ABSTRAK

Nama	:	Muhammad Fakhrul Akhyar
NPM	:	062230200214
Jurusan	:	Teknik Mesin
Program Studi	:	D – III Teknik Mesin
Judul Laporan	:	Rancang Bangun Mesin Gergaji Pita Portabel sebagai Alat Bantu Potong Benda Kerja (Proses Perawatan)

(2025: xv + 86 Halaman, 61 Gambar, 18 Tabel, + 33 Lampiran)

Laporan akhir ini membahas rancang bangun mesin gergaji pita portabel sebagai solusi pemotongan benda kerja yang efisien, fleksibel, dan sesuai dengan kebutuhan bengkel skala kecil maupun praktikum pendidikan. Mesin ini dirancang khusus untuk memotong material baja karbon ST 37 menggunakan sistem transmisi motor listrik dan speed reducer, sehingga menghasilkan kecepatan potong yang sesuai standar industri, yaitu sekitar ± 25 m/menit. Desain portabel memudahkan pemindahan alat, meningkatkan fleksibilitas penggunaan, serta membantu optimalisasi tata letak dan ruang kerja bengkel. Fokus utama laporan ini adalah penerapan perawatan preventif untuk menjaga performa mesin tetap optimal sekaligus memperpanjang umur pakai. Perawatan meliputi komponen vital seperti motor listrik, pulley, mata gergaji, bearing, pillow block bearing, hingga gas springs. Prosedur dilakukan melalui inspeksi berkala, pelumasan, pengencangan, pembersihan, serta penggantian suku cadang bila ditemukan tanda-tanda aus atau kerusakan. Metode penelitian mencakup studi literatur, observasi lapangan, perancangan desain 3D, pemilihan material dan komponen, proses fabrikasi, perakitan, pengujian performa, serta evaluasi hasil. Pengujian dilakukan terhadap berbagai jenis profil logam, termasuk besi hollow, besi siku, dan pipa baja. Hasilnya menunjukkan bahwa mesin bekerja stabil, memberikan potongan presisi, dan memenuhi parameter teknis yang direncanakan. Hasil evaluasi membuktikan bahwa perawatan preventif terjadwal mampu mengurangi risiko kerusakan mendadak, meminimalkan downtime, dan mempertahankan kualitas hasil pemotongan. Rancang bangun ini diharapkan dapat meningkatkan efisiensi kerja, mengurangi biaya perbaikan jangka panjang, serta menjadi sarana pembelajaran praktis bagi mahasiswa dalam memahami prinsip kerja mesin pemotong sekaligus manajemen perawatan peralatan.

Kata Kunci: gergaji pita, portabel, pemotongan, perawatan mesin, efisiensi kerja.

ABSTRACT

Design and Construction of a Portable Band Saw Machine as a Tool for Cutting Workpieces

(Maintenance Process)

(2025: xv + 86 Pages, 61 Figures, 18 Tables, + 33 Attacchments)

Muhammad Fakhrul Akhyar

062230200214

DIPLOMA – III MECHANICAL ENGINEERING STUDY PROGRAM

MECHANICAL ENGINEERING DEPARTMENT

STATE POLYTECHNIC OF SRIWIJAYA

This final project discusses the design and construction of a portable band saw machine as an efficient and flexible cutting solution tailored to the needs of small-scale workshops and educational practical activities. The machine is specifically designed to cut ST 37 carbon steel using a transmission system powered by an electric motor and a speed reducer, producing a cutting speed in accordance with industrial standards, approximately 25 m/min. The portable design allows easy relocation of the equipment, increases operational flexibility, and optimizes workshop space utilization. The main focus of this project is the application of preventive maintenance to ensure optimal machine performance and extend its service life. Maintenance is carried out on critical components such as the electric motor, pulleys, saw blade, bearings, pillow block bearings, and gas springs. The procedures include periodic inspections, lubrication, tightening, cleaning, and replacement of worn or damaged parts when necessary. The methodology involves literature review, field observation, 3D design, material and component selection, fabrication, assembly, performance testing, and evaluation. Tests were conducted on various metal profiles, including hollow steel, angle steel, and steel pipes. The results demonstrated that the machine operates stably, produces precise cuts, and meets the planned technical parameters. The evaluation results confirm that scheduled preventive maintenance reduces the risk of sudden breakdowns, minimizes downtime, and preserves cutting quality. This design and build project is expected to improve work efficiency, reduce long – term repair costs, and serve as a practical learning medium for students to understand the principles of cutting machines as well as equipment maintenance management.

Keywords: band saw, portable, cutting, machine maintenance, work efficiency.