AALTO UNIVERSITY
SCHOOL OF ENGINEERING
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Influence of tyre pressure on vehicle steady-state lateral dynamics

Thesis submitted in partial fulfilment of the requirements for the degree of

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ABSTRACT OF THE MASTER'S THESIS

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This M.Sc. thesis is the result of experience made at the Department of Engineering Design and Production at Aalto University School of Engineering. It examines the steady-state turning of a real vehicle using the handling diagram theory.

A test vehicle, equipped with a number of sensors, is used. This was first modelled with the simulation software CarMaker® and then the results obtained were compared to experimental data acquired during proving ground tests. The understeering-oversteering behavior of the vehicle was analysed.

Moreover, the influence that tyre inflation pressure has on the modification of the handling diagram is shown. Thanks to this approach, the inflation pressure is considered as a new variable for the handling diagram, and so a three-dimensional graphic was built. Two sets of tyres were used with different inflation pressures; front and rear axle tyre pressure influences were considered separately. This leads to several combinations which generate different handling surfaces. These results are presented to illustrate the characteristic of this analysis.

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