

SCANIA GEARBOX OVERHAUL QUALITY IMPROVEMENT THROUGHT
STANDARDIZATION OF THE MAIN SHAFT AXIAL PLAY ADJUSTMENT PROCESS
AT PT UNITED TRACTORS PANDU ENGINEERING BALIKPAPAN

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STATEMENT BY THE AUTHOR

I hereby declare that this submission is my own work and to the best of my knowledge, it contains no material previously published or written by another person, nor material which to a substantial extent has been accepted for the award of any other degree or diploma at any educational institution, except where due acknowledgement is made in the thesis.


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ABSTRACT

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This research aims to enhance the quality of the SCANIA gearbox overhaul process at PT United Tractors Pandu Engineering Balikpapan through the standardization of the main shaft axial play adjustment process. The study is motivated by a high rate of failure in field in delivered components, which resulted in customer complaints and significant financial losses. The methodology employed is Six Sigma DMAIC (Define, Measure, Analyze, Improve, Control). The Define phase utilizes a SIPOC diagram, followed by the Measure phase using a Pareto chart to map the types of problems. The Analyze phase identifies the root causes using a fishbone diagram, while the Improve phase establishes corrective action priorities through Failure Mode and Effect Analysis (FMEA). The results indicated that the method factor was the dominant cause of excessive main shaft axial play beyond the specified tolerance. Through experimental validation, a standardized main shaft axial play adjustment procedure was developed to ensure that the required specifications were consistently achieved. In conclusion, the implementation of Six Sigma DMAIC is proven effective in significantly eliminating failures in the field (zero problems) and reducing failure costs.

Keywords: *SCANIA Gearbox, Failure in Field, Axial Play Adjustment, Six Sigma DMAIC, Failure Mode and Effect Analysis, Cost Efficiency.*

ABSTRAK

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Penelitian ini bertujuan untuk meningkatkan kualitas proses *overhaul gearbox* SCANIA di PT United Tractors Pandu Engineering Balikpapan melalui standardisasi proses *adjustment main shaft axial play*. Studi ini dilatarbelakangi oleh tingginya *failure in field* atas komponen yang dikirimkan mengalami problem sehingga memicu keluhan pelanggan dan kerugian finansial. Metodologi yang digunakan adalah *Six Sigma DMAIC (Define, Measure, Analyze, Improve, Control)*. Tahap *Define* menggunakan diagram SIPOC, dilanjutkan tahap *Measure* dengan diagram Pareto untuk memetakan jenis masalah. Tahap *Analyze* mengidentifikasi akar penyebab menggunakan *fishbone diagram*, pada tahap *Improve* menyusun prioritas tindakan korektif melalui *Failure Mode and Effect Analysis (FMEA)*. Hasil penelitian mengungkap bahwa faktor *methode* merupakan penyebab dominan *axial play* lebih dari standar. Melalui uji coba, ditetapkan standar baru pada proses *adjustment axial play main shaft* guna mencapai standard yang ditentukan. Kesimpulannya, penerapan *Six Sigma DMAIC* terbukti efektif mengeliminasi *failure in field (zero problem)* dan *cost failure* secara signifikan.

Kata Kunci: *Gearbox SCANIA, failure in field, Axial Play Adjustment, Six Sigma DMAIC, Failure Mode and Effect Analysis, Efisiensi Biaya.*



LEMBAR PERSEMBAHAN

Thesis ini saya persembahkan kepada seluruh keluarga khususnya untuk isrti saya tercinta, rekan rekan, dosen, dan PT. United Tractors Tbk. Atas segala dukungan dan bimbingan kepada saya selama ini.



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