

ABSTRACT

Making a prototype of PPCW 57 tons is clear proof of the innovations made by PT Industri Kereta Api (Persero). During the production process of the PPCW 57 tons prototype, there were several obstacles, especially during the whole welding process of PPCW 57 tons underframe. The entire welding process PPCW 57 tons underframe must be assisted by a crane. The crane functions as a tool in turning the underframe of PPCW 57 tons so that all parts of the connection on the PPCW 57 tons underframe can be carried out with a process of full welding. Turning the underframe with the help of a crane is not very effective and efficient. Moreover, this is also very dangerous for the safety of PT INKA Multi Solusi (IMS) employees. Therefore, the purpose of this research is to design a rotary welding jig that can be used to assist the process of full welding of PPCW 57 tons underframe.

The jig rotary welding design process is carried out with the help of computer-aided design (CAD) software, namely Solidworks 2019. The design process starts from the manufacture of parts jig rotary welding. Then do the process sub assy of jig rotary welding. The sub assy of the jig rotary welding is divided into 3, namely: the foundation of the jig rotary welding, the clamping frame, and the clamp. After the sub assy step is done, the next is the process full assy, where the three subs assy are combined into one to produce a jig rotary welding.

From the results of the design will be obtained a tool that is jig rotary welding. The method of the jig rotary welding is expected to help the problems experienced when carrying out the process of full welding underframe PPCW 57 tons, thus helping to improve the effectiveness and efficiency of the manufacturing process for trains PPCW 57 tons.

Keywords: design, jig rotary welding, underframe, PPCW 57 tons

INTISARI

Pembuatan *prototype* PPCW 57 ton adalah bukti nyata dari inovasi yang dilakukan PT Industri Kereta Api (Persero). Pada saat proses produksi *prototype* PPCW 57 ton terdapat beberapa kendala, terutama saat proses pengelasan akhir (*full welding*) *underframe* PPCW 57 ton. Proses pengelasan akhir (*full welding*) *underframe* PPCW 57 ton harus dibantu dengan *crane*. *Crane* berfungsi sebagai alat bantu dalam memutar *underframe* PPCW 57 ton agar seluruh bagian sambungan pada *underframe* PPCW 57 ton dapat dilakukan proses *full welding*. Memutar *underframe* dengan bantuan *crane* sangatlah tidak efektif dan efisien, terlebih hal ini juga sangat berbahaya bagi keselamatan dari pegawai PT INKA Multi Solusi (IMS). Oleh karena itu, tujuan dari penelitian ini adalah untuk merancang sebuah *jig rotary welding* yang dapat digunakan untuk membantu proses *full welding* dari *underframe* PPCW 57 ton.

Proses perancangan dari *jig rotary welding* dilakukan dengan bantuan *software computer-aided design* (CAD) yaitu Solidworks 2019. Proses perancangan dimulai dari pembuatan *part-part jig rotary welding*, kemudian melakukan proses *sub assy* dari *jig rotary welding*. *Sub assy* dari *jig rotary welding* dibagi menjadi 3, yaitu: fondasi *jig rotary welding*, rangka pencekam, dan alat pencekam. Setelah *sub assy* dilakukan, selanjutnya adalah proses penggabungan dari ketiga *sub assy* menjadi satu sehingga menghasilkan sebuah *jig rotary welding*.

Dari hasil perancangan akan diperoleh sebuah alat yaitu *jig rotary welding*. Perancangan *jig rotary welding* diharapkan dapat membantu permasalahan yang dialami saat melakukan proses *full welding underframe* PPCW 57 ton, sehingga membantu dalam meningkatkan efektivitas dan efisiensi dari proses manufaktur kereta PPCW 57 ton.