

11/6/2021

# CADA ASSIGNMENT

## B.E Mechanical\_2nd Year

Project 3



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# ACKNOWLEDGMENT

I would like to express my special thanks to my Professors who gave me this wonderful task on preparing a project on, **Project 3** which helped me to increase my, thinking, analysing and writing skills. Through this work I came to know about so many new things. I am really thankful to them.

# CERTIFICATE

This is to certify that the project work entitled **Project 3** submitted by **Abhaas Shankar** is completed in due time at **Thapar Institute Of Engineering and Technology, Patiala** is an authentic work carried out by him under my supervision and guidance. To the last of my knowledge the matter embodied in the project has been written by a student himself.

**DATE**

**TEACHER'S SIGNATURE**

# Introduction

**Hydraulic Ram Pump:** A hydraulic ram pump is a water pump powered by water with a height difference. In areas where natural flows exist with a height difference of the water over a small distance, hydraulic ram pumps can be used to transport water to higher grounds without using electricity or fuel. The hydraulic ram uses the water hammer effect to develop pressure that allows a portion of the input water that powers the pump to be lifted to a point higher than where the water originally started. Apart from the kinetic energy of the water, no other source of power is needed.

The hydraulic ram pump was invented in 1772 and widely used in the 19th century, but was side-tracked by the advent of the coal-powered steam engine and later by diesel powered pumps. In recent years the hydraulic ram pump has seen a renewed interest, because it is powered by sustainable energy, and can be produced locally.

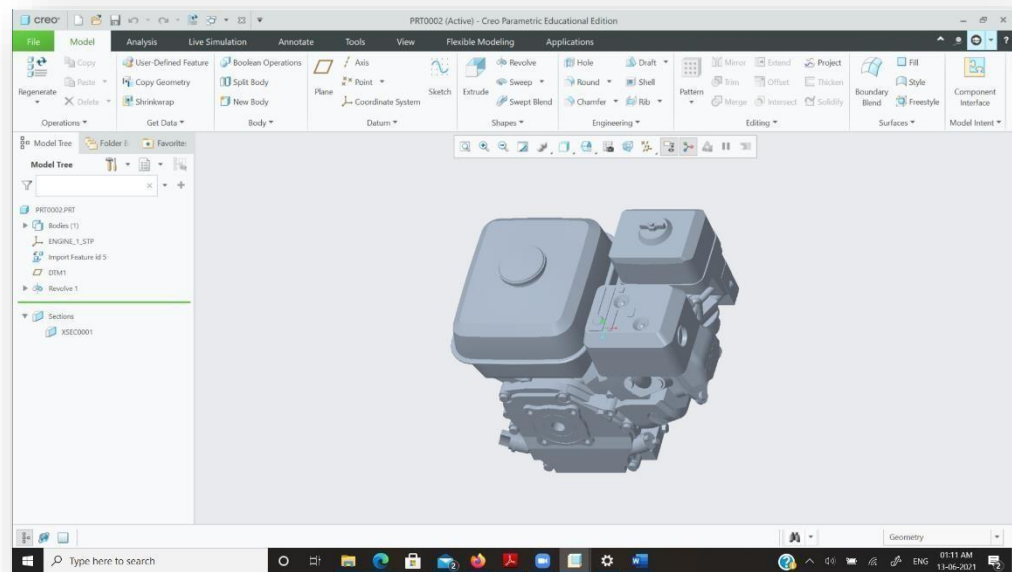
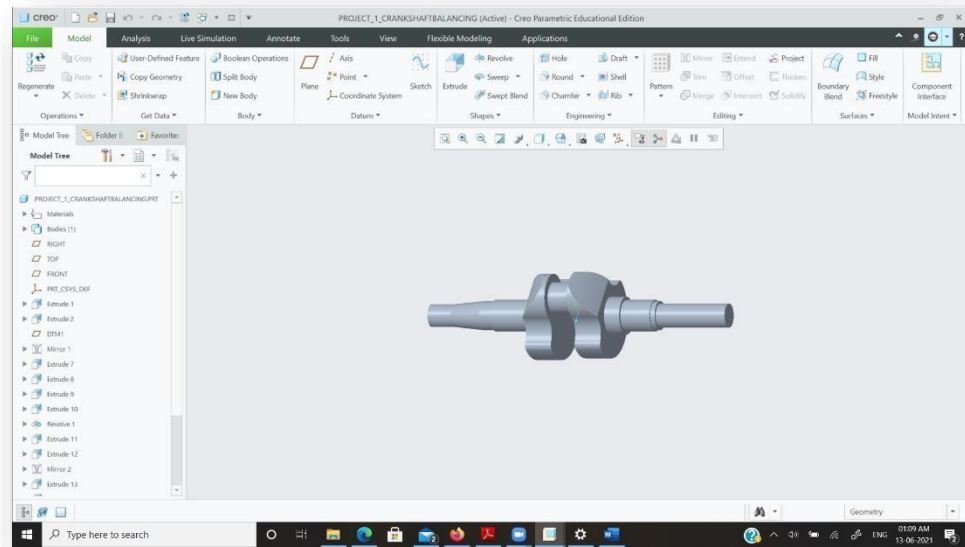


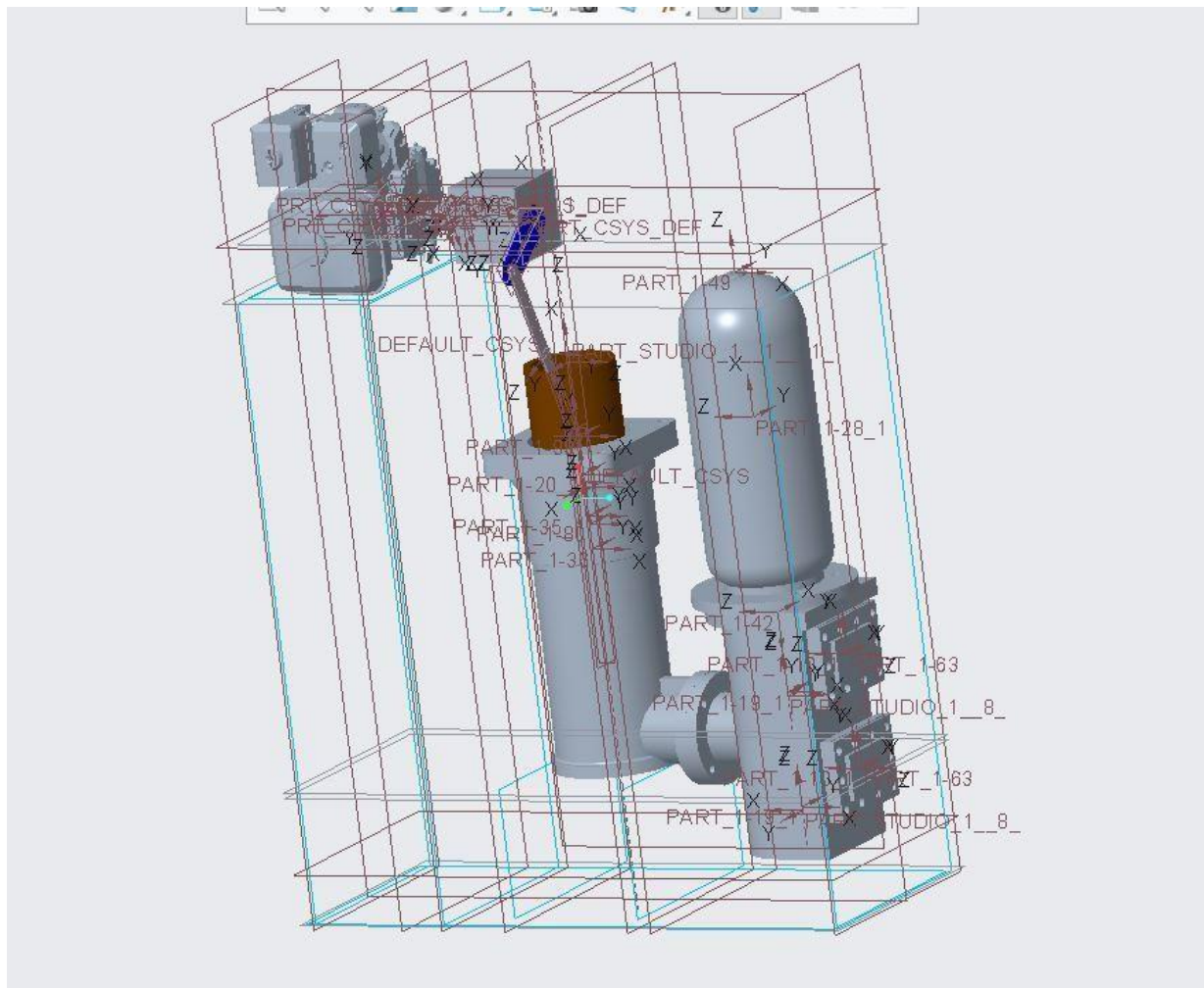
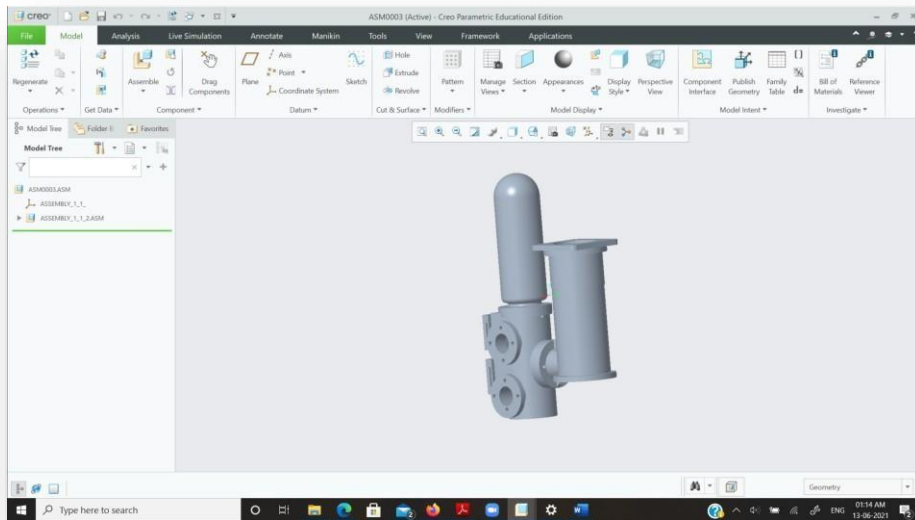
*Figure 1- Air Vessel*

# Modelling

The steps involved in the modelling of the vessel are as follows:

1. First the design of engine and coupling was made
2. This led to the following being made

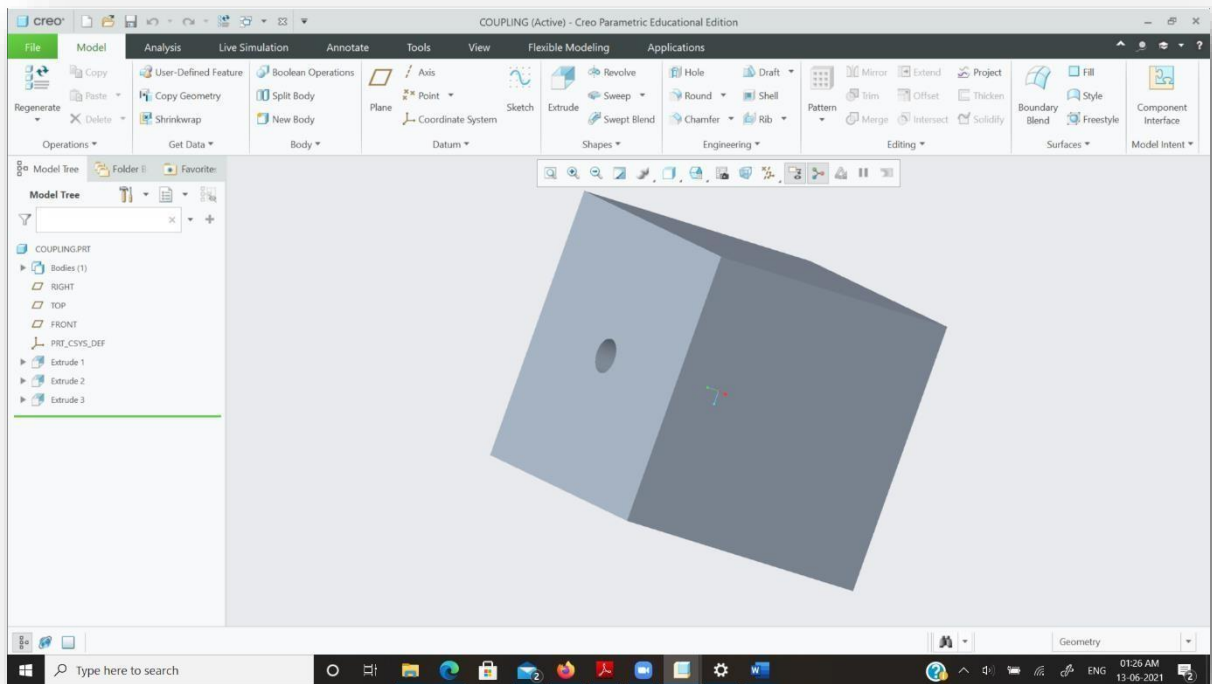
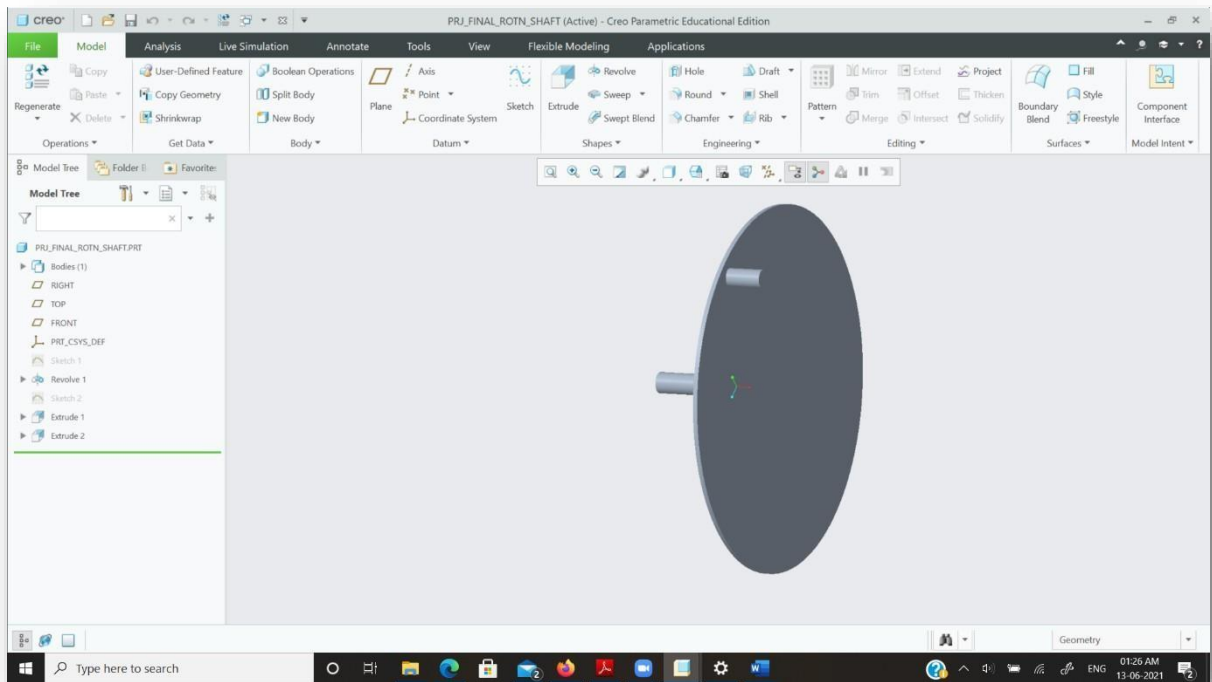


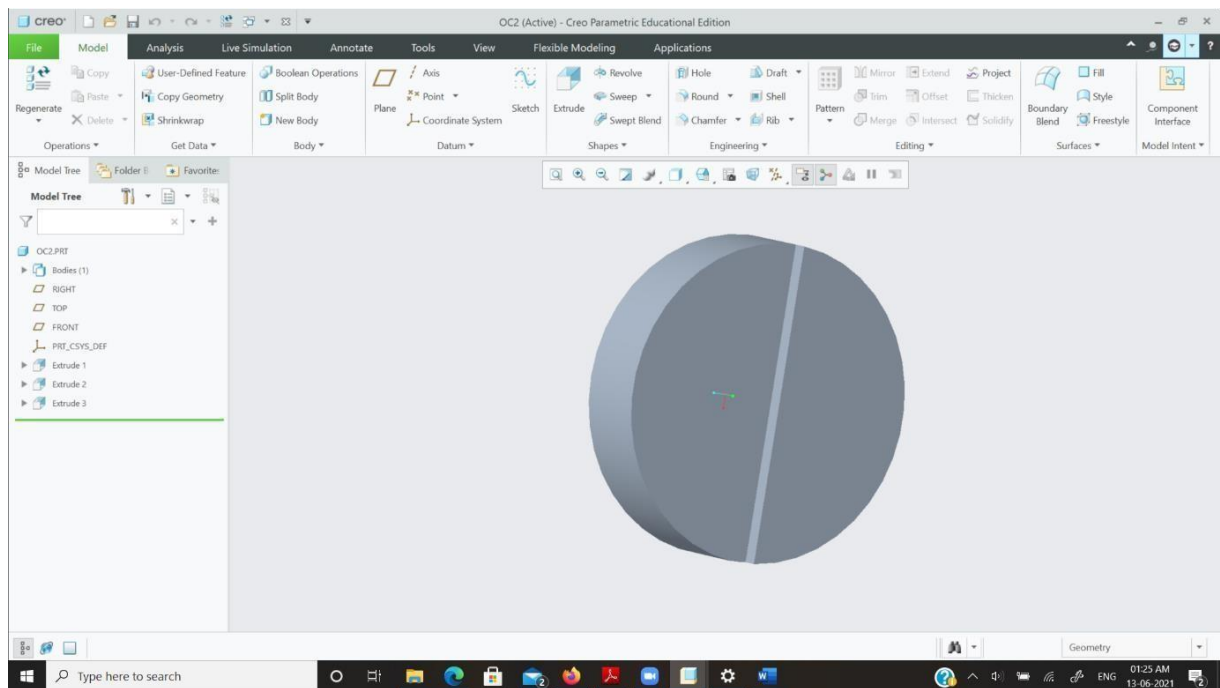




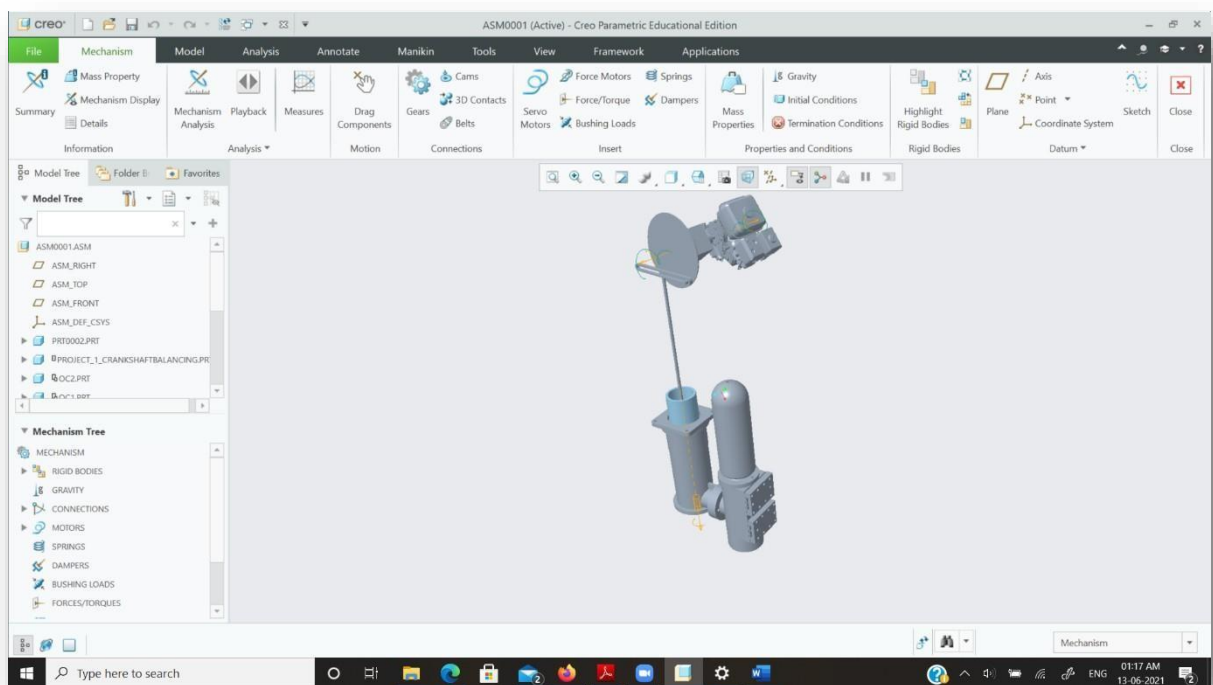
Drive Mechanism:







## Finalised Design:



# Reflection:

1. Assumptions in design: The assumptions taken is that the gear will be hypothetical due to constraint in time some parts were difficult to be managed as such.

The design of the coupling is also taken arbitrarily.

Other shafts and connecting rod dimensions are also arbitrarily taken

Further improvements in the project can be done are: Defining the COG of the whole assembly, placing the parts in such a manner that reflects the real design.

2. This project helped to understand how the work is in the industry and how to proceed with it and ultimately come to the conclusion of the report.

The main learning from the project is to explore the PTC-Creo and Onshape.

It helped in gaining some industrial knowledge and experience therefore it fully helped in the gaining experience as an design engineer.

As now I could stimulate how real life working of my project can be infer various outcomes from it and future problems can be resolved.

# References:

- **Starting information on Page 4:**  
[https://akvopedia.org/wiki/Hydraulic\\_Ram\\_pump](https://akvopedia.org/wiki/Hydraulic_Ram_pump)