

ABSTRAK

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Judul Laporan Akhir : Rancang Bangun *Brake System Trainer* Sebagai Alat Pembelajaran Sistem Pengereman Kendaraan Roda Empat Dibengkel Alat Berat Teknik Mesin Politeknik Negeri Sriwijaya

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Sistem pengereman merupakan salah satu komponen penting pada kendaraan yang berfungsi untuk memperlambat, mengurangi kecepatan, dan menghentikan laju kendaraan melalui gaya gesek antara komponen rem. Pemahaman mengenai prinsip kerja sistem pengereman menjadi kompetensi yang harus dimiliki oleh mahasiswa Teknik Mesin, khususnya pada mata kuliah yang berkaitan dengan sistem kendaraan. Namun, proses pembelajaran sistem pengereman pada kendaraan roda empat masih mengalami kendala karena sebagian besar komponen rem terpasang pada kendaraan sehingga sulit diamati langsung saat kegiatan praktikum. Kondisi tersebut menyebabkan mahasiswa kesulitan memahami konstruksi, mekanisme kerja, serta hubungan antar komponen pada sistem pengereman. Oleh karena itu, dirancang dan dibuat *Brake System Trainer* sebagai media pembelajaran yang memungkinkan mahasiswa mempelajari prinsip kerja rem cakram dan rem tromol lebih jelas, aman, dan interaktif. Proses perancangan dan pembuatan alat dilaksanakan di Bengkel Kimkim25 Garage, sedangkan kegiatan pengamatan dan pengujian dilakukan di Bengkel *Maintenance and Repair* Jurusan Teknik Mesin Politeknik Negeri Sriwijaya selama periode April hingga Juni 2026. Metode yang digunakan dalam penyusunan laporan akhir ini meliputi studi literatur, observasi lapangan, dan bimbingan dosen. Adapun tahapan pembuatan alat meliputi proses pemotongan bahan, pengelasan, pengeboran, penggerindaan, pengecatan, serta perakitan seluruh komponen hingga alat siap dioperasikan. Hasil perancangan menunjukkan bahwa *Brake System Trainer* berhasil dibuat sesuai dengan desain yang telah direncanakan dan mampu memperagakan mekanisme kerja sistem pengereman cakram dan tromol dengan baik. Dengan adanya media pembelajaran ini, mahasiswa diharapkan dapat lebih mudah memahami sistem pengereman kendaraan roda empat, meningkatkan efektivitas kegiatan praktikum, serta mendukung proses pembelajaran di Bengkel Alat Berat Jurusan Teknik Mesin Politeknik Negeri Sriwijaya.

Kata Kunci: *Brake System Trainer, rem cakram, rem tromol.*

ABSTRACT

DESIGN AND DEVELOPMENT OF A BRAKE SYSTEM TRAINER AS A LEARNING MEDIA FOR FOUR-WHEELED VEHICLE BRAKING SYSTEMS AT THE HEAVY EQUIPMENT WORKSHOP, DEPARTMENT OF MECHANICAL ENGINEERING, POLITEKNIK NEGERI SRIWIJAYA

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***DIPLOMA–III MECHANICAL ENGINEERING STUDY PROGRAM
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The braking system is one of the important components of a vehicle because it functions to reduce speed and bring the vehicle to a stop through the friction between braking components. Understanding the working principles of automotive braking systems is an essential competency for Mechanical Engineering students, particularly in courses related to automotive systems. However, the learning process for four-wheeled vehicle braking systems faces challenges because braking components are installed inside the vehicle, making them difficult to observe directly during practical sessions. This condition makes it difficult for students to understand the construction, operating mechanism, and interaction among braking components. Therefore, a Brake System Trainer was designed and manufactured as a learning medium that enables students to study the operating principles of disc brakes and drum brakes more clearly, safely, and interactively. The design and fabrication processes were carried out at Kimkim25 Garage, while observation and testing activities were conducted at the Maintenance and Repair Workshop, Department of Mechanical Engineering, Politeknik Negeri Sriwijaya, from April to June 2026. The methods used in this final project included literature study, field observation, and supervision. The manufacturing stages consisted of material cutting, welding, drilling, grinding, painting, and component assembly until the trainer was ready for operation. The results showed that the Brake System Trainer was successfully developed according to the planned design and was capable of demonstrating the operating mechanisms of both disc and drum braking systems. The trainer is expected to facilitate students' understanding of four-wheeled vehicle braking systems, improve the effectiveness of practical learning activities, and support the teaching and learning process in the Heavy Equipment Workshop of the Department of Mechanical Engineering at Politeknik Negeri Sriwijaya.

Keywords : Brake System Trainer, disc brake, drum brake.