

PROJECT SCOPE

Our team project has been to build a log splitter. By using hydraulic pressure, a log splitter significantly reduces the manual labour of splitting wood. This was our primary goal.

We set ourselves a task to fabricate something that would be suitable for small industry rather than a smaller “handyman” one. For this reason our splitter would have to be used for long periods of time, this meant that safety, reliability and comfort of use had to be considered.

The key constraint we experienced during the project design and build was cost. Having decided to take on our own project, we also had to finance it. With foreseeably large costs associated with the hydraulic system and steel, we decided to focus on sourcing as much material as possible through scrap dealers and friends and family. Using our contacts we were able source almost all the raw materials for free. This meant we were able to buy better components in areas where quality is of importance.

FUNCTION OF DESIGN.

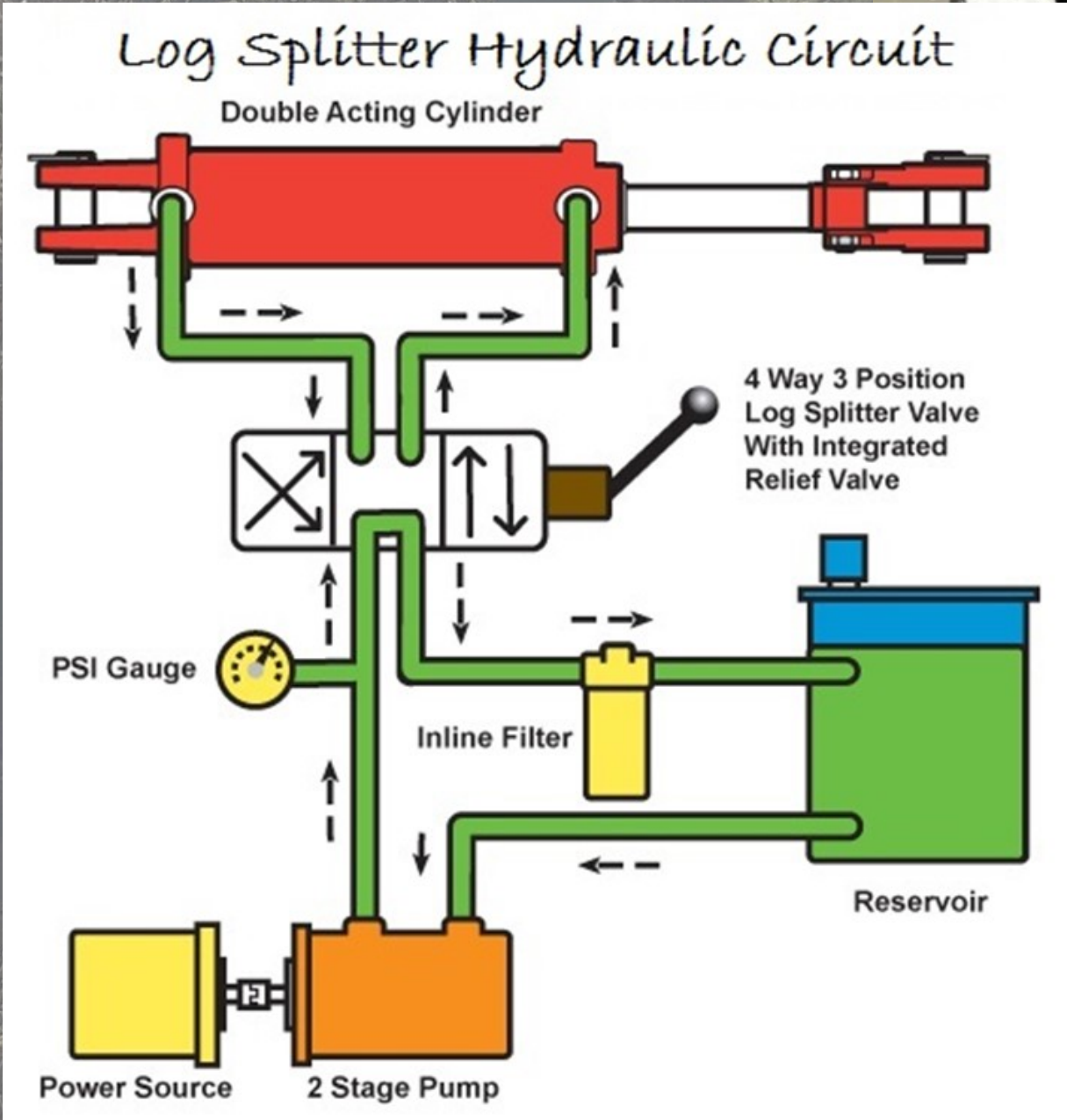
Our system uses a 13hp petrol motor to power a hydraulic system to drive an axe trough blocks of wood.

This is controlled by valve that diverts flow to either end of a hydraulic ram that drives the axe head with 20+ tonnes of force.

The steelwork needed to withstand the significant forces. With this in mind we ensured our design could withstand these forces and double checked key pinch points by running calculations to determine the maximum load. We came to the conclusion that the maximum load was 40 tonnes (this max load rating is how the commercial log splitters are marketed).

WOOD SPLITTER

PROJECT



AREAS OF IMPROVEMENT.

We have already thought ahead with the future in mind. We hope to add interactable axe heads, a large toolbox for chainsaws petrol and oil, and mechanical lift to lift large wood rings onto the tabletop.

As the initial task was to produce a splitter suitable for industry, the lift was something we had thought of at the beginning. This would provide the operator with a much easier way to load the next ring. We have discussed numerous methods of achieving this, either by another hydraulic cylinder, or by use of a cable and pulley using the main splitting cylinder, or by using an electric motor and winch.

The main other area of improvement might be the overall height. Because of the limited availability of the cylinder, we ended up with one with a large stroke. This meant in order to come clear of the tabletop the whole splitter had to be quite tall.

CONCLUSION

When reviewing the project, we are generally very happy. It functions and resembles as we first envisioned it would.

Our main area of improvement would be the overall height. A larger budget would have been nice as this would have meant we were able to buy components and steel to our own design, rather than design the splitter based on the materials we had sourced for free. If we were to build another splitter and had suitable funding, we would have built something similar but more refined.