

## 고유진동수를 고려한 자동차 후드 보강재의 최적설계

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Considering Natural Frequencies**

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**Key Words:** Topology Optimization(위상 최적설계), Natural Frequency(고유진동수),  
Optimum Design(최적설계), Reinforcement of an Automobile Hood(후드보강재)**Abstract :** The automobile hood is a shell structural member which contains the rotating parts as engine, transmission so that there is worried which the resonance occurs due to the frequency of the rotating parts. The hood must be designed by supporting the stiffness of design loads and considering the natural frequencies. Hence, it is sustained the stiffness and considered the vibration by resonance. It is deep related to ride. Therefore, the topology, shape and size optimization methods are used to design the automobile hood. Topology technique is applied to determine the layout of a structural component optimum size with maximized natural frequency by volume reduction. In this research, The optimal structure layout of an inner reinforcement of an automobile hood for the natural frequency of a designated mode is obtained by using topology optimization method. The optimum size of reinforcement and the optimum shape are determined by PLBA algorithm.

## 차량 리어 트레일링 암의 좌굴강도해석 및 형상 최적화

장종민<sup>†</sup> (고려대 원) · 박진무\* (고려대)**Buckling Strength Analysis and Shape Optimization of Vehicle Rear  
Trailing Arm**

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**Key Words:** Buckling Strength(좌굴강도), Rear Trailing Arm(리어트레일링 암), Flange(플랜지)  
Shape Optimization(형상 최적화), Hole(구멍), FEM(유한요소해석)**Abstract :** The riding in a car feeling and stability are essential element from the vehicle. The trailing will be one element of rear suspension system and it will receive a compression mainly and the buckling will be able to occur. In This study, it evaluates the effect which receives buckling strength it follows in flange shape form and hole shape change of the parts. Therefore, the applied flange shape and hole shape of the model was obtained by using FEM method and it approached the optimization of the trailing arm's shape. It compares an actual test result and an analysis result to be approximate prove