PE11-041

ANDREW MCPHATE

AFFIDAVIT

UNITED STATES DISTRICT COURT, EASTERN DISTRICT OF LOUISIANA

Re: Ryan Earls vs. Medtec Ambulance Corp., et al
CDC Case No.: 11-661 Division "E"
USDC Case No.: 2:11-cv-00398-ILRL-ALC

BEFORE ME, the undersigned notary public, personally came and appeared:

Andrew J. McPhate, Sr., P.E.

who avers and swears that:

1. He is a Louisiana licensed Mechanical Engineer, #9415. A copy of his curriculum vitae is attached as Exhibit #1.
2. He inspected and photographed the Medtec Ambulance involved in Mr. Ryan Earls' accident, N.O. EMS Unit 3215, and N.O. EMS Units 3165 and 3170.
3. He memorialized his impressions and conclusion in a report issued 16 October 2011. A copy of this report is attached as Exhibit #2. As pointed out in his report, the principal cause of Ryan Earls' injury was the defective design of the Squad Bench on Ambulance 3215.

Signed on this 4rd day of November, 2011, East Baton Rouge Parish, Louisiana.

Andrew J. McPhate

SWORN TO AND SUBSCRIBED

before me, Notary Public, this

4th day of November, 2011.

Judy Halbert Jackson

NOTARY PUBLIC
Judy Halbert JACKSON
NP# 015534

Exhibit #1

Curriculum Vitae

of

A. J. McPhate, P.E.

Curriculum Vitae 4-Nov-11

Andrew J. McPhate, Sr.
6618 Highland Road
Baton Rouge, LA 70808-5401

Birth: 1934-08-19, Alexandria, Louisiana

Education:

High School, 1952, Menard, Alexandria, LA
US Navy School for Engineman, 1954
BSME, summa cum laude, Aug. 1960, Louisiana Polytechnic Inst., Ruston, LA
MSME, Aug. 1961, Louisiana Polytechnic Inst., Ruston, LA
Isotope Methods, 1964, Summer Program, LSU-NSF
National Science Foundation Science Faculty Fellow, 1966-1968, Stanford University, Mechanical Engineering

Professional:

Registered Mechanical Engineer, LA 9415, since 1964
Member, American Society of Mechanical Engineers
Member, Louisiana Engineering Society
Member, Sigma Xi Research Society
Member, American Society for Metals, International
Member, Society for Industrial and Applied Mathematics

Experience:

2010-Now PE Overseeing Treestand Testing, Scientific Testing Labs, Baton Rouge, LA

2007-Now Sr. Mechanical Engineer, Professional Engineer of Record, Engineered Casting Repair Service - Metalock, Denham Springs, LA. Worldwide Heavy Equipment Failure Analysis and Repair.

2005-Now Sr. Mechanical Consultant, Knighthawk Engineering, Inc., Houston, Texas. Worldwide Petro-Chemical Industry static and rotating equipment consulting.

1992-Now Professor Emeritus Mechanical Engineering, LSU Baton Rouge

1972-Now Consultant in Mechanical Engineering, Private practice in machine & product design, vehicle dynamics, expert witness in machine & product design, vehicle dynamics & vehicular crash reconstruction.

1998-Now Sr. Mechanical Engineering Consultant, Kemper Engineering, Inc. Mechanical Design and Analysis.

1997.05-Now Mechanical Engineer, one half owner, WARMAK, Inc. Design, Testing, Measurement, Troubleshooting & Failure Analysis, and Field Service of Static and Dynamic Mechanical Systems

1992.12-97.05 Sr. Mechanical Advisor & Part Owner, KNIGHTHAWK Engineering, Inc., BATON ROUGE, LA. Specialists in Mechanical Engineering Design, Analysis and Testing.

1962-92 Professor, Assoc. Prof., Asst. Prof. of Mechanical Engineering, LSU BR. On leave, 1966-68.
Teaching: Machine Design and Analysis, Computer methods in design and analysis, FEM & BEM, computer aided and optimum design.
Research: Computer aided design, mechanism design, nonlinear programming (optimization), nonlinear dynamics (robotics), nonlinear material behavior modeling, and FEM & BEM analysis.

1980-85 Consultant in machine design and analysis, Gonzales Machine Works, Gonzales, LA

1973-77 Consultant in machine design, analysis & repair and NC machining, Engineered Mechanical Services, Inc., Baton Rouge, LA.

1972-74 Consultant in computer methods in analysis and design, US Air Force, Air Force Armaments Testing Laboratory, Eglin AFB, FL .

1967 Summer Fellow, Lawrence National Laboratory, Livermore, CA. Predicting seismic response of ground zero structures to nuclear device underground testing.

1966-68 Science Faculty Fellow (NSF) in Mechanical Engineering, Stanford University, Stanford, CA. Computer methods in machine design and analysis.

1961-62 Staff member, mechanical engineer, Missile Systems Division, Sandia Corporation, Albuquerque, NM.

1960-61 Graduate Student & Part time instructor in the Mechanical Engineering Department at Louisiana Polytechnic Inst., Ruston, LA.

1957-61 Enlisted, US Naval Reserve. Honorable Discharge, ENR-C (E-7).

1957-60 Undergraduate student in Mechanical Engineering at Louisiana Polytechnic Inst., Ruston, LA.

1953-57 Enlisted, US Navy, Pacific Fleet. Internal combustion engines, refrigeration, propulsion equipment. Released from active duty, EN-1 (E-6).

1952-53 Construction laborer, heavy duty fork lift operator for H. D. Foote Lumber Co., Alexandria, LA.

MOST RECENT PUBLICATIONS

"Approximate Residual Interface Compression in a Laminated Magnet", S. Jahanian & A. J. McPhate, Reliability, Stress Analysis, and Failure Prevention in Design, Vol. 55, Sept 1993, pp 185-188.

"Bodner-Partom Viscoplastic Constitutive Model and the Non-Linear Finite Element Analysis of a Stress Concentration at High Temperature", F. A. Kolkailah & A. J. McPhate, International Journal of Science and Technology, Accepted for publication, Dec 89

"Bodner-Partom Constitutive Model and Nonlinear Finite Element Analysis", F. A. Kolkailah & A. J. McPhate, Journal of Engineering Materials and Technology, Transactions of the ASME, Oct 89

"Analytical Design of Band Cams for Compound Bows", A. J. McPhate, Developments in Mechanics, Vol 15, Proceedings of Twenty-First Midwestern Mechanics Conference, MTU, Houghton, MI, Aug. 1989.

"Numerical Representation of Bodner Viscoplastic Constitutive Model", F. A. Kolkailah & A. J. McPhate, Journal of Engineering Mechanics, Vol. 115, No. 2, pp 223-230, Feb. 1989.

"Bodner-Partom Viscoplastic Constitutive Model and the Nonlinear Finite Element Analysis of a Stress Concentration at High Temperature", F. A. Kolkailah & A. J. McPhate, ASME Winter Annual Meeting, Chicago, Nov. 1988.

"Dynamic Effects of Coefficient Terms in a Robot Dynamic Model Under Optimum Motion", Hwang, H., McPhate, A.J., Sistler, F.E., Proceedings of the 10th Applied Mechanisms Conference, New Orleans, LA, Dec. 1987.

"Minimum Time Trajectory Planning Using Parametric Cubic Splines" , Hwang, H., McPhate, A.J., Sistler, F.E.. IXth Int. Conf. Prod. Res., 8-87. (Also in Recent Developments in Production Research, Ed. Mital, A., Elsevier Sci. Pub., 1987)

"A Semi-Analytical Investigation of Fatigue Stresses in a Bolted Headplate by Finite Elements and Classical Plate Theory", A. J. McPhate, G.S. Gipson, & J.C. Ortiz, Tran. ASME, J. Vib., Acoustics, Stress, & Rel. in Design, 7-87, V 109, pp 289-296.

"A Nonlinear Finite Element Analysis of a Stress Concentration at High Temperature", F. Kolkailah & A. J. McPhate, Proc. Int. Conf.& Expo. on Fatigue--Failure Analysis, ASM, Salt Lake, UT, 12-85.

"A Numerical Analysis of Bodner-Partom Viscoplastic Constitutive Model for Inconel 718", F. Kolkailah & A. J. McPhate, Proc. 19th MW Mechanics Conf., OSU, Columbus, OH, 9-85.

"Uni-Axial Bodner-Partom Data and 2-D FEM", F. Kolkailah & A. J. McPhate, Proc. W. Mich. Conf. on M E, Kalamazoo, MI, 10-84.

"Bodner Visco-Plastic Constitutive Model for Inconel 718", F. Kolkailah & A.J. McPhate, Vol 2, Proc. 5th E M D Spec. Conf. ASCE. Laramie, WY, 8-84.

Exhibit #2

Report by

A. J. McPhate, P.E.

16 October 2011

A. J. McPhate, P.E.
Mechanical Engineer
6618 Highland Road
Baton Rouge, LA 70808-5401

Fone: 225-769-9761 **Cell: 225-278-8108** **email:** phateful@bellsouth.net aj@warmak.com

2011.10.16

David W. Oestreicher, II
Attorney at Law
307 Exchange Place
New Orleans, LA 70130

Re: Ryan Earls vs. Medtec Ambulance Corp., et al
CDC Case No.: 11-661 Division "E"
USDC Case No.: 2:11-cv-00398-ILRL-ALC

PRELIMINARY REPORT of Analysis and Opinions on Ryan Earls Accident of 2010.12.12

Qualifications

I am a mechanical engineer with more than 48 years experience in the practice and teaching of analysis and design of mechanical systems and components. I have been continuously registered since 1964 by Louisiana to practice Mechanical Engineering. I taught analysis and design of mechanical systems and components in the Mechanical Engineering Department of Louisiana State University at Baton Rouge from 1962 until retirement in 1992. I hold the rank of Professor Emeritus in Mechanical Engineering at Louisiana State University at Baton Rouge and participate in the Senior Design course as an occasional lecturer and project judge. A resume' of my experience is attached. I have been accepted in State and Federal courts of Louisiana and Mississippi as an expert in mechanical engineering and subspecialties machine design, system and vehicle dynamics, and vehicular crash analysis and reconstruction. A fee schedule and a four-year listing of testimony events is attached.

Information Sources

The analysis and opinions reported here are based on information obtained from:

1. Petition for Damages;
2. Documents produced by Medtec;
3. Photographs of damaged seat produced by Ryan Earls;
4. Examination, 2011.09.19, of New Orleans EMS unit 3215;

5. Discussion of accident with Ryan Earls, 2011.09.19;
6. Affidavit, 2011.03.02, of Matthew Alewine;
7. Statement , 2011.04.27, by Jason Tabor; and
8. USDA publication FPL-GTR-190, 2010, Wood Handbook.

The opinions expressed in this report are subject to modification to comport with additional information discovered and made available.

Background

On 2010.12.12, at about 0300 hrs, Matthew Alewine and Ryan Earls answered a call for a gunshot victim. Alewine was the driver and Earls was the attending EMT. Earls was sitting on the Squad Bench attempting to put an IV into the victim. Ambulance 3215 hit a bump and the piano hinge on the Squad Bench separated from the bench seat and dropped Earls down into the cavity under the seat. Earls' back was injured.

The piano hinge attachment screws were found completely pulled from the plywood bottom of the Squad Bench seat. Photo 1 shows the configuration after the collapse of the seat. Jason Tabor, after conferring with Medtec, repaired the Squad Bench by through bolting the piano hinge to the seat bottom and the hinge support frame. Tabor also used an 1/8 inch thick steel backing strip. Photo 2 shows Tabor's solution.

Opinion 1

The design of the seat of the Squad Bench on Ambulance 3215 was defective and unfit for the normal service and use intended.

Basis 1

Ryan Earls weighed 215 lbs at the time of his accident. This is not an unusual weight for an EMT.

The ambulance hit a bump in the street during a speedy run to the hospital. This is not an unusual event.

The rear edge load carried by the seat bottom was solely taken by the piano hinge. There was no other structural support at the rear of the seat, nor was there any structural support at the sides. The only vertical support the seat had was the piano hinge and the front wall of the under seat compartment. This is an unusual configuration. Figure 1 shows this configuration and the resulting loading on the piano hinge.

The attachment of the piano hinge to the seat bottom was by 14 sheet metal screws into plywood. The screws were loaded in tension. This is an

unusual configuration. Figure 2 shows this configuration and a force analysis for reasonably expected loadings. Average screw load is total load divided by 14.

Earls weighed 215 lbs at the time of the accident. Just sitting down on the bench by a 215 lb man will generate a load of about 430 lbs. A bump at speed in the ambulance can reasonably be expected to generate a vertical acceleration of 4 g's. This gives a load of about 860 lbs. The least damaging location for this load would be in the middle of the seat toward the front. However, in the dynamics of a bump, one could reasonably expect the load to be applied toward the hinge and near one end of the seat. This would result in local loads on the hinge being several times the average load. The analysis shown assumes the peak load is only twice the average load caused by four times the weight of the person on the seat. This conservative analysis gives a screw load of 208 lbs. Testing under laboratory conditions reported in the Wood Handbook, USDA FPL-GTR-190, 2010, indicates a maximum pull out load of 440 lbs from wood equivalent to plywood. In real world situations with repetitive loading, vibration, and climatic changes, this pull out load will never be reached. In fact, depending on where Earls was sitting, even that load may well have been exceeded.

Opinion 2

Alternative designs have existed since hinges were invented that do not rely on the pull out strength of screws from wood.

Basis 2

The simplest of these alternative designs was that implemented by Jason Tabor where the screws were replaced with through bolts and a backing plate. This design still places all the load on the hinge with no back up and will be vulnerable to eventual hinge wear out and a catastrophic failure.

Another simple fix would be to support the ends of the seat with vertical support. On the left end a partial bulkhead could support both the left end of the long seat and the right end of the short seat. On the right end a piece of plywood could be bolted to the underside of the top of the under seat box to support the right end of the seat. The hinge would experience only light load.

Yet another simple fix would be to bolt a plywood support to the underside of the hinge support shelf at the rear of the box. Any sag through the hinge would be carried by this support and the seat could not fall into the box, Figure 3.

Opinion 3

Ryan Earls was in no way the cause of this accident.

Basis 3

Ryan Earls was simply sitting on the Squad Bench. He did not fall on to the bench. He did not stand or jump onto the bench. He was not excessively heavy. He took no action that loaded the Squad Bench in an excessive or unusual manner.

Report by,

Andrew J. McPhate, P.E.
Mechanical Engineer, LA 9415

Attachments: Fee Schedule
CV
Witness List

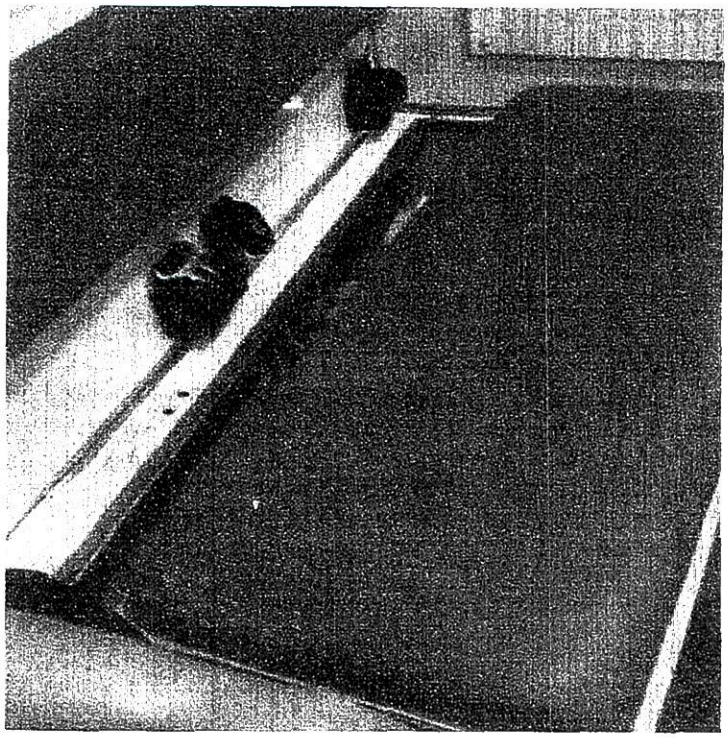

Photo 1: Broken Seat

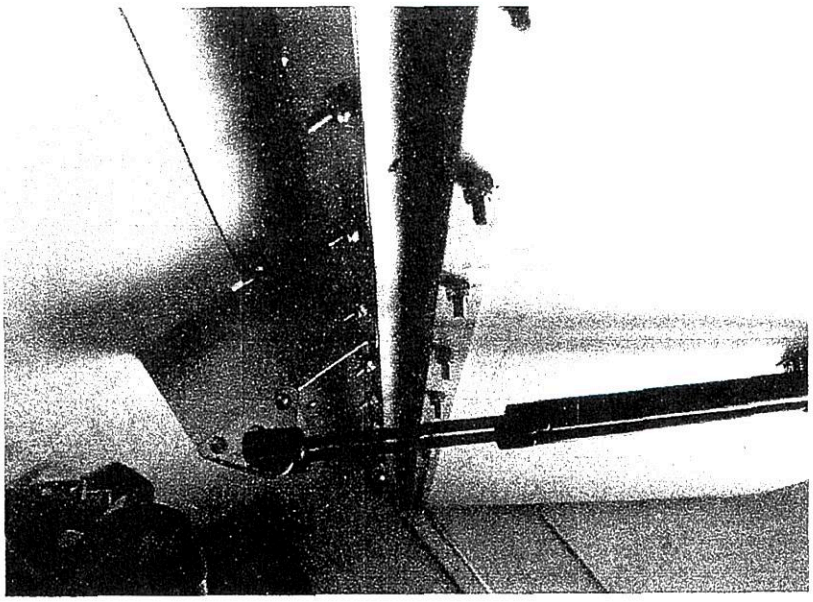

Photo 2: Through Bolting Solution

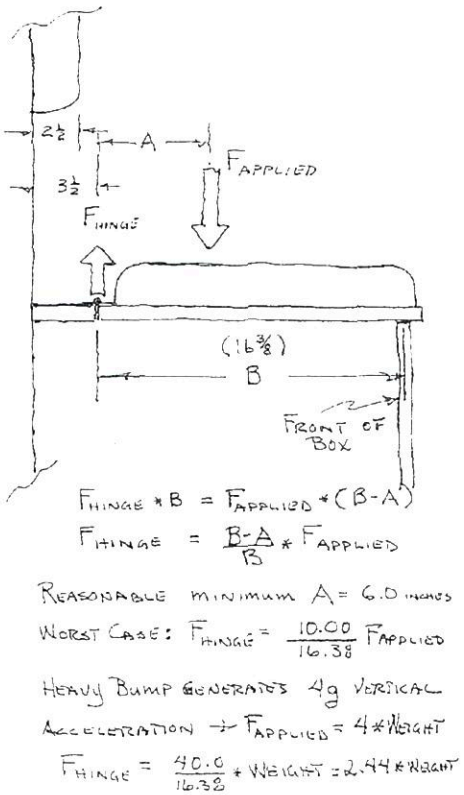

Figure 1: Seat Load Configuration

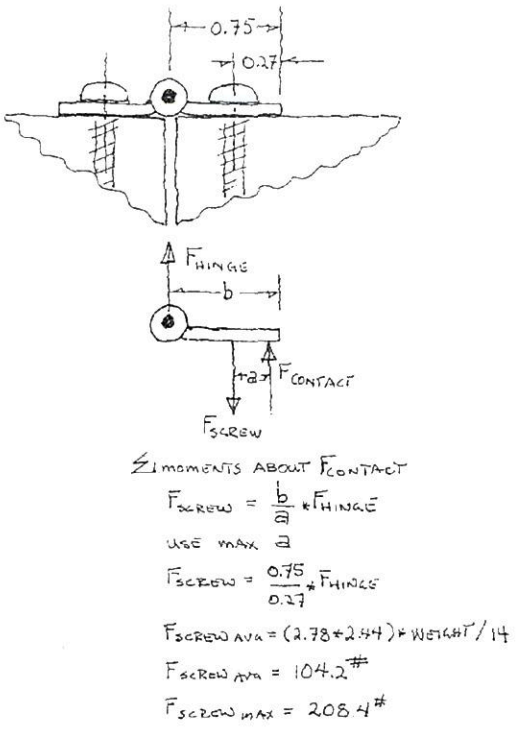

Figure 2: Hinge and Screw Loading

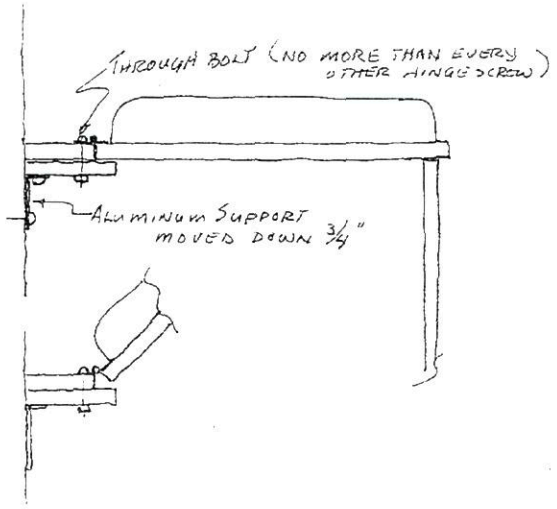

Figure 3: Simple Alternative Design

Andrew J. McPhate, P.E.
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2010/07/01

Fee Schedule

Consultation, depositions, court appearances, opinion reports	$300/hr
Reading, analysis, computation, testing, inspections	$200/hr
Travel, waiting, and other killed time	$100/hr
Contract work, portal to portal	$200/hr

Expenses

Minor expenses, such as automobile mileage, meals and incidental supplies will be covered by me.
Major expenses, such as testing lab fees, air travel, lodging, and hired hands will be billed to the client.

Retainer and Tax ID

To open a non-contract file, a retainer of $2000 is requested. No taxes are required to be deducted. My IRS tax I.D. is **58-1801192**.

Billing

The client will generally be billed when the billing time exceeds four hours or when the file reaches an obvious bench mark.

Resume'

A resume' of my experience and qualifications follows as a separate document. A list of testimony events is also available.

Four Year Witness List

The following is a list of the instances of recorded testimony of A. J. McPhate, P.E., as an expert in Mechanical Engineering spanning the last four years. It is up to date as of 2011.10.11 and correct to the best of my knowledge. AJM

Schexnader v. LADOTD & AT&T, LADC St. Charles Parish, Motorcycle crash, K. Hooks, plntf, trial, 2011.10.05

Jewell v. Bradford, 355th JDC, Hood County, TX, Hunting stand accident, David Pels, plntf, trial, 2011.07.28

Rastagar v. State Farm, 19th JDC, EBR Parish, Vehicle repair, S. Thompson, plntf, depo, 2011.05.05

Schexnader v. LADOTD, LADC St. Charles Parish, Motorcycle crash, K. Hooks, plntf, depo, 2011.03.31

Jewell v. Bradford, 355th JDC, Hood County, TX, Hunting stand accident, David Pels, plntf, depo, 2011.03.10

Pizzo v. St. Tammany Parish Hospital, LADC St. Tammany, L. Kullmann, plntf, depo, 2011.03.01

Fernandez v. Hollaway-Houston, USDC Galveston, TX, Crane rigging failure, A. Schechter, plntf, court, 2010-11-30

Zulli v. Meyers, USDC New Orleans, Boating accident, Moak & Assoc., defns, depo 2010-11-02

Christy v. DS Waters, 24th JDC, Jefferson Parish, motor vehicle crash, Thomas Cerullo, plntf, depo, 2010-10-04

Hymel v. Evans, LAJDC St. John Parish, motor vehicle crash, Randi Ellis, defns, court, 2010-09-27

Godfrey v. EBR Parish, 19th JDC, EBR Parish, Rick Caballero, motor vehicle crash, plntf, court, 2010-09-23

Gulotta v. General Motors, LAJDC, Tangipahoa, Byard Edwards, motor vehicle crash, plntf, depo, 2010-09-22

George v. Brasseaux, LAJDC, Opelousas, motor vehicle crash, Jerry Falgoust, defns, court, 2010-09-17

Coastal Drilling v. Lemoine's Refrigeration, 16th JDC, St. Mary Parish, A/C unit, fire, Daniel Atkins, Jr., defns, depo 2010-04.23

McCallister v. LADOTD, 19th JDC, East Baton Rouge, motor vehicle crash, Randall Hunter, plntf, depo 1020-04-19

Guadagnola v. Sears, USDC, Alexandria, Hydraulic, mechanical automobile jack, Charles Charrier, plntf, depo, 2010-04-06

Taha v. J C Penney, et al, USDC, WDLA, Lafayette Div., Friction joint, Alan & Gooch, defns, depo 2010-03-29

Percle v. LADOTD, LA JDC, St. James, Hydroplane Auto, Jaime Funderburk, atty plntf, trial, Convent, 2010-03-25

Rester v. Farm Bureau, LA JDC, West Baton Rouge, motorcycle dynamics, Rowe Law Firm, defns, trial, 2010-02-24

Holt v. Hercules Lift Boats, USDC, WDLA, Lafayette Div., Hydraulic Crane, Wm. Gee, plntf, depo, 2010-03-19

Reddick v. Heise, 18th JDC, Docket # 35586, vehicle accident reconstruction, structural failure, Jay Parker, atty, plntf, depo, 2009-12-08

Coastal Drilling v. Lemoine Marine Refrigeration and First Operations, 16th JDC, St, Mary Parish, mechanical design, D. Atkinson, Atty, defns, depo, 2009-10-16

Robillard v. Custom Bus, 19th JDC, EBR Parish, mechanical design, R. Piedrahita, Atty, Baton Rouge, plntf, depo, 2009-09-22

Jason v. State Farm, LA JDC, Avoyelles Parish, 18 Wheeler (Cane Truck) crash, Jerry Falgoust, Atty, defense, depo 2009.08.25

Swain v. Smitty's Supply, LA JDC, Vernon Parish, Hydraulic Machine Failure, Richard Schwartz Law, Amite, LA, defns, trial, 2009-07-29

Darnell v. Priefert Manufacturing, Circuit Court Lowndes County, MS, Mechanical Design, Studdard Law Firm, Columbus, MS, plntf, depo, 2009-07-07

Drago v. Friedman, LA JDC, Livingston Parish, Vehicle Crash, Rowe Law Firm, defns, trial, 2009-04-08

Inferrera v. KCS Railway, LA JDC, Rapides Parish, Vehicle Crash, David Abraham, atty, plntf, depo 2009-02-05

Cole v. All Star Chevrolet; 19th JDC, EBR, machine design & behavior, defns, Liberty Mutual, depo 2008-12-23

Ansalve v. Miles Enterprises; 19th JDC, EBR, # 564,574, Div 25, Hartford Ins., defns, depo 2008-12-02

Walker v. Koch; US DC, Southern District of Mississippi, Hattiesburg Division; Civil Action No. 2:07cv274, Ladder/Stair Design, McHard Law, plntf, depo, 2008-10-09

Brooks vs LADOTD, LAJDC, Iberville, Accident Reconstruction, Alton Moran, plntf, trial, 2008/08/27

Fontana versus CEC Entertainment, Inc. USDC, MDLA CA NO: 07-37, Connell Archey, dynamics & design of waverunner ride, defns, trial, 2008/08/21

Hebert vs. Entergy, LAJDC Tangipahoa, Waterman Law, plntf, depo, 2008-08-06

Walker v. Koch; US DC, Southern District of Mississippi, Hattiesburg Division; Civil Action No. 2:07cv274, Ladder/Stair Design, McHard Law, plntf, depo, 2008-07-08

Thongsavanh vs. Schexnader, 23rd JDC, Ascension, LA, No. 00084863B, Auto crash recon, defns, Rowe Law, court, 2008/05/14

Universal Contract Services vs. Kobelco, et al, 17th JDC, Lafourche, No. 94673, "E", Breazeale, Sachse & Wilson, plntf, depo, 2008/04/29

Hicks vs. Bossier Parish, LAJDC, Bossier Parish, Motorcycle crash, Morris Bart, plntf, depo, 2008/04/17

Mitchell vs. Wicker Construactio, USDC, EDTX, MD, CA No. 2:07CV70, Veh Crash Recon, George Nalley. plntf, depo, 2008/04/11

White vs. Brown, 19th JDC, EBR, LA, No. C504052 Sec. 22, Veh crash recon, plntf, Steve Adams, depo, 2008/03/31

Thongsavanh vs. Schexnader, 23rd JDC, Ascension, LA, No. 00084863B, Auto crash recon, defns, Rowe Law, depo, 2008/03/28

Cedotal vs Mumphrey, LAJDC, West Baton Rouge, Truck dynamics, time and distance, defns, James Moore, depo, 2008/03/17

Peters vs Nissan, USDC EDLA C.A. No. 06-2880, Machine design, dynamics of pallet truck, plntf, D. Impastato, trial 2008/03/04

Young vs. American Eagle Lines, USDC, MDLA, Civil Case No.: 05-1079-JVP-SCR, repair and collapse of van semi-trailer, plntf, Art Smith, trial, 2008/01/24

Trahan vs. General Motors, LA 33rd JDC, Allen Parish, Docket #: C-2006374, Airbag non-deploy and SDM download interpretation, plntf, depo, 2007/12/18

Ernest vs CARBIS, LA 19th JDC, No. 479-651-D, Structure stability and walking friction, defns, Bradford Felder, Court, 2007/11/02

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