

DESAIN DAN ANALISIS PENGARUH KETEBALAN PEGAS DAUN PARABOLIC PADA MOBIL PICK UP TERHADAP PEFORMA KENDARAAN

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Abstrak

Suspensi pegas daun salah satu faktor utama kendaraan berat. Pegas daun merupakan sepotong baja pegas atau material yang panjang dan pipih ,dan tipis namun memiliki daya tekan kuat dan kelenturan pada kendaraan berat untuk menopang berat kendaraan. Sistem suspensi pegas kendaraan berfungsi meredam gejala gerak kendaraan naik turun akibat jalan yang tidak rata. Suspensi pegas adalah salah satu faktor utama untuk menurunkan berat kendaraan tersebut. Penelitian ini bertujuan mengetahui desain pegas daun parabolic dan analisis perbandingan ketebalan pegas daun serta kekuatan tegangan von mises dan displacement pada pegas daun original, pegas daun modifikasi 1, dan pegas daun modifikasi 2 dari *design of experiment* hasil simulasi melalui software *Catia V5 R21*. Dengan 3 pegas daun modifikasi dengan material *Aisi 4340 Stell* pada beban variasi 2500 N, 2608 N, 2716 N, 2824 N, 2922 N, 2941 N. Hasil analisis tegangan von mises dan displacement pada 3 pegas daun modifikasi dengan variasi beban dapat disimpulkan bahwa semakin berat beban maka tegangan akan semakin besar. Dapat disimpulkan bahwa pegas daun dengan beban standar pabrik 2922 N pegas daun modifikasi 2 mempunyai tegangan tinggi sebesar 50 Mpa , setelah itu pegas daun modifikasi 1 mempunyai posisi kedua dengan tegangan sebesar 37 Mpa , dan pegas daun original mempunyai tegangan paling rendah di urutan ketiga sebesar 33 Mpa . Pegas daun modifikasi 2 mempunyai tegangan displacement tinggi sebesar $4,268 \times 10^{-2}$ mm , setelah itu pegas daun original memiliki urutan kedua tegangan displacement sebesar $4,168 \times 10^{-2}$ mm ,dan pegas dun modifikasi 1 mempunyai tegangan displacement paling rendah di urutan ketiga sebesar $3,69 \times 10^{-2}$ mm .

Kata kunci : desain pegas daun ,simulasi ,analisis, tegangan ,catia v5 r21.

DESIGN AND ANALYSIS OF THE INFLUENCE OF PEGAS THICKNESS OF PARABOLIC LEAVES ON CAR PICK UP ON VEHICLE PERFORMANCE

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Abstract

Leaf spring suspension is a major factor in heavy vehicles. Leaf springs are a piece of steel or spring material that is long and flat, and is thin but has strong compressive and flexibility in heavy vehicles to support the weight of the vehicle. The vehicle's spring suspension system functions to reduce the symptoms of vehicle movement up and down due to uneven roads. Spring suspension is one of the main factors in reducing vehicle weight. This study aims to determine the design of parabolic leaf springs and comparative analysis of leaf spring thickness as well as von mises stress strength and displacement on real leaf springs, modified leaf springs 1, and modified leaf springs 2 from the experimental simulation results design through Catia V5 R21 software. With 3 modified leaf springs with Aisi 4340 Stell material at various loads of 2500 N, 2608 N, 2716 N, 2824 N, 2922 N, 2941 N. The results of von mises stress analysis and displacement on 3 modified leaf springs with load variations can be concluded that the heavier the load, the greater the voltage. It can be concluded that leaf spring with factory standard load of 2922 N modified leaf spring 2 has a high tension of 50 Mpa, after that modified leaf spring 1 occupies the second position with a tension of 37 Mpa, and the original leaf spring has a high tension. lowest stress in third place 33 Mpa. The modified leaf spring 2 has a high shear stress of 4.268×10^{-2} mm, after that the original leaf spring has a second order displacement stress of 4.168×10^{-2} mm, and the modified 1 dun spring has the lowest displacement stress in the third place $3,69 \times 10^{-2}$ mm.

Keywords: leaf spring design, simulation, analysis, stress, catia v5 r21.