

David Beneke Consulting

Finite Element Analysis for Engineering

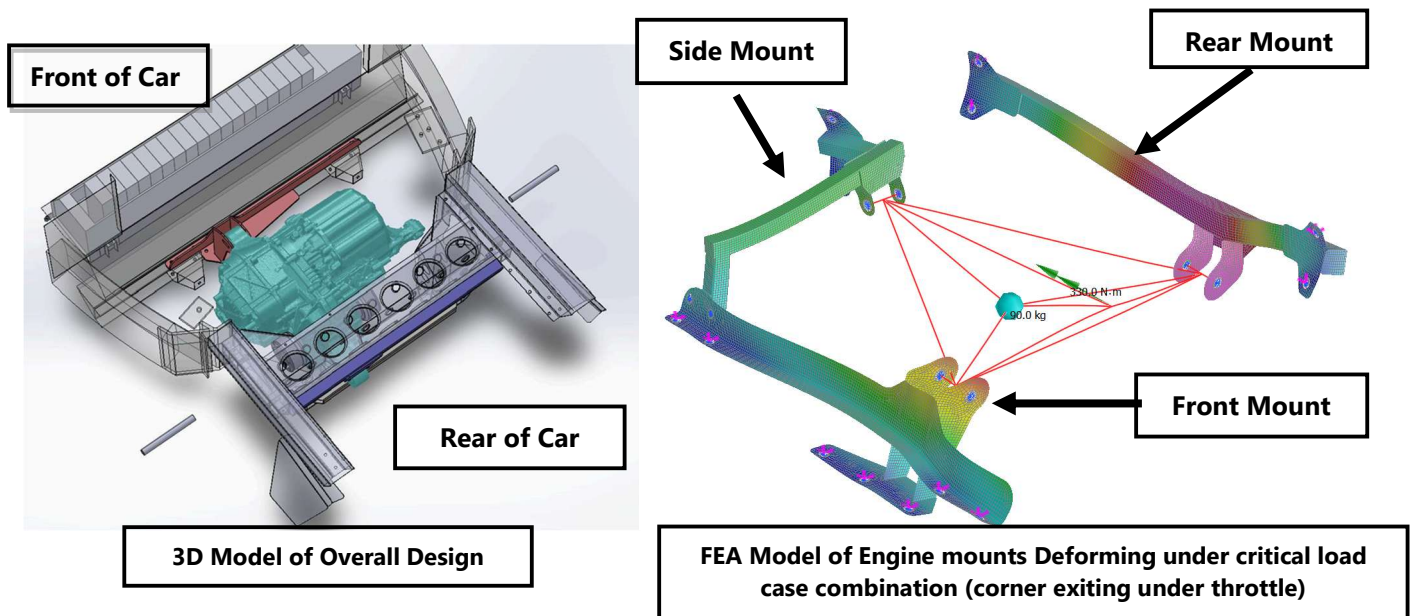
Lotus Elise Electric Vehicle (EV) Conversion Finite Element Analysis of Engine Mounts

Date: March 2025

Client: Private Client

Project Description:

David Beneke Consulting was commissioned by a Private Client, to undertake a finite element analysis (FEA) of the front, side and rear mounts that support an EV motor within a Lotus Elise road going vehicle. The purpose of the FEA was to determine the calculated fatigue life of these EV motor mounts.



The solid model geometry was imported into Strand7 FEA software. The solid model geometry contained the centre of gravity and centre of torque data. The following critical load cases combinations were adopted to complete the study amongst others; 1) corner exiting under throttle, 2) maximum accelerating forward with maximum vertical load and 3) maximum deceleration with maximum vertical load. It is noted that the maximum vertical load simulated the car hitting a pothole.

Based off the aforementioned load case combinations, the critical fatigue stress and resultant number of cycles to failure for each EV motor mount was derived using Section 11 of AS4100-2020 Steel Structures Standard. The analyses conducted determined that the minimum number of cycles to failure was greater than 600,000 cycles.

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