# ABSTRAK


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Alat uji kelelahan tipe rotary bending merupakan perangkat penting untuk menguji ketahanan material terhadap beban berulang (cyclic loading). Namun, hasil rancangan alat yang dibuat oleh mahasiswa sebelumnya belum dapat berfungsi optimal akibat adanya kerusakan pada komponen mekanis, keterbatasan sistem kelistrikan, dan ketiadaan fitur otomatisasi. Kondisi ini menyebabkan alat tidak dimanfaatkan secara maksimal dan hanya tersimpan di laboratorium. Oleh karena itu, dilakukan kegiatan optimalisasi dan rekondisi agar alat dapat digunakan secara efektif untuk kegiatan praktikum dan penelitian di Jurusan Teknik Mesin Politeknik Negeri Sriwijaya. Optimalisasi difokuskan pada perbaikan dan peningkatan kinerja komponen, meliputi penggantian tachometer, digital counter, pemasangan speed control, penambahan limit switch, perbaikan sistem kelistrikan, serta perapian kabel untuk meningkatkan keamanan. Selain itu, dilakukan perawatan preventif terjadwal seperti pelumasan pillow block bearing, inspeksi visual korosi, pengecekan kekencangan baut, dan pengujian fungsi sistem. Pendekatan ini dipadukan dengan perawatan korektif untuk mengganti komponen yang rusak atau tidak berfungsi. Hasil optimalisasi menunjukkan bahwa alat yang sebelumnya tidak berfungsi kini dapat beroperasi normal dengan peningkatan aspek keamanan, efisiensi, dan kemudahan pengoperasian. Penerapan strategi perawatan preventif diproyeksikan dapat memperpanjang umur pakai alat, mengurangi risiko kerusakan mendadak, serta meminimalkan biaya perbaikan di masa depan. Dengan demikian, alat uji kelelahan rotary bending yang telah dioptimalkan dapat menjadi sarana pembelajaran dan penelitian yang berkelanjutan, mendukung penguasaan konsep mekanika material khususnya pada pengujian kelelahan di jurusan Teknik mesin Politeknik Negeri Sriwijaya.



Kata Kunci: optimalisasi, rekondisi, perawatan preventif, rotary bending

# ABSTRACT

**Optimization Of Rotary Bending Type Fatigue Test Equipment (Maintenance)**

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The rotary bending fatigue testing machine is an essential device for evaluating the durability of materials under cyclic loading. However, the machine designed by previous students could not function optimally due to mechanical component failures, limitations in the electrical system, and the absence of automation features. These conditions resulted in the machine being underutilized and stored in the laboratory without significant use. Therefore, optimization and reconditioning efforts were carried out to enable the machine to operate effectively for practical and research activities in the Mechanical Engineering Department, State Polytechnic of Sriwijaya. The optimization focused on repairing and improving component performance, including replacing the tachometer, digital counter, installing a speed control unit, adding a limit switch, repairing the electrical system, and organizing wiring for improved safety. Furthermore, a scheduled preventive maintenance program was implemented, such as lubricating pillow block bearings, conducting visual inspections for corrosion, checking bolt tightness, and testing system functionality. This approach was complemented with corrective maintenance to replace components that were damaged or non-functional. The optimization results indicate that the previously non-functional fatigue testing machine can now operate normally, with improved safety, efficiency, and ease of operation. The implementation of a preventive maintenance strategy is projected to extend the machine's service life, reduce the risk of sudden breakdowns, and minimize future repair costs. Consequently, the optimized rotary bending fatigue testing machine can serve as a sustainable learning and research tool, supporting the mastery of material mechanics concepts, particularly in fatigue testing in the Mechanical Engineering Department, State Polytechnic of Sriwijaya

Keywords : optimization, rekondition, preventif maintenance, rotary bending