

Failure Analysis of Hydraulic Cylinders in Speed Lift Accident by Beacon Forensic, P.C.



The Problem

In spring of 2016, Beacon Forensic, P.C. was contacted to investigate a hydraulic cylinder failure that led to the injuries of two employees operating a speed-lift loading dock lift. A subsequent investigation confirmed that two hydraulic cylinders had failed, dropping the lift to the floor while in operation and resulting in the injuries.

The Investigation and Analysis

The engineer conducted a failure analysis to determine the cause of the incident. During the investigation, the engineer researched specifications and equipment manuals for the speed-lift as well as specifications for the hydraulic cylinders and completed calculations for lift weight loads. The weld was inspected by a material scientist using the latest technologies to reveal an abnormality in the weld.



The Results

Based on the investigation and research, it was concluded that at the time of the failure, the lift was not overloaded. Due to defective welding during the manufacturing process, the weld on one of the cylinders failed when it experienced high stresses. Once the incident weld failed, the remaining cylinder had to support the weight of the lift platform and its contents. After a period of time, the additional weight exposed led to further deformity and fractures, and subsequently failed, causing the raised platform to drop during operation. It was also determined that the supplier of the speed-lift failed to correctly install the equipment before selling the unit.