

RANCANG BANGUN KOMPONEN Pengereman PADA MOBIL HEMAT ENERGI KELAS PROTOTYPE

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ABSTRAK

Penelitian ini membahas rancang bangun komponen pengereman berupa *steering knuckle*, arm roda, dan pedal rem pada mobil hemat energi kelas prototype. Komponen dirancang dengan mempertimbangkan bobot kendaraan yang ringan, untuk mendukung performa pengereman yang optimal. Proses perancangan meliputi perhitungan kebutuhan gaya pengereman, pemilihan material, pembuatan desain komponen, serta pengujian fungsi sistem rem pada kendaraan. Disimpulkan bahwa dengan kecepatan yang sudah ditentukan 2,78 m/s, 4,17 m/s, 5,56 dan 6,94 m/s, maka didapatkan nilai perlambatan 8,33 m/s². Untuk perhitungan waktu henti pengereman secara praktik (pengujian) didapatkan nilai, 0.35s, 0.51s, 0.68s dan 0.84s. Untuk Perhitungan jarak henti pengereman secara praktik (pengujian) didapatkan nilai 0,79m, 1,75m, 3m dan 4,58m.

Kata kunci: Sistem pengereman, mobil hemat energi, *steering knuckle*, arm roda pedal rem, optimalisasi bobot.

DESIGN AND DEVELOPMENT OF BRAKING COMPONENTS FOR ENERGY-EFFICIENT PROTOTYPE VEHICLES

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ABSTRACT

This study discusses the design of braking components in the form of steering knuckles, wheel arms, and brake pedals on a prototype class energy-efficient car. Components are designed by considering the light weight of the vehicle, to support optimal braking performance. The design process includes calculating braking force requirements, material selection, component design, and testing the function of the brake system on the vehicle. It was concluded that with a predetermined speed of 2.78 m/s, 4.17 m/s, 5.56 and 6.94 m/s, the deceleration value was 8.33 m/s². For the calculation of braking stopping time in practice (testing) the values obtained were 0.35s, 0.51s, 0.68s and 0.84s. For the calculation of braking stopping distance in practice (testing) the values obtained were 0.79m, 1.75m, 3m and 4.58m.

Keywords: braking system, energy-efficient vehicle, steering knuckle, wheel arm, brake pedal, weight optimization.