

ASSEMBLY OF LANDING GEAR IN CATIA V5

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ABSTRACT

The objective of this paper is to make the 3D model of landing gear components. This paper also. The whole process done in CatiaV5 software. Various types of landing gear such as skid, wheel landing gear. In this paper we are dealing with wheel landing gear.

Keywords

Landing Gear, CatiaV5

1. INTRODUCTION

Landing Gear is the subsystem of the aircraft. It is the undercarriage of the aircraft and spacecraft. The purpose of the landing gear is to provide suspension system during landing, takeoff and taxiing from or on the ground. It also provides better visibility for the pilot during ground operation and prevents the tendency of the aircraft during ground loop. Much landing gear made retractable for minimizing drag during flying operation. Landing gear made by taking so many parameters into mind like strength, stiffness, ground clearance. Aircraft landing gear is mainly having wheels equipped with simple shock absorbers, or more advanced oil for runway and rough terrain landing.

2. BASIC COMPONENTS OF LANDING GEAR

2.1 Strut

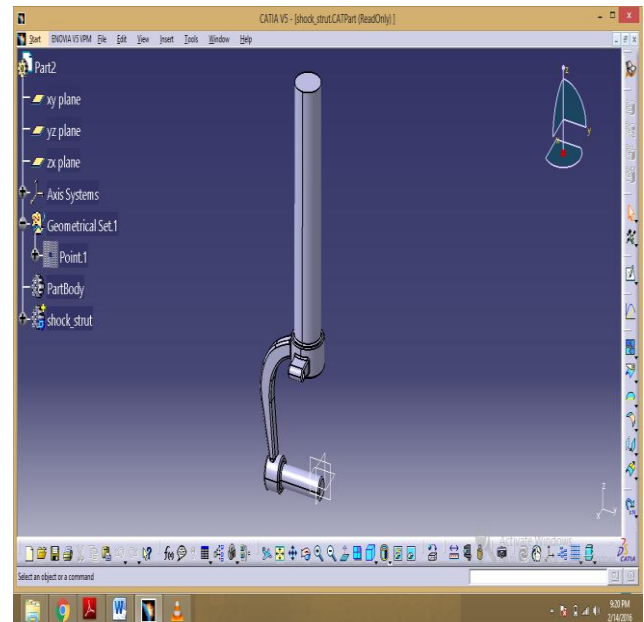
A strut is a structural component designed to resist longitudinal compression. Bracing strut is used in present aircraft to prove them stiffness, strength. Landing gear Strut is of four types such as rigid, spring steel, bungee, shock struts.

Material: -Ti 10-2-3 & Ti 5-5-5-3

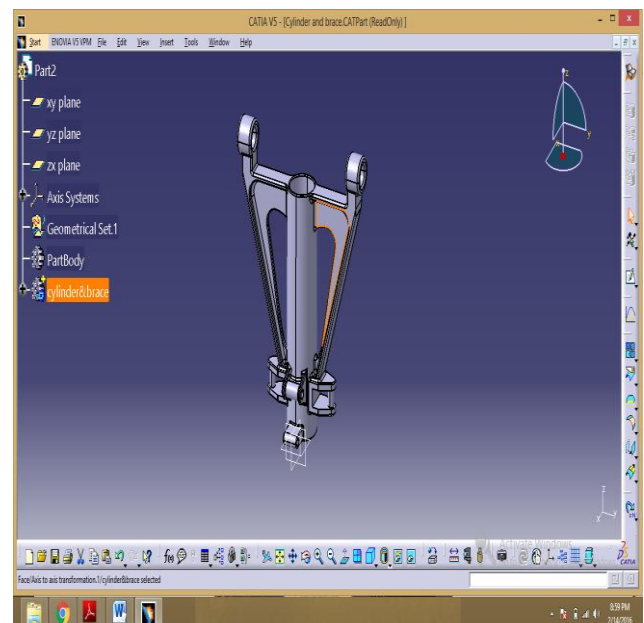
2.2 Cylinder and Brace

The cylinder of the landing gear with the connecting elements provides the suspension and impact suspension during landing. Two landing gear are there one is outer and second one is inner, outer one is fitted in inner cylinder.

Material: - Ti 10-2-3 & Ti 5-5-5-3



2.1.1 Strut

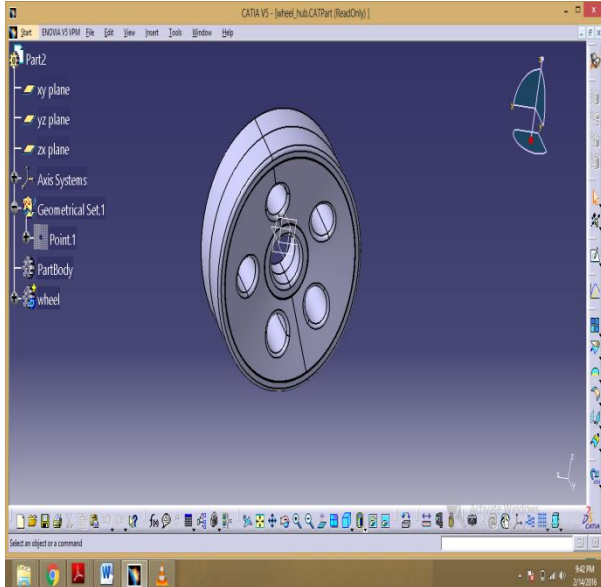


2.2.1 Cylinder and Brace

2.3 Wheel Hub

Wheel is outer covering of wheel hub. Wheel is attached to the hub by the means of nuts and bolts. It contains an inflation valve for inflating or deflating the tire.

Material: - Ti 10-2-3 & Ti 5-5-5-3

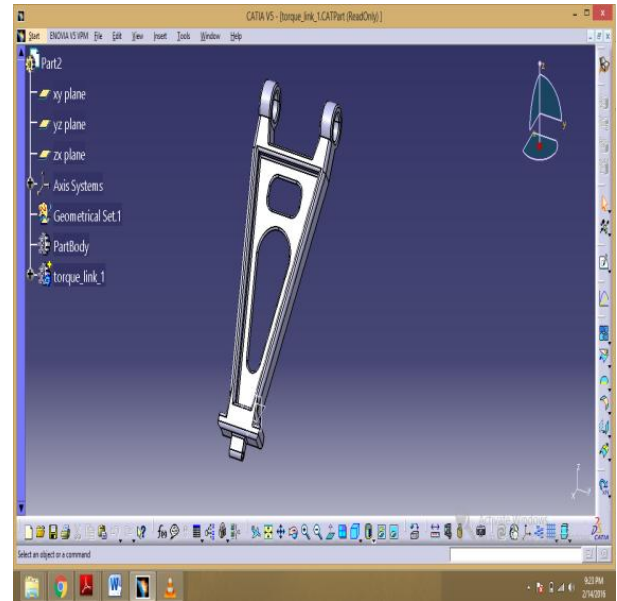
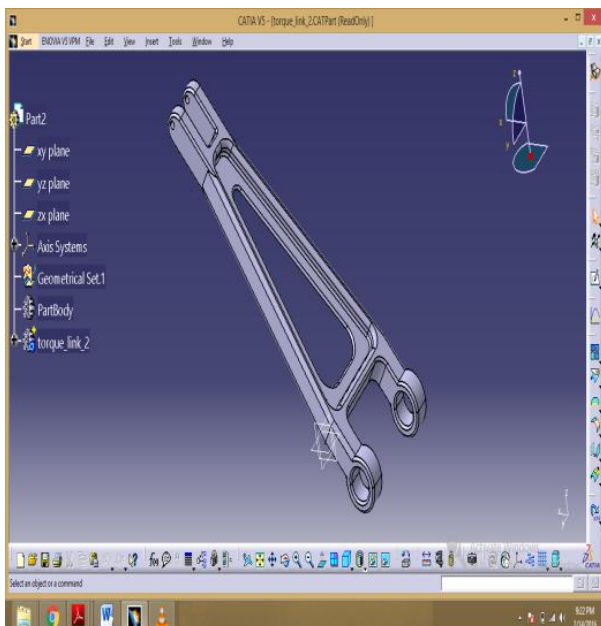


2.3.1 Wheel hub

2.4 Bearings (Torsional Link)

There are two bearings present on landing gear such as lower and upper. Both of them provides sliding surface and locate the inner cylinder concentrate on outer cylinder.

Material: - Ti 10-2-3 & Ti 5-5-5-3

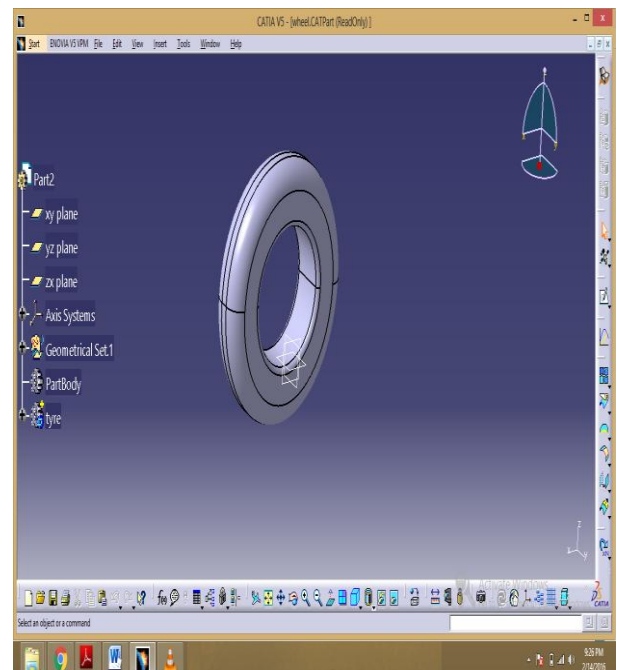


2.4.1 Bearings

2.5 Wheel

Landing gear usually consists of three wheels or sets of wheel for large aircraft or special purpose aircraft. But many aircraft are attached with skis landing on ice or snow.

Material: - Ti 10-2-3 & Ti 5-5-5-3

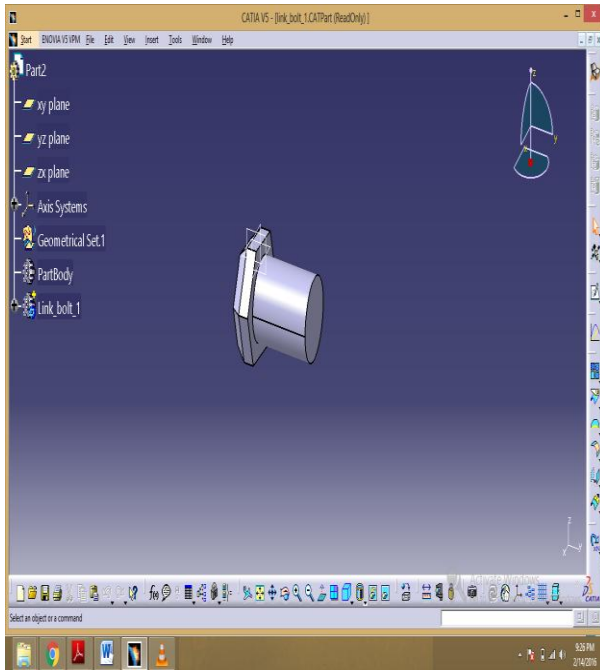


2.5.1 Wheel

2.6 Bolts or Nuts

These bolts and nuts are providing the strength or making the join tight and they also maintain the position of various components on landing gear of aircraft.

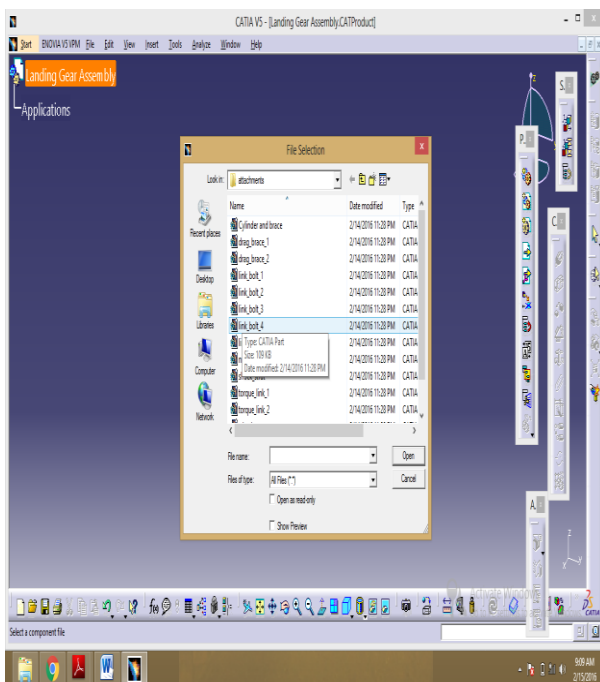
Material: - Ti 10-2-3 & Ti 5-5-5-3



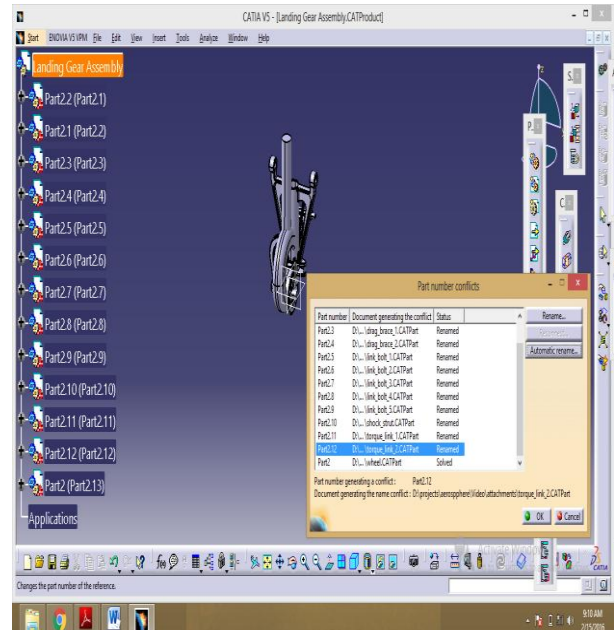
2.6.1 Bolts and Nuts

3. ASSEMBLY OF COMPONENTS OF LANDING GEAR

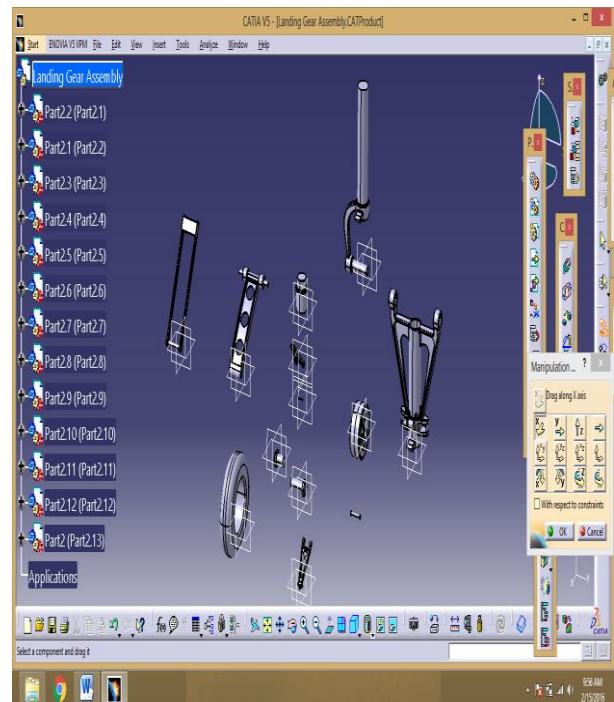
- Click the new part and open the assembly design on Catia V5.
- Right Click the Product1 on specification tree to choose property as guided below.
- Rename the part as Landing gear Assembly.
- Right click on landing gear assembly on specification tree to insert the existing component.



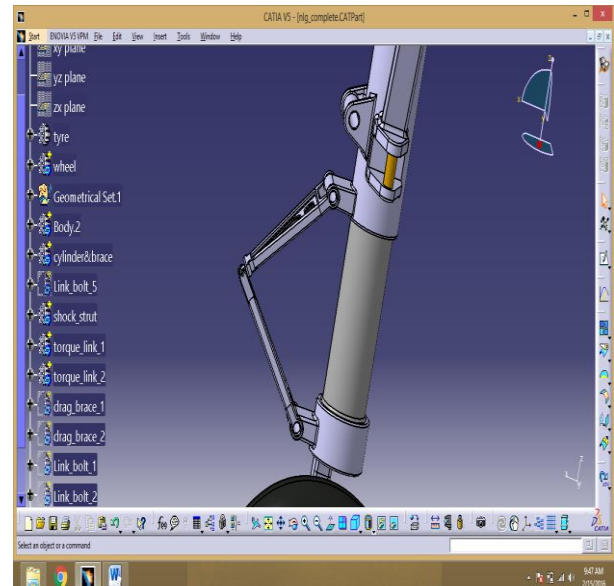
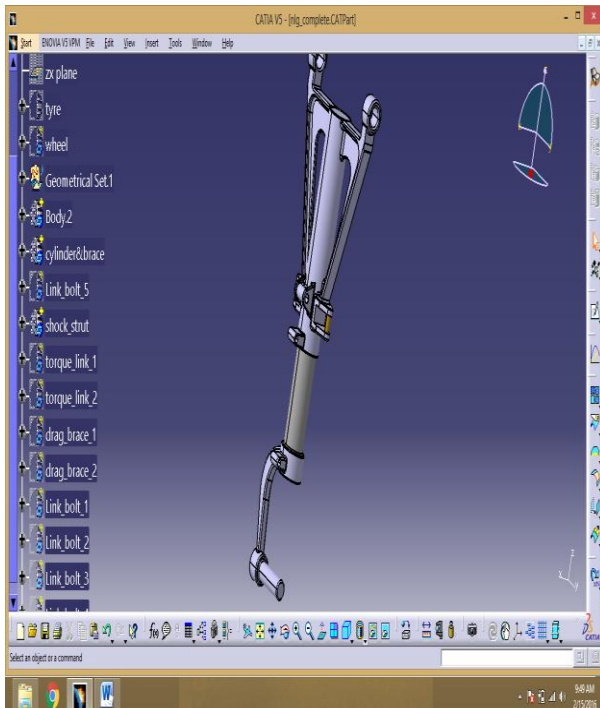
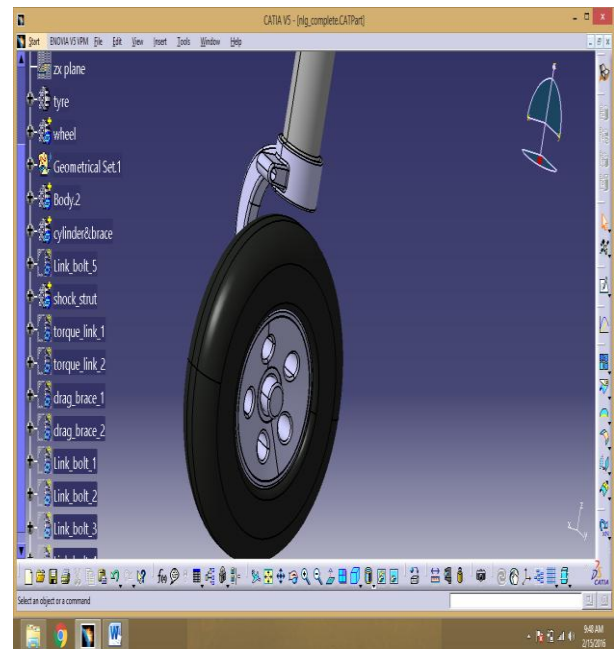
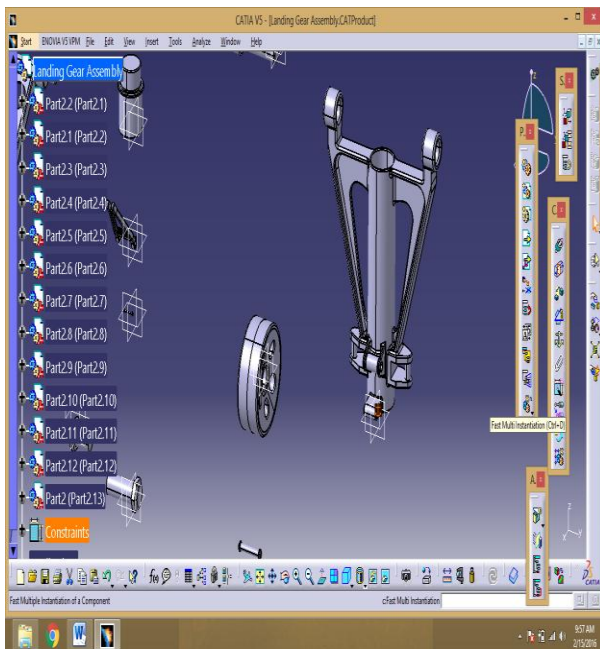
- Insert all the components after selecting all and click on automatic rename after clicking on individual components by which all will get a new identity.



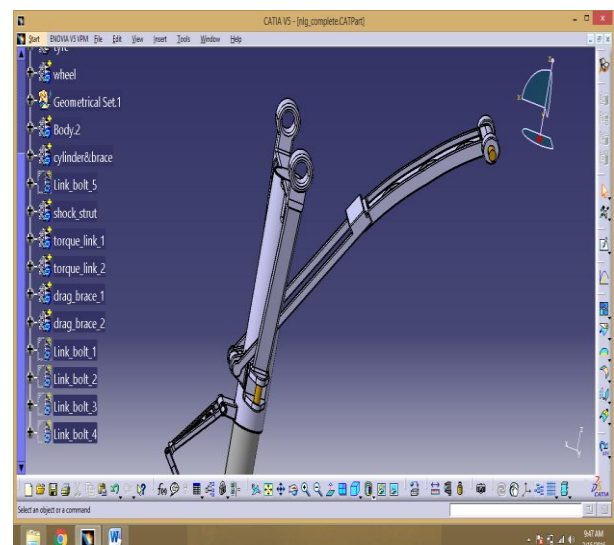
- Click on Manipulation on tools bar and displace all the components in desired direction.



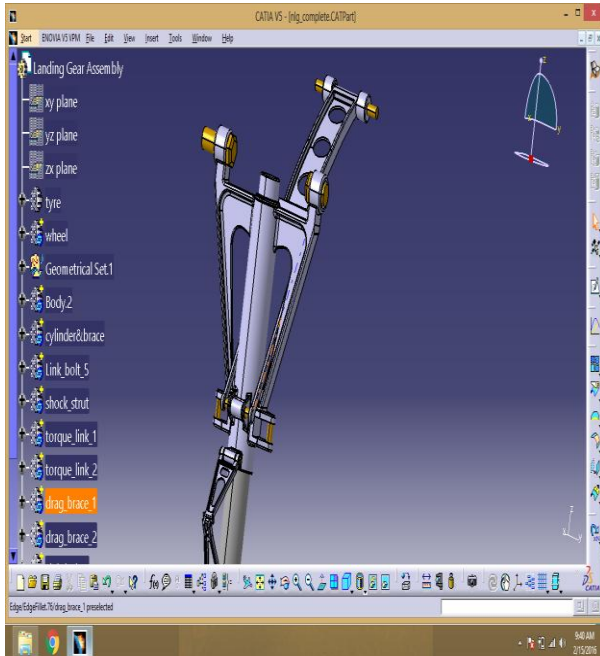
- Select the piston to apply the fix constraints.
- Select the strut and apply the coincidence constraint in Z direction and fix the strut with piston.
- Use the manipulation tool to set the strut and piston on Z direction.



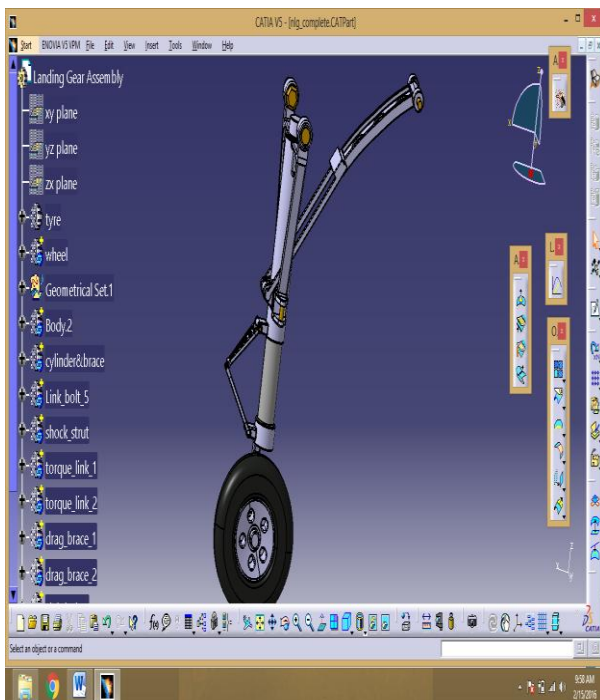
- Place the wheel and wheel hub using coincidence constraint on Y direction.
- Use the manipulation tool to set the wheel and wheel hub to previous part on Y Direction.
- Place the bearings (torsional links) using coincidence constraint on Y direction.
- Use the manipulation tool to set the links to previous complete part.
- Place the drag braces using coincidence constraint on y direction.
- Use the manipulation tool to set the drag braces to previous parts on Y direction.



- Same place all the nuts and bolts in their respective places using coincidence constraints on their respective position and direction.
- And finally done the manipulation in their respective direction.



- Once completing the constraints and manipulation process, landing gear assembly process is done.
- Finally save the model in the format of .CATPRODUCT.



4. REFERENCES

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- [2] <https://www.infosys.com/engineering-services/white-papers/Documents/landing-gear-design-and-development.pdf>
- [3] "Landing Gear of an Aircraft – A Review" International Journal of Aerospace and Mechanical Engineering Volume 2 No.5 – August 2015