AN ABSTRACT OF THE THESIS OF

Curtis J. Peterson for the degree of Honors Baccalaureate of Science in Mechanical Engineering presented May 29, 2014. Title: CFD and Wind Tunnel Determination of Rear Wing Slot Gaps for 2014 Formula SAE Racecar.

Abstract Approved:

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The purpose of this project is to examine the effect of the slot gap spacing on a multi element rear wing. A three element rear wing is used in order to produce maximum downforce at the relatively low speed of Formula SAE competitions. These high lift configurations serve to increase the overall angle of attack of a wing, which turns into more lift (or downforce in the case of racecars). Higher angles of attack are susceptible to stall and it is essential to prevent flow separation on the wing in order to produce the desired effect. Correct slot gap spacing helps to maintain flow continuity on the under side of the wing. Computational Fluid Dynamics (CFD) software and data taken in the OSU wind tunnel will be examined for trend comparisons and selection of the slot gap that produces the most competition points.

Key Words: Computational Fluid Dynamics (CFD), Wing, Wind Tunnel, Multi-element airfoil, downforce, Formula SAE

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