ABSTRACT

The Stirling engine is a reciprocating, externally-heated engine. The heat is transferred to the working gas and is then converted to work via expanding the gas inside the cylinder. In the process of making this Stirling engine through several stages, one of which is the assembly process, namely the work that starts from the object or component that is ready to be installed until the installation process is perfect. In the Stirling engine assembly process, some unergonomic posture are found. This unergonomic posture is obtained from the analysis using the RULA method and also posture analysis uses jack software to simulate the effect of the Stirling engine load on the posture when lifting the Stirling engine. And the results of the RULA analysis indicate condition is quite dangerous and further investigation is needed. Furthermore, design designs using axiomatic design methods are carried out, focusing on two axioms, namely the axioms of independence and the axioms of information. The axiom of independence states that a product must maintain freedom of FR function. In essence, the ideal change in design parameters (DP) only affects one function and does not affect other parameters. Whereas the axiom of information states that an ideal design must have simpler information. And then improve the technical attributes of a system will affect other technical attributes so that the appropriate design results are obtained. Base on the research, a design jig was obtained that could assist the assembly process of the Stirling engine, and a RULA score is 2 was obtained as well as in a stress analysis which was declared feasible. So that value can be demonstrated by using the design jig will eliminate the problem during the assembly process.

Keywords: Axiomatic Design, TRIZ, Jig, Stirling Engine, Assembly.