Helping an Industrial OEM bring cost efficiencies in a product line through design optimization

The Client

One of the world's leading manufacturers of construction and mining equipment, diesel and natural gas engines, industrial gas turbines, and diesel-electric locomotives.

The Challenge

The customer wanted to bring in cost savings for a particular product line by making efficient design changes. Geometric worked with the customer to identify possibilities for cost reduction. As a cost savings idea, the customer decided to look at commonizing the FEAD (Front Engine Accessory Drive) system across a series of its product lines. The FEAD bracket is quite simply a bracket, mounted to the front of the engine. The FEAD system itself consists of the bracket, alternator, compressor, drive belt, belt tensioner and idlers, and all mounting hardware. Due to the nature of the engines, and any given application where they may be used, the accessories could not be restricted to any one location on the engine. Therefore, the challenge of the project was the fact that the system must remain flexible enough to accept various alternator designs at various locations on the engine, while maintaining commonality throughout the family of products.

The Solution

Geometric worked with the customer to determine how something could remain common, yet maintain the potential to be unique. The final solution was to identify and segregate the common aspects of the system and the uniqueness needed for each application. By creating a modular FEAD design consisting of a common main bracket and a unique auxiliary bracket, we were able to meet the challenge. The main bracket is the larger and the more expensive of the two brackets. The belt tensioner and idler locations are restricted only to this bracket. By commonizing this component and increasing its usage, the customer was able to keep costs at an acceptable level across each application. The auxiliary bracket is the smaller and less expensive of the two brackets. The addition of this bracket has allowed the overall design to remain flexible enough to satisfy the various alternator locations, and designs used in each unique application.

The Results

Since its initial release, this new FEAD system has proven to be a successful design as evidenced by the continuing adaptation into additional applications. Although modified and added to since first designed by Geometric, this design remains at the heart of customer’s product systems in production today.