Reverse Engineering Pneumatic Steel Strapping Machine

Case Study Highlights

Client Profile:
Tools Manufacturer, USA

Objective:
To reverse engineer steel strapping machine for design optimization and document design information digitally

Challenges:
- 3D scanning complex machine geometry to capture accurate geometrical dimensions
- Performing manual dimension measurements to obtain missed-out geometrical information during the 3D scanning process
- Developing CAD models, 3D and 2D detailed drawings for manufacturing purposes
- Evaluating the design for stress concentration and performing subsequent optimization to propose better design of the strapping machine

Solution:
The steel strapping machine prototype was transformed into digital CAD model using 3D scanning technique and manual measurements. To reverse engineer the machine, the components were disassembled sequentially to capture accurate geometric information of each individual component. The final design obtained was utilized to perform structural analysis for identification of stress concentration. Based on the analysis results, the design was optimized to withstand high stress values without failure.

Benefits:
- Competitive advantage in the market with improved product design
- 30% reduction in prototyping test trials
- Identified major design flaws with reduced turn around and faster time to market
- Digital design documentation for future modification in design

About Mechanical 3D Modelling

Mechanical 3D Modelling is an India based company that caters for global clientele and plans to penetrate deeper into the existing and emerging markets. Proficiency lies in offering qualitative, cost effective and time bound mechanical engineering design services, including 2D, 3D CAD drafting, 3D solid modeling, FEA, CFD, rapid prototyping, reverse engineering. Professional and highly experienced team can handle all kind of CAD projects with the use of AutoCAD, Wildfire, 3D Max, Inventor, Solid Works, Solid-edges and Pro-e tools.