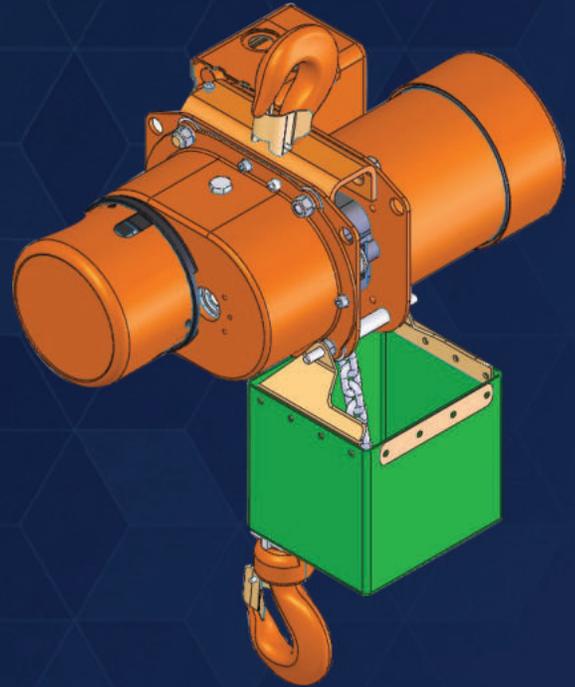


# CCE Industry Solution Industrial Equipment



## About CCE

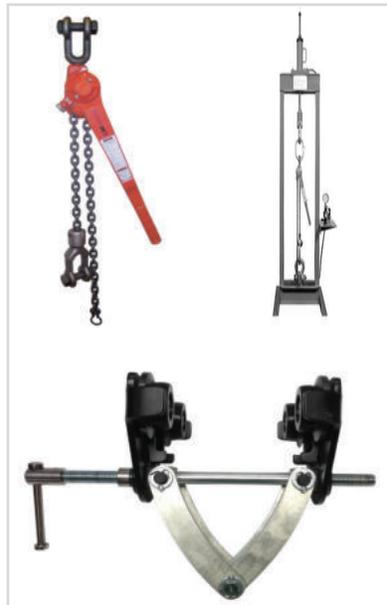
CCE is a Michigan corporation in business since 1989. Our offices are located in Farmington Hills, Michigan and Fort Lee, New Jersey, as well as a state-of-the-art engineering development center in Chennai, India. CCE is an engineering product development company that offers a comprehensive solution to our clients, to reduce time, cost, and risk inherent in product development.



We help companies across a wide variety of industries with their new product development (NPD) and sustaining engineering needs.

## About Client

The client is a leading worldwide designer, manufacturer and marketer of material handling systems and services, which efficiently and ergonomically move, lift, position or secure material.

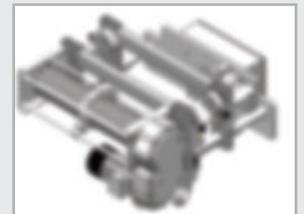


Key products include hoists, actuators, cranes, lifting and rigging tools and more!

## Our Goal

Our goal was to work in collaboration with the client's team on multiple product design activities during the development stage

## New Configurations



Assembly with New Configuration



Detailed Drawing

Built new assembly with required configurations as per the given BOM, clearance diagram and reference assembly

## New Product Development

- ▶ Customer wanted to develop a 3-step (3 gears) winch over existing 2-step (2gears) winch. The new version will convert the winch motor power into a large pulling force keeping the design compact and lighter than the earlier model
- ▶ For ease of manufacturing the new design metal frame, side cover to adopt an outer profile of the assembly and the metal frame was split into two pieces
- ▶ Gaskets were provided between cover and metal frame to avoid oil leakages
- ▶ Provided threaded mounting holes on the side plate in-line with the cover
- ▶ Provided Fill-in and Drain-out plug holes in the side plate on the cover side at appropriate locations
- ▶ Based on new design parts, assemblies and final drawings were released



Winch Assembly

- ▶ NPD engineers collaborated with the client's engineering team on a weekly basis for project progress and design reviews
  - As part of the project deliverables
  - CCE team
    - Created parametric SolidWorks models
    - Delivered detailed manufacturing drawing
  - Ensured manufacturability of all the parts designed

## Electrical Component

Besides mechanical design, the CCE team also designed electrical components including transformer and contactor board sub-assembly. The deliverables included

- ▶ Parametric SOLIDWORKS models
- ▶ Detailed drawings with Bill of Materials (BOM)
- ▶ Cable and wire harness drawings



Transformers



Contactor Board Sub-Assembly

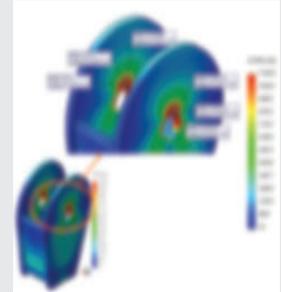
## De-featuring



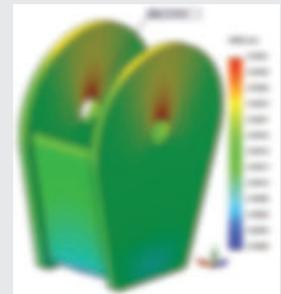
De-featured SolidWorks parametric model by removing all the internal details and created configurations for the de-featured model. De-featured, high level assemblies help in plant layout preparation and to do interference analysis.

## Finite Element Analysis

Performed static analysis of Swivel Trunion with the given loads and boundary conditions. Identified high stress zones and redesigned part.



Transformers



Displacement Plot

- ▶ Increased plate thickness
- ▶ Added fillet to crosshead
- ▶ Extrude cut increased

## Work Highlights

- ▶ New product development was done in continuous collaboration with the client's team
- ▶ All modules were designed using SOLIDWORKS
- ▶ The final design, 3D CAD models and manufacturing drawings were delivered to the customer through our proprietary web-based work order management system PowerLink. PowerLink provides control, visibility, traceability, accountability, and helps to