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Fabrication, Modeling and Analysis of Track Buggy

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Abstract: As we know a buggy is used for racing in terrain which isn't very suitable for racing with cars. A buggy is a vehicle used for extremely difficult terrains to race on. Using that concept we decided to build a buggy that is more focused on tarred road on concrete road. Buggy in general will cost a lot of money to build or even buy, we managed to build a track buggy which is cheap and provides good mileage. We have completed this project by using processes like welding, grinding, cutting, drilling and many other mechanical processes. The model of the track buggy was made using Lumina Software. The model was done using the exact shape and the size of the track buggy was finalized. After this the fabrication for it was done according to the model created. The fabrication was done using auto chassis, Tata ace axle and many other parts from different automobiles. The main aim was to compare this with the go-karts present in the industry and replace it with Track Buggies, this being more stronger, powerful, manual transmission and safer on the tracks perspective. The analysis of the Chassis and the axle was done to contradict the above statement. Track buggy being rigid due to the heavy axle and the rear engine gives more advantage for being used on a track as the weight is evenly distributed. The centre on gravity being right under the seat gives it a better control of the vehicle on sharp turns, whereas go-karts in the seat is sometimes placed towards the right hand side or the left hand side of the chassis and the engine being place either on the left or right hand side of the seat. The track buggy being ride height being low gives it more advantage to have more downforce. Track Buggy according to the analysis done has a greater advantage than the go-karts as well as certain disadvantages.

Keywords: Track buggy, go-karts,buggy.

I. INTRODUCTION

Buggy is generally used to refer to any lightweight automobile with off road capabilities and sparse bodywork. Most are built either as a kit car or from scratch. Originally used to describe very lightweight horse-drawn vehicles for one or two persons, the term was extended to lightweight automobiles as they became popular. As automobiles became increasingly sophisticated, the term briefly dropped out of use before being revived to describe more specialised off road vehicles.

The different types of buggies are:

1) Bennett buggy
2) Dune buggy
3) Baja buggy
4) Moon buggy
5) Sandrail buggy
6) Swamp buggy

Our buggy is track based. We wondered why there wasn't a buggy made for road. So we took this opportunity to build one ourselves. Usually buggies have suspension at the front as well at the rear for off roading capabilities. So we decided not to have a suspension at the front end so that it is closer to the ground.

Our buggy is built using an auto engine. We took a 175cc bajaj gas auto rickshaw and made it into a buggy. As we had taken a gas powered auto rickshaw, so we converted it into a petrol powered engine by fitting a CD100 carburetor.

While building this buggy, we had another car in mind. The ramp car that was used in the fast and furious series. We kept that car in mind while designing our buggy.

So we took an auto rickshaw and cut it into half. We used the back end of the auto and we fabricated a tata ace axle in front. This tata ace we used it so that it equalizes the weight. So using this axle we get distributed weight.

We used a momo santro racing steering. We used a wooden plank which is placed over our chassis. This wooden plank acts as a body covering. We also used stainless steel rods for the roll cage. We designed the roll cage on a piece of paper then calculated how

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much material was required. We used roughly 40 feet of stainless steel rods to complete our roll cage. We welded the rods in place to make or roll cage strong.

The entire roll cage is detachable by removing few screws so that it is easier to work on the buggy.

We used a silicon mesh to cover the whole buggy to give it that buggy look what we desired.

We also used aluminum composite sheets to make a casing for the engine. We made the engine casing in such a way that the entire engine casing is detachable just by removing few screws.

The front of the car is made in such a way that it is aerodynamic. We have fitted another aluminum composite sheet at the bottom of the front portion.

Our buggy can travel at a top speed of 100 km/hr. As an auto rickshaw's top speed is 70km/hr but that is with more weight and passengers. We have reduced the weight by removing the upper casing of an auto rickshaw and we have just used the engine.

The mileage of our buggy is 35 km/litre. This is possible because a gas powered auto rickshaw has a mileage of 40 km/litre, since we have a customized silencer our mileage is 35 km/litre.

A. Objectives

1) The idea behind this is to replace go karts in the championships. As go-kart championships are world-wide and all legendary F1 champions started their racing career at a younger age from go-karts which were unsafe.
2) Since our buggy is bigger than a go-kart it is safer than a go-kart because of roll cage, heavy front tata ace axle, rear engine placement and the placement of the seat is right in the middle which helps with the center of gravity.
3) Our buggy is stable at high speeds because of proper distribution of weight and low ride.
4) As our buggy has manual transmission it is capable to produce more rpm compared to automatic transmission vehicles.
5) Being 11bhp at 5,000rpm its way better than go-karts. Go-karts typically have half the bhp.
6) Go-karts of higher bhp with manual transmission but are expensive to buy and maintain.

II. MATERIALS PROPERTIES

A. Stainless Steel

Stainless steel is known for being corrosive resistant. Stainless steel is also a poor conductor. Stainless steel bolts and nuts have one good feature, due to rubbing of stainless steel, oxides are produced which end up welding them together. Stainless steel has a long duration. It is also ductile, so it can be worked with.

Table 2.1. Typical Properties of Stainless Steel

Property	Value
Density	8.87g/cm^3
Melting point	1350°c - 1530°c
Modulus of elasticity	205 gpa
Thermal conductivity	16.2w/mk

B. Mild Steel

Mild steel is a more rigid material. Due to its carbon content it is malleable, so its easier to make it into sheets. It gets rusted faster if not coated properly. Mild steel is easy to work with, making it wieldable, machinable, cheap.

Table 2.2. Typical properties of Mild Steel

PROPERTY	VALUES
Density	7.7g/cm^3
Melting Point	927°C
Modulus of Elasticity	193-200 GPa
Thermal Conductivity	16.2W/mK

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C. Poly Vinyl Chloride (P.V.C.)

PVC is one of the most widely used plastic polymer in the world. About 40 million tons are produced per year. Its IUPAC (international union of pure and applied chemistry) name is poly (1-chloro ethylene). Its chemical formula C2H3CL

Table 2.3.Typical properties of Poly Vinyl Chloride.

PROPERTY	VALUES
Elongation at break	20-40%
Notch test	2-5kj/ m^3
Melting point	100°C - 260°C
Specific heat	0.9kj/(kg-k)

D. Aluminum Composite Sheets

Aluminum composite sheets is made up of three layers which are bounded to each other. In this two thin aluminum sheets along with the core in between is glued together. The strength and the lightness of this technology makes it popular and wide spread.

Table 2.4.Typical properties of Aluminum composite sheets.

PROPERTY	VALUES
Thermal resistance	0.0024-0.05w/(m-k)
Acoustic insulation	25dB-30Db
Thickness	40mm-200mm
Density	10-35kg/m2

III. MODELLING

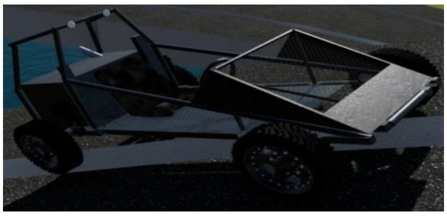
Fig 5.1 Front view of track buggy


Fig 5.2 Side View of track buggy


Fig.5.3 front view of track buggy


Fig. 5.4 Arial view of track buggy


Fig. 5.5 inclined view of track buggy

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The modeling of the track buggy was done using a software named Lumina software. It is a software that also has the capabilities to perform analysis. This is used in certain companies research and development department as it helps the user rectify and visualize certain faults and issues that might exist in the design.

IV. METHODOLOGY

First the basic design of our track buggy was made on a piece of paper. Then we bought a second hand auto rickshaw, this was gas powered. This was selected because we wanted a rear engine with the suspensions and chassis. Then the auto rickshaw was cut into half, leaving 18 inches of horizontal chassis from the suspension arm bed. The rest of the auto rickshaw except the engine and half the chassis was given up for scrap. Then huge lengths of rectangular mild steel channels were bought. These channels were used to fabricate the front chassis in which we constructed a C-box of 31 inches wide and 16 inches long. This was then welded to the auto chassis.

The front axle was the main part in our project as it played a vital role in the stability, safety and steering as well as downforce. After a lot thinking and segregation, the choice of axle was made which would meet our criteria, Hence Tata ace axle was chosen. The axle set was bought with the disk brake kit. The aim was to build a streamlined buggy, so the axle was cut short by 13 inches and making it 40 inches in width. The axle was cut short in the middle and welded with internal threads for strength. Then the rectangular mild steel channels were used to weld on the top portion of the axle where the body of the vehicle is bolted to. The other end of these two 12x4 inches rectangular boxes were welded onto the front chassis as well. Two 2 inches circular rods were welded onto the chassis to act as stoppers to the steering rod which limited the turning radius to be 2.5 inches.

The steering rods used here were from the Tata ace itself, which was made out to be 18 inch long. One end had bearings which were bolted to the axle. The other end was welded to plates with 1 inches wide hole, through which a 5 inch long bolt passes through, which takes up the action in steering. The bolt is in turn welded to a c-shaped plate of 5 inches, which in turn is welded to the steering bearing of maruti 800. The steering is mounted onto a rectangular box which is of dimensions 14 inches long, 4 inches wide and 2 inches high. This is welded to the chassis at 40 degree angle.

In our buggy, 4 inches wide auto tires are used. As the front axle was from Tata ace, the rims had to be bigger. As the rims were bigger a turning process had to be done for 2 rims for the auto tires to fit in. 2 inch spacers were inserted in the rear tyres and inverted the rim plate for the reason of making the tyres to come out. For the rear tyres the same auto rickshaw drum brakes were used where the cylinders and oil had to be changed for better performance. As they was no place to fit the disk brake kit for the front tyres it was left empty.

After the basic chassis work was finished the focused moved onto the engine. The auto rickshaw was a gas powered engine, so the first task was to convert it into a petrol engine. For this, the engine was dismantled and boring was done. After boring the engine, installation of new piston, piston rings, gasket kit, oil seals and smoothen the valves was done. The carburetor was replaced and a CT 100 carburetor was used for better performance and mileage. This carburetor was the only one fitting properly in the required space. The magnetic coil in the rickshaw that was purchased was of no use and we wanted the vehicle to have a self-start. For this reason, a CBZ magnetic coil was installed, which was a second hand. After all this, an Activa scooter petrol tank was purchased and bolted it to the chassis. This was selected as it had a good capacity to store, made up of metal and the shape was as required. After all this the battery was bought, which was the specified one for auto rickshaw.

The next work in hand was the cables, pedals, levers, and the key ignition system. As the vehicle was a rear engine, a long clutch as well as accelerating cables had to be used, as the placement of the pedals to be operated by foot. So a bajajchetak cable was selected for both. For the accelerating pedal, a RX 100 gear shifter was used and for the clutch pedal the brake pedal of RX 100 was used. The cables were passed through the chassis and tape was used to stick it. The brake pedal was of a Yezdi bike as the brake system was push rod drum brakes. This set was welded directly under the steering to the chassis. After all this, the starter was placed onto the steering mount and the connections were made to the main cable of current.

After all this, a piece of wood was cut out which was purchased from scrap exactly to the dimensions of the chassis. Then this wooden piece was placed on the chassis, the reason for choosing this was weight reduction and vibration. Then the seat was placed at 18 inches from the front of the chassis by making four holes onto the existing plate where the seat of the auto rickshaw used to be. The seat used was from the Tata ace vehicle which was fabricated into a bucket seat style and new leather. After the placement of the seat was done, the placement of the gear lever was done which was the Eterno gear shifter. As in India cars are right wheel drive, we placed the gear shifter to the left side of the seat by bolting 5 long bolts to the wood which was placed. To the gear lever a kicker of Yezdi was welded so it gives a stick like structure and made it a sequential gear shifter. The cable was then adjusted and fixed to the rear. As all cars have a reverse gear, a reverse gear lever was installed. This was taken from the auto rickshaw itself.

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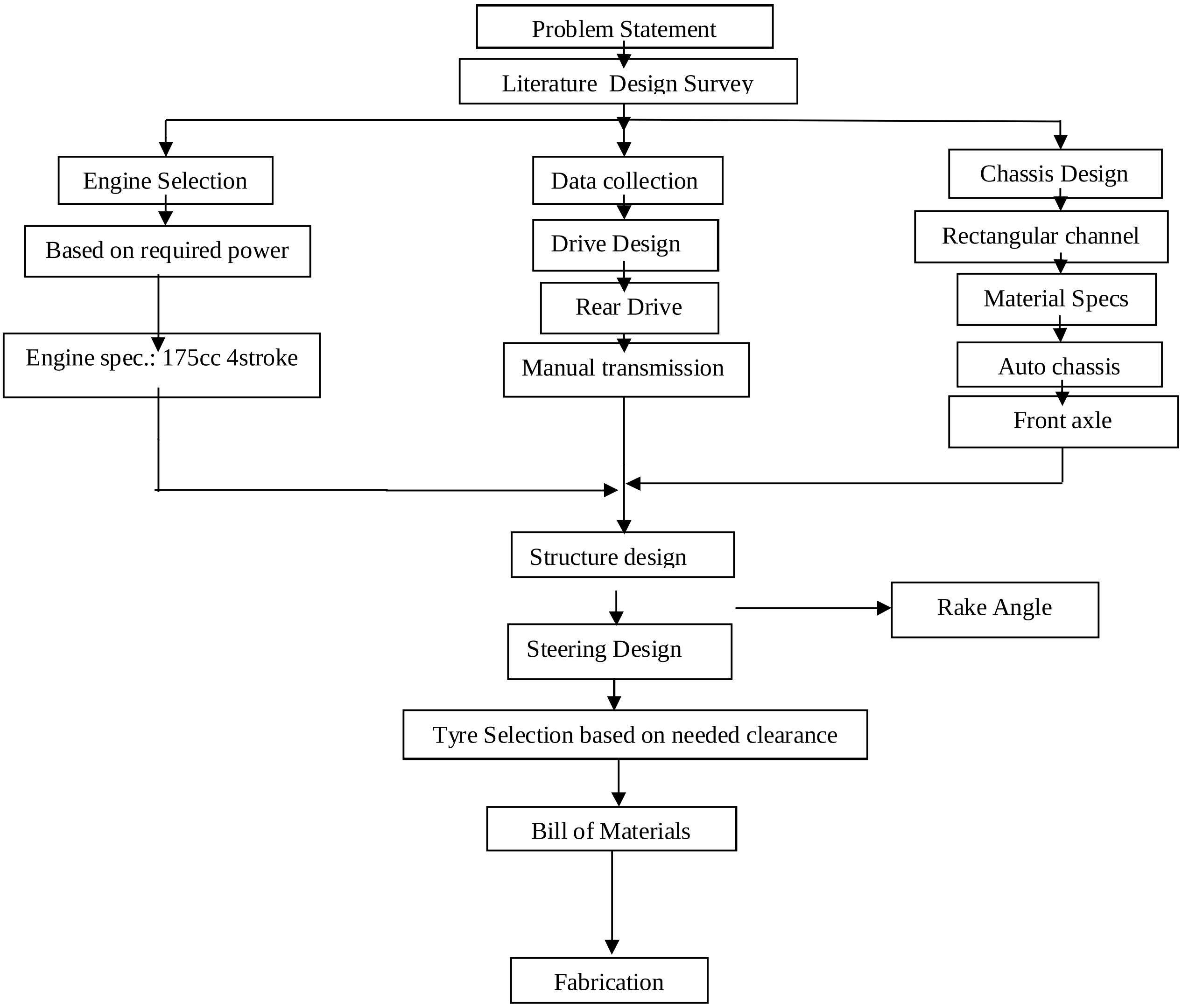
At the end safety had to be taken into consideration, which was to build a roll cage to provide safety in case of accident. As the whole vehicle was streamline designed, the roll cage was streamlined too. Also, thought of making a ramp kind of structure in front. The roll cage was build out of stainless steel rods of 1.5 inches' diameter. The entire roll cage was made out of 5 rods which was welded at different angles which was instead welded to 4x4 inches mild steel plates at the bottom of the vertical ones. The plates were welded in a manner where 2 were on the swing arms on either ends and the other 2 were welded at the front ends. The bottom plates were drilled with 4 holes, each of them were welded bolts. This was done to make the roll cage removable. Then 1 inch rectangular rods were used to build the ramp which was welded to the long 65 inches stainless steel rod. The sides of the ramp were covered using the aluminum composite sheets and a strip in the shape of a trapezoid at the nose of the car. The rest of it was covered by using 1-inch square box silicon net.

The engine was covered by making a box out of the aluminum composite sheets which were riveted to the beams. The complete box is removable making it easy to work on the engine. Two grooves were made on the top sheet, one was for the silencer and the second was for the petrol inlet. For a better look, PVC pipes were used to make a structure on the engine case making it removable. After the work was done the body was sprayed with primer and the complete vehicle was painted black using spray cans. Later carbon fiber stickers were used for better look. The vehicle was completed and it was tested.



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V. WORKING PRINCIPLE

The track buggy we build runs on 4 stroke petrol engine. A 4 stroke petrol engine works on the principle of 4 upward-downward movement of the piston inside the cylinder. The different strokes are suction stroke, compression stroke, power stroke and exhaust stroke. In the suction stroke or the first stroke, the fuel-air mixture enters the cylinder from the inlet valve. This pushes the piston from top dead center to bottom dead center. After the piston reaches the BDC, the second stroke starts. In the compression stroke the piston then compresses the air-fuel mixture moving along the cylinder to the TDC. As petrol engines are spark ignited, a spark plug placed at the top of the cylinder ignites the compressed mixture. The combustion of the mixture pushes the piston from TDC to BDC, this is the power stroke. At the end of power stroke, there are a lot of gases formed inside the cylinder which has to be drawn out through the exhaust valve. This is where the exhaust stroke comes in, where the piston pushes the gases outside while moving from BDC to TDC. The process keeps on repeating. The carburetor mixes the fuel from the petrol tank and the air from the air filter. The accelerating cable is connected to the top of the carburetor which has a pin-spring system to allow the amount of mixture to be sent according to the throttle response.This is a manual transmission vehicle, where it has 4 gears and one reverse gear. The gear system is cable operated, where we have fixed aEterno gear shifter to which a Yezdi kicker is welded to it. If one shifts the gear the cables in the gear shifter pulls as well as retracts to rotate the gear mechanism at the rear engine.

When the clutch pedal is pressed the clutch plates disengages from the transmission shaft and then the gear is shifted. Once you release the pedal the clutch plate engages and the engine power is transmitted to the wheels. The brakes used in this are drum brakes, where 2 drums consisting brake pads and cylinders. The drums are placed behind the rear rims. When the pedal is pressed a rod connected to it pushes backward pressing the brake oil from the container to move into the lines. These lines are connected to the drums at the rear. The oil gushes to the drums where it enters the cylinders filling it up. As they will be filling up it pushes the brake plates against the inner surface to slow down the speed and bring it to a complete stop. The design of the buggy is made in such a way that it helps in achieving greater speed and stability around corners. The buggy is made in a streamline shape for the reason of increasing the speed. The rear end seems to be wider than the front end, this helps to give more grip and stability just like in dragsters. The vehicle is low ride to reduce the drag force on it. Keeping the ride height low there is less amount of air going underneath therefore reducing the friction. If not a whirl will be produced which resist the movement of the vehicle. The front nose is shaped in the form of an arrow so as to break through wind and to provide down force. This avoids the vehicle to get into a wheelie at very high speeds.

VI. SPECIFICATIONS

A. Engine

Bajaj auto rickshaw engine came with an 175cc air cooled, single cylinder engine. This engine generates maximum power of 11bhp at 5000 rpm and maximum torque of 18 Nm at 3500 rpm. Its engine is coupled with 4 speed constant mesh gearing System. It gives a mileage of 35-40 km/litre.

B. Buggy Tires

Size- 4.00-8
Ply rating - 6&8
Weight - 6 kg
Dimensions - 49x11x49 cm

C. Axle Rod

Material - High strength Mild Steel
Length - 40 inches
Machine work - Cut-short 13 inches in centre and welded

D. Chassis

Auto chassis - 18 inches + engine bed
Fabricated chassis- 31x16 inches Mild steel channel

E. Roll Cage

Material- stainless steel rods
Diameter -1.5 inches

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F. Accessories

Steering – Momo brand racing steering wheel
Seat- TATA Ace fabricated
Spacers- Fabricated
Ignition system- Maruti 800
Gear lever- Eterno Gear shifters
Rims- Auto Rims
Pedals – Used parts such as gear lever and brake pedals from different vehicles
Foot rest- Fabricated
Engine casing- Using ACP sheets
Lights- Projector lamps

VII. ANALYSIS

A. Chassis Analysis

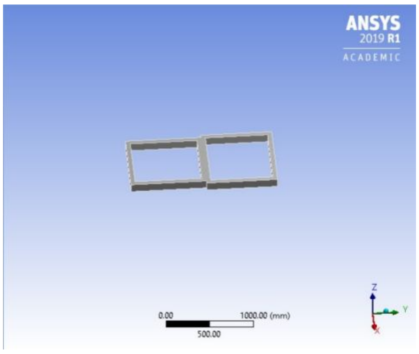

Fig.7.1. Basic Chassis

Table 7.1.Maximum Static Structural Results.

Object Name	*Total Deformation*	*Equivalent Stress*	*Equivalent Elastic Strain*	*Structural Error*
State	Solved			
Scope				
Scoping Method	Geometry Selection			
Geometry	All Bodies			
Definition				
Type	Total Deformation	Equivalent (von-Mises) Stress	Equivalent Elastic Strain	Structural Error
By	Time			
Display Time	Last			
Calculate Time History	Yes			
Identifier				
Suppressed	No			
Results				
Minimum	0. mm	4.3531e-004 hbar	2.2314e-008 mm/mm	4.6249e-006 mJ
Maximum	5.4013e-002 mm	0.43432 hbar	2.1838e-005 mm/mm	1.0639 mJ
Average	2.2274e-002 mm	0.10955 hbar	6.0132e-006 mm/mm	
Minimum Occurs On	base frame-FreeParts|PartBody			
Maximum Occurs On	base frame-FreeParts|PartBody			
Total				13.292 mJ
Information				
Time	1. s			
Load Step	1			
Substep	1			
Iteration Number	1			
Integration Point Results				
Display Option		Averaged		
Average Across Bodies		No		

Table 7.2 Minimum Static Structural Results.

Object Name	*Total Deformation*	*Equivalent Stress*	*Equivalent Elastic Strain*	*Structural Error*
State	Solved			
Scope				
Scoping Method	Geometry Selection			
Geometry	All Bodies			
Definition				
Type	Total Deformation	Equivalent (von-Mises) Stress	Equivalent Elastic Strain	Structural Error
By	Time			
Display Time	Last			
Calculate Time History	Yes			
Identifier				
Suppressed	No			
Results				
Minimum	0. mm	2.1766e-004 hbar	1.1157e-008 mm/mm	1.1562e-006 mJ
Maximum	2.7007e-002 mm	0.21716 hbar	1.0919e-005 mm/mm	0.26599 mJ
Average	1.1137e-002 mm	5.4774e-002 hbar	3.0066e-006 mm/mm	
Minimum Occurs On	base frame-FreeParts|PartBody			
Maximum Occurs On	base frame-FreeParts|PartBody			
Total				3.3229 mJ
Information				
Time	1. s			
Load Step	1			
Substep	1			
Iteration Number	1			
Integration Point Results				
Display Option		Averaged		
Average Across Bodies		No		

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B. Load Deformation

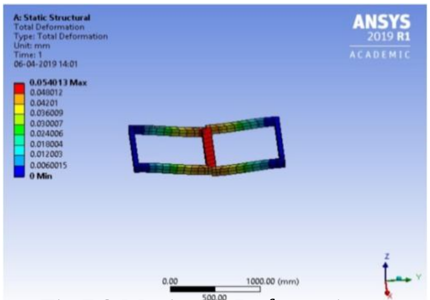

Fig.7.2 Maximum Deformation.

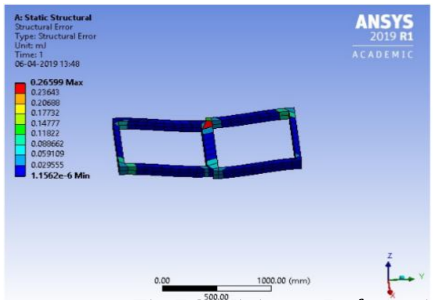

Fig.7.3 Minimum Deformation.

C. Strain

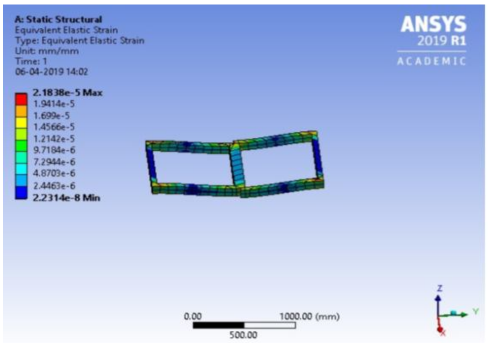

Fig.7.4 Maximum Strain.

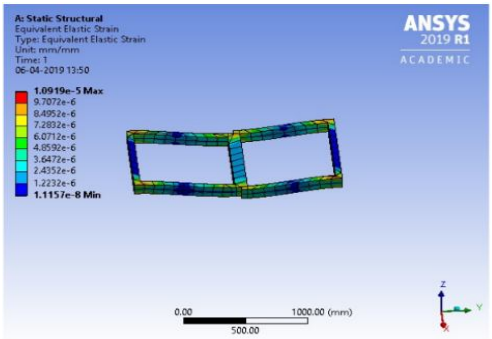

Fig.7.5 Minimum Strain.

D. Stress

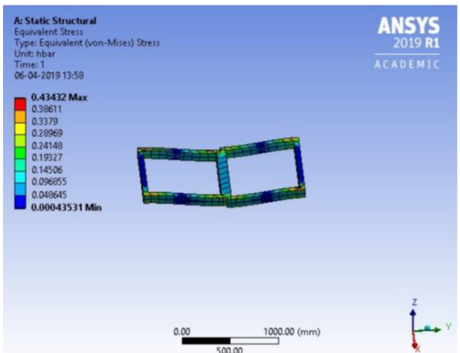

Fig.7.6 Maximum Stress.

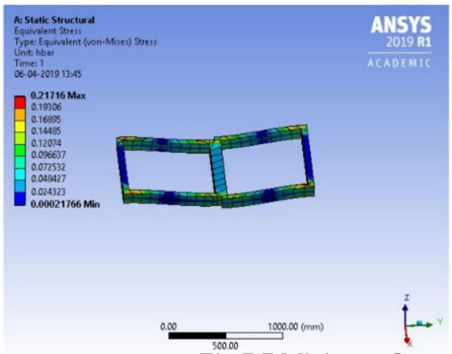

Fig.7.7 Minimum Stress

E. Structural Error

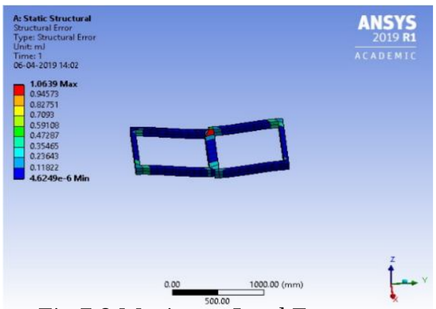

Fig 7.8 Maximum Load Error.

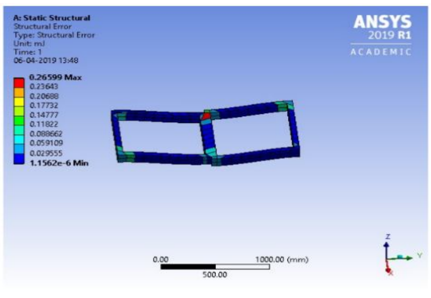

Fig .7.9 Minimum Load Error.

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Table 7.3 Summary of chassis:

Compressive Yield Strength hbar	Tensile Yield Strength hbar	Tensile Ultimate Strength hbar
25	25	46

Table 7.4 Total Deformation

Time [s]	Minimum [mm]	Maximum [mm]	Average [mm]
1.	0.	5.4013e-002	2.2274e-002

Table 7.5 Equivalent Stress

Time [s]	Minimum [hbar]	Maximum [hbar]	Average [hbar]
1.	4.3531e-004	0.43432	0.10955

Table 7.6 Equivalent Elastic Strain

Time [s]	Minimum [mm/mm]	Maximum [mm/mm]	Average [mm/mm]
1.	2.2314e-008	2.1838e-005	6.0132e-006

Table 7.7 Strain-life parameters:

Strength Coefficient hbar	Strength Exponent	Ductility Coefficient	Ductility Exponent	Cyclic Strength Coefficient hbar	Cyclic Strain Hardening Exponent
92	-0.106	0.213	-0.47	100	0.2

Table 7.8 Isotropic Elasticity

Young's Modulus hbar	Poisson's Ratio	Bulk Modulus hbar	Shear Modulus hbar	Temperature C
20000	0.3	16667	7692.3	

F. Axle Analysis

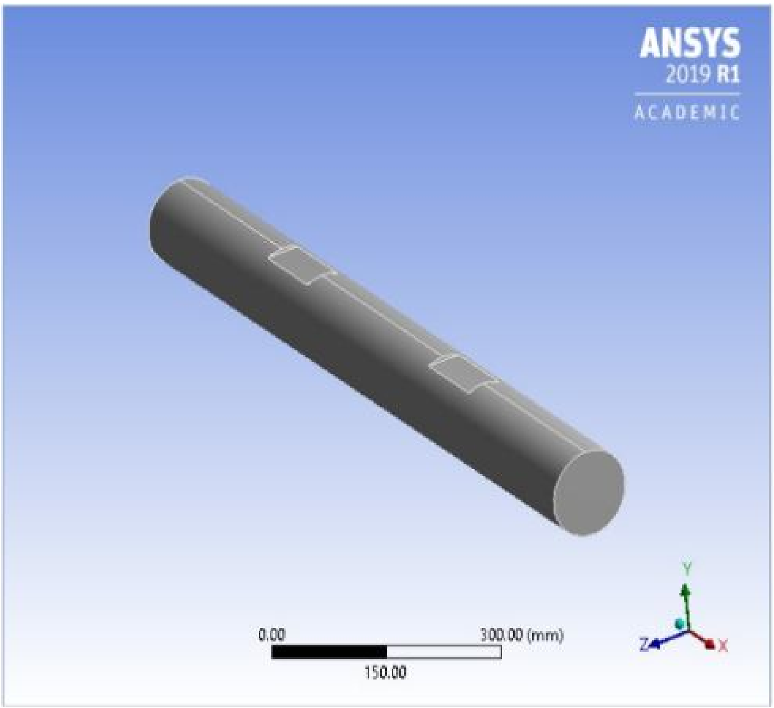

Fig 7.10 Basic Axle

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Table 7.9 Maximum Static Structural Results.

Object Name	*Total Deformation*	*Equivalent Stress*	*Structural Error*	*Equivalent Elastic Strain*
State	Solved			
Scope				
Scoping Method	Geometry Selection			
Geometry	All Bodies			
Definition				
Type	Total Deformation	Equivalent (von-Mises) Stress	Structural Error	Equivalent Elastic Strain
By	Time			
Display Time	Last			
Calculate Time History	Yes			
Identifier				
Suppressed	No			
Results				
Minimum	0. mm	1.3374e-003 hbar	6.6865e-005 mJ	7.3711e-007 mm/mm
Maximum	1.8416e-002 mm	0.46318 hbar	8.9057e-002 mJ	2.3313e-005 mm/mm
Average	1.1105e-002 mm	0.13048 hbar		7.5705e-006 mm/mm
Minimum Occurs On	front axel1-FreeParts|PartBody			
Maximum Occurs On	front axel1-FreeParts|PartBody			
Total			6.2196 mJ	
Information				
Time	1. s			
Load Step	1			
Substep	1			
Iteration Number	1			
Integration Point Results				
Display Option		Averaged		Averaged
Average Across Bodies		No		No

Table 7.10 Minimum Static Structural Result.

Object Name	*Total Deformation*	*Equivalent Stress*	*Structural Error*	*Equivalent Elastic Strain*
State	Solved			
Scope				
Scoping Method	Geometry Selection			
Geometry	All Bodies			
Definition				
Type	Total Deformation	Equivalent (von-Mises) Stress	Structural Error	Equivalent Elastic Strain
By	Time			
Display Time	Last			
Calculate Time History	Yes			
Identifier				
Suppressed	No			
Results				
Minimum	0. mm	6.6871e-004 hbar	1.6716e-005 mJ	3.6856e-007 mm/mm
Maximum	9.208e-003 mm	0.23159 hbar	2.2264e-002 mJ	1.1657e-005 mm/mm
Average	5.5527e-003 mm	6.5242e-002 hbar		3.7853e-006 mm/mm
Minimum Occurs On	front axel1-FreeParts|PartBody			
Maximum Occurs On	front axel1-FreeParts|PartBody			
Total			1.5549 mJ	
Information				
Time	1. s			
Load Step	1			
Substep	1			
Iteration Number	1			
Integration Point Results				
Display Option		Averaged		Averaged
Average Across Bodies		No		No

G. Load Deformation

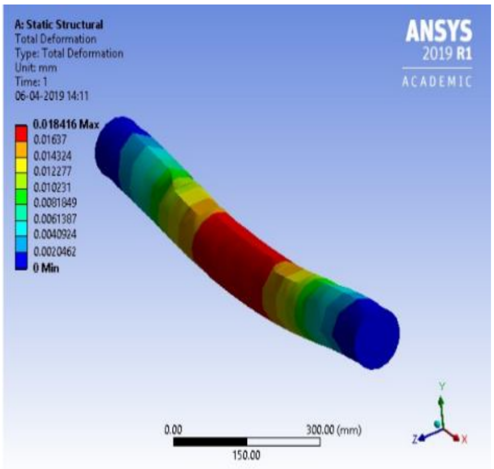

Fig.7.11 Maximum Deformation.

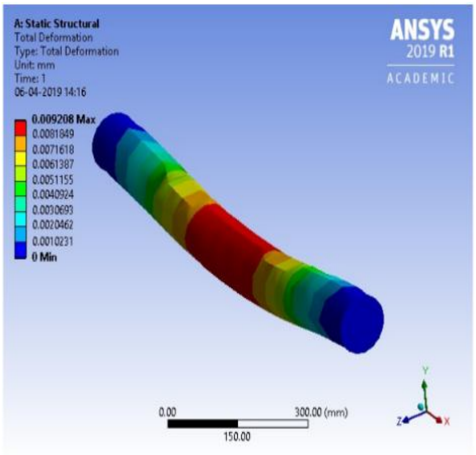

Fig 7.12 Minimum Deformation.

H. Strain

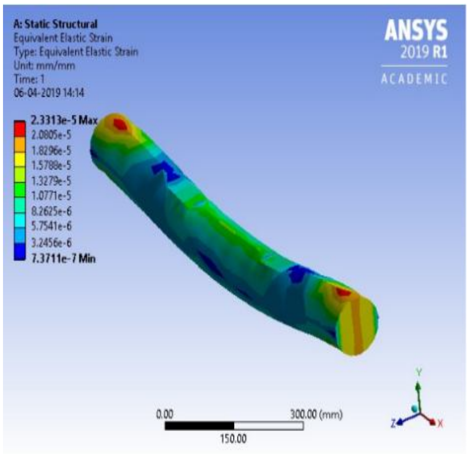

Fig 7.13 Maximum Strain.

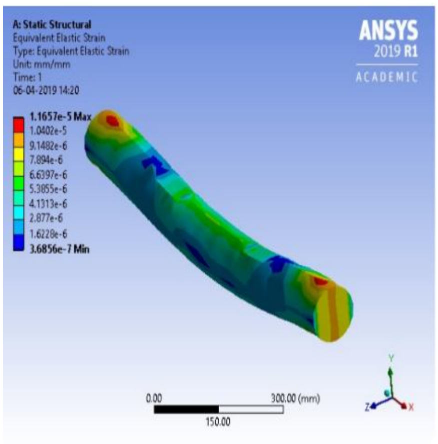

Fig 7.14 Minimum Strain.

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I. Stress

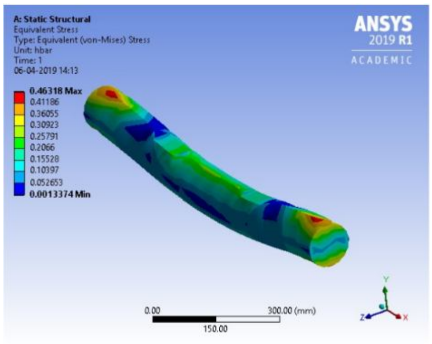

Fig 7.15 Maximum Stress.

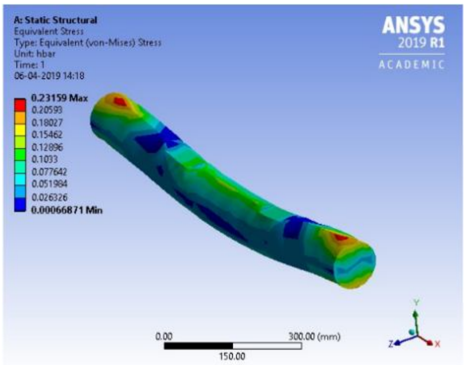

Fig 7.16 Minimum Stress.

J. Structural Error

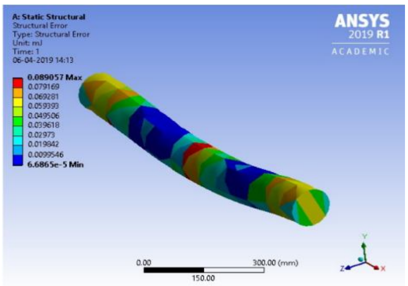

Fig 7.17 Maximum Load Error.

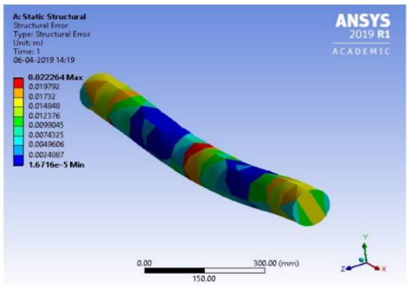

Fig 7.18 Minimum Load Error.

Table 7.11 Summary of Axle

Compressive Yield Strength hbar	Tensile Yield Strength hbar	Tensile Ultimate Strength hbar
25	25	46

Table 7.12 Total Deformation

Time [s]	Minimum [mm]	Maximum [mm]	Average [mm]
1.	0.	1.8416e-002	1.1105e-002

Table 7.13 Equivalent Stress

Time [s]	Minimum [hbar]	Maximum [hbar]	Average [hbar]
1.	1.3374e-003	0.46318	0.13048

Table 7.14 Equivalent Elastic Strain

Time [s]	Minimum [mm/mm]	Maximum [mm/mm]	Average [mm/mm]
1.	7.3711e-007	2.3313e-005	7.5705e-006

Table 7.15 Strain-life parameters

Strength Coefficient hbar	Strength Exponent	Ductility Coefficient	Ductility Exponent	Cyclic Strength Coefficient hbar	Cyclic Strain Hardening Exponent
92	-0.106	0.213	-0.47	100	0.2

Table 7.16 Isotropic Elasticity

Young's Modulus hbar	Poisson's Ratio	Bulk Modulus hbar	Shear Modulus hbar	Temperature C
20000	0.3	16667	7692.3	

VIII. RESULT

The Track Buggy was successfully fabricated, which has never been built before. After all the hours of hard work and pain we went through, the project was completed in a spectacular manner. We have actually learnt a lot from this project, we learnt a lot about engines and the amount of work that goes into building a vehicle is immense. We tested this project on road and have achieved max. speed of 100 km/hr. We also tested the mileage of vehicle and found it to be 35kmpl. During this test we analyzed the stability and safety of the vehicle. We would love to bring this project into mass production in future and see it making history in the racing field. We conducted analysis on the chassis of our track buggy and compared it to a go-kart. The track buggy we build can take a load of about 750kg while a go-kart can withstand much less.

IX. CONCLUSION

The Track Buggy was made with hard work and a lot of time. For two months we went to the garage and worked on the project. We started our journey first with the designing the purchasing of parts slowly from different places. We went to different places to see who would give us a better rate for our parts. Most of the parts we used second hand products as well as scrap material. We searched online for help and guide lines for our project but as there weren’t any journals, we had to combine a couple of patent papers to get a basic idea. We did take few ideas from the Flip car which was used in FAST 6 movie series. In the end we think the project came about fairly nice and this might probably change the future of racing cars in India.

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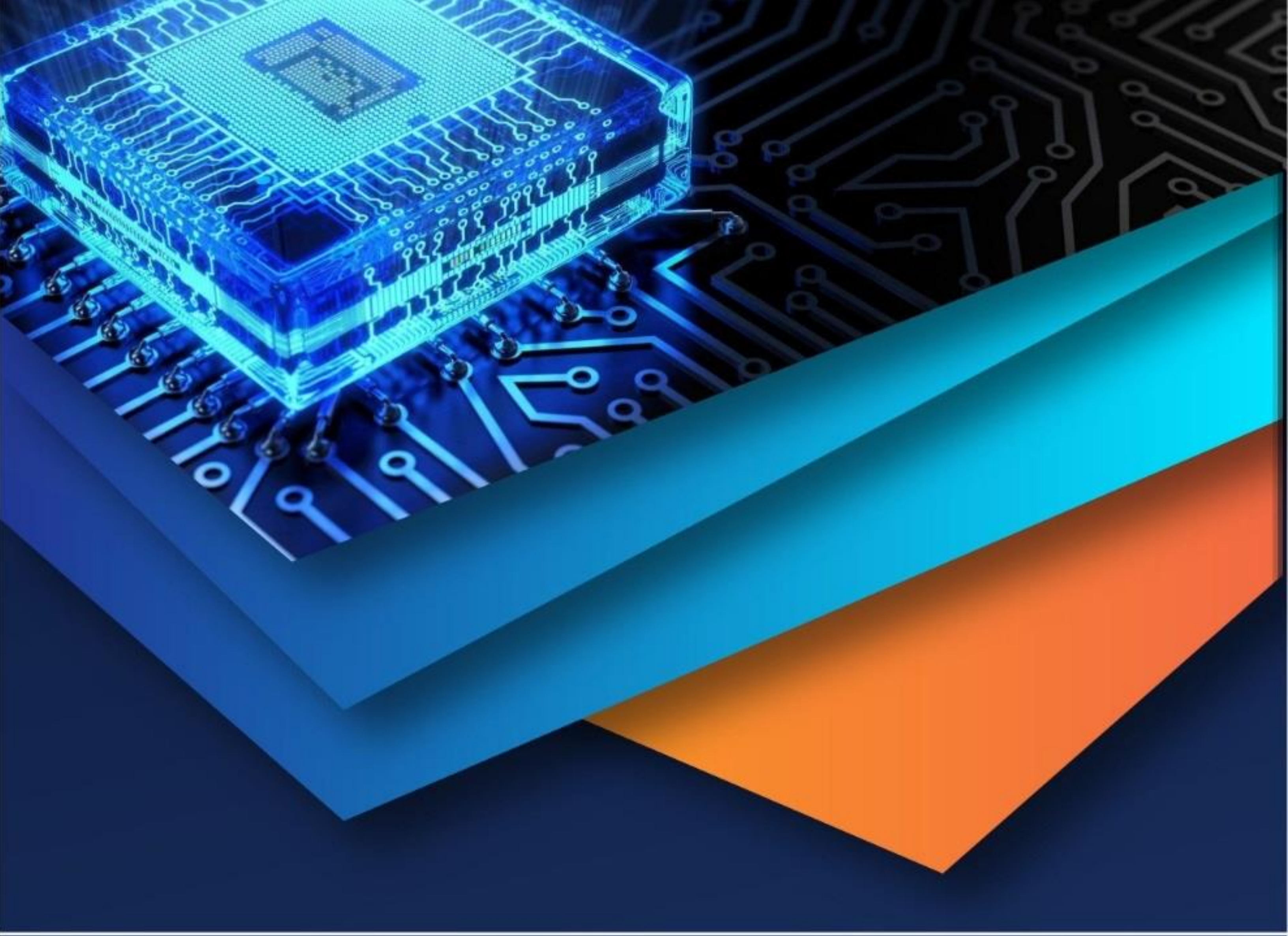

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