Log Splitter Tank Quality Improvement

Overview
The 22-ton log splitter produced and assembled by SpeeCo, Inc. is built around a central hydraulic tank which acts as the base of the log splitter. The tanks can leak due to poor weld integrity, further aggravated by stresses on the tank during towing. Also, internal rust and weld slag/spatter left in the tank can cause premature failure of the pump and other hydraulic components.

Objectives
The objectives of the project are:
- Develop and document standard operating procedures for welding the tank
- Identify critical areas of the welding process that need improvement
- Derive a better method of carrying out the leak test
- Design a process for cleaning rust and slag from the tank

Approach
- The team developed a set of standard operating procedures for the welding process
- The team received part drawings from SpeeCo for the log splitter tank
- The team compared SMAW and GMAW processes to evaluate a change in processes
- The SJTU team gathered the current welding parameters in order to recreate the current process
- The team mimicked the welding process using a tube made of 1/8” hot-rolled steel
- Tensile testing was used to compare the strengths of welds for SMAW and GMAW
- Leak testing methods were researched and evaluated based on company needs
- CAD models were created for possible fixture designs
- The workstation was redesigned as a cost-effective alternative to implementing the fixture
- Qualitative results were used to assess the presence of weld spatter following the welding

Outcomes
- A fixture was designed to further standardize the welding process
- A switch to GMAW should be analyzed further based on strong results
- An inline gauge should be implemented to standardize the leak test
- 2 oz. of oil must be put into each tank