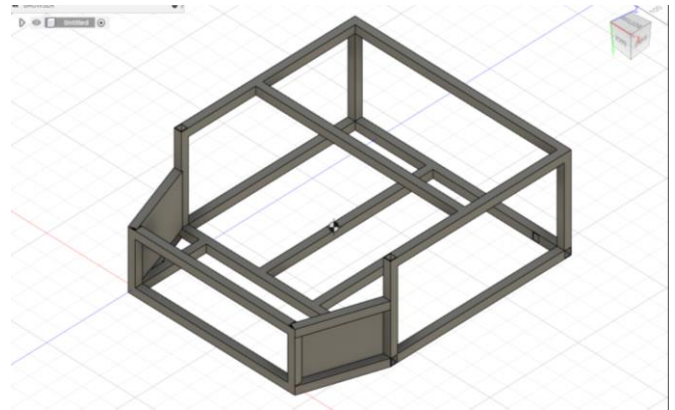


CHASSIS

Chassis is a major component of a Rover. It consists of internal framework that supports rover. It is the underpart of the rover which consists of frame and running gear like engine, bio-assembly system, robotic arm, suspension system etc. The Rover chassis is tasked with keeping all components together while driving and transferring vertical and lateral loads, caused by acceleration, on the chassis through suspension and the wheels. The key to good chassis design is the proper distribution of mass on it in order to distribute the load evenly

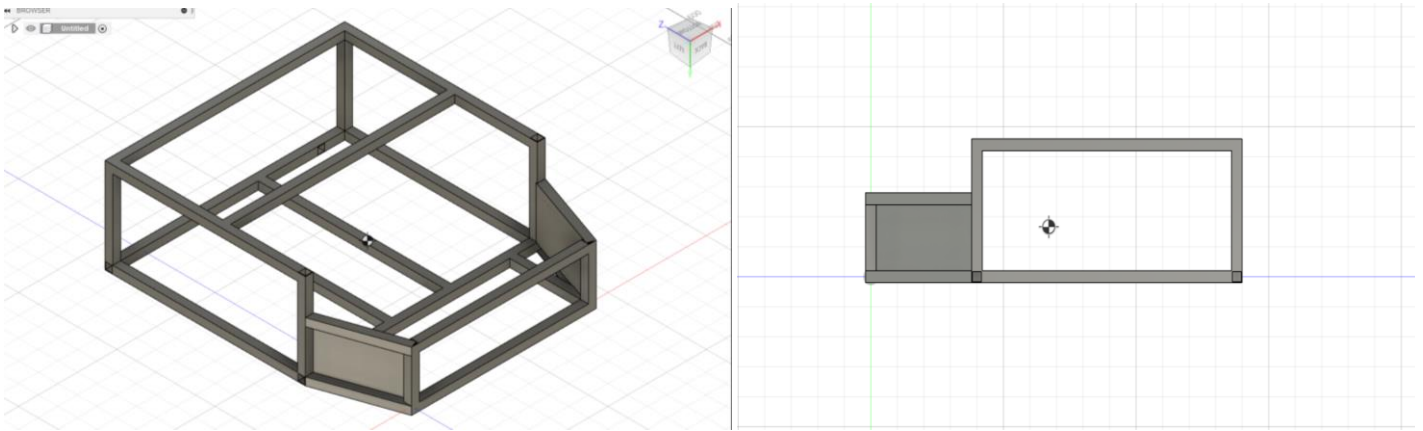


DESIGN AND CONSTRUCTION

For construction of chassis the different materials available to us were Aluminum, Steel, Aluminum T-slots, square bars and Circular bars. Using square cross-section aluminum hollow bar is the best choice as aluminum is lightweight and has natural resistance to corrosion. Aluminum also has mechanical stability, dampening and thermal management greater than other metals.

Square bar was chosen because load was anticipated only in one direction, also it has higher moment of inertia so it has lower bending stress compared to circular or any other bars.

The bars will be welded together for strong joints



Total Deformation Analysis-

(For the arm a force of 110N was applied and a force of 400N for the rest of the body)

The maximum deformation recorded was 0.03mm.

Total Stress and Strain Analysis-

The maximum equivalent total strain was .0000215 and the maximum von-mises stress was 2500 kPa.

