

Mini Project Report On
Reverse Engineering On Pulsar 150 Bike
(15EMEW301)

Under The Guidance Of
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Submitted By

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Pulsar 150 Bike



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Abstract

Reverse engineering is a process whereby an existing product, system, or component is analysed to understand its design, structure, and functionality in detail. The ultimate goal is to recreate or improve upon the original item, often with the aim of enhancing its performance, compatibility, or efficiency. This concept is widely applied across various fields, including engineering, software development, manufacturing, and even in the study of biological systems. Reverse engineering is the process of analysing and understanding the design and functionality of a product or component by examining its structure, behaviour, and operation. It involves deconstructing the object, using various techniques like scanning, measurement, and analysis, to create a digital representation or model. Reverse engineering can be used to gain insights into how a product works, identify its strengths and weaknesses, and even recreate or modify it. It is commonly used in industries such as manufacturing, automotive, and aerospace to improve existing designs, create replacement parts, or enhance product performance.

Components

The components we taken for reverse engineering are:

SL.NO	Component Name	Quantity
1.	Brake Pedal	1
2.	Gear Lever	1
3.	Foot Rest Bracket	2
4.	Foot Rest	2
5.	Battery	1
6.	Support	1

1. Brake Pedal

The brake pedal is located on the bottom of bike. When pressed, it applies the brakes, causing the vehicle to slow down and/or stop.



2. Gear Lever

A lever used to engage or change gear in a motor vehicle.



3. Foot Rest Bracket

A footrest bracket is a component used in various applications to provide support and stability for footrests.



4. Foot Rest

A footrest is a component that provides a platform for the rider's feet when they are not actively pedalling.



5. Battery

An electric battery is a source of electric power consisting of one or more electrochemical cells with external connections for powering electrical devices.

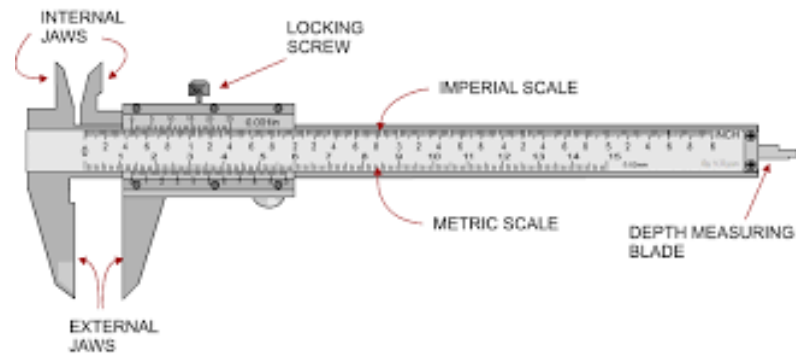


6. Support



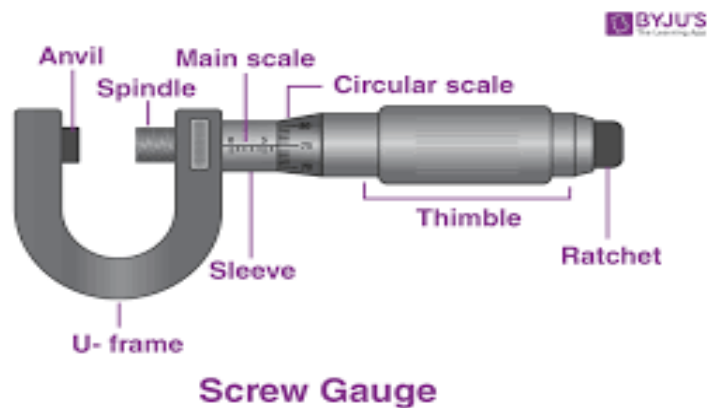
MEASURING INSTRUMENTS USED

1. Vernier Calliper



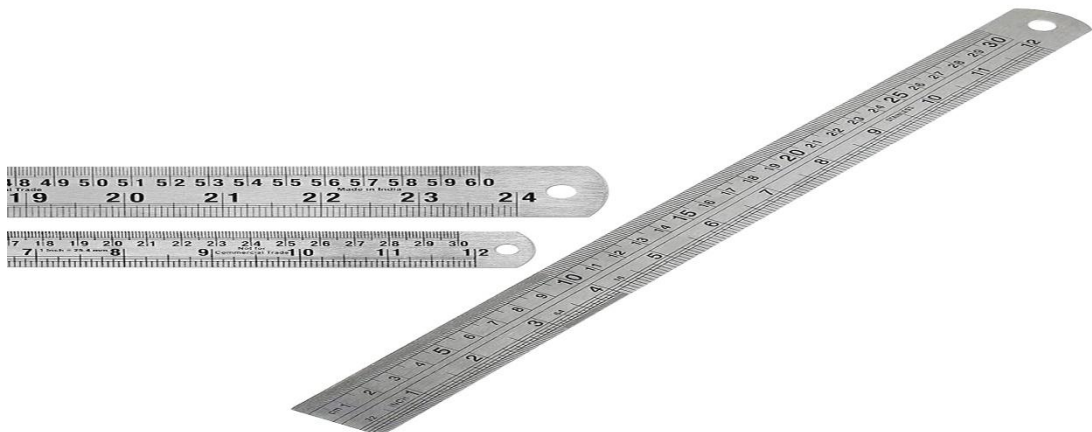
A vernier calliper is defined as a measuring device that is used for the measurement of linear dimensions. It is also used for the measurement of diameters of round objects with the help of the measuring jaws

2. Screw Gauge



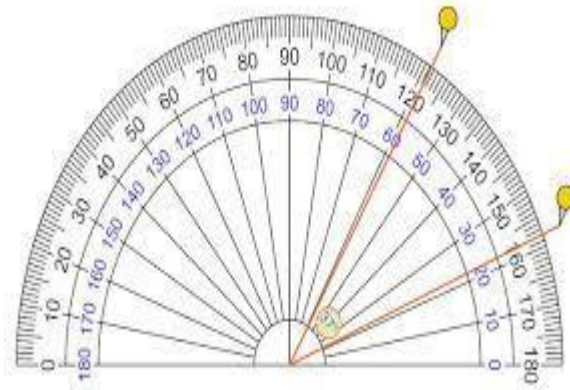
The Screw Gauge is a tool for measuring the dimensions of very small items up to 0.01 mm. It is made up of a U-shaped metal frame. One side of the frame has a hollow cylinder connected to it. On the inside surface of the cylinder, grooves are carved through which a screw travels. A millimetre scale called Pitch Scale is graded on the cylinders parallel to the axes of the screw.

3. Measuring Scale



It is instrument used for measuring the length, width and breadth etc.

4. Protractor



An instrument for measuring angles, typically in the form of a flat semicircle marked with degrees along the curved edge

5. Depth Gauge



A depth gauge is used to gauge the hole depth on a feature, groove, drilled hole, workpiece edge or any other required depth measurement. A common application would be to gauge whether a hole is drilled to the correct required depth.

About Catia Software

CATIA stands for Computer Aided Three-Dimensional Interactive Application. It's much more than a CAD (Computer Aided Design) software package. It's a full software suite which incorporates CAD, CAE (Computer-Aided Engineering) and CAM (Computer-Aided Manufacture).

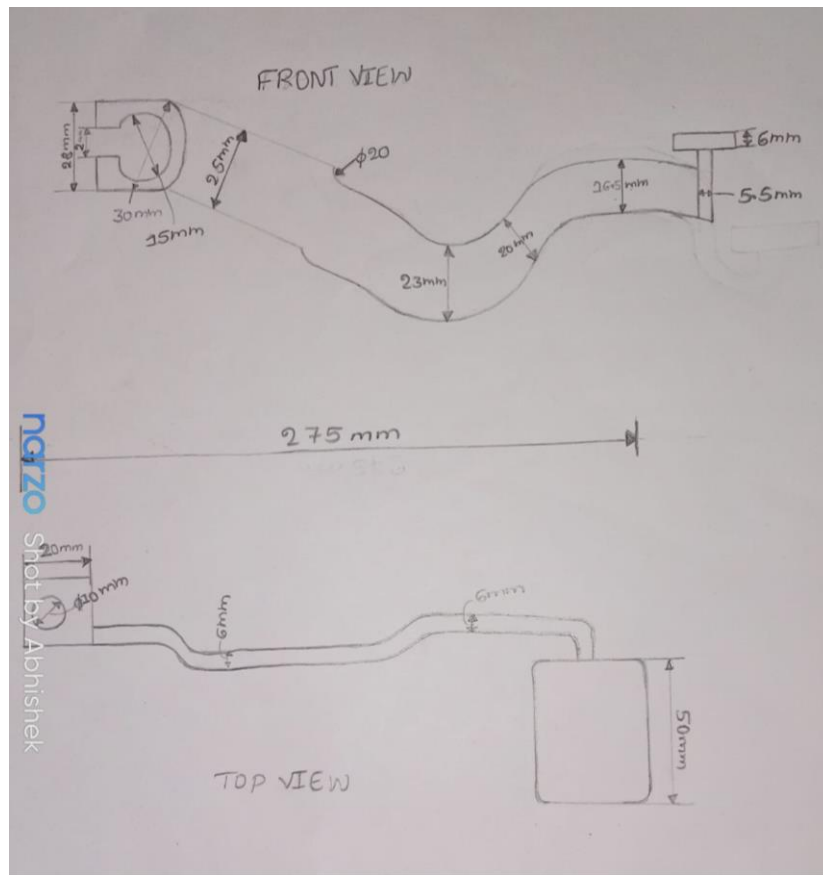
CAD software innovation continues to improve the quality of design through greater accuracy and the reduction of design errors. CAD software is also capable of improving communication due the centralization of design data and documentation, creating a single source of truth for engineers and manufacturers.

Computer-aided manufacturing is commonly used by Manufacturers – rather than Design Engineers – to plan, manage, control and automate manufacturing operations. CAM software uses CAD designs to infer machining instructions while optimizing part production efficiency and material usage.

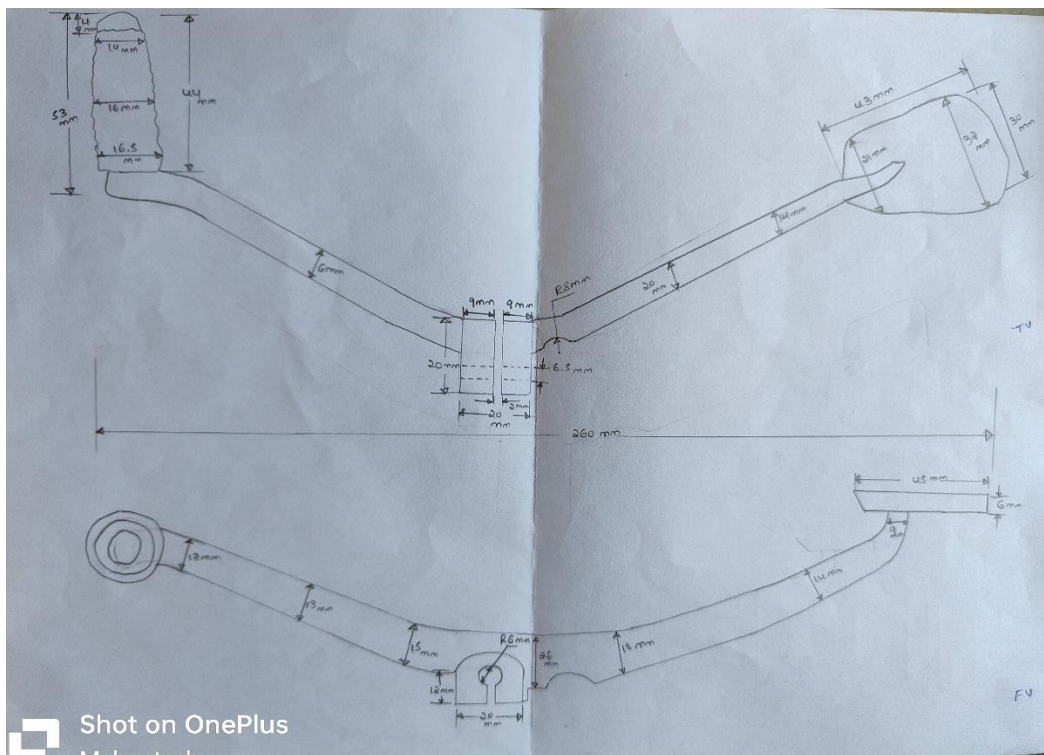


2D HAND SKETCHES OF COMPONENTS

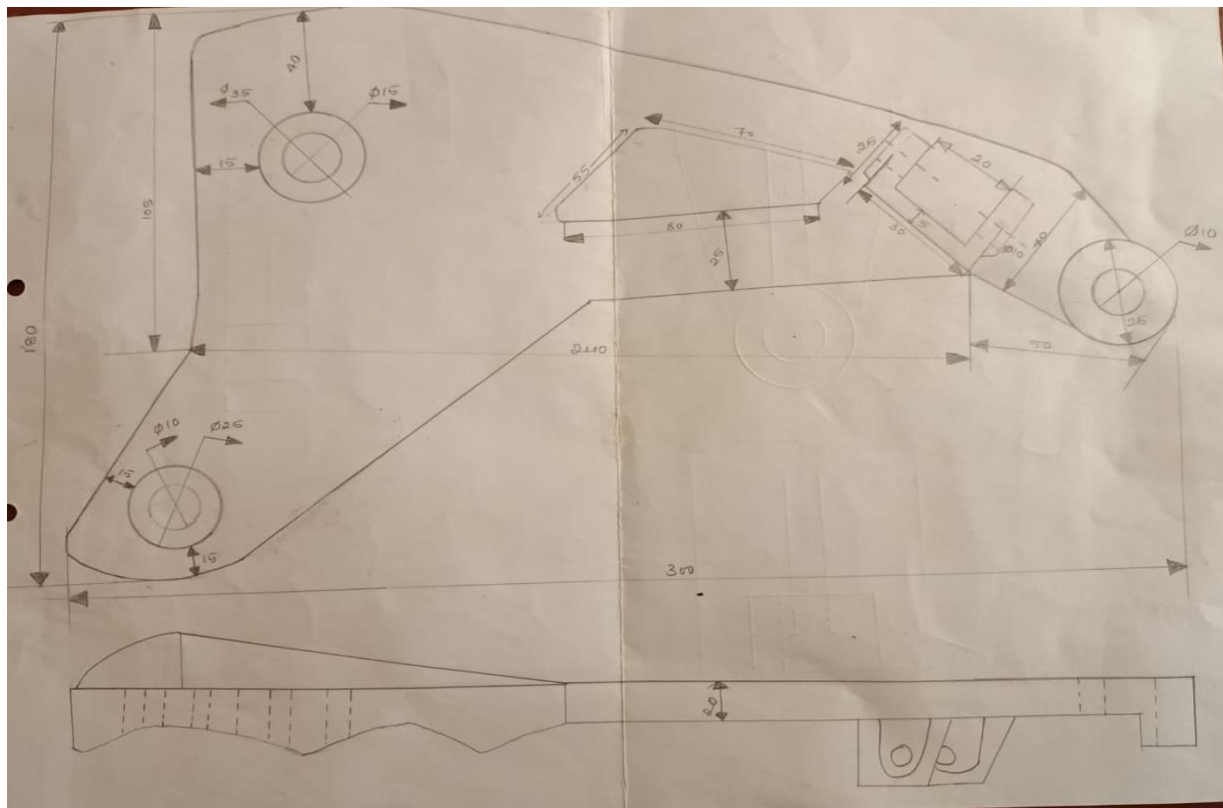
Brake Pedal



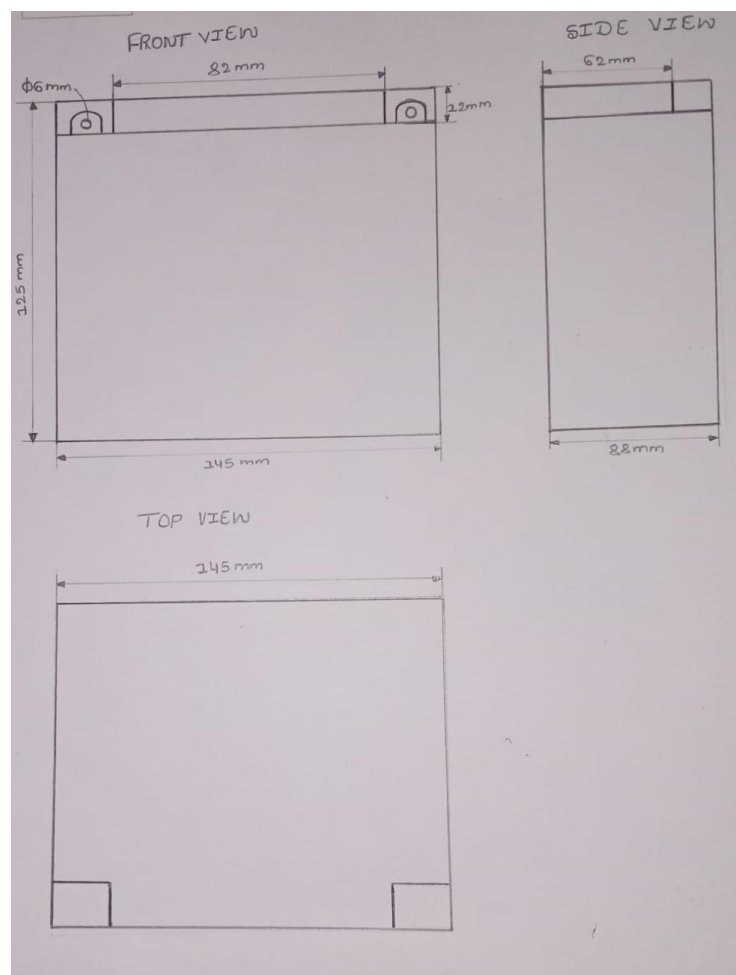
Gear Lever



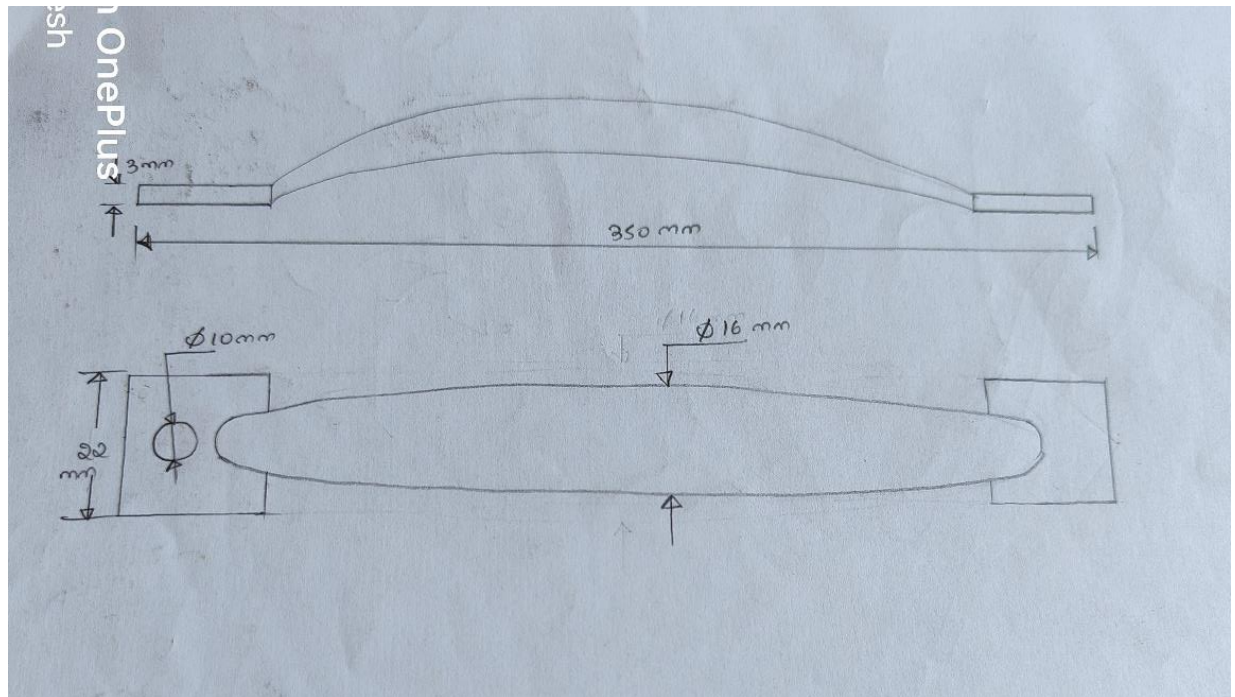
Foot Rest Bracket



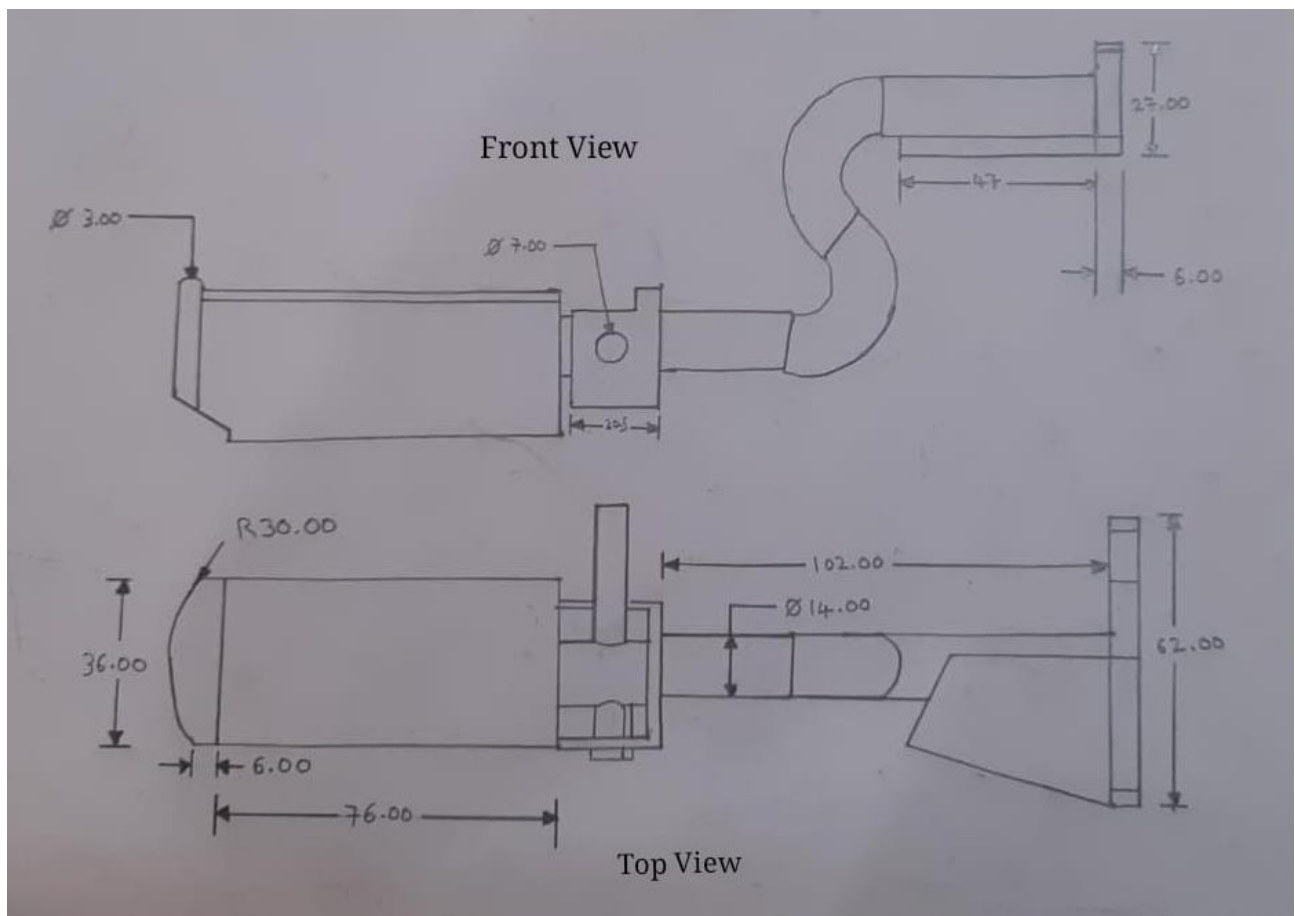
Battery



Support

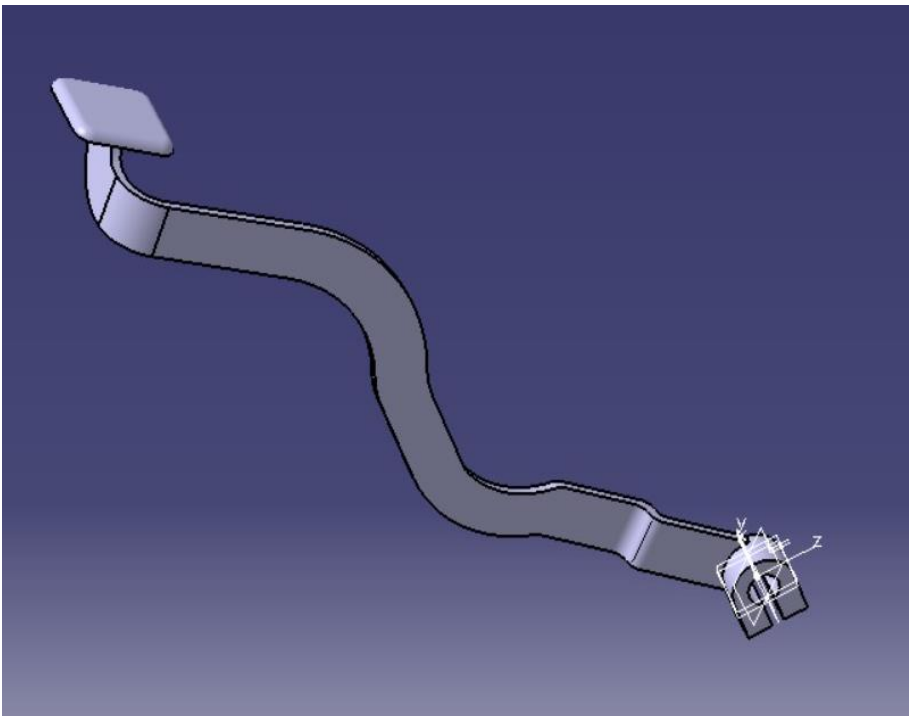


Foot Rest

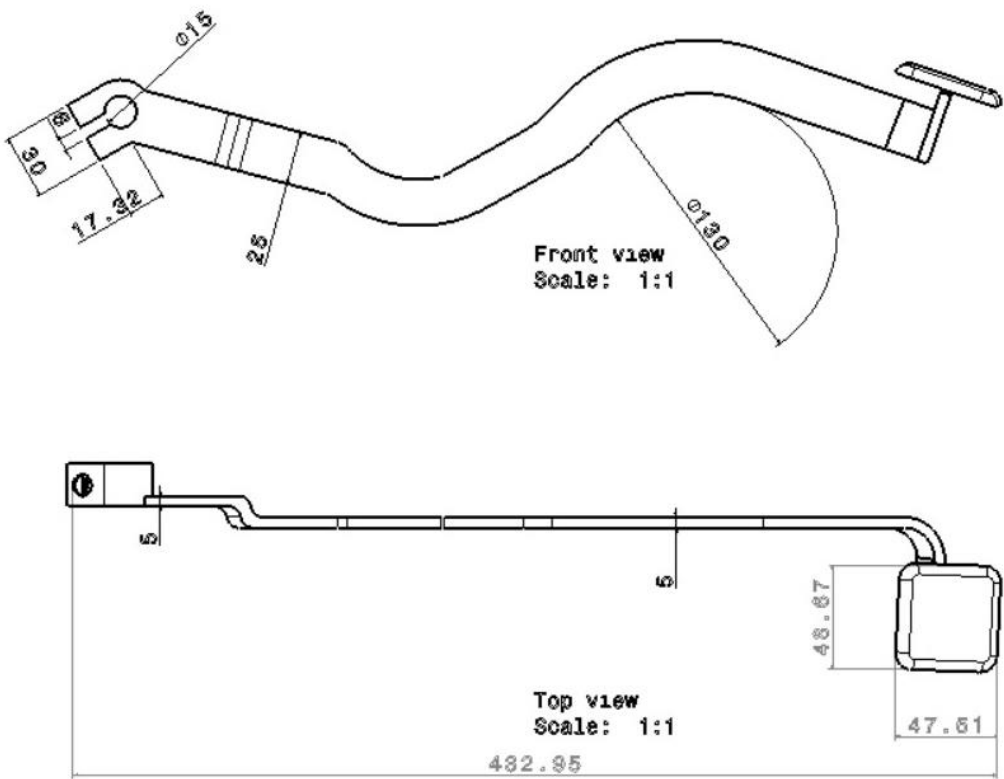



3D MODELS AND DRAFTING BY CATIA V5

Brake Pedal

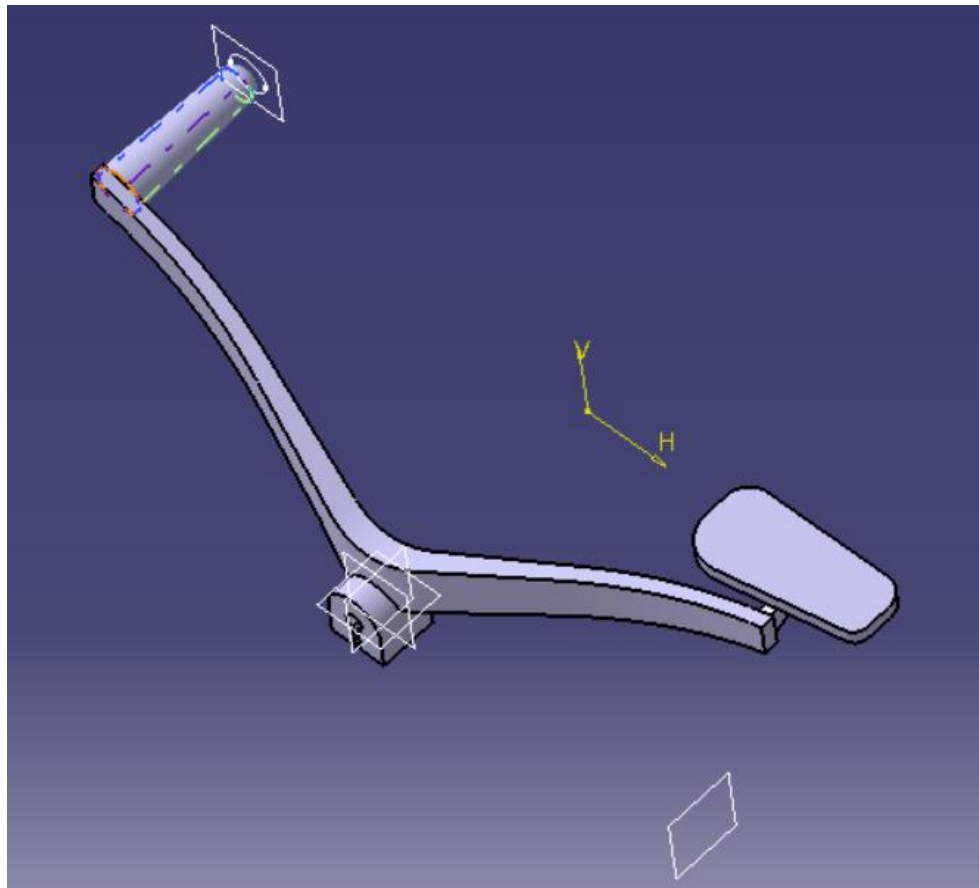


Drafting

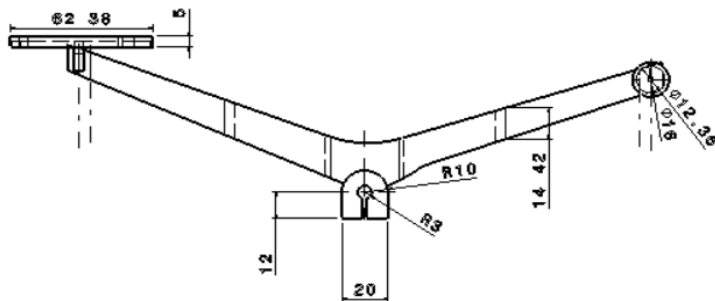


	Brake Pedal
	Scale: 1:1

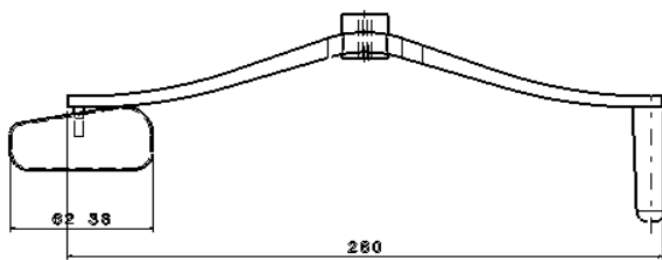
Gear Lever



Drafting



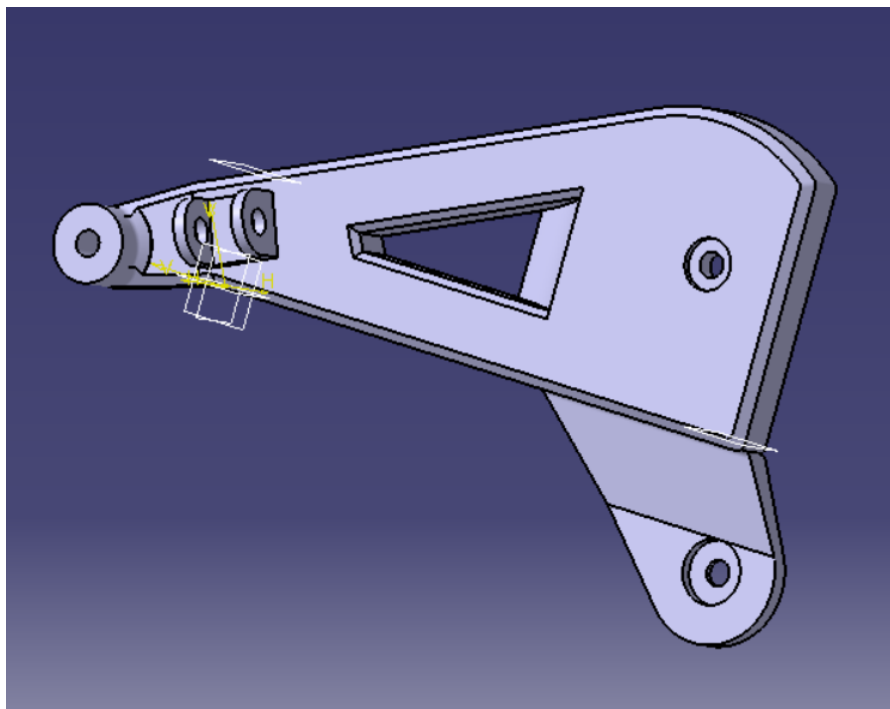
Front view
Scale: 1:1



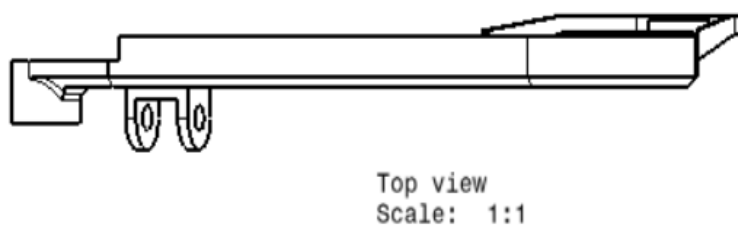
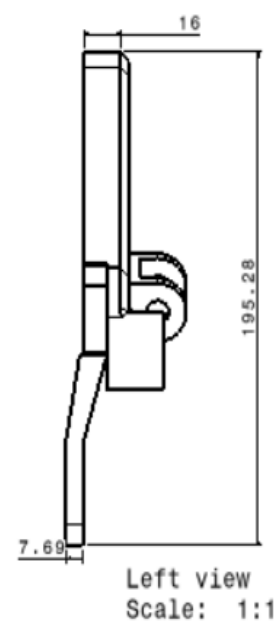
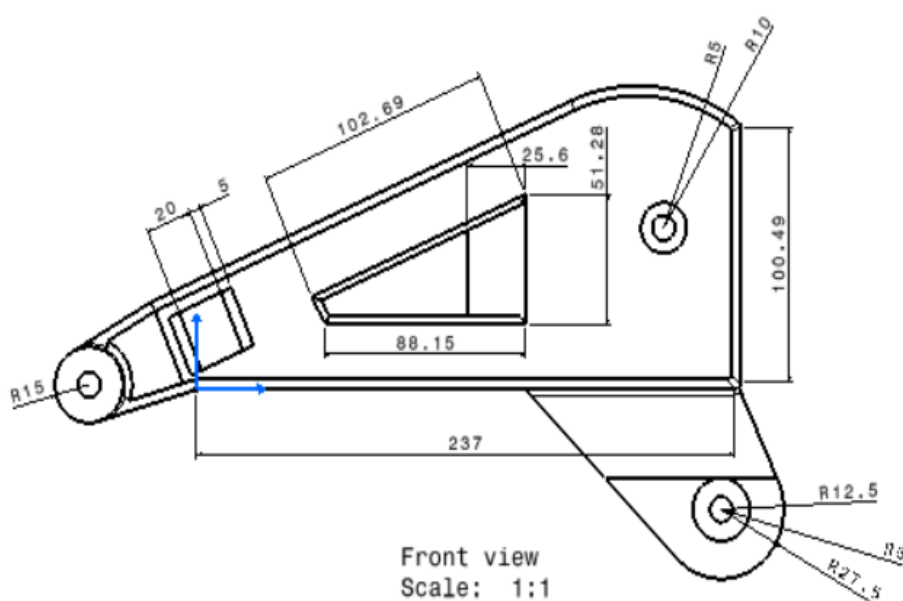
Top view
Scale: 1:1

	Brake Pedal
	Scale: 1:1

Foot Rest Bracket

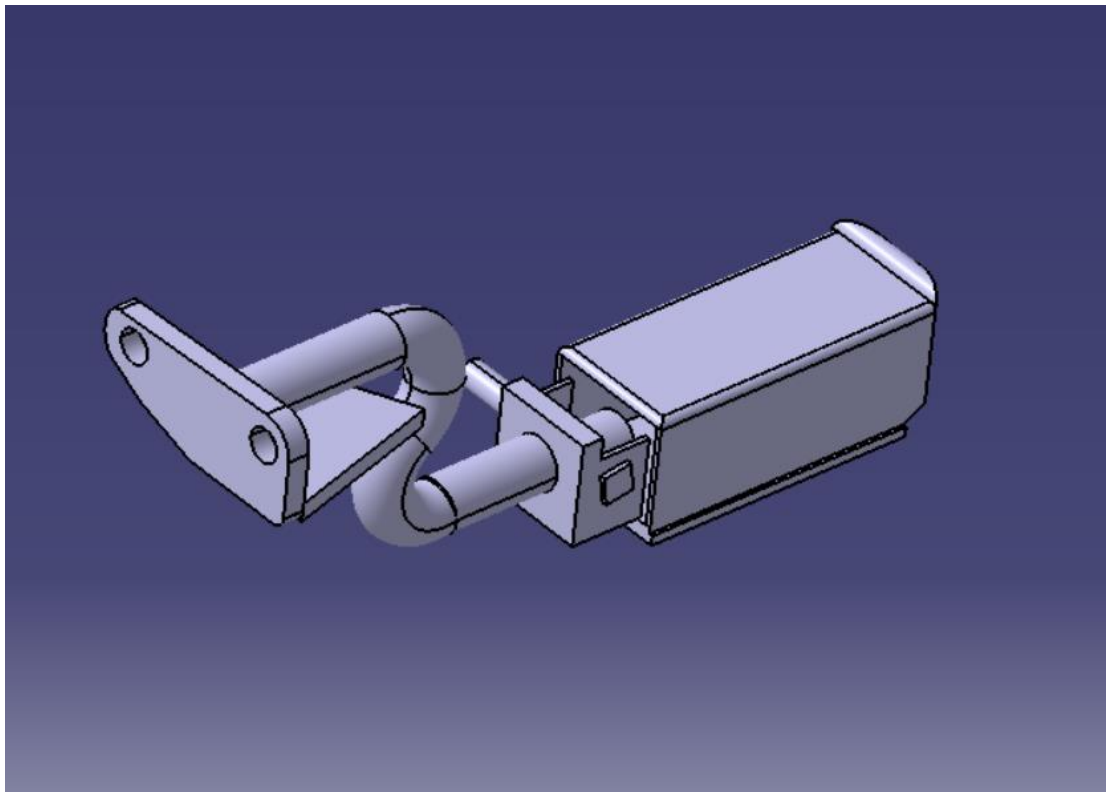


Drafting

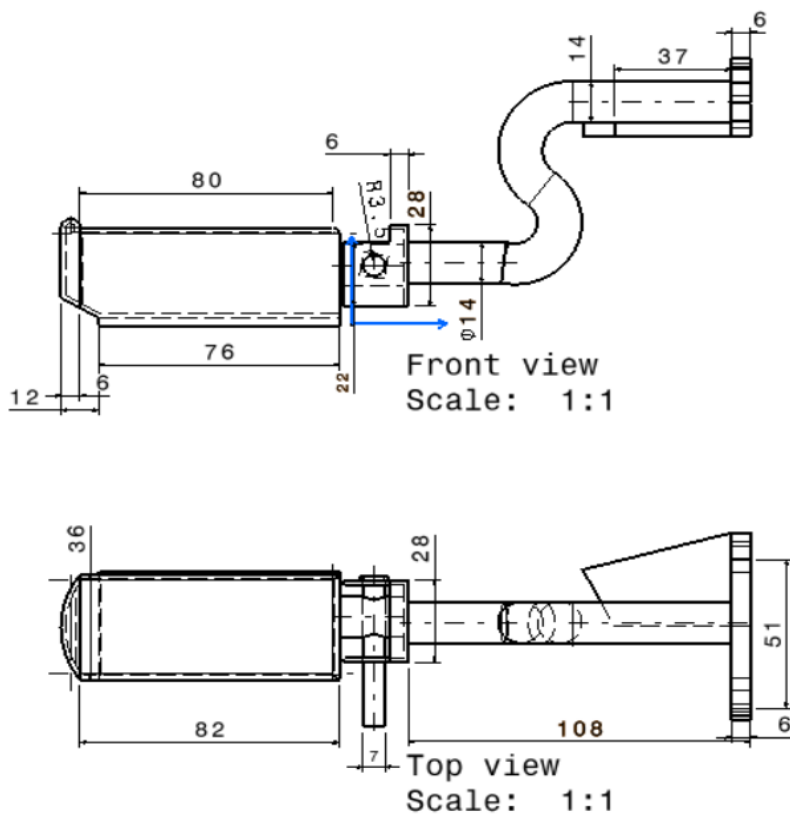



	Foot Rest Bracket
	Scale: 1:1

Foot Rest

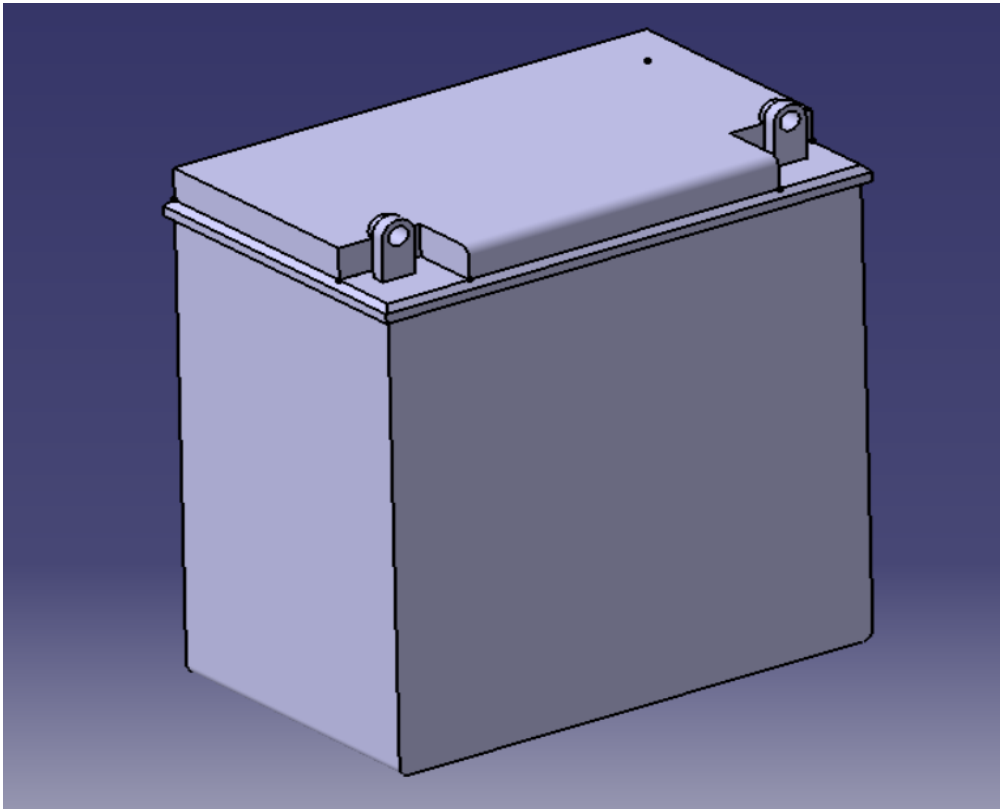


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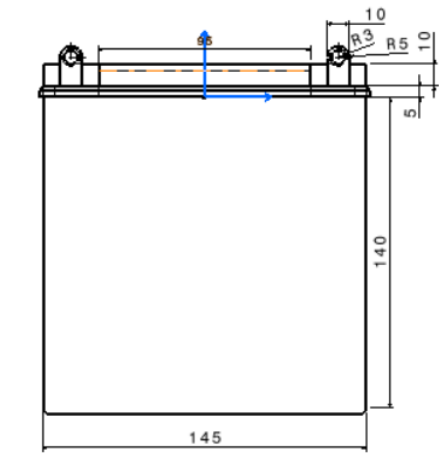


	Foot Rest
	Scale: 1:1

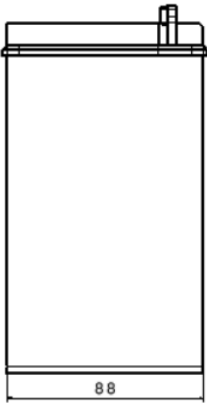
Battery



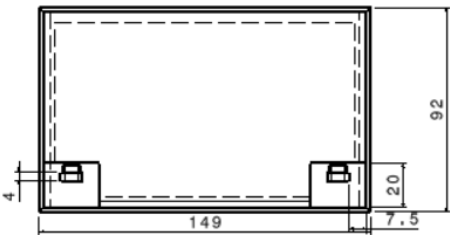
Drafting




Front view
Scale: 1:1



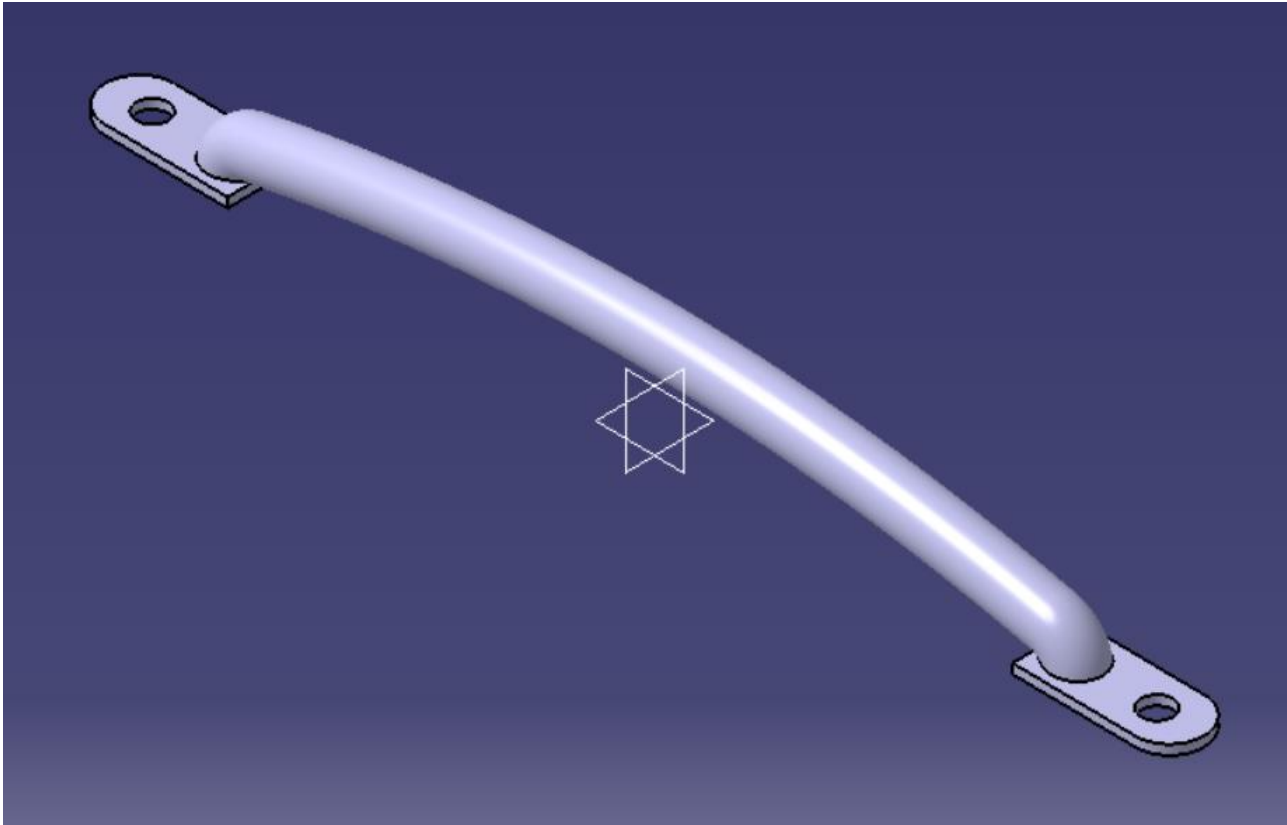
Left view
Scale: 1:1



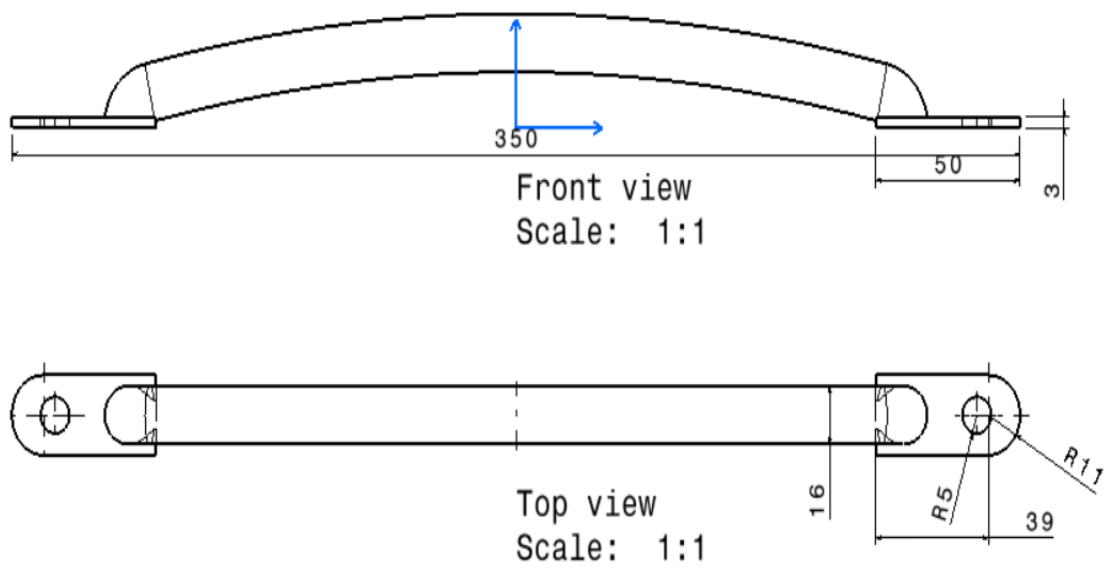
Top view
Scale: 1:1


	Battery
	Scale: 1:1

Support



Drafting



	Support
	Scale: 1:1

Conclusion

CAD (Computer-Aided Design). CAD experience can be valuable in various industries, such as engineering and architecture. It allows us to create detailed and precise designs, improving efficiency and accuracy in the design process. CAD software provides tools for modelling, simulation, and visualization, enabling us to bring our ideas to life. Overall, CAD experience can greatly enhance our ability to design and create complex components and structures.

Geometric Dimensioning and Tolerancing (GD&T). GD&T is a system used to define and communicate the allowable variations in the form, size, and orientation of parts in engineering drawings. It provides a standardized language for specifying and interpreting dimensions and tolerances, ensuring consistent and accurate manufacturing processes. By using GD&T, engineers can effectively communicate design requirements, improve product quality, and enhance the interchangeability of parts. It plays a crucial role in industries such as aerospace, automotive, and manufacturing. Overall, GD&T is a powerful tool that helps ensure the proper functionality and assembly of components in various engineering applications.

“THANK YOU”