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## **Curriculum Vitae**

### **LOREN D. SACKETT, P.E.**

#### **CERTIFICATIONS**

Mr. Sackett is a Mechanical Engineer who has earned the following certifications:

- Mechanical Professional Engineer (P.E.) licensed in Utah, #7796279-2202
- Certified Safety Professional (CSP) from the Board of Certified Safety Professionals, CSP-34749
- Certified Design Certifying Engineering (DCE) for hazardous material tanker trailers
- Certified fork lift operator

#### **EDUCATION**

Mr. Sackett attended college at Utah State University in Logan, Utah, where he earned his Bachelor of Science degree in mechanical engineering and graduated in December of 2005. While at Utah State, Mr. Sackett completed specialized coursework in Finite Element Analysis, Kinematics, Control Systems, and Mechatronics. He was also a member of the USU Robotics Team, received several scholarships and graduated cum laude.

#### **WORK HISTORY**

As part of his bachelor's degree studies, Mr. Sackett completed a summer internship at Inovar Inc. in Logan Utah. Inovar Inc. manufactures electronics for a variety of different OEMs. Mr. Sackett worked on diverse team to optimize oven temperature profiles, increase worker efficiency, ensure high quality results, and ensure profitability of the manufacturing process.

Mr. Sackett has worked as a mechanical engineer for Alpine Engineering & Design, Inc. (AED) in Alpine, Utah since February 2006. During his time at Alpine Engineering, he has become a Professional Engineer licensed in the state of Utah and become a Certified Safety Professional in comprehensive practice. Mr. Sackett is also certified as a Design Certifying Engineering (DCE) for hazardous material tanker trailers and is a certified lift truck operator.

As part of AED's consulting engineering work, Mr. Sackett has worked on many design, analysis, testing, prototyping, and DCE projects. The following are some of the key areas and engineering projects Mr. Sackett has worked on while employed at AED.

##### **Aerial Lift Trucks**

Mr. Sackett has worked extensively in aerial lift truck design. This work has included designing aerial lifts from the ground up. This work included designing and sizing components, running stress analyses, laying out the hydraulic circuit, specifying hydraulic motors and actuators, creating detailed drawings, and testing and troubleshooting prototype units.

### Hazardous Material Tanker Trailers

Mr. Sackett has also worked extensively in the hazardous material tanker trailer industry as a Design Certifying Engineer (DCE). His work included verifying compliance to the U.S. Code of Federal Regulations (CFR) and Department of Transportation (DOT) regulations regarding the repair and modification of hazardous material tanker trailers. He has also performed detailed analyses of full trailer designs to verify the strength of the trailer in various situations.

### Miscellaneous Dump and Flat-Bed Trailers

Mr. Sackett has designed, analyzed, and modified the design for many different trailers, including side-dump trailers, end-dump trailers, and flat-bed trailers. This work included stress analysis using hand calculations and FEA, sizing components, choosing materials, specifying welds, specifying fasteners, and making detail drawings.

### Amusement Park Rides

Mr. Sackett has designed, performed stress analysis using hand calculations and FEA, sized components, chose materials, specified welds, specified fasteners, made detail drawings, and ensured the designs met regulatory requirements for a number of amusement rides. Mr. Sackett has also worked on the ensuring standards compliance TUV, ANSI, etc. for powered zip-line rides at unique installations.

## **THE FOLLOWING IS A SAMPLING OF PROJECTS MR. SACKETT HAS WORKED ON**

### Design Projects

- Designed a material placer for use in road construction
- Designed automated refuse truck lifting arm mechanisms
- Designed and analyzed a rear impact guard
- Designed a truck-mounted crane
- Designed a spring-assist mechanism for liftgates
- Designed a mechanism for moving bariatric patients to and from hospital beds
- Designed a food smoking device
- Designed a trailer tarping system
- Designed a roll-off platform for transporting a tank

### Analysis Projects

- Utilized finite element analysis (FEA) to analyze a hydroponic grow pod support structure
- Utilized finite element analysis to analyze a rear impact guard
- Utilized finite element analysis to analyze a work platform for repairing aircraft
- Analyzed the design of a specialized wrench for use in the drilling/mining industry
- Utilized finite element analysis to analyze a trailer hitch
- Analyzed the stresses in a tilted drilling mast
- Analyzed the stresses in the deck supporting a water tank
- Safety analysis of a trailer-mounted conveyor system
- Utilized finite element analysis to analyze a quarter frame end dump trailer
- Utilized finite element analysis to determine the deflection of different window pane spacers
- Utilized finite element analysis to analyze the design of a semi-trailer jack stand
- Utilized finite element analysis to analyze a steerable jeep for use in the heavy-haul industry
- Safety analysis of tire machine

### Testing Projects

- Set up a machine for testing rear impact guards
- Tested the strength of a horizontal life line anchor

- Tested the strength of golf club head attachment mechanisms
- Measured the loads on a tire changing machine to ascertain the cause of bolt failures

#### Prototyping Projects

- Assisted in prototyping of a new exercise equipment design
- Built machine for testing rear impact guards
- 3D printed a scaled-down boom tip for experimenting with hose routing options

### **EXPERT WITNESS WORK HISTORY**

As part of his work at Alpine Engineering, Mr. Sackett has worked on over 20 product liability and IP cases. This work involved reviewing documents and writing technical reports for product liability and patent lawsuits. Mr. Sackett has also assisted with many tests and inspections in connection with these lawsuits.

Mr. Sackett has worked on the following expert witness projects:

- Construction elevator control system failure
- Air pressure in a hydraulic cylinder causing fatal injury to repairman
- Fatal folding chair seat failure
- Farm sprayer tractor visibility issues causing motorcycle crash
- Multiple patent suits surrounding containers for hauling sand
- Worker fall from a moving garbage truck
- Broken hydraulic fitting resulting in oil causing a motorcycle accident
- Leak of fiberglass pipe causing environmental contamination and expensive clean-up
- Hydraulic failure in a trailer gate
- Failure of slewing ring bolts on a aerial lift
- Failure of a high-pressure water hose during pressure test
- Trailer came off hitch due to improper loading and poorly maintained hitch
- Patented design of a safety railing post
- Extremely poor reliability of a mowing machine
- Patented design of a specialty fastener
- Patented design of a trailer suspension
- Thread failure of hydraulic fitting
- Tip-over of T.V. cart
- Controls design on a tow truck leading to a fatal automobile accident
- Sudden drop of the lift frame of a car hauler
- Table saw without a lower guard