150:19	25:21	71:10,14	170:8,10
153:25	50:19	150:20	79:16	72:22	203:14
154:1	52:9,13	150:22	80:1	74:4,8	212:14
155:5,22	52:13,17	152:21	109:14	74:15	212:20
155:23	52:19	153:1,25	thorough	75:24	thresh...
166:5,10	53:23	158:15	108:6	79:9	122:3
170:24	58:14	160:20	though	80:12,13	through
172:24	59:23	162:6	21:20	80:23	16:1
175:2	60:9	163:4,9	24:20	81:4,9	20:6,14
178:5	61:9	164:6	41:25	83:9	24:4
185:16	63:16	173:22	55:18	84:7,7	42:20
193:11	65:18	174:2,4	56:11,17	84:14	43:8
think 4:13	67:2	176:8	58:9	86:6,15	48:17
5:4,13	68:17	177:16	70:23	87:17,25	49:18
5:24 6:4	76:25	179:13	88:22	89:1,1	50:19,21
6:7,17	80:11	179:15	103:8	93:20,22	51:1,9
6:20	86:12	184:2,3	116:13	94:8	53:10
8:16	88:23	185:3,11	117:18	96:15,19	54:3
9:20	91:5	187:18	164:18	96:20	56:2
10:4,8	97:14	188:10	180:13	97:1	65:16
10:12	100:17	190:3,15	215:7	102:14	66:10
13:14,23	102:5	193:1,3	thought	105:13	72:4
14:18,19	104:14	193:7,9	17:13	105:14	73:4,9
14:22,23	111:16	193:15	48:21	117:5	74:17
16:14	111:17	193:20	57:14	124:9,9	75:22
19:6,7	111:23	194:3,7	76:18	128:18	76:11
19:22	112:4,25	194:21	77:6	151:11	90:18,22
20:16	113:25	194:25	78:19,19	207:6	92:3,7
21:14,17	114:10	196:13	88:21	214:2	92:23
22:9,22	116:2,7	196:14	100:6	three-...	101:24
22:24	118:22	196:25	106:16	122:17	123:16
23:3,4,9	120:25	197:2	127:24	three-...	123:25
23:13,17	122:9,10	202:18	130:3	60:9	124:1
23:22	123:19	202:18	150:9	71:20,24	152:17
24:2,22	124:6,8	208:3,14	155:6	74:10,14	155:4
26:16,17	127:11	208:22	162:8,11	84:17	160:9

  
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 DEPOSITION SERVICES

A RECORD OF EXCELLENCE

Troy  
 248-244-9700  
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 313-961-5560

Lansing  
 317-337-7337  
 Ann Arbor  
 734-769-7808

Grand Rapids  
 616-456-6300  
 Kalamazoo  
 616-552-4438

163:21	56:10	185:5,15	175:10	total 63:1	10:6,6
179:15	59:1,24	185:22	175:10	80:10,11	19:19
181:23	66:24	185:24	203:1	133:8	20:15
187:7	67:4,8	186:7,25	204:8	totally	transv...
190:15	67:14,15	187:5	210:22	11:19	86:1,11
203:7	70:22,25	193:11	211:3,10	40:5	travel
204:24	71:4,5	194:13	together	touch	111:4
208:25	74:25	199:24	10:24	87:18	traveling
209:21	76:11	203:8	12:15	100:22	111:6
215:4	82:16	209:2,3	35:4,4	tough	treatable
throug...	88:23	209:7,20	47:1,2	126:13	145:3
100:12	89:10	209:22	49:22	towards	treas
throwing	90:11,12	216:13	77:3	80:6	60:18
168:14	90:16	times	83:6	82:11	62:13
168:16	91:23,24	27:25	91:7,10	Downcar	trial
thrusted	94:12	28:19	92:21	82:23	111:25
88:14,24	97:9	49:20	153:14	trace	112:14
88:25	98:10	59:13	162:7	209:25	112:17
thumb	100:13	89:23	190:8	track	112:25
91:12	108:2	92:6	198:8,16	209:6	triaxial
thump	109:15	114:5	told 6:24	tracks	205:25
165:20	110:1,2	134:17	11:9	45:6	207:21
Thursd...	110:16	169:10	14:10	trains	208:5,13
111:22	111:8,10	214:2	45:25	72:18	trick
time 6:2,2	111:11	timing	142:19	transc...	165:20
6:4 7:2	112:21	67:17	159:25	218:7	167:14
7:6 11:1	115:4	165:16	184:4	transc...	tried
12:14	116:6,8	166:12	185:13	218:8	13:16
13:4	119:22	177:18	214:2	transc...	triggered
21:19	124:1	today 4:6	tolerance	218:7	169:6
22:18,18	130:18	7:8 25:5	146:2,23	transi...	trim 45:3
23:1,9	134:7	28:21	147:8	44:4	tripled
24:11	138:24	44:6	tomorrow	translate	199:4
25:25	139:8	47:2,6	109:11	86:11	trouble
26:7,17	147:25	56:18	tone 131:6	transl...	137:10
28:22,23	151:6,24	61:7	131:7,8	89:2	troubl...
29:3,21	152:13	93:11	131:12	transm...	11:17
30:13,19	152:21	94:23	131:13	46:10	54:8
33:12	162:11	95:9	131:15	62:20	truck 94:6
36:3	165:18	97:22,25	131:24	transmit	94:7
39:5	167:20	109:15	tools	171:17	169:3,14
41:19	167:23	113:10	121:20	transm...	203:25
42:22,24	168:1	118:8	top 56:20	65:16	trucks
44:2,2,3	169:7	127:17	79:18	90:25	44:7,18
44:4	171:8	127:21	83:4	183:12	169:15
47:22,22	172:21	130:8	178:6	transm...	169:18
49:3,23	178:6	142:5,7	183:24	75:18	169:19
50:20	180:12	142:18	197:21	transp...	204:2
52:14,21	180:13	157:21	torsion	14:21	true 36:17
52:22	181:24	172:19	14:17	Transp...	40:9

  
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 DEPOSITION SERVICES

A RECORD OF EXCELLENCE

Troy  
248-244-9700  
Detroit  
313-961-5560

Lansing  
517-337-7337  
Ann Arbor  
734-769-7808

Grand Rapids  
616-456-6300  
Kalamazoo  
616-552-4438

50:7	33:8	175:12	111:25	64:2,4	135:2
144:13	37:11,12	204:17	115:4,5	64:17,18	136:11
145:25	41:1	tunnel	118:2	69:15	142:25
162:8	49:12	209:18	121:6	70:19	144:15
201:11	55:1	turn 16:25	124:6,6	74:19	146:16
217:5	62:9	56:8	127:15	75:6	154:13
218:8	76:9	75:20	128:8,9	102:22	160:15
truth	86:12	87:20	128:12	122:19	173:18
218:5,5	99:5,6	turned	128:15	145:7	173:25
218:6	103:9	9:19	128:15	155:21	176:1
TW 14:10	120:2	48:17	128:16	162:20	177:14
14:23,24	122:2	65:3,3	129:1,7	176:12	190:1
try 8:19	139:3	twining	129:16	195:3	196:22
8:21 9:1	141:24	87:21	135:16	208:18	203:4
9:1,5	143:9	twist	140:6	types 7:24	212:10
11:10,11	150:23	87:14	141:7,9	57:3	undern...
13:19	151:6	two 18:10	163:4	63:6,19	117:17
18:4	155:13	30:15,16	165:21	102:12	117:19
20:19	170:13	41:6	166:23	108:15	unders...
22:19	176:2	52:4,6	170:7	152:2	4:6,12
31:18	180:9	61:5	177:10	205:16	8:4,11
32:15	185:12	63:6,22	179:23	206:10	8:21 9:1
43:6	186:12	67:7	182:12	207:20	11:5,11
48:14,19	193:15	69:14,16	185:16	typical	12:21
49:18	198:3,20	70:12	185:20	18:17	13:19,21
53:24	tube 53:22	71:10	188:25	typically	20:8
57:1,8	63:20	72:22	199:21	11:15	22:20
57:10	64:15,16	74:5	207:6	17:25	28:15,21
61:9	64:24	75:13,14	214:2	U	31:18
63:4	65:6,13	75:15,16	two-di...	ultimate	32:12
67:14	65:14	75:20	187:2	52:5	33:8
99:9	66:17,18	79:10,11	two-point	55:7	39:11
111:21	67:12	79:12	164:1	190:5	40:10
119:24	69:5	80:6,8	two-se...	ultima...	43:6
135:12	74:20,21	80:11,25	85:1	17:5,9	48:14,19
135:15	75:12	81:5,15	two-stage	29:20	53:3,23
141:22	86:8,19	84:20	166:22	78:11	53:24
151:25	90:13	85:6,7	two-th...	104:6	54:2
154:10	116:11	90:9	99:15	unbelted	55:14
155:12	119:2	91:7,10	type 20:16	138:5	57:8
175:2	191:18	91:13	28:4	148:22	66:13
193:21	tubes 64:3	93:17	37:10	unclear	67:2
202:24	85:12,12	94:2	45:8	171:13	70:2
203:16	87:17,20	95:3	53:5	under 4:17	86:5
209:16	152:19	96:12,21	54:1	29:9	98:13
trying 6:9	tuned	97:11,18	60:13	35:10	100:8
10:8,22	55:25	99:17	63:7,8	83:17	101:23
13:14	114:20	101:14	63:10,18	92:22	106:3
21:14,21	tuning	103:11	63:20,21	121:8,17	112:12
21:24	62:5	108:21	63:22,25		112:18

  
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 DEPOSITION SERVICES

A RECORD OF EXCELLENCE

Troy	Lansing	Grand Rapids
248-244-9700	517-337-7337	616-456-6300
Detroit	Ann Arbor	Kalamazoo
313-961-5560	734-769-7808	616-552-4438

115:11	44:19	91:21,22	175:5	U-S-F-...	132:4
115:19	82:25	155:15	user 131:8	168:25	180:10
117:2	83:3,5	155:17	uses 162:5	U.K.161:16	199:13
119:24	units 77:3	unwind	162:10		199:18
123:3	unknown	66:21	176:15	V	vary 62:18
140:9	170:9	updated	using 9:13	v1:8	178:5
145:4	unless	132:18	51:11	104:19	vast 59:7
147:4,10	60:9	upper	57:10	105:1,10	vector
168:22	108:6	160:3	82:16	107:21	85:19,24
192:9	126:16	upset	118:18	108:9	85:25
193:21	132:9	62:24	121:20	valid	86:13,16
197:18	141:16	use 12:19	123:20	170:7	86:24,25
201:6,6	142:3	31:8	132:23	valleys	87:1,6,9
201:9	157:18	55:20	139:15	76:15	87:13
202:24	163:2	62:22	149:9,10	vandalism	122:17
209:1	214:3	64:15,24	152:9	121:18	vectors
unders...	unlikely	84:5	175:7	variab...	.86:5,10
7:20	110:7,9	108:7	198:3	62:1	108:18
29:11,13	169:8	134:16	211:7	variable	122:16
31:13	unmovable	136:20	usual	61:3	vehicle
49:1	136:21	140:18	157:4	116:20	6:5 7:3
51:23	138:14	143:23	usually	116:22	7:6,10
85:24	unrest...	185:2	10:21	196:9	8:16
100:5	56:19	used 15:2	12:13,21	197:15	9:17
102:14	unsurv...	26:5	30:17	197:16	19:17
121:5	145:9	27:11	38:5	197:21	20:1
150:25	153:11	30:23	52:6	198:2,5	38:3,5
198:5,21	until	34:8	65:10	198:16	43:8
unders...	12:15	46:1,9	66:2	198:22	44:6,12
39:12	21:19	47:4	72:9	200:9	44:15
40:13	22:1	56:16	79:18	201:13	45:8
52:23	26:1	58:25	91:12	variables	50:6
71:22	29:21	62:25	92:14	61:8,9	54:14
undertake	32:4	64:4,7	118:21	variab...	56:22
104:11	33:12	64:10,12	122:14	198:21	60:11
underw...	49:23	64:12,14	123:5,15	variance	62:6,10
184:25	57:24	73:2	125:21	82:19	62:20
185:1	60:24	76:25	132:21	variat...	70:20
under-...	72:4	77:14,14	142:1	63:18	72:20
60:17	73:9	122:9	143:17	variety	73:6,9
unique	76:14,17	123:6	153:10	108:17	73:11,22
114:24	78:22	130:4	155:4	126:14	73:25
United 1:1	94:23	134:14	158:24	175:2	75:8,9
25:6	101:10	143:5	160:7	207:23	76:21,22
107:8	103:5	169:18	162:19	various	82:1,20
161:7	112:18	189:17	175:25	48:9	83:3
163:16	139:8	203:13	188:24	49:8	84:2
163:17	142:7	useful	192:1,8	59:16	87:15,20
194:20	169:9	24:6,8	195:7,16	79:6,8	88:11
unitised	unusual	24:10,20	203:6	117:4	91:14



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248-244-9700  
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Lansing  
517-397-7937  
Ann Arbor  
734-769-7808

Grand Rapids  
616-456-6300  
Kalamazoo  
616-552-4438

92:16	62:2,2	26:18	155:17	214:1	217:3,9
93:4,4	62:17,18	version	163:4	vital	Wagners
94:6	64:16	53:6	164:12	170:12	38:17
96:18	70:8,18	70:11	166:14	171:16	Wagner's
97:8	70:24	162:17	166:20	171:18	104:15
99:8	72:1	162:25	166:20	volatile	110:4,12
100:16	74:1	versions	167:6	170:6	110:20
102:5	76:9	64:4,6	168:3	171:4	111:4
103:7,11	80:8	79:8	169:4,5	Volksw...	112:8
105:3	81:23,24	versus 6:8	170:5	73:2	113:6
108:4,5	82:22,23	24:11	171:4	voltage	wait 61:10
113:24	90:9	62:19	177:19	123:2,5	137:9
114:20	91:6,7	78:7	177:19	123:8,9	149:9
114:21	91:10,13	91:12	178:9	123:13	waiting
114:22	96:18,21	119:12	180:12	123:16	18:10
114:24	102:12	163:11	180:19	123:24	182:9,20
115:7	102:24	164:22	213:1	123:25	waits
117:16	103:4	185:5,22	visibility	123:25	182:18
117:20	106:23	186:25	170:11	124:1	walk 54:3
118:25	115:20	191:17	vice 52:12	Volvo	181:23
123:4	124:17	191:24	52:20	126:7,8	walked
124:13	125:6,9	209:7,20	videos	126:11	24:25
124:18	126:20	very 32:1	143:10	152:13	wall-t...
125:20	126:23	47:6,14	view 60:16	160:19	136:5
133:4,8	134:1	47:25,25	Visteon	Volvos	want 3:8
135:23	139:23	50:18	34:5,21	126:3	8:11
136:3,15	140:12	58:25	46:12,12	W	27:19
137:7	141:9	59:3,10	48:10	W3:17	30:18
148:14	162:20	59:10	49:4	wager	32:12
154:4	163:15	64:11	122:22	164:18	43:18
156:19	164:14	66:11,14	123:19	Wagner	48:3
158:3,7	velocity	66:14,14	129:11	1:13 2:9	53:24
161:3,9	58:24	67:20	129:23	2:16	54:11,15
161:10	65:7	70:5	177:17	3:14,15	64:14
163:5	104:19	71:22	185:12	3:23,25	102:7,9
167:8,9	104:21	76:8	188:10	4:2 42:5	104:2,8
177:7	106:24	88:9	188:17	43:18	104:8
184:18	137:25	102:21	188:19	100:22	105:25
195:16	venture	106:11	188:20	105:5,23	107:23
199:8	174:16	108:6	190:2	107:23	110:10
202:5,25	Veridian	138:21	192:6	109:24	112:21
204:14	23:20	138:21	198:10	111:1,2	116:7
205:18	verifi...	144:15	198:14	111:6,19	117:7,8
205:18	204:20	144:18	199:7	111:20	119:4,22
205:21	217:1	146:4	202:22	113:16	119:25
205:21	verify	147:17	205:24	200:7	121:16
206:8	60:5	152:10	207:23	210:21	129:25
vehicles	66:5	153:8,10	208:14	216:11	135:2,2
19:24	90:20,21	155:14	208:22	216:15	147:5
27:18	verifying	155:14	211:24		148:23

  
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 DEPOSITION SERVICES

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Troy  
248-244-9700  
Detroit  
313-961-5560

Lansing  
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Ann Arbor  
734-769-7808

Grand Rapids  
616-456-6300  
Kalamazoo  
616-552-4438



165:23	50:18	195:15	121:14	210:2,10	170:22
165:25	68:20	wear 23:14	125:6,8	213:1,12	179:21
166:15	70:4	wabbing	125:18	214:21	186:14
169:17	75:10	45:23	128:5	216:3	190:22
174:14	83:10	week	131:6,9	Wells 1:18	192:13
181:21	89:16	111:23	131:20	2:10 3:5	192:18
188:7	91:1	weeks	132:13	3:13,21	200:3,12
189:1,18	108:4,13	18:10	132:13	7:14	200:14
189:19	131:6	110:5	135:6	37:22	200:16
200:12	142:19	weight	137:18	41:1,12	200:19
200:16	186:19	57:6	141:9	41:16,25	200:25
214:11	194:14	58:8	143:16	42:3,9	201:3,6
215:23	202:15	64:9	144:8	42:15	201:9,12
wanted	watch	66:21	147:23	43:14,17	201:22
8:25	111:9	73:23	148:13	47:9	202:1
13:21	167:14	91:13	149:5	101:19	203:19
20:7,11	watching	115:3	151:24	101:23	205:2,5
20:18	77:10	193:15	152:11	102:9,13	205:10
27:21	way 7:21	welcome	154:12	103:23	207:8,10
32:23	8:23	41:14	155:11	104:2,13	210:20
39:12	42:8	welded	158:24	104:17	213:10
54:19,20	56:4	83:6	160:12	105:8,21	213:15
59:13	64:21,24	well 6:19	162:4	105:24	213:23
62:9	70:21	7:2	163:18	106:10	214:15
70:2	80:3	13:14	166:12	106:15	214:21
99:9	83:10,10	14:5	168:1	106:18	215:9,19
131:13	83:12	27:2	172:22	107:4,16	215:23
162:21	86:20,20	33:20	174:10	107:22	215:25
167:1	87:1	41:1,9	174:24	108:12	216:4,7
177:8	88:7	49:2	176:14	109:1,5	216:17
184:10	89:16	53:24	177:3	109:8,23	216:20
wanting	102:9	58:3,19	179:19	112:12	well-c...
187:24	107:20	63:13	180:11	112:17	89:16
200:4	108:8,14	64:19	181:15	113:2,14	went 4:23
wants	116:20	66:11,14	181:18	113:15	10:3,15
181:9	118:20	66:18	186:23	124:20	13:12
216:11	122:9	69:2	190:18	124:22	15:9
warn 75:8	127:17	71:22	190:25	127:14	16:8,13
131:1	143:1	75:3,18	191:9	133:13	17:1
warning	150:17	76:1	194:14	133:15	19:17
131:17	166:2	88:11	195:6	137:16	24:4
warnings	172:22	101:20	196:23	157:11	31:16
173:7	174:24	102:3,13	197:5	163:18	48:23
washer	177:14	103:13	198:1	164:4,15	52:4
45:16	187:14	107:25	204:14	164:17	66:23
Washtenaw	195:7,8	111:21	204:14	164:21	69:4
218:2,17	195:14	113:3,21	208:11	164:24	70:19,20
wasn't	195:16	114:15	208:23	165:1	71:13,16
6:15	196:25	117:7	209:14	170:16	71:20,24
24:8,20	ways 116:5	119:21	209:17	170:17	74:10

  
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77:4	30:9,10	76:2,9	123:20	199:23	63:6
78:23	30:11	76:15,19	125:6,18	202:14	75:6
81:8,15	31:9,14	77:7,10	126:3	202:20	93:11
84:17	31:15,20	77:10,11	131:2	202:23	103:2,2
88:20	31:21	78:2,24	139:3,4	205:15	103:12
90:22	32:5	79:2,12	139:5,9	205:23	108:21
92:3,7	33:7	79:14,15	139:17	206:1,14	110:6
94:22	35:16,18	80:1,2,6	139:17	209:15	112:15
95:15	36:2,3	80:10,10	139:19	210:9,12	113:4,10
96:3,4	37:9,11	80:11,12	139:20	210:23	113:16
101:24	37:13	80:13	140:3	210:24	122:9
114:4	38:8	81:3,3	142:3	211:5,8	141:18
138:13	39:5,6	81:10,13	145:6	211:8,9	144:10
152:17	43:1,7	82:10,13	150:1	211:10	149:13
162:13	43:20,20	82:16,24	151:6	211:12	154:14
163:24	44:8	82:24	152:22	212:24	157:16
173:1	46:17,18	87:25	152:22	215:11	157:19
198:14	47:4,23	88:12,19	156:12	215:12	163:23
200:10	49:11	88:25	159:25	216:9	169:11
215:16	50:23	89:22	161:13	were'n't	179:16
were 5:4,5	51:6,12	91:18,18	162:22	21:6	196:14
7:18 9:8	52:3,5	92:17,23	162:23	22:1	201:13
10:24	52:12,13	93:22	163:10	50:7	203:3
13:14	52:15,19	94:2,21	163:10	57:13	209:21
14:13,15	52:22	94:23	163:21	80:5	210:5,21
14:25	53:9,14	95:14,22	164:21	92:9	211:10
15:13	54:5,21	96:21	165:13	172:4	215:19
16:2,2	55:1,16	97:1	165:17	we'll	we've 4:14
16:14	55:24	98:11,18	170:3	24:14	9:9 41:4
17:8,10	56:9	98:25,25	171:1,2	35:5	41:4
17:15,17	57:6,10	99:5,6	171:8,12	40:21	49:15
18:1	57:15,16	100:4,14	172:2,3	41:5	109:14
19:1,2	58:16	100:18	173:13	42:4,10	110:13
20:2,6	59:24	100:24	175:4	61:2	113:10
20:22,23	60:9,14	101:2	185:14	102:8	191:9
21:7,9	60:15,16	102:21	185:20	110:23	196:7
21:12,19	63:16	103:21	185:22	112:10	213:21
21:20,21	64:4,4,5	104:15	190:13	112:10	214:25
21:24	64:13,16	104:18	190:15	113:12	whale 32:2
22:2,5	64:22	107:7	191:1,1	215:4,10	whatso...
22:10,12	65:17,20	108:8,10	191:15	216:21	112:14
24:7,16	65:21,25	108:14	192:7	we're 3:10	wheel
25:11,12	66:3,18	108:22	193:4,7	4:7	34:12
25:16	67:4,15	109:12	193:15	13:11	45:14,16
26:10	68:3	115:4,5	193:20	23:22	45:18
27:2,14	69:2	116:13	193:21	26:14	168:11
27:17,19	71:4	117:6	194:1,12	41:1,8	WHEREOF
27:25	74:8,13	118:18	195:25	50:14,15	218:12
29:16,18	74:18,21	119:5	196:1,4	51:6	while 9:13
29:23	74:24	123:5,6	196:24	53:3	16:2



**A RECORD OF EXCELLENCE**

<b>Troy</b> 248-244-9700	<b>Lansing</b> 517-337-7337	<b>Grand Rapids</b> 616-456-6300
<b>Detroit</b> 313-961-5560	<b>Ann Arbor</b> 734-769-7408	<b>Kalamazoo</b> 616-552-4438

25:11	wiring	28:8	66:11,14	110:8,9	122:10
215:12	34:17	61:17	99:3	121:4	187:5
whole	45:20	63:9	100:5	132:9	207:21
58:16	46:19	143:5	103:21	141:16	208:6
59:10	54:13	170:10	134:20	143:2	X-Banning
73:8	68:6	worded	142:16	158:10	122:5
95:24	89:8,25	70:21	164:6	174:9,18	X-Y-Z
116:24	90:1,10	196:25	202:12	174:18	122:10
136:13	90:24	words 68:9	working	177:11	122:14
163:14	91:19	103:20	22:2,12	199:1,2	
174:7	92:8	151:2	29:15	wreck 21:1	Y
204:23	93:14,17	177:2	35:4	59:14	Y86:3
218:5	95:3,6	192:21	82:11	61:8	122:10
wide	96:23	209:6	99:14	183:4	122:11
108:17	97:5,19	work 16:3	121:17	187:23	207:21
126:14	97:20	16:6	131:24	211:10	208:6
Williams	200:17	18:3,19	186:11	write 7:17	year 16:16
1:19	200:17	20:21	186:13	12:13,14	21:14
wind 66:20	wish 97:1	23:14	202:11	12:17	26:16
window	wished	27:10	202:15	37:21	46:7
66:9	59:11	29:12	203:21	48:22	50:14
90:13	witness	30:1,3,8	203:22	188:9	52:3
windsh...	2:8 7:15	30:16	204:5	writes	64:20
83:22	25:22	31:10,10	works 4:12	26:14	69:3
windsh...	37:19	34:12	49:24	183:24	79:22
63:3	42:8	35:16	110:14	184:7	85:7
Windstar	46:7	45:4	123:1	187:23	86:6
114:22	102:20	46:23	world 31:6	writing	93:14
114:25	106:16	47:1,11	31:7,7	32:18	94:12
115:10	107:25	50:14,15	63:19	55:12	122:11
125:15	112:9	80:20	69:11,13	107:5	124:25
126:23	124:21	85:22	73:25	109:3	126:8
152:13	127:11	92:10	153:16	218:6	135:25
wipe	137:14	110:23	162:20	written	137:19
176:18	164:13	112:7	165:24	10:10	193:12
wiped	170:15	113:12	169:16	36:5	201:3
183:13	192:15	131:4	worlds	160:20	204:9
wiping	205:7	144:22	63:22	186:15	205:6
172:9	207:2,5	144:25	worry 58:7	wrong	207:1,4
wire 90:6	213:12	150:3	worst	33:19	207:8
123:25	214:19	151:5	86:17	84:12	209:16
124:1	216:15	154:24	wouldn't	96:22	214:19
130:24	218:4,6	155:7	7:5	147:10	215:25
171:18	218:8,12	164:6	25:16	wrongful	year 30:15
wires	witnesses	165:14	43:12	1:5	30:16
64:23	112:6	166:9	85:22	W-a-g-...	39:2,5
88:12	women 55:4	210:13	87:5,8	3:24	52:4
89:9,14	wondered	worked	98:23		53:4
90:4,18	40:1	5:20	100:15	X	55:11
171:22	word 28:7	51:17,21	100:19	X 2:7 86:3	71:12,19

  
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 DEPOSITORS SERVICES

A RECORD OF EXCELLENCE

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734-769-7808

Grand Rapids  
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Kalamazoo  
616-552-4438

71:22	209:8	206:17	89:2	142:7	120:2
72:4	none 56:13	207:11	141:25	151:8	127:7
73:3	56:14	207:13	158:4	152:19	135:1,3
74:11	66:3	209:23	15100:5	156:22	169:2
97:7,15	88:4	1st 109:25	137:13	157:14	170:11
124:19	153:21	110:5	157:16	1980s	178:1
125:7,9	169:12	111:17	180:14	94:19	180:22
161:15	169:23	1038:14	216:6	1985 70:8	181:22
195:1,1	170:18	39:8,8	15th	94:20	193:3,10
196:18	191:3	59:6	111:22	1990 58:16	193:14
years 13:7		77:16	111:22	70:20	203:5
20:14		149:23	15-mil...	71:6	204:24
30:14	\$1051:8	151:22	108:3	72:2	205:25
42:6	\$20199:22	177:24	15043:4	74:3,17	207:13
48:18	\$32197:20	10,000	133:8	80:17	207:16
49:16	197:21	68:22	184:4	81:13	208:2
53:10,11	\$4.23	76:25	150,00...	94:22	2:15 109:9
55:19	196:18	77:2	152:9	97:10,11	2042:6
57:14		1000 1:24	15th	101:10	53:11
58:3	0	10173:6	111:22	103:4,10	59:6
59:11	0012068	73:16	16756:24	106:21	90:17
72:11,22	204:22	170:1,1	171:15	108:21	100:23
76:17		170:25	3:2,7	1990s	102:15
79:6	I	191:9	116:8	103:20	135:10
86:6	12:16 3:8	11:08 1:15	158:5	1991 71:12	137:25
105:4	3:15	3:3	177:25	71:17	138:1,9
142:17	4:15	1102	180:14	76:7	175:14
151:1	25:10	170:23	191:20	1992 70:25	180:14
153:17	103:13	1104	199:22	1994 72:4	187:21
160:18	104:15	170:24	217:4,15	73:4	203:15
175:11	110:15	117184:5	17th	102:22	213:9
175:14	110:22	12103:18	216:12	1995 80:16	20s 141:18
189:17	111:16	209:10	18-mon...	82:9,14	20-dollar
192:22	114:11	12-loop	55:13	1996 72:15	116:17
194:15	120:2	128:22	18673:13	73:6	20-som...
196:2,17	127:7	129:1,3	73:14	1997 52:17	36:22
yonder...	129:12	129:5,6	161:16	53:9	39:13
106:8	134:25	12068	191:9	171:9	41:4
York 38:21	135:3	205:8	1973:5	1999 47:23	20-som...
Young 1:19	137:21	208:19	142:1	51:6	191:20
	149:24	210:22	158:8	69:25	2000 1:20
	166:18	13137:12	169:7	73:9	21:17
86:3	177:24	14135:10	1900s 70:1	74:18	33:24
207:22	178:24	137:12	1970s	162:14	46:2
208:6	180:22	137:13	151:8		47:13,16
zero	181:22	138:6	152:18	2	47:24
119:22	193:3,10	148:17	1980	225:14	50:24
177:21	193:12	14th	139:24	110:19	51:7
180:12	203:5	111:22	140:11	111:19	52:4
181:24	204:24	14-mil...	141:13	114:11	53:4
	205:25				

  
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Kalamazoo  
616-552-4438

54:2,4	190:1	76:16	3.2.1	31 102:15	77:16
57:13	191:5,16	78:14	122:6	31st 5:9	91:9
63:14,16	192:21	160:14	3.4 133:3	32 102:15	135:9
63:24	194:11	160:16	3:01-C...	35 30:14	136:8
69:19,19	194:14	176:2	1:8	139:5,25	138:16
69:23	195:1,23	194:3	30 42:6	140:12	138:24
73:11,14	195:23	21 142:2	61:25	140:16	139:4,5
102:6	196:18	158:5,9	76:17	141:13	139:17
113:17	197:7,10	21-mil...	85:8	142:10	139:20
113:20	197:11	169:8	96:9,17	143:16	143:13
114:4,14	199:11	211 1:24	97:12	144:1,2	144:4,23
114:15	200:21	22 42:20	100:11	146:12	145:14
115:5,20	201:23	178:1	102:1	146:20	147:8,13
117:6	202:7	179:7	104:3,21	147:1,3	147:15
118:8	205:12	212:3	106:24	147:6	147:16
119:11	205:13	23 214:13	106:25	150:13	147:20
119:15	205:19	25 5:1	108:22	151:24	147:23
120:16	205:20	6:18	139:8	153:1	149:5,10
120:22	205:21	37:9	143:19	157:2	149:16
121:1,5	206:8	43:10	144:1,2	159:25	150:10
124:20	208:12	77:16	146:11	160:11	151:11
125:7,9	210:12	101:3	147:6	160:23	152:7,15
125:11	210:24	135:10	151:20	173:13	152:24
126:16	211:12	137:14	177:24	173:13	152:25
127:19	2000s	138:1,11	216:6	35-mil...	153:1,5
128:7,23	100:12	141:1	30 6 3:5	143:19	158:13
130:2	200 15:9	172:13	4:9 7:12	151:9	158:19
132:8	16:15	172:21	7:15,19	35-mil...	159:18
133:10	21:17	179:15	7:20	156:10	164:4
133:16	26:3	208:16	102:10	160:8	166:2
133:22	125:12	25-dollar	109:9,18	176:3	179:16
134:4,4	125:16	116:8	110:11	177:25	40-mil...
135:4	126:16	250 59:4	110:19	35-ton	93:6,24
136:12	158:12	256 68:18	110:25	136:5,14	138:22
136:25	2002 1:15	68:19,22	111:8,9	36 140:1	144:12
137:23	3:2,7	27 73:24	112:8	140:12	150:5
138:3,14	63:13	2792 39:18	113:6	140:16	152:4
148:23	158:12	40:8	163:9	142:10	40-mil...
154:3	217:4,11		164:7	143:20	93:25
158:12	2004	3	30-degree	160:1	45 108:6
159:17	194:23	3 2:10,16	88:18	36-mil...	108:13
161:5,15	2005	95:9	30-mil...	141:14	144:23
163:11	217:15	114:11	106:6	37 140:1	145:14
164:5	2006	137:14	30-mil...	37201 1:25	
165:4	194:23	137:22	94:25	39201 1:20	5
170:2	2008	193:3,10	30-mil...		5 73:19
172:2	194:10	193:19	143:16	4	74:10
173:1	2010 194:9	203:5	156:10	4 203:5	109:12
175:6	208 55:1	205:25	177:22	205:25	110:17
177:13	56:22	3s 58:19	30559 1:14	40 58:3	205:25

  
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Grand Rapids  
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208:1	145:15	97:8	74:13
5:26	151:11	8897:8	79:9
215:23	174:21	8997:9	192:21
5:30	60m 37:6		199:17
110:17	76:4	9	
216:4	60-degree	9209:18	
5:30ish	108:19	9-17-2005	
216:12	60-mil...	218:17	
5:31	177:4	9071:15	
216:22	601-94...	97:16,17	
5026:5	1:21	90m 46:11	
55:19	615-72...	68:25	
91:9	1:25	98:18	
137:8		100:12	
139:1	7	100:17	
140:18	7205:25	104:16	
140:20	7030:19	9174:7	
141:10	139:8	81:8	
144:23	70m 37:6	97:3,4	
145:14	76:5	97:14,16	
146:5	139:1,21	97:17	
151:11	7315 127:3	91m 71:16	
152:8,15	7588 196:8	9271:5	
156:19	8	72:3	
178:6	8197:5,9	74:8	
179:16	199:16	81:15	
50th 54:25	200:3	84:19	
55:9	205:25	130:14	
56:23	8-inch	9340:8	
195:12	159:15	47:22	
50-mil...	8030:19	71:5,24	
92:5	209:9	74:8,9	
141:10	80m 68:25	84:19	
50-mil...	94:11	162:13	
91:9,14	98:8	9440:8	
91:15	139:18	47:22	
166:2	139:19	71:24	
50043:10	80-mil...	73:5	
52132:23	178:2	74:9	
132:24	8243 132:2	81:19	
5765	213:22	196:24	
161:15	213:24	9573:5	
6	213:24	80:19	
6109:22	8251 122:5	9673:16	
205:25	8596:24	74:13	
6th 109:23	169:10	79:9	
111:16	8670:9	169:2,11	
112:4	72:9	9953:6	
6026:5	94:12	63:16	
	8794:12	73:16	

  
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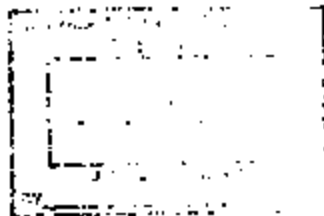
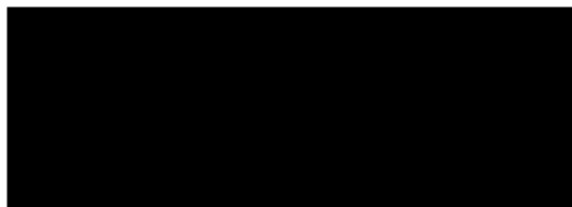
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 Kalamazoo  
 616-552-4438

ER83-010 0038

IN THE UNITED STATES DISTRICT COURT  
FOR THE SOUTHERN DISTRICT OF MISSISSIPPI  
JACKSON DIVISION



PLAINTIFFS

VS.

CAUSE NO. 3:01CV403BN

FORD MOTOR COMPANY, BUDGET  
RENT-A-CAR SYSTEMS, INC., and TEAM  
FLEET SERVICE FINANCING  
CORPORATION

DEFENDANTS

PLAINTIFF'S RE-NOTICE OF RULE 30(b)(6) DEPOSITION

TO: Ford Motor Company

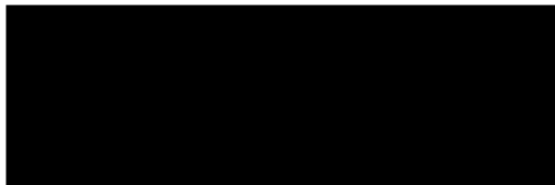
By and Through Counsel of Record:

Bradley W. Smith, Esq.  
Baker, Donelson, Bearman & Caldwell  
4268 I-55 North  
Meadowbrook Office Park  
Jackson, Mississippi 39211

PURSUANT TO Rule 30(b)(6) of the Federal Rules of Civil Procedure, you are ordered to produce the appropriate representative to appear at a deposition to be taken on July 17, 2002 at 9:00 a.m. and to continue day to day until completed, at a location to be mutually agreed upon by counsel, to give testimony in the above captioned cause.

Examination shall be continued on matters listed on Exhibit "A" attached.

Dated, this the 17<sup>th</sup> day of June, 2002.



By:   
Jay M. Kilpatrick

Wagner  
EXHIBIT NO. 1  
7/17/02 010

ROBERT L. WELLS (MSB #7102)  
JAY M. KILPATRICK (MSB #100136)  
YOUNG, WILLIAMS,  
HENDERSON & FUSELIER, P.A.  
2000 AmSouth Plaza  
Post Office Box 23059  
Jackson, Mississippi 39225-3059  
Telephone: (601) 948-6100

**CERTIFICATE OF SERVICE**

I, Jay M. Kilpatrick, hereby certify that I forwarded via United States Mail, postage prepaid, a copy of the above mentioned documents to the following:

Bradley W. Smith, Esq.  
Baker, Donelson, Bearman & Caldwell  
4268 I-55 North  
Meadowbrook Office Park  
Jackson, MS 39211

Forrest W. Stringfellow, Esq.  
Daniel, Coker, Horton & Bell  
P. O. Box 1084  
Jackson, MS 39215-1084

Dated, this the 17<sup>th</sup> day of June, 2002.

  
Jay M. Kilpatrick



IN THE UNITED STATES DISTRICT COURT  
FOR THE SOUTHERN DISTRICT OF MISSISSIPPI  
JACKSON DIVISION



PLAINTIFFS

VS.

CAUSE NO. 3:01CV403BN

FORD MOTOR COMPANY, BUDGET  
RENT-A-CAR SYSTEMS, INC., and TEAM  
FLEET SERVICE FINANCING  
CORPORATION

DEFENDANTS

EXHIBIT "A"

1. The design, analysis, testing, and other development of the airbag and restraint system implemented in the 2000 Ford Taurus.
2. The relationship between Ford and all manufacturers and/or suppliers of the crash sensors, diagnostic systems, airbag modules, and individual airbag module compartments, including but not limited to Visteon Corporation, TRW, Inc., and/or AutoLiv.
3. All tasks performed by Visteon Corporation, TRW, Inc. and/or AutoLiv.
4. The decision making process involved in determining the mounting locations of the driver and passenger side airbag modules, airbags, inflators, and sensors.
5. All reports, analyses, tests, and/or other studies concerning the development of the airbag crash sensor system implemented in the 2000 Ford Taurus.
6. Performance of the airbag system, including the airbag crash sensor, in all impact tests performed with the 2000 Ford Taurus.
7. All crash testing performed in the development of the airbag and restraint system implemented in the 2000 Ford Taurus.
8. The cost of the airbag and restraint system implemented in the 2000 Ford Taurus and the cost of the airbag and restraint system implemented in the 1999 Taurus.

9. The location of all correspondence, comments, or petitions between Ford and NHTSA, Visteon Corporation, TRW, and/or AutoLiv pertaining to the airbag and restraint system at issue.
10. The barrier speed and/or other various thresholds and conditions at which both First and Second stage airbag deployment as well as pre-tensioner actuation is expected with the system at issue.
11. The knowledge and skill required to decipher the information stored on the Restraint Control Module used in the system at issue.
12. Failure Mode and Effects Analysis (FMEA) for all sensors, restraints control module, and/or other diagnostic modules used in the airbag and restraint system at issue.
13. The method and criteria by which the crash data is processed, analyzed and the determination to deploy the airbags or activate the seatbelt pre-tensioner is made.
14. The net worth of Ford Motor Company and/or all monies set aside by Ford Motor Company for payment of products liability claims associated with its vehicles.
15. All marketing pertaining to the airbag and restraint system at issue.
16. Any and all designs, prototypes, and/or variations of the airbag system at issue as well as any tests of said alternate designs.
17. The dummy injury assessment reference values or injury measurement criteria for all dummies or dummy components used in the design and development of the airbag and restraint system at issue.
18. The specifics of all crash performance tests of the subject vehicle including dummy characteristics, seat position, speed of the vehicle, whether the manual three point belt was fastened, occupant location, and the characteristics of the types of barriers used in the tests.
19. All work orders, job tickets, service reports, safety directives, service letters, service bulletins, letter, memoranda, instruction of engineering change, advisories, or other information relating to any change or modification of airbag and restraint system implemented into the 2000 Ford Taurus.
20. Other legal causes of action brought against Ford Motor Company wherein passengers were severely injured or killed by the failure of airbags to deploy.

21. The document retention policy of Ford Motor Company pertaining to documents dealing with restraint (both primary and supplemental) development and testing. This includes, but is not limited to, what information is retained, the form of the information retained, and where the information is physically located.
22. Ford Motor Company's policy on the printing of e-mail correspondence including the location of all printed e-mail correspondence.
23. The reason why the information produced to the Plaintiffs in this case is not numbered sequentially, including an identity of the documents left out which would fill the gaps, the custodian of these records, and a list or index of the missing documents.
24. The efforts taken by Ford Motor Company to stay informed on the issues of airbag restraint design and airbag restraint performance.
25. The details of any studies performed by or for Ford Motor Company to compile statistics or gather information pertaining to the performance of Ford airbag restraint systems in real world accidents.
26. The physical characteristics of all barriers (including poles) used in the various crash tests at Ford applicable to the system installed in the 2000 Ford Taurus.
27. Whether or not the vehicle at issue was in the same condition as it was when it left Ford's factory in Chicago, Ill. when it was sold to Fleet Service Financing Corp.
28. All statistics pertaining to the survivability of crashes in a 1999 Ford Taurus when the vehicle is travelling 40 m.p.h. or less including whether the statistics are derived from crash tests or real world accidents.
29. All statistics pertaining to the survivability of crashes in a 2000 Ford Taurus when the vehicle is travelling 40 m.p.h. or less including whether the statistics are derived from crash tests or real world accidents.
30. All differences and reasons therefore in the airbag system in the 1999 Ford Taurus and the 2000 Ford Taurus.
31. The percentage of non-deployments of airbags in the 1999 model year Taurus where the speed of the vehicles exceeded 25 m.p.h. which were known to Ford at the time the decision was made to alter the system for the 2000 model year.

32. The percentage of non-deployments of airbags in any Ford vehicle where the speed of the vehicle exceeded 25 m.p.h. and the car was equipped with a "smart" "dual-stage" airbag system like the one implemented in the 2000 Ford Taurus.
33. Why Ford believes one sensor located directly below the hood ornament of a vehicle is better than multiple sensors located in different locations in the vehicle.
34. Whether or not sensors from any entity other than Visteon were considered by Ford to be used with this airbag system, including all reasons why those sensors were not used.
35. The physical characteristics (including case strength and shield strength) of all other sensors considered by Ford.
36. The purposes of the Restraint Control Module used in the airbag restraint system.
37. An interpretation of the information retrieved by Ford from the Restraint Control Module of the subject vehicle.
38. Any and all reasons Ford believes more information was not recorded on the Restraint Control Module.
39. The identity of all engineers or engineer teams involved in the design of the restraint system in the 2000 model year Taurus, and their primary duties.
40. The identity of all persons plus their title, address, employer, and employment history with Ford who have knowledge of any of the above categories.