



## TRAIN CONDUCTOR FALL FROM TANK CAR; RECONSTRUCTION OF SAFETY APPLIANCE LOCATION

A train service employee fell from a tank car while attempting to dismount the car. Repairs were made to the car prior to position of the safety appliances (sill step) being measured. ESi performed a 3D scan of the car and reconstructed the original position of the sill step at question, showing that it was within the allowable FRA regulatory requirements.

### SITUATION

A train conductor was working in a rail yard as part of a switching crew. During their switching activities the conductor needed to cross over a storage track of rail cars to reach an adjacent track. The conductor attempted to cross over a tank car using the end platform of the car. The conductor alleged that they fell while climbing down the tank car when placing their foot in the sill step of the car. No one witnessed the incident and the conductor radioed for help at which point he was transported by ambulance to the hospital.

A local mechanical department employee inspected the tank car and determined that the sill step needed to be adjusted; however, no measurements were made of the sill step to determine if its position on the car complied with FRA regulations regarding its position on the car (such as relative to the sides and end of the car).

ESi was asked by counsel for the railroad to address the issues raised by an expert hired by the conductor and to inspect and analyze the subject railcar to determine if the sill step was in compliance with FRA safety appliance regulations.

**Practice:** Railroad Services

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#### Services Utilized:

- FRA Compliance Review
- FARO 3D Laser Scanner
- Safety Assessment

#### About ESi

For over 30 years, ESi has leveraged its multidisciplinary team of engineers, scientists, and professional technical staff to investigate many major accidents and disasters. Our technical expertise, hands-on experience and state-of-the-art facilities, combined with diagnostic, analytical and physical testing capabilities create an ideal environment for quickly identifying and interpreting the facts of a case.

#### Contact ESi

For more information visit our website or call us toll free at 866.596.3994

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## SOLUTION

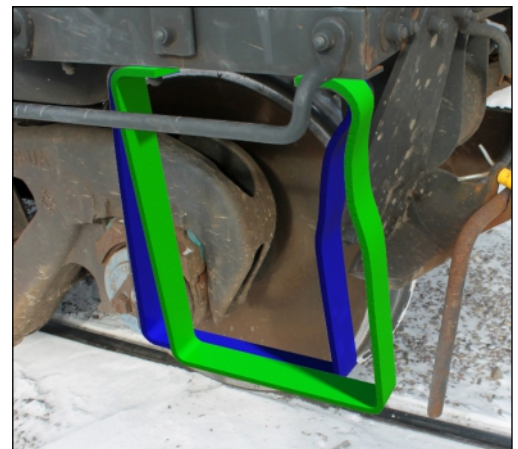
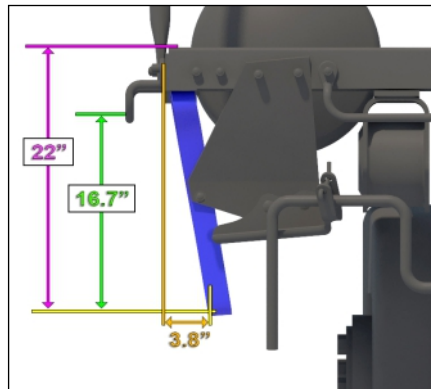
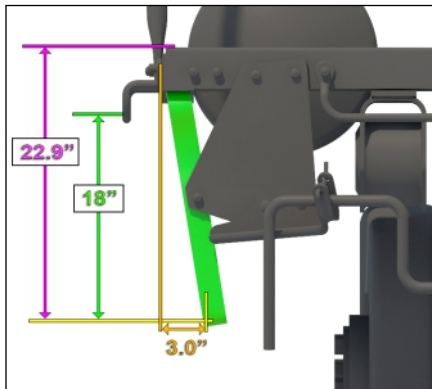
ESi reviewed the depositions of the conductor who fell and other people working in the yard at the time of the incident. There were no witnesses to the fall and no measurements of the safety appliances were made prior to the tank car being sent to the repair track. The railroad did take photographs of the tank car immediately after the conductor fell which showed the position of the sill step in question prior to adjustment.

ESi inspected the tank car in question and performed a FARO scan of the entire car with a focus on the safety appliances. A digital model of the tank car was created from the FARO scan and the original photograph taken immediately after the incident was overlaid onto the digital model. The sill step was then digitally "bent" until it matched the sill step in the photograph. The original dimensions of the sill step were then measured and demonstrated that the sill step complied with the FRA safety appliance regulations.

## RESULTS

The opposing expert's report alleged several other defects on the tank car in question including the securement of other safety appliances. The FARO scan data allowed ESi to show that this was not the case and that the other defects alleged were in compliance with FRA Safety Appliance Standards. Without the FARO scan data this may not have been possible as detailed inspection and measurement generally focus on the part in question.

ESi's investigation and analysis evaluated the entire tank car in question and determined the sill step in question was bent inward but, within the allowable range of FRA Safety Appliance Standards. The case settled shortly after the ESi report and analysis were disclosed.



**WHY ESi.** The ESi rail team members are engineers with specialized knowledge and expertise covering every component of the rail industry and the many ways they connect and interact with one another. Their broad range of experience in the railroad operating, mechanical, engineering, and metallurgical disciplines includes:

- 3D Laser Scanning
- Bridge Assessments
- Component Evaluations
- Derailment Cause Analysis
- Failure Analysis
- FELA/Employee Injury Investigations
- Grade Crossing Accident Reconstruction
- Hazardous Materials Safety, Release and Dispersion Analysis
- Locomotive and Vehicle Data Analysis
- Locomotive Electrical and Propulsion Systems Analysis
- Passenger and Transit Safety
- Simulations & Animations
- Vibration Analysis



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