

# Wheel to hub alignment tool

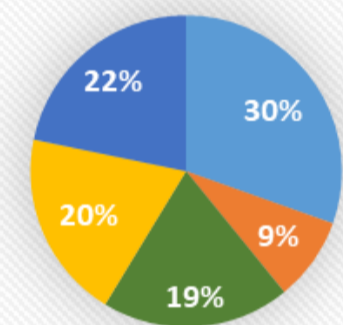
## Team B1

### Aim of the Project

The Aim of the project is to research, design and build a wheel to hub alignment tool to aid in the event of a puncture

### Survey

#### Problems faced when changing a wheel



- Loosening bolts
- Taking the spare out of the boot
- all of the above
- Lifting and positioning to the Hub
- Carrying the spare

A survey was sent out by the group at the very start of the project it gave the group an insight into the problems faced by the public in regard to this issue. The survey found that loosening the bolts on the wheel was the most difficult part for most of the general public

### Ergonomics

The final design was a combination of multiple designs, the x shape on the final design was inspired by a motorcycle jack. the final design incorporates the x,y and z planes. The assembly in the picture above does not contain castor wheels as they are not available on solid works. The castor wheels will be added after assembly. The materials used in the final design are aluminium, nylon and box iron



### Two types of Hub



There are two types of hubs on vehicle wheels, the most common type is with bolts however some manufacturers of vehicles are using a hub with no bolts also. This changes according to the specification that the manufacturer sets out.

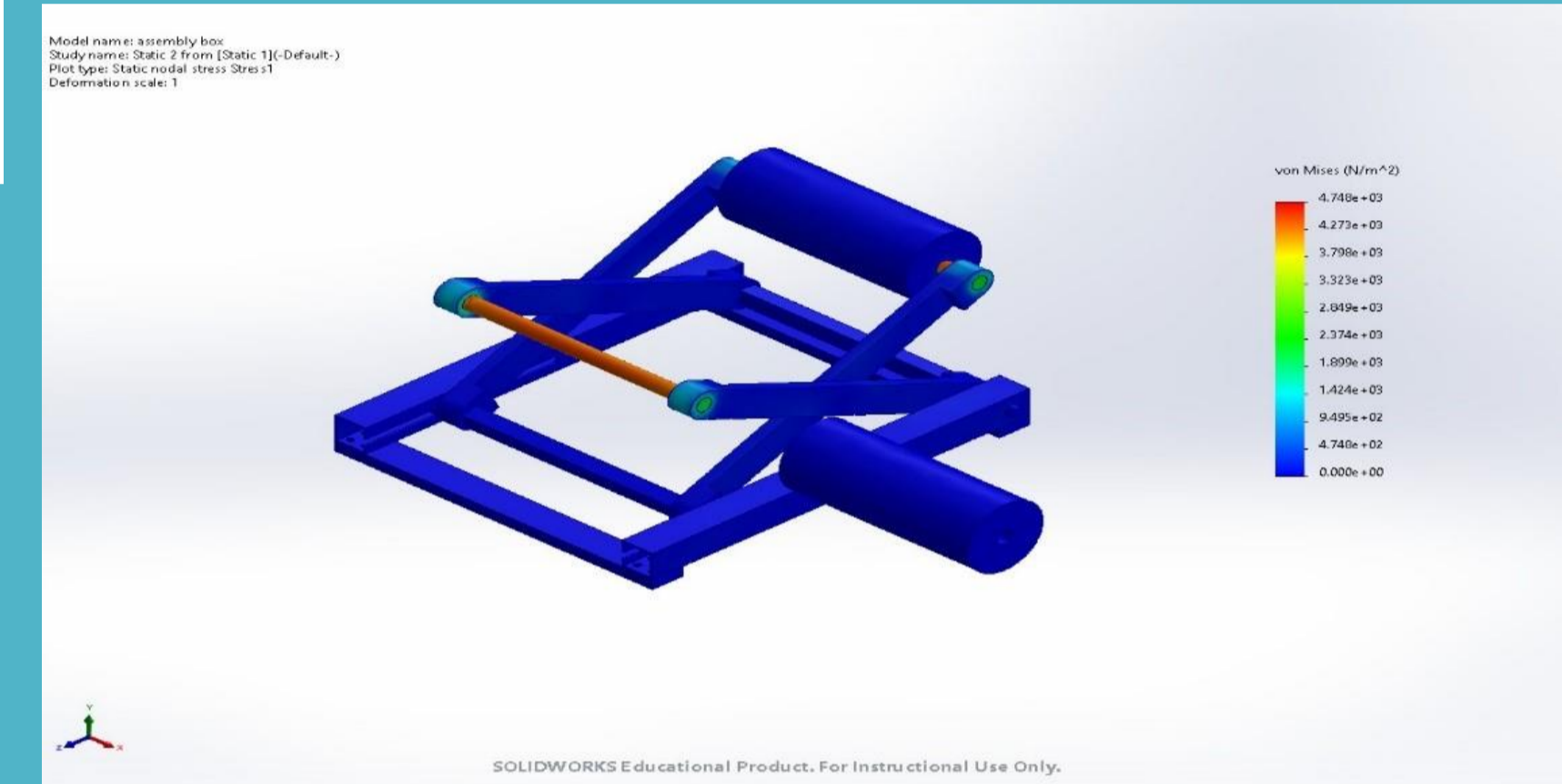
### Final design



From the survey the group found that injuries were being caused when changing wheels these are musculoskeletal disorders. The most common of these disorders are herniated disks. These injuries occur when changing a wheel due to the weight of the wheel being handled in an unnatural way.

### FEA

An FEA was crucial for the team to find out the components in the assembly that would be put under severe stress and could break as a result. The part that had the most stress upon it was the cross bar that held the nylon roller on it this was put under 180 Newtons of force



### Manufacturing

There were many different methods of manufacturing used while completing this project. 3D printing, CNC, lathe and mill were all used to machine multiple parts required to complete the assembly

