Log Splitter
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TUS
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Aim of project

- To create a hydraulically driven log splitter
- To reduce manual labour involved with splitting blocks
- To split blocks with speed and efficiency

Background/Research

Hydraulically driven log splitters are essential in todays world for splitting efficiency and output.

Hydraulics

Hydraulic cylinder

Things to be taken into account before picking size of hydraulic ram

- Flow rate
- Pressure
- Mass of load being lifted/pushed

Directional control valve

- Two way directional control valves

Methods of transportation

3 point linkage

This is a linkage on the back of the tractor using a top link and two lift arms.

Advantages

- Don't need an extra pump or motor to drive the log splitter saving cost.
- Easy transport it on rough terrain as it will be linked onto the back of the tractor.

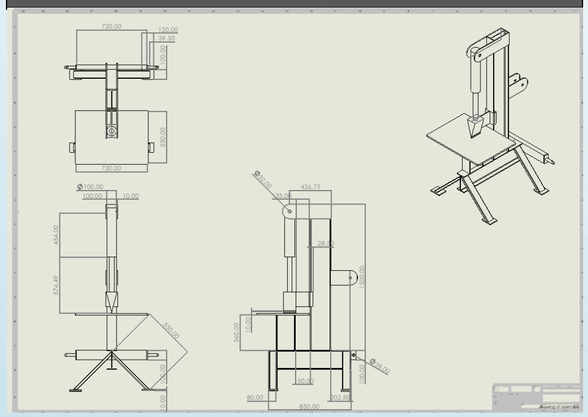
Disadvantages

- Slow to transport

Objectives

- *To be able to split heavy logs with efficiently and speed.*
- *Project must be easily transported*
- *Project to be hydraulically driven*
- *Project to be safe when operating*
- *Project must be durable and be able to withstand wear and tear.*

Design



Solid works drawing of log splitter

Steel used in project

- Beam 100mm by 200mm
- Box Iron 80mm by 40mm
- Flat Iron 100mm width (10mm thickness)
- Flat iron 150mm width by 10mm thickness
- Channell Iron 100mm by 50mm
- Flat plate 730mm by 530mm
- This was the final design idea that was chosen
- I took into account cost, splitting method and ease of transportation .

Cost

Tried saving on cost by making all the flat iron on the project 150mm to save cost on purchasing steel and make the steel beams in the project all 100mm by 200mm.

Transportation

Decided to make the log splitter 3 point linkage mounted. This was to save cost on a motor and hydraulic pump.as the hydraulics on the tractor can be used. And for ease of transport on rough terrain.

Splitting method.

Decided to make this log splitter a vertically driven log splitter.(Hydraulic ram mounted vertical)

Methodology

Base

- First thing to make was the base of the log splitter. This consists of the standing legs and a beam.
- The beam is (100mm by 200mm) the length of it 850mm

Base (Continued)

- The legs consist of (80mm by 40mm) box iron cut with 45degree angles at either side.520mm in length.
- The base plate is (100mm width by 120mm length) flat iron is 10 mm thickness. .
- Firstly, tacked the base plate to the legs. After this the legs were tacked to the beam. Once this was done the base of the project was fully welded.

Base of log splitter

Wedge

First thing was to make the wedge. Using a wear plate off a bucket. This was to lower the cost of the wedge as they are quite expensive.

- Cut out two plates 125mm in length these were cut at 20degree angles on the band saw.
- These where then placed and tacked onto the wear plate bucket edge to create a v shape. The gaps either side of the wear plate were filled with scrap steel before being welded giving the wedge extra strength. Steel plate was then welded onto the side of the wedge. This connected the wedge with the slide so the hydraulic ram would move straight up and down.

Making of wedge

Splitting table and part

Splitting plate

- Firstly cut a beam 100mm by 200mm 360mm (long) and 150mm flat iron 360mm (long)
- The flat iron was then tacked into the middle of the beam on the side.
- It was then welded fully and tacked onto the base.
- 80mm in from the end of the base beam.
- Beam holding on the hydraulic ram was then cut.at 1500mm
- This was tacked and welded onto the base.
- The two plates holding the ram were then welded on to the top of the beam 1500mm long.
- The ram is held to these plates by a 21mm pin.

Conclusion

Overall throughout this project many learnings were gathered. The project itself is feasible to make. Costs could be further cut down on steel if they were to be mass produced. As the purchasing of steel was the most expensive part of the project. Moving forward improvements could be made to safety as this piece of machinery can put out enormous forces up to aprox 10 Tonnes. Overall this is a cost effective design.