ABSTRAK

Nama	:	M. Prasetyo Pratama
NPM	:	062230200256
Program Studi	:	Diploma III Teknik Mesin
Judul Laporan Akhir	:	Perbaikan Mesin *Rotary grinding* Dan *Polishing* Di Laboratorium Mekanik Jurusan Teknik Mesin Politeknik Negeri Sriwijaya

(2025: xv + 65 Halaman, 41 Gambar, 12 Tabel + 2 Lampiran)

Proses produksi dalam industri manufaktur sangat bergantung pada efektivitas dan efisiensi mesin yang digunakan. Salah satu mesin penting dalam bidang metalurgi dan material adalah mesin *rotary grinding and polishing*, yang berfungsi untuk melakukan penghalusan dan pemolesan spesimen sebelum dilakukan analisis lebih lanjut. Namun, dalam praktiknya, mesin ini sering menghadapi berbagai kendala, seperti ausnya komponen, getaran berlebih, sistem transmisi yang tidak stabil, serta keterbatasan pada aspek ergonomis dan keselamatan kerja. Kondisi tersebut berdampak pada menurunnya kualitas hasil pengolahan permukaan serta meningkatkan risiko kerusakan mesin, sehingga perbaikan dan modifikasi menjadi suatu keharusan. Penelitian ini berfokus pada proses perbaikan mesin *rotary grinding and polishing* yang mengalami penurunan performa akibat kerusakan pada bagian transmisi dan ketidakstabilan putaran motor. Tahapan perbaikan meliputi identifikasi masalah, analisis penyebab kerusakan, perancangan solusi teknis, hingga implementasi perbaikan. Metode yang digunakan mencakup pengamatan langsung, pengukuran parameter mekanis, serta pengujian performa setelah perbaikan. Beberapa komponen kunci yang diperbaiki antara lain sistem transmisi sabuk, bantalan, motor penggerak, serta dudukan spesimen. Selain itu, dilakukan pula modifikasi pada rangka mesin untuk meningkatkan kestabilan dan kenyamanan operator dalam pengoperasian. Hasil perbaikan menunjukkan adanya peningkatan signifikan dalam stabilitas putaran mesin serta pengurangan getaran yang sebelumnya mengganggu proses penghalusan. Secara keseluruhan, perbaikan mesin *rotary grinding and polishing* ini tidak hanya mengembalikan fungsi utamanya, tetapi juga meningkatkan performa operasional dan memperpanjang umur pakai mesin. Dengan demikian, hasil yang diperoleh mampu mendukung efektivitas penelitian material dan proses produksi yang membutuhkan kualitas spesimen dengan tingkat presisi tinggi.

Kata Kunci: Perbaikan, mesin *rotary grinding polishing*, metalografi.

ABSTRACT

Repairs To The Rotary grinding And Polishing Machine In The Mechanical Laboratory Of The Mechanical Engineering Department Of The Sriwijaya State Polytechnic

(2025: xv + 65 Pp + 41 Figures + 12 Tables + 2 Attachments)

M. Prasetyo Pratama
NPM. 062230200256
DIPLOMA–III MECHANICAL ENGINEERING STUDY PROGRAM
MECHANICAL ENGINEERING DEPARTMENT
STATE POLYTECHNIC OF SRIWIJAYA

The production process in the manufacturing industry is highly dependent on the effectiveness and efficiency of the machines used. One of the important machines in the field of metallurgy and materials is the rotary grinding and polishing machine, which is used to smooth and polish specimens before further analysis. However, in practice, this machine often faces various challenges, such as wear and tear of components, excessive vibration, unstable transmission systems, and limitations in terms of ergonomics and workplace safety. These conditions impact the quality of surface processing results and increase the risk of machine damage, making repairs and modifications necessary. This study focuses on the repair process of a rotary grinding and polishing machine that has experienced a decline in performance due to damage to the transmission system and motor rotation instability. The repair process includes problem identification, analysis of the causes of damage, design of technical solutions, and implementation of repairs. The methods used include direct observation, measurement of mechanical parameters, and performance testing after repairs. Key components repaired include the belt transmission system, bearings, drive motor, and specimen mount. Additionally, modifications were made to the machine frame to enhance stability and operator comfort during operation. The results of the repairs showed a significant improvement in machine rotation stability and a reduction in vibrations that previously disrupted the grinding process. Overall, the repairs to the rotary grinding and polishing machine not only restored its primary function but also improved operational performance and extended the machine's service life. As a result, the outcomes achieved support the effectiveness of material research and production processes that require specimens with high precision levels.

Keywords: Repair, rotary grinding and polishing machine, metallography,