Job category	Students & Graduates
Form of employment	-
Location	Gothenburg
Country	Sweden

Thesis Work:

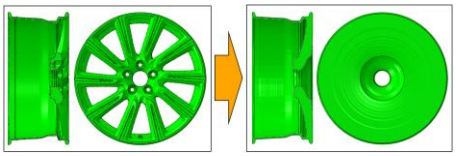
Axisymmetric rim models for road NVH

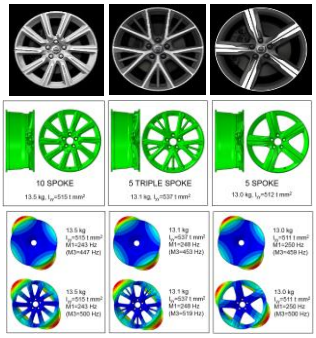
Background

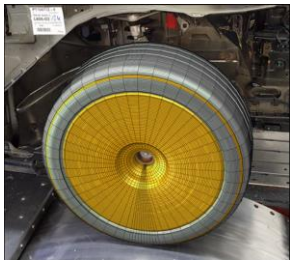
The noise and vibration which occurs in the vehicle when driving over different road surfaces is a major factor in how the customer perceives the quality of the vehicle. This is therefore one of the most important load cases used during the development process of a new car.

The road noise and vibration levels are highly dependent on the interaction between the tire, rim, wheel suspension and car body. Continental tires and Volvo cars run a joint method development project, where Continental FE tire models are coupled to Volvo rim and complete vehicle FE models and used in analysis of interior road noise. When coupling the axisymmetric tire models to rim models, axisymmetric rim models are required.

This thesis will focus on the impact of rim design on road NVH (Noise, Vibration and Harshness), with the goal of developing an automated procedure for creating axisymmetric rim models from existing rim designs.The procedure should retain mass, stiffness and modal properties of a given number of selected eigenmodes of the rim in the axisymmetric model. In the longer perspective, the procedure will be used for establishing rim design guidelines for road NVH performance.







This project is run in cooperation between Continental Reifen and Volvo Car Group.

Scope

The project will include:

- Literature study
- FE modelling and analysis of rims

- Investigation of different rim designs and establishing a knowledge of how the modal properties of a rim depend on its dimensions
- Establishing an understanding of how severe the restriction to axisymmetric models is – are there rim designs which are unfeasible for axisymmetric model conversion?
- Identifying and implementing efficient and accurate procedures of creating and updating/calibrating axisymmetric rim models with respect to mass, stiffness and modal properties
- Studying the dependence of isolation efficiency of tire+rim on rim properties and rim modes
- Investigation of which rim modes (free-free/free-fixed) are most important for the road NVH performance of the coupled wheel-vehicle system, and if this is dependent on different rim dimensions

Profile

Required: Students from Master program in Applied Mechanics, Sound and Vibration or Automotive Engineering. Good knowledge in FEM, structural dynamics, noise and vibrations. Self standing, curious and fast learner. Driving license.

Application

CV and point list is needed for application

Duration

- The job will start February 2019 and continue 20 weeks.
- 1-2 students. This diploma work gives 30 points/student. The project is splitted between Continental Reifen in Hannover and Volvo Car Corporation in Gothenburg.

Contact

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Last application date **2019-01-25**