

# Volvo Cars Thesis Work Proposal

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Title	
<b>Experimental studies of water management on a simplified rear view mirror</b>	
Fields of study	Department / Company / Location
Aerodynamic testing, Multiphase flows, Windtunnel experiments	96600 Fluid Dynamic Center , Volvo Car Corporation , Göteborg
Description of thesis work	
<p>Background: The ability to control water management on exterior glass surfaces like side glass, mirrors and lamps are important for maintaining vision and improving active safety. To be able to achieve this the factors that influence deposition and transport of water over the vehicle needs to be predicted. The Fluid Dynamic Center at VolvoCars is continuously developing and using methods to predict contamination and water management in customer driving situations.</p> <p>Scope: The scope of this thesis is to conduct experimental studies on a generic rear view mirror shape. The results will be used to validate numerical models of the air flow and water transport on the mirror that are developed in a PhD program at CTH. The thesis work consist of setting up a prebuilt rig in the model wind tunnel at VolvoCARS and to perform experimental studies in terms of video and high speed filming, smoke vizualisation and velocity measurements with existing methods available at VCC. Programs in MATLAB needs to be developed to asses the droplet speed and size behind the mirror.</p> <p>Tasks:</p> <ul style="list-style-type: none"> <li>• Video and High Speed filming of rivulets and breakup of droplets</li> <li>• Development of Matlab Image analysis program to asses velocity and droplet sizes</li> <li>• Smoke Vizualization and Image analysis of wake structure behind the mirror</li> <li>• Experiments with different mirror shape modifications</li> </ul> <p>The work will primarily be carried out at the VCC model wind tunnel. Experience with conducting fluid dynamic experiments is appreciated.</p> <p>The duration of the study will be 20 weeks for one student and the work will be carried out at the Contamination and Water Tightness group at Volvo Cars Corporation, Gothenburg.</p>	
Suitable Student background	
Good knowledge of general fluid mechanics/experience from measurements.	
Starting date	Number of students
June 2006	One student

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**ADM Info**

**Date of publication** (must be on form :YY-MM-DD)

2006-01-25

**Publisher**

Andreas Borg

**Withdrawal date** (must be on form :YY-MM-DD)

2006-05-23

**Created By** Andreas Borg **on** 2005-04-25