ANALISIS VARIASI KETEBALAN PEGAS DAUN MENGGUNAKAN METODE ELEMEN HINGGA PADA TRUK MITSUBISHI FUSO 125 PS PENGANGKUT KELAPA SAWIT

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ABSTRAK

Pegas daun merupakan komponen sistem suspensi yang berfungsi menopang beban dan menjaga kestabilan kendaraan. Penelitian ini bertujuan menganalisis pengaruh variasi ketebalan pegas daun terhadap deformasi, tegangan von Mises, dan *Safety Factor*, serta menentukan ketebalan yang paling optimal. Analisis dilakukan menggunakan Finite Element Method (FEM) pada ANSYS Workbench dengan material AISI 5150. Variasi ketebalan yang digunakan yaitu 10 mm, 11 mm, dan 12 mm, dengan pembebanan 7500 kg, 9500 kg, dan 11500 kg. Hasil simulasi menunjukkan bahwa peningkatan pembebanan meningkatkan deformasi dan tegangan von Mises serta menurunkan *Safety Factor*. Sebaliknya, penambahan ketebalan pegas daun menurunkan deformasi dan tegangan serta meningkatkan *Safety Factor*. Variasi ketebalan 12 mm memberikan performa terbaik dengan deformasi dan tegangan terendah serta *Safety Factor* tertinggi. Oleh karena itu, ketebalan 12 mm direkomendasikan sebagai desain yang paling optimal.

Kata kunci: Pegas daun, Finite Element Method, ANSYS Workbench, deformasi, tegangan von Mises, *Safety Factor*.

ANALYSIS OF LEAF SPRING THICKNESS VARIATIONS USING THE FINITE ELEMENT METHOD ON A MITSUBISHI FUSO 125 PS TRUCK TRANSPORTING OIL PALM

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ABSTRACT

Leaf springs are essential suspension components that support vehicle loads and maintain stability. This study aims to analyze the effect of leaf spring thickness variation on deformation, von Mises stress, and safety factor, and to determine the optimum thickness. The analysis was conducted using the Finite Element Method (FEM) in ANSYS Workbench with AISI 5150 steel. Thickness variations of 10 mm, 11 mm, and 12 mm were evaluated under loads of 7,500 kg, 9,500 kg, and 11,500 kg. The simulation results show that increasing the load increases deformation and von Mises stress while reducing the safety factor. In contrast, increasing the leaf spring thickness reduces deformation and stress and improves the safety factor. The 12 mm leaf spring exhibited the best performance, producing the lowest deformation and stress with the highest safety factor. Therefore, the 12 mm thickness is recommended as the optimum design.

Keywords: *Leaf spring, Finite Element Method, ANSYS Workbench, deformation, von Mises stress, safety factor.*