

A Project Report On Suspension Assembly

SUBMITTED BY:

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15B00072

As part of Academic requirement in the course

Computer Aided Design

(2017-2018)



SCHOOL OF ENGINEERING AND TECHNOLOGY

Founded by:
THE HERO GROUP

Academic Mentor:
Imperial College London

PROJECT CERTIFICATE

This is to certify that the CAD project entitled.....**Suspension**.....and submitted by**ShivamDeshRatna**.....ID No.....15800072.....of the course embodies my original work and not directly copied from any other sources.



Signature of the student



Signature of CAD lab instructor

Date: 06/12/17

Date: 06/12/17

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1. Abstract and Introduction

The suspension of a car is actually part of the chassis, which comprises all of the important systems located beneath the car's body.

These systems include:

- The **frame** - structural, load-carrying component that supports the car's engine and body, which are in turn supported by the suspension
- The **suspension system** - setup that supports weight, absorbs and dampens shock and helps maintain tire contact
- The **steering system** - mechanism that enables the driver to guide and direct the vehicle
- The **tires and wheels** - components that make vehicle motion possible by way of grip and/or friction with the road

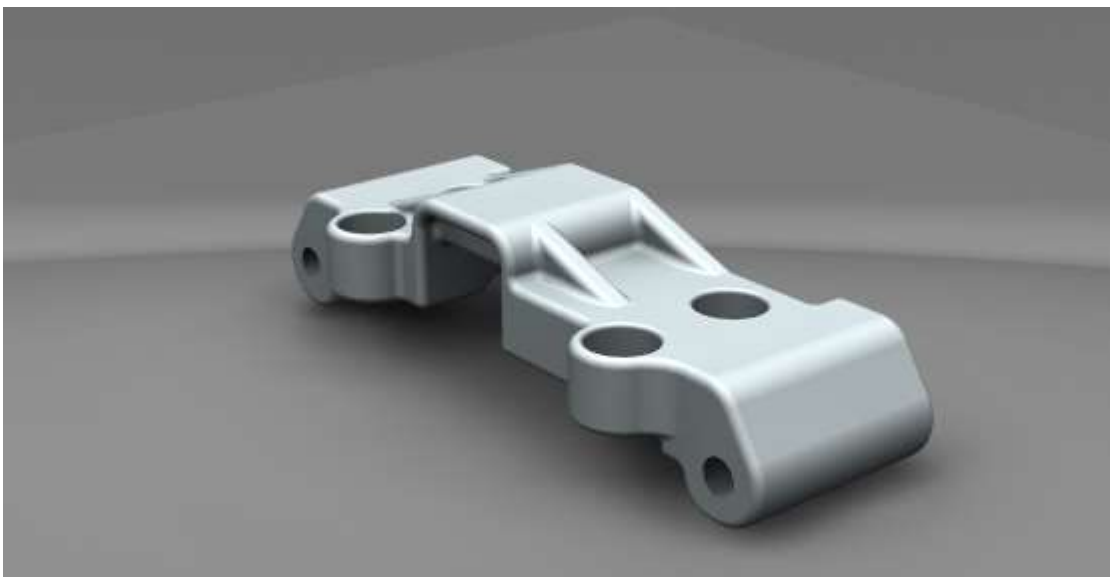
So the suspension is one of the major systems in any vehicle.

2. Part Modeling

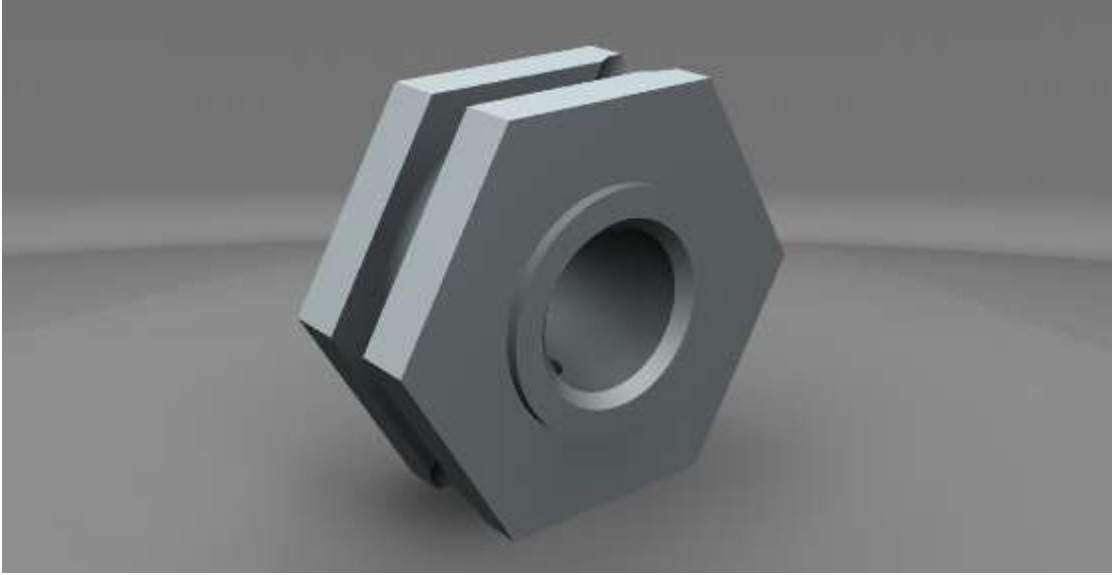
Part-1. Front Upper Arm



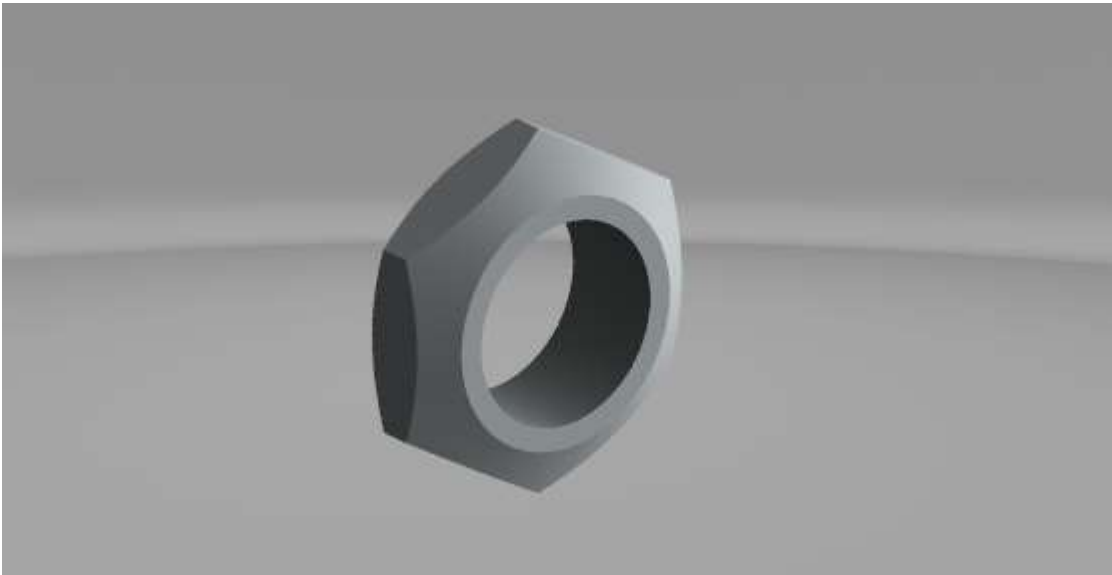
Part-2. Front Upper Arm Mount



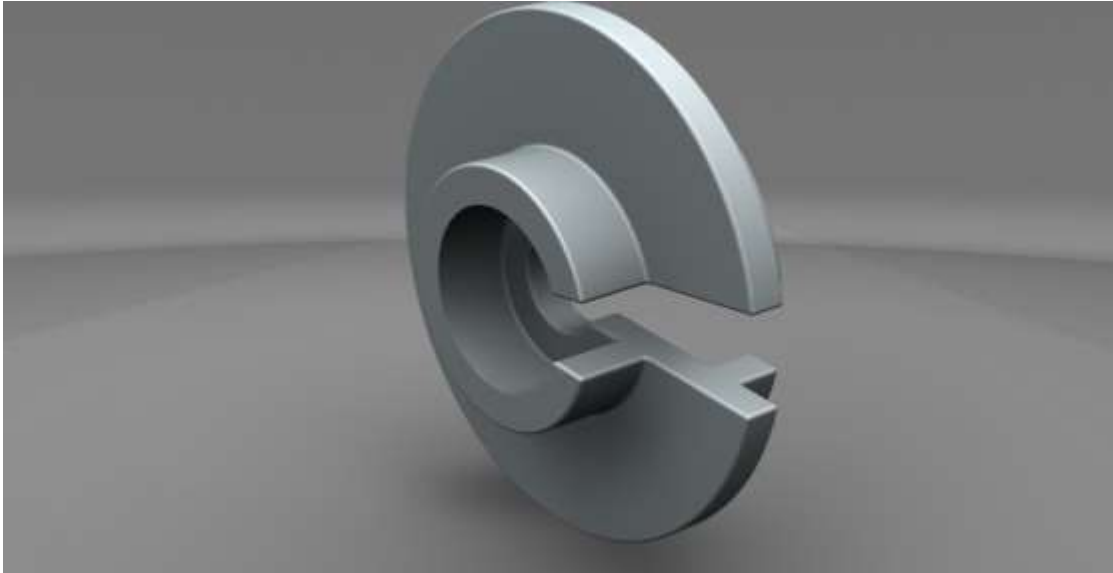
Part-3. Hex Drive



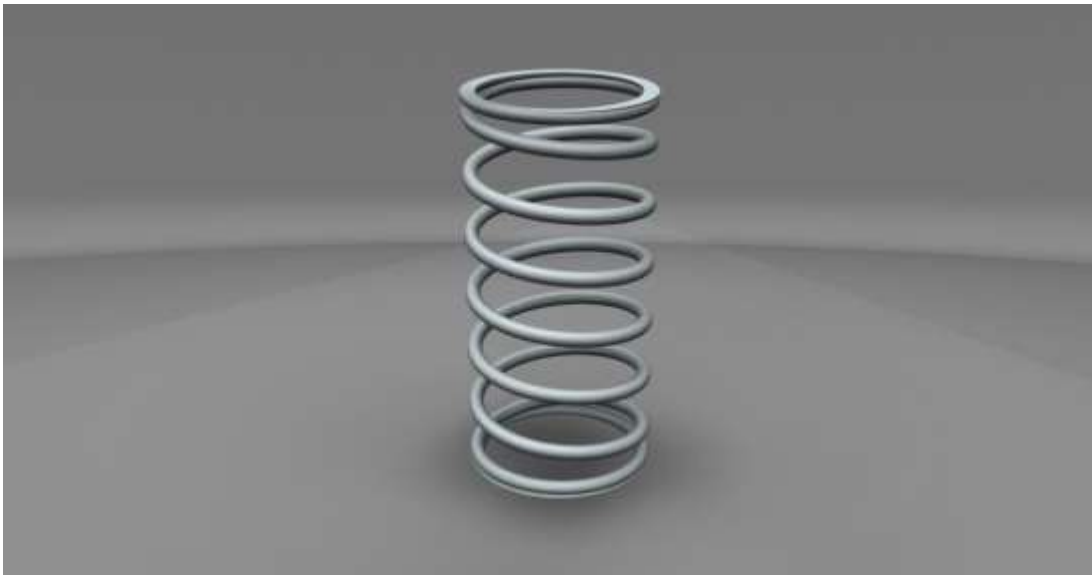
Part-4. Nut



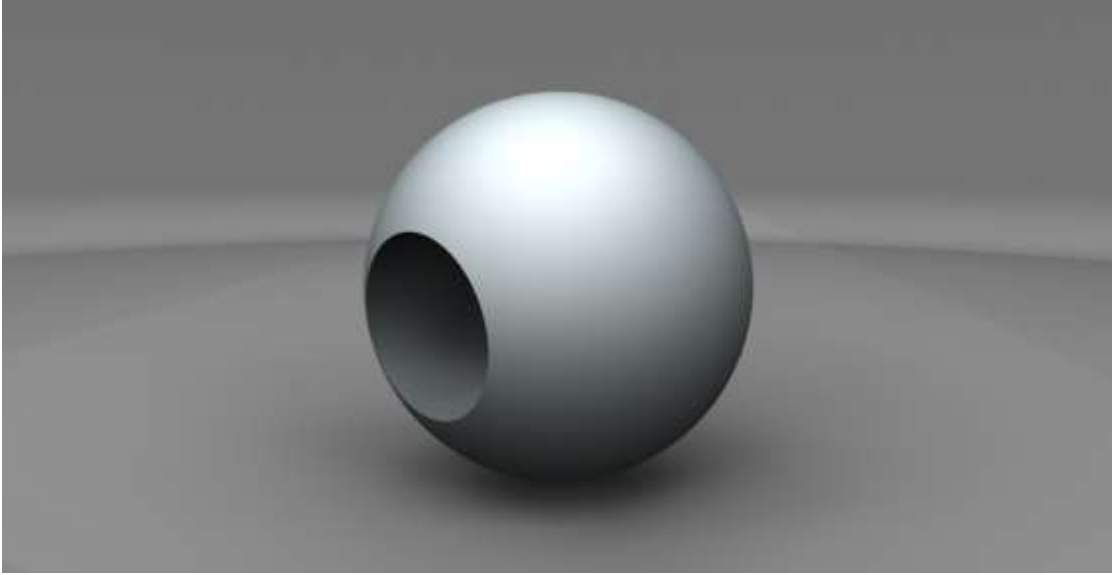
Part-5. Spring Cup



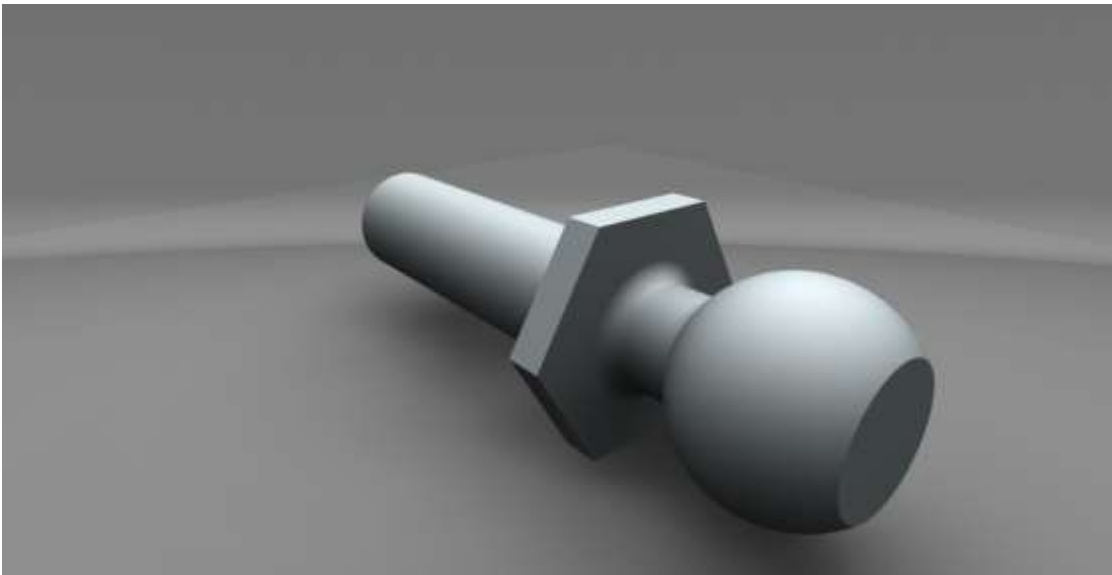
Part-6. Spring



Part-7. .25 Ball



Part-8. .1875 Ball Stud .375



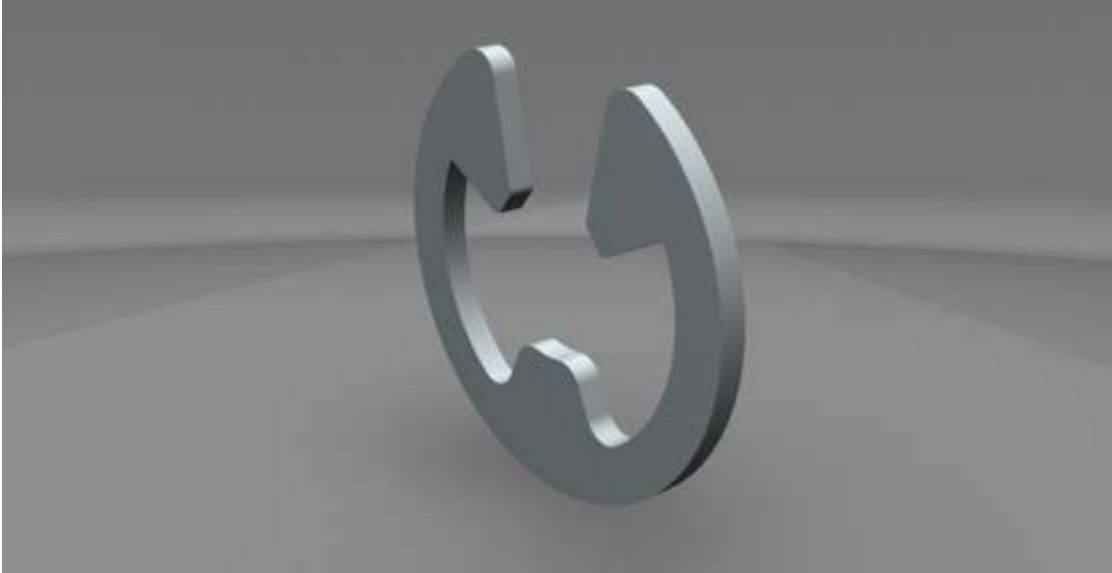
Part-9. Alloy



Part-10. Ball end



Part-11. E-clip



Part-12. Front Axel



Part-13. Front Hub Carrier



Part-14. Front Side plate

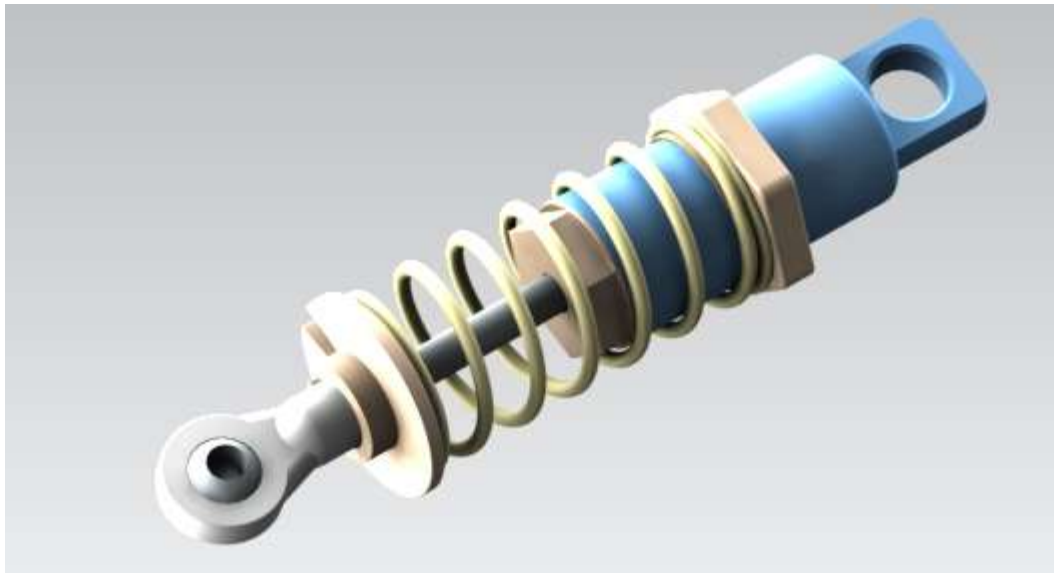


4. Assembly

- Sub assembly 1 – Tire



- Sub assembly 2 – Shock Absorber



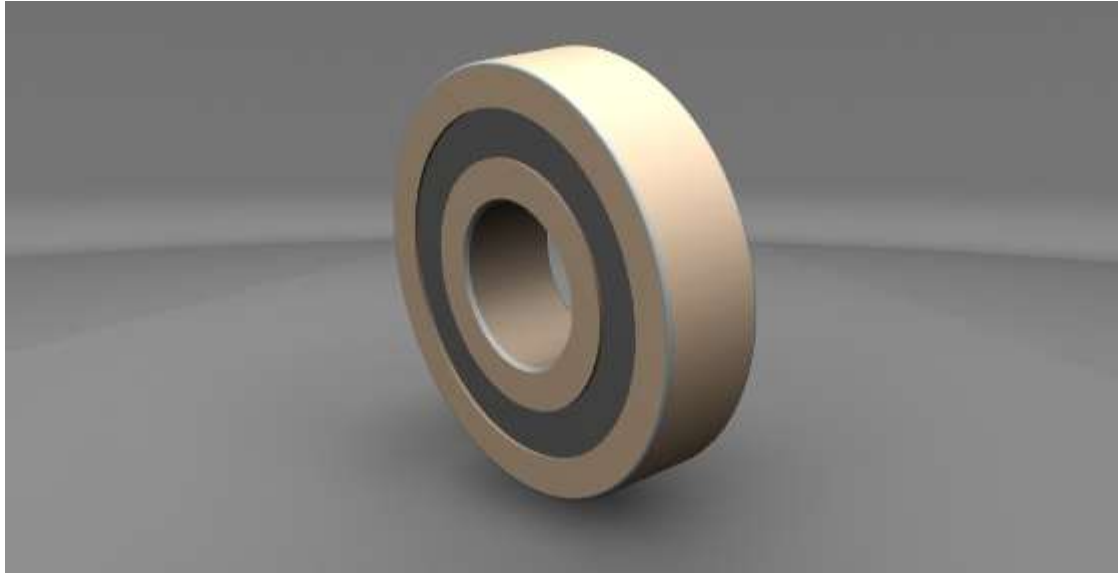
- **Sub Assembly 3: Front Hub Left Carrier Tire**



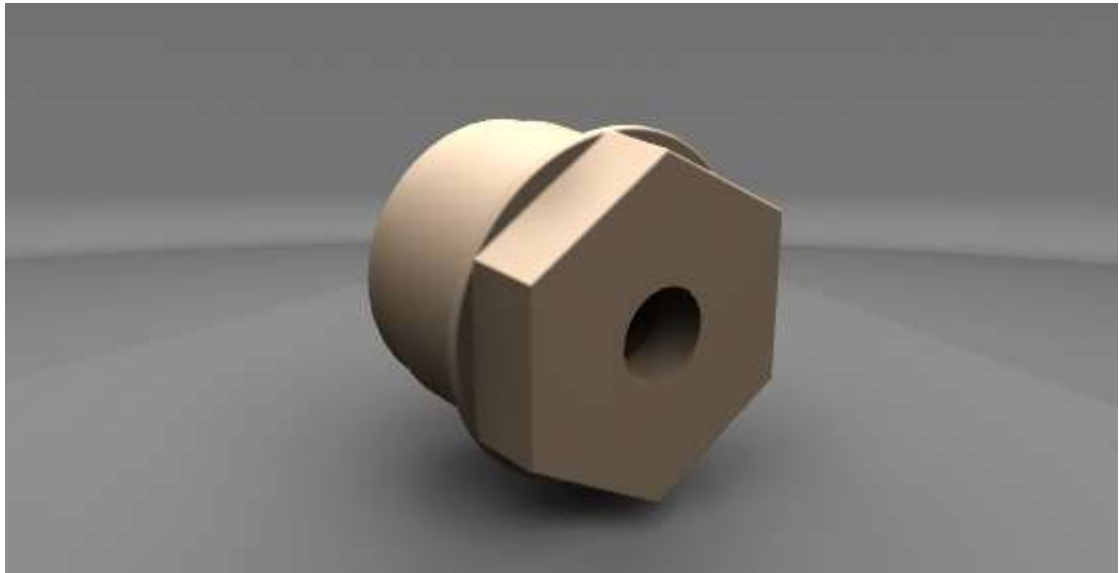
- **Sub Assembly 4 : Front Upper Arm**



- **Sub Assembly 5 : Rear Hub Bearing**



- **Sub Assembly 6 : Shock Cartridge**



- **Final assembly : Suspension**



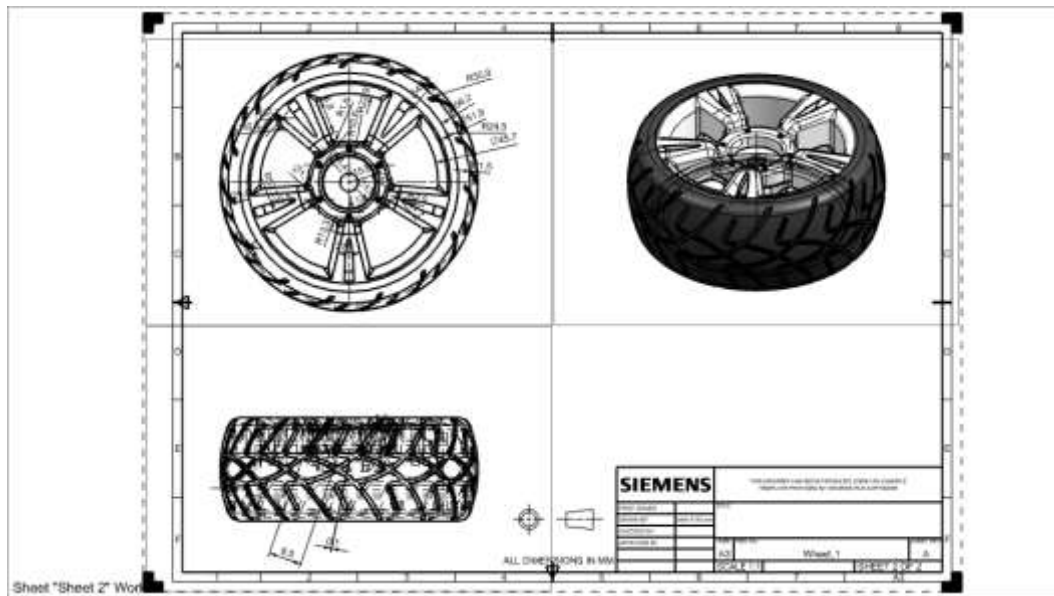
Assembly tree Figure (screen shot)

Assembly Navigator

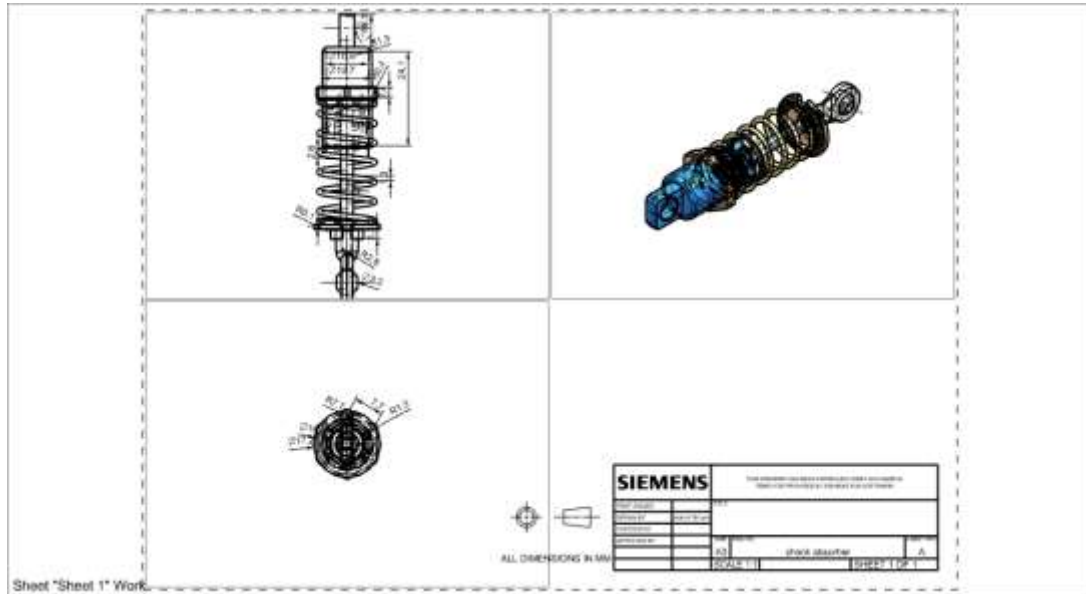
Descriptive Part Name ▲	Info	R..	M
+ <input checked="" type="checkbox"/> Sections			
- <input checked="" type="checkbox"/> suspension (Order: Chronolog...			
+ <input checked="" type="checkbox"/> Constraints			
<input checked="" type="checkbox"/> fronty side plate R		<input type="checkbox"/>	
<input checked="" type="checkbox"/> Front Side Plate L		<input type="checkbox"/>	
<input checked="" type="checkbox"/> front upper arm mount		<input type="checkbox"/>	
<input checked="" type="checkbox"/> Front Shock Brace		<input type="checkbox"/>	
+ <input checked="" type="checkbox"/> front upper arm_1 x 2		<input type="checkbox"/>	
+ <input checked="" type="checkbox"/> front lower arm_1 x 2		<input type="checkbox"/>	
<input checked="" type="checkbox"/> front lower arm brace		<input type="checkbox"/>	
<input checked="" type="checkbox"/> front lower hinge pin x 2		<input type="checkbox"/>	
<input checked="" type="checkbox"/> front upper hinge pin x 2		<input type="checkbox"/>	
<input checked="" type="checkbox"/> e-clip x 8			
<input checked="" type="checkbox"/> Front Suspension Adjustm...		<input type="checkbox"/>	
<input checked="" type="checkbox"/> Shock bushing x 2		<input type="checkbox"/>	
+ <input checked="" type="checkbox"/> shock absorber x 2		<input type="checkbox"/>	
+ <input checked="" type="checkbox"/> Front hub carrier L_1		<input type="checkbox"/>	
+ <input checked="" type="checkbox"/> front hub carrier R_1		<input type="checkbox"/>	
<input checked="" type="checkbox"/> nut1 x 2		<input type="checkbox"/>	
<input checked="" type="checkbox"/> screw1 x 2		<input type="checkbox"/>	
<input checked="" type="checkbox"/> washer x 4		<input type="checkbox"/>	
<input checked="" type="checkbox"/> screw x 6		<input type="checkbox"/>	

5. Drafting

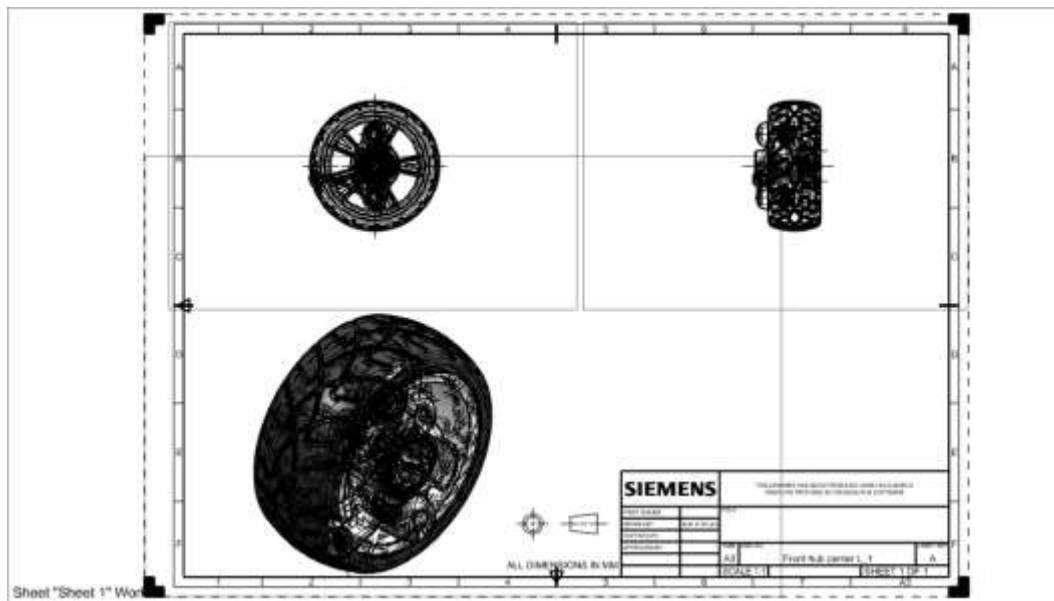
- Sub Assembly 1: Tire



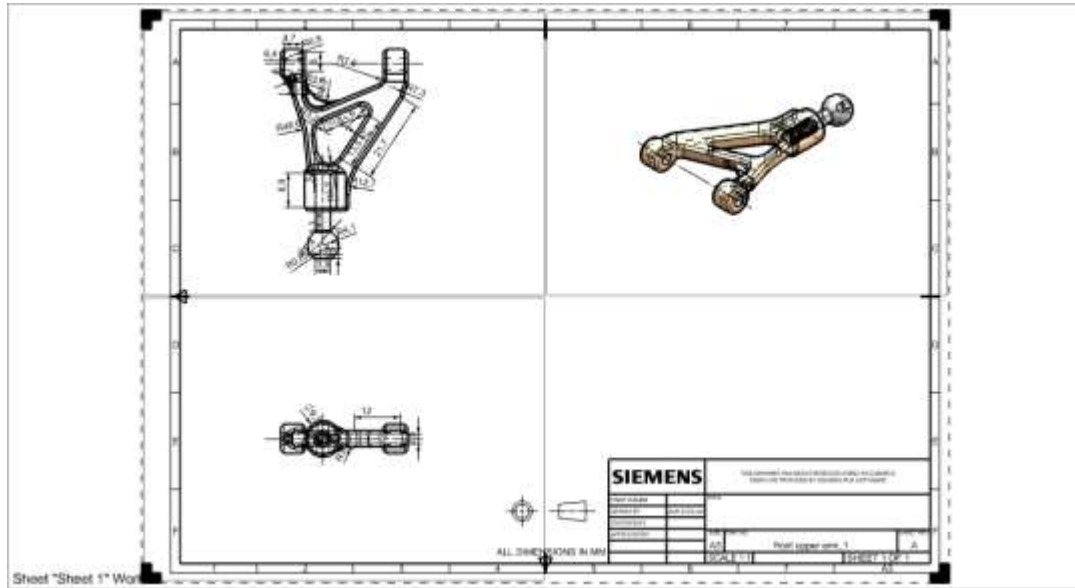
- **Sub Assembly 2 : Shock Absorber**



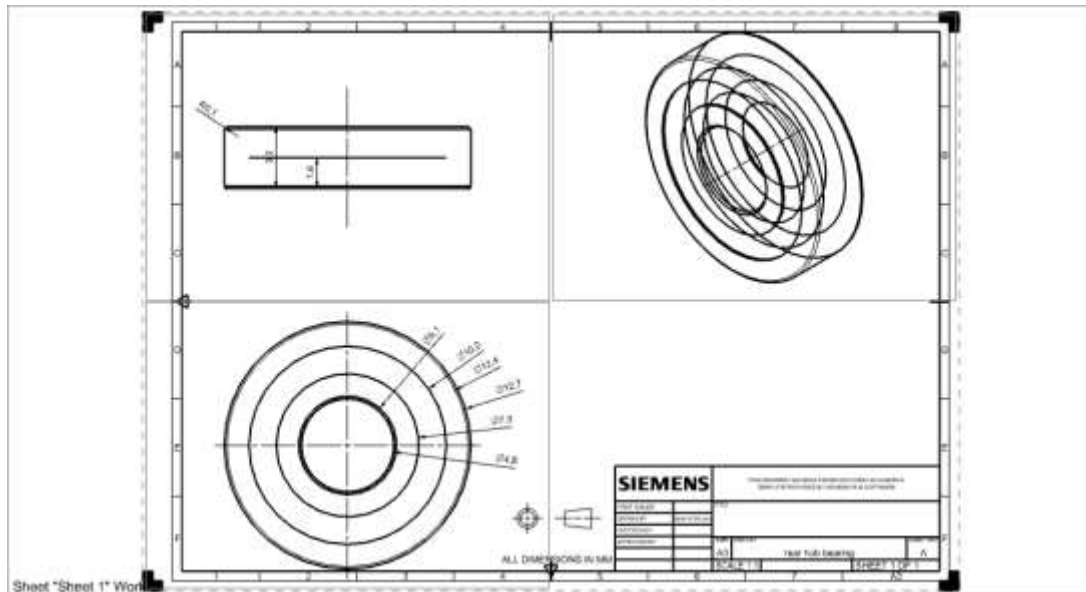
- **Sub Assembly 3 : Front Hub Left Carrier Tire**



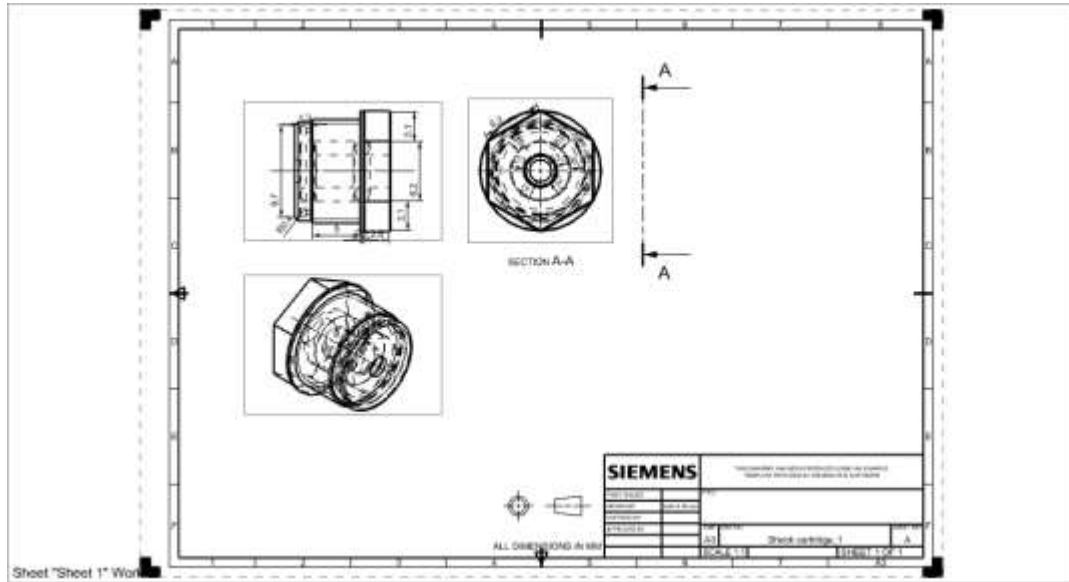
- **Sub Assembly 4 : front Upper Arm**



- **Sub Assembly 5 : Rear Hub Bearing**

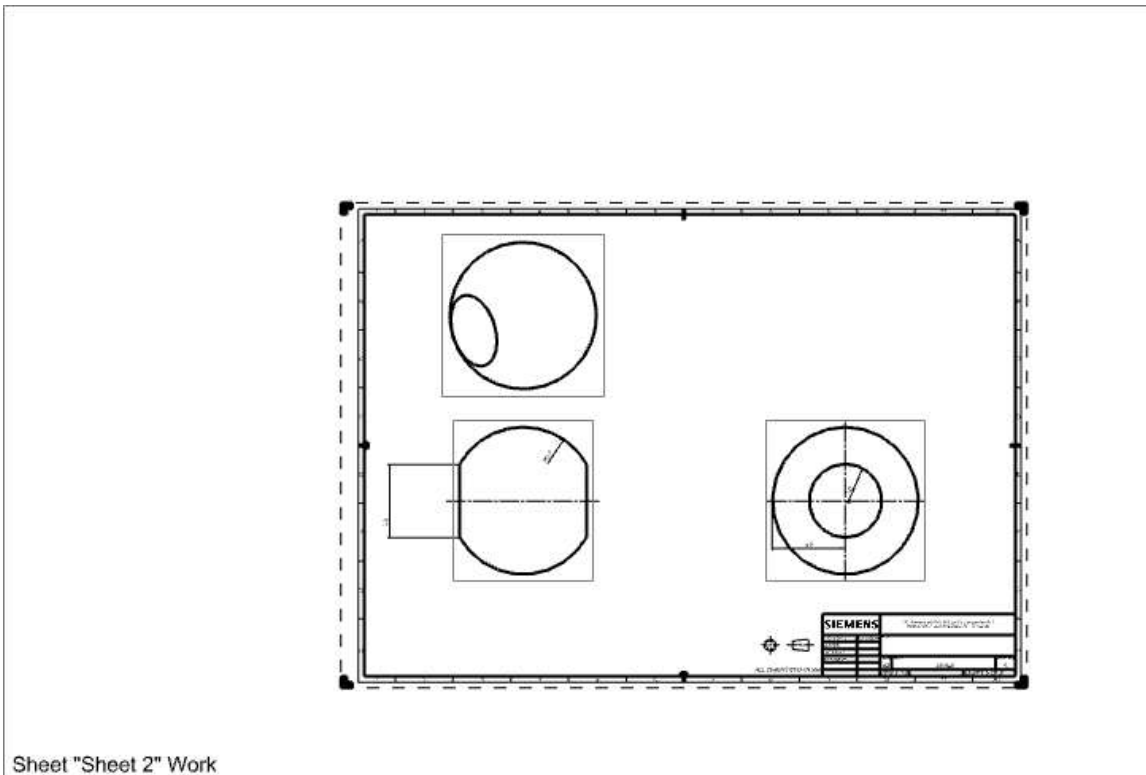


- Sub Assembly 6 : **Shock Cartridge**

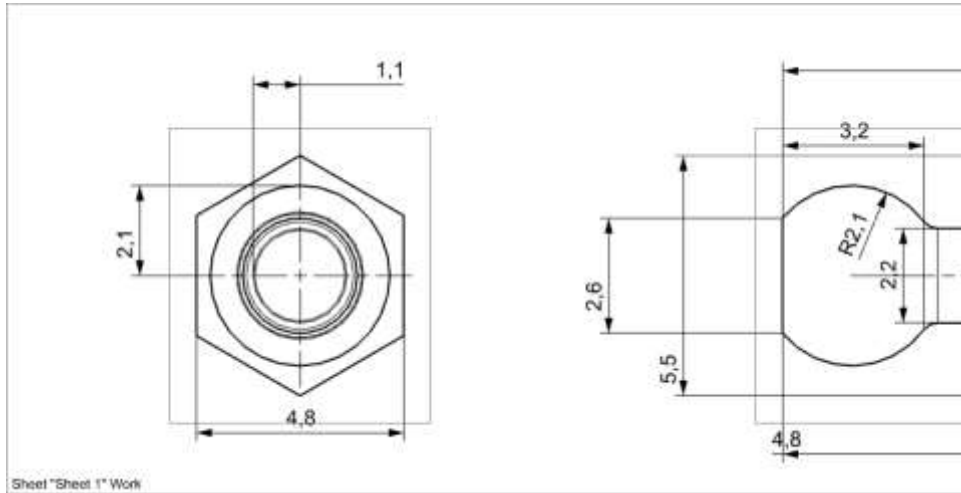


6. Drafting (Parts)

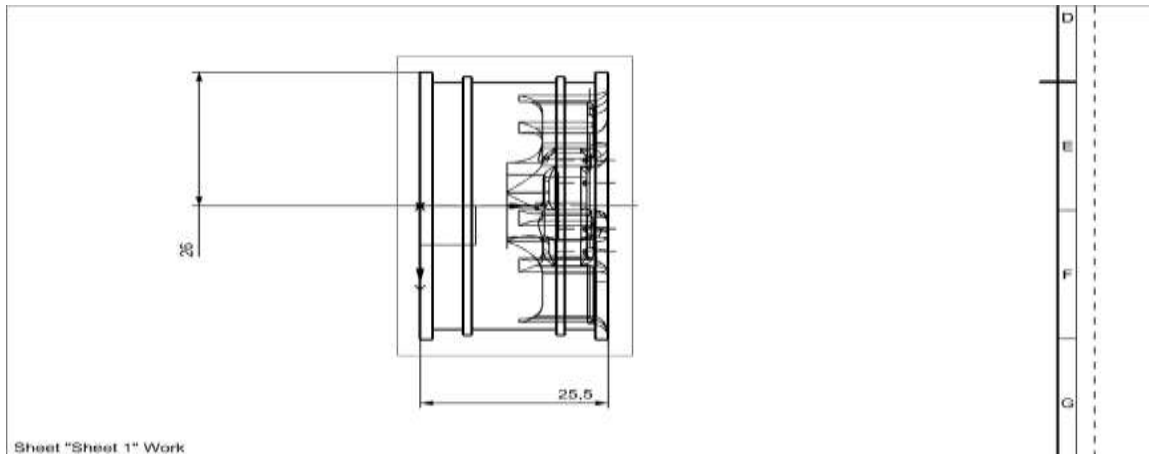
1. 0.25 Ball



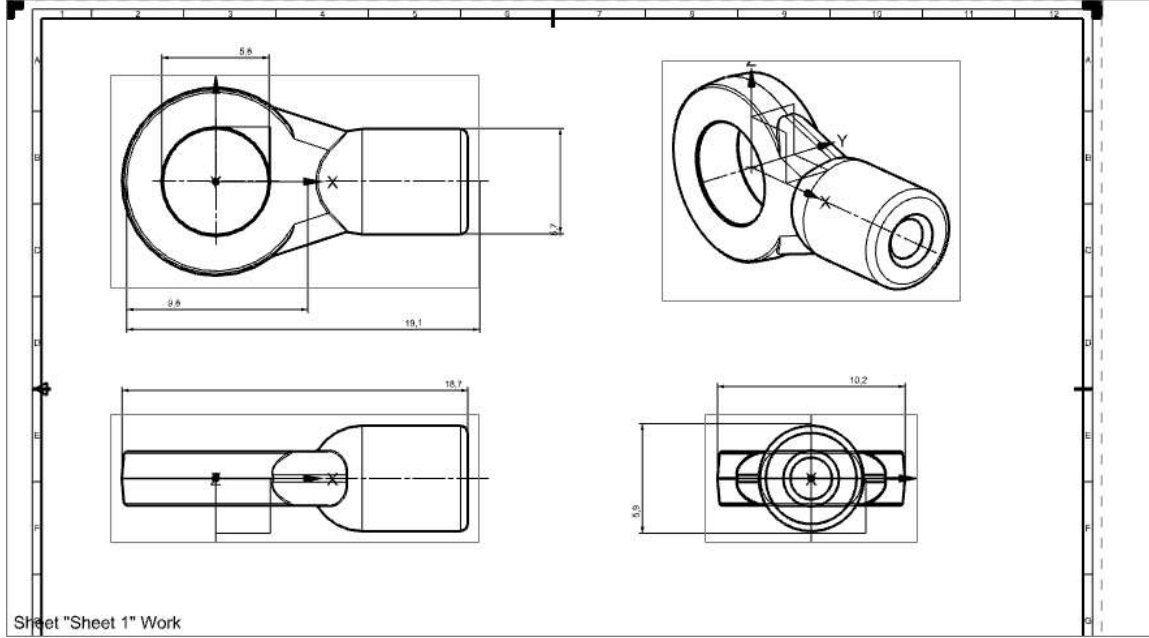
2.0.18 Ball Stud



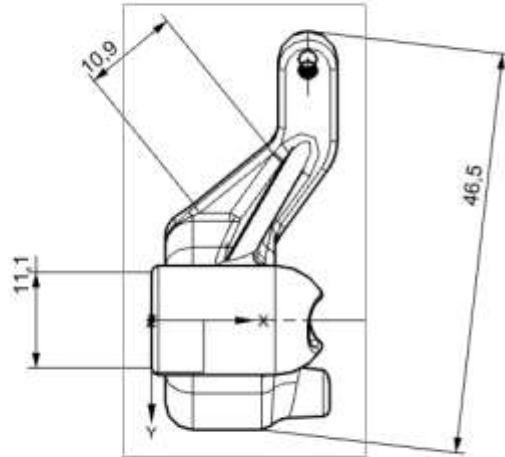
3. Alloy



4. Ball End

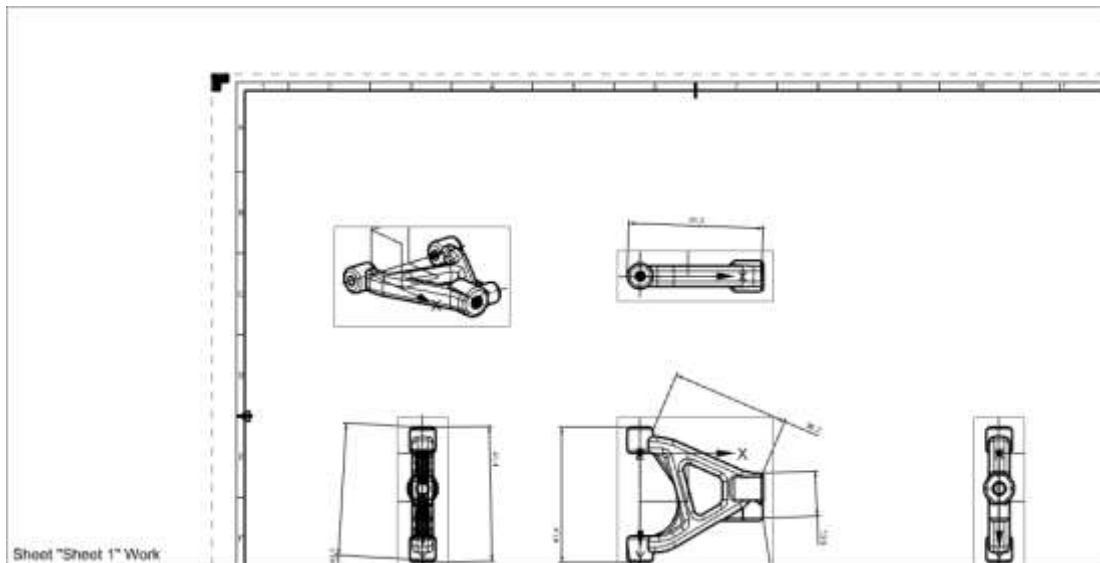


5. Front Hub carrier



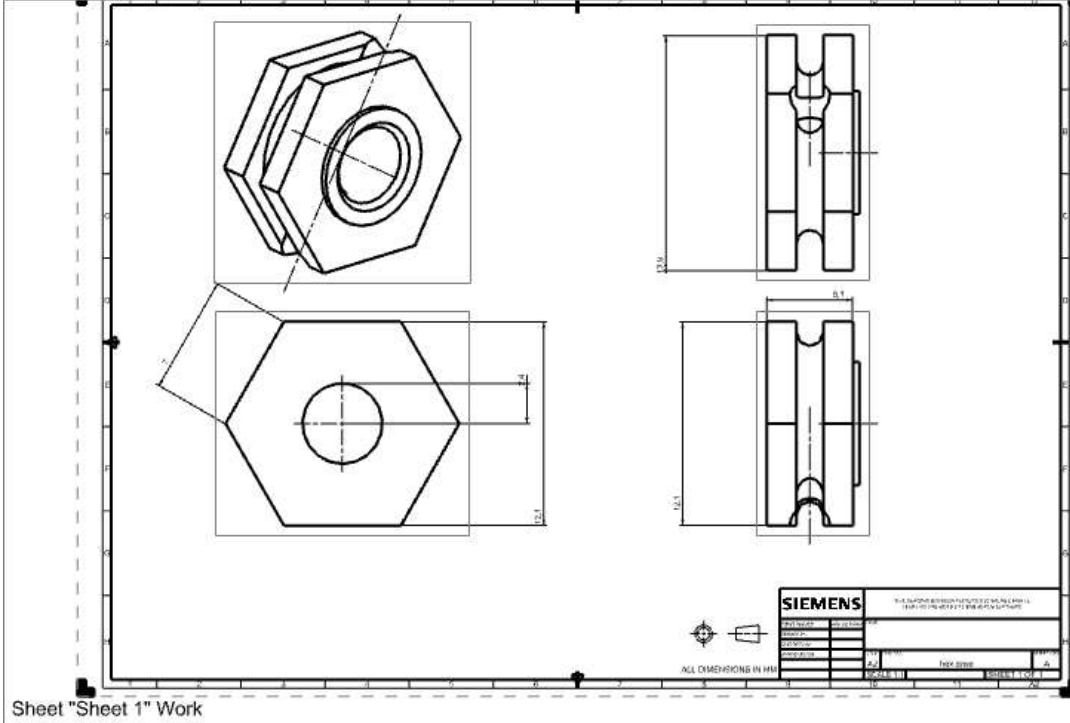
Sheet "Sheet 1" Work

6. Front Lower arm

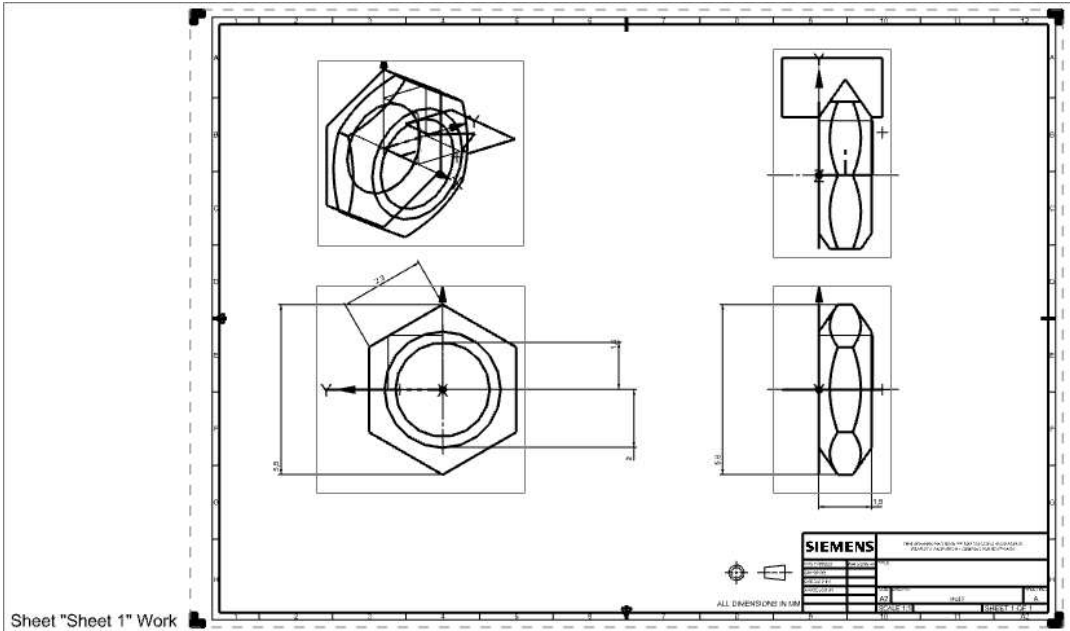


Sheet "Sheet 1" Work

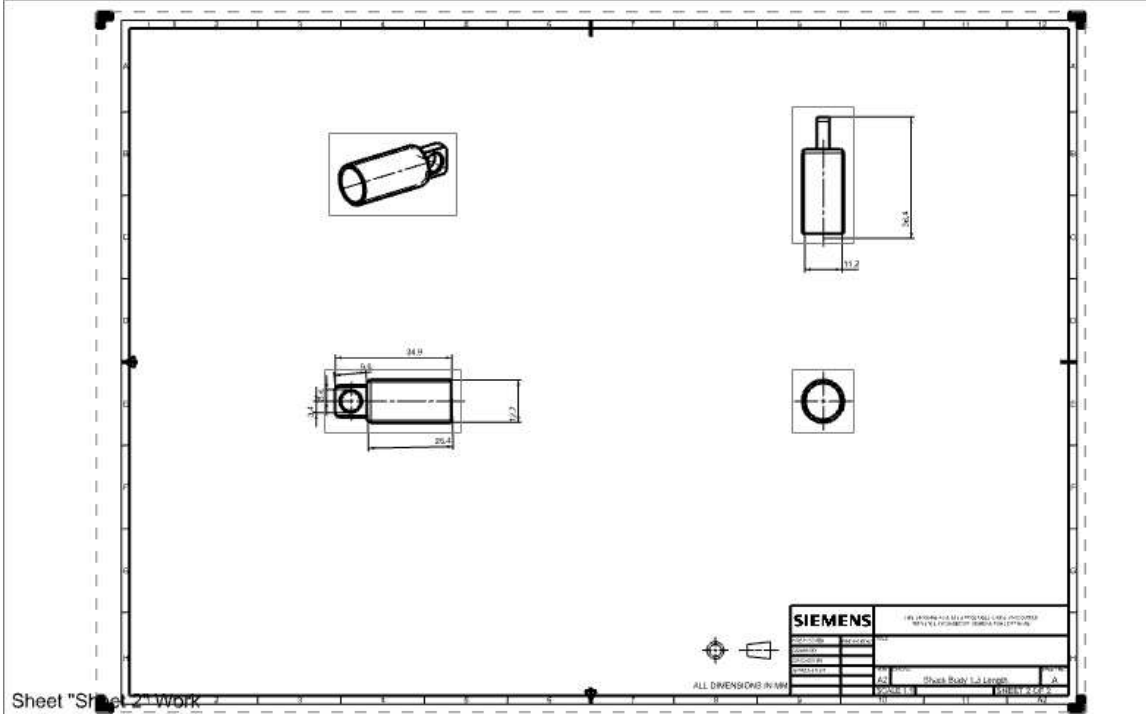
7. Hex Drive



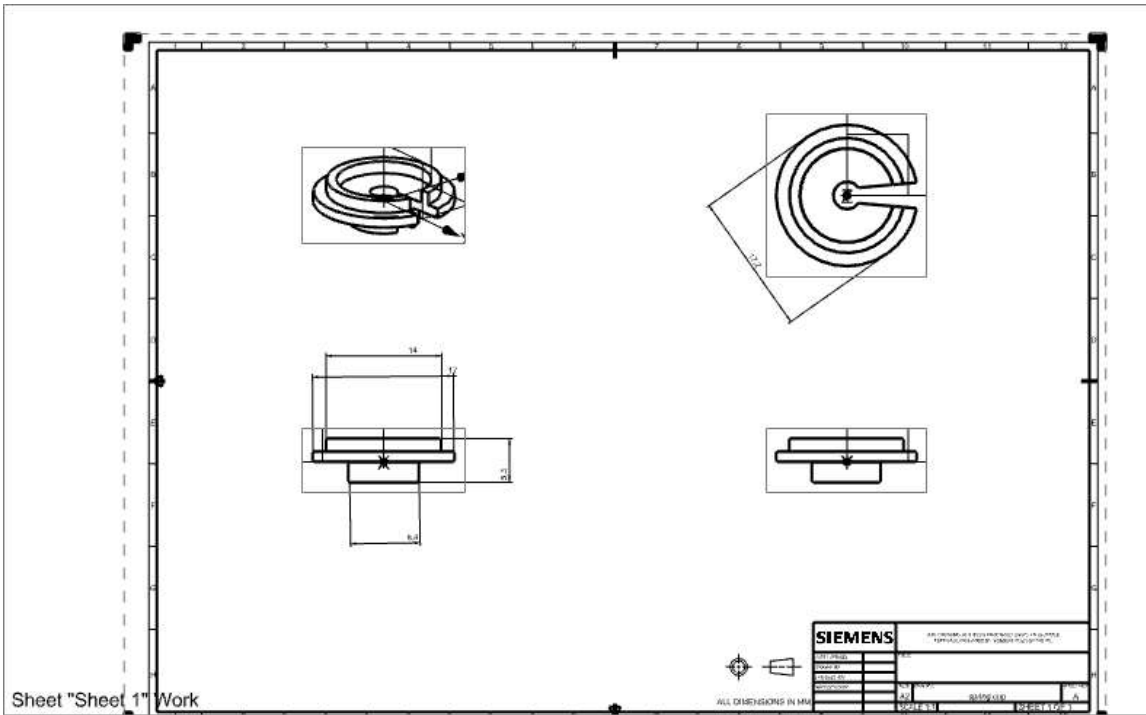
8.Nut



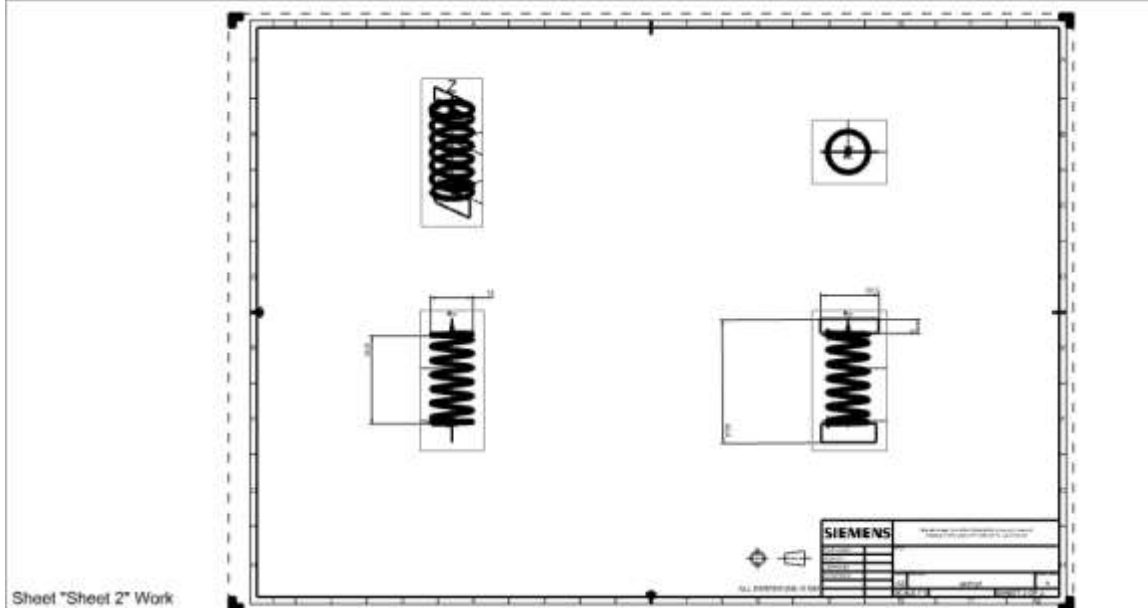
9.Shock Body



10. Spring Cup



11. Spring



Bill of Materials

Sheet "Sheet 4" Work

PC NO	PART NAME	QTY
30	NUT	2
29	SHOCK ABSORBER	2
28	SPRING	2
30	SHOCK SPRING ADJUSTMENT NUT	2
26	SHOCK BODY	2
28	SHOCK BODY 1.5 LENGTH	2
27	SHOCK CARTRIDGE 1	2
26	SHOCK CARTRIDGE	2
25	SHOCK CARTRIDGE SPACER	2
24	O-RING	4
23	SHOCK CARTRIDGE	2
22	SHOCK SHAFT	2
21	SHOCK SHAFT	2
20	FRSTCN	2
19	BALL END 1	2
18	BALL END	2
17	35 BALL	2
16	SPRING CLIP	2
16	SHOCK BUSHING	2
14	FRONT SUSPENSION ADJUSTMENT CLIP	2
13	FRONT UPPER HINGE PIN	2
12	E-CLIP	32
11	FRONT LOWER HINGE PIN	2
10	FRONT LOWER ARM BRACE	1
9	FRONT LOWER ARM 5	2
8	FRONT LOWER ARM	2
7	FRONT UPPER ARM 1	2
6	FRONT UPPER ARM	2
5	ELLOW BALL	4
4	FRONT SHOCK BRACE	1
3	FRONT UPPER ARM JOINT	1
2	FRONT SIDE PLATE L	1
1	FRONT SIDE PLATE R	1

Conclusion

This project was a great learning experience to me. I learnt various commands of NX that I couldn't learn in classroom due to limited hours of teaching. I learnt how to work in modelling of an assembly of various different components. Suspension Assembly is an integral part of a car and is an artistic piece of work with various intricate

components. We learnt how to make an assembly of various components and manage various components.