

ABSTRAK

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(2026: xii + 41 Halaman, 23 Gambar, 9 Tabel + 6 Lampiran)

Mesin CNC TU-3 Axis merupakan salah satu fasilitas praktikum di Politeknik Negeri Sriwijaya yang dimanfaatkan dalam kegiatan pemesinan dengan tingkat ketelitian yang tinggi. Seiring dengan lamanya masa penggunaan, beberapa komponen mengalami penurunan performa dan kerusakan yang menyebabkan mesin tidak dapat beroperasi secara optimal. Penelitian ini bertujuan untuk mengetahui kondisi mesin, melakukan proses rekondisi, serta menerapkan perawatan guna meningkatkan kinerja dan keandalan mesin CNC TU-3 Axis. Metode yang digunakan dalam penelitian ini meliputi observasi, identifikasi kerusakan, pembongkaran, perbaikan dan penggantian komponen, pengujian, serta penerapan preventive maintenance. Proses rekondisi dilakukan pada beberapa komponen, seperti motor stepper, sistem kelistrikan, panel kontrol CNC, motor spindle, linear guideway, serta komponen pendukung lainnya. Selain itu, sistem kontrol yang mengalami kerusakan diganti dengan perangkat lunak Mach3 agar mesin dapat beroperasi kembali secara optimal. Hasil yang diperoleh menunjukkan bahwa rekondisi dan perawatan yang dilakukan mampu mengembalikan fungsi mesin CNC TU-3 Axis sehingga dapat digunakan kembali dengan baik. Penerapan preventive maintenance secara rutin terbukti dapat meningkatkan kinerja dan keandalan mesin, memperpanjang umur pakai komponen, serta mengurangi risiko terjadinya kerusakan secara mendadak. Dengan demikian, rekondisi dan perawatan mesin CNC TU-3 Axis dapat mendukung keberlangsungan kegiatan praktikum di Politeknik Negeri Sriwijaya.

Kata Kunci: *rekondisi, mesin CNC TU-3 Axis, Mach3, maintenance, preventive*

ABSTRACT

***Reconditioning Of Tu-3 Axis CNC Machine Based On Mach 3 Control At
Sriwijaya State Polytechnic
(Maintenance)***

(2025: xii + 41 pp. + 23 Figures + 9 Tables + 6 Attachments)

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**DIPLOMA–III MECHANICAL ENGINEERING STUDY PROGRAM
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The TU-3 Axis CNC machine is one of the lab facilities at Sriwijaya State Polytechnic that is used for machining activities requiring high precision. Over time, several components have experienced performance declines and damage, causing the machine to not operate optimally. This study aims to understand the condition of the machine, carry out the reconditioning process, and implement maintenance to improve the performance and reliability of the TU-3 Axis CNC machine. The methods used in this study include observation, damage identification, disassembly, repair and replacement of components, testing, and implementing preventive maintenance. The reconditioning process is carried out on several components, such as the stepper motor, electrical system, CNC control panel, spindle motor, linear guideway, and other supporting components. In addition, the damaged control system was replaced with Mach3 software so that the machine could operate optimally again. The results showed that the reconditioning and maintenance carried out were able to restore the functions of the TU-3 Axis CNC machine, allowing it to be used properly again. Regular preventive maintenance has proven to improve machine performance and reliability, extend the lifespan of components, and reduce the risk of sudden breakdowns. In this way, reconditioning and maintenance of the TU-3 Axis CNC machine can support the continuity of practical activities at Sriwijaya State Polytechnic.

Keywords : *reconditioned, CNC TU-3 Axis machine, Mach3, maintenance, preventive*