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Fabrication and assembly on custom parts of Hydraulic Braking system used in ATV

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Abstract—*In an automobile vehicle, braking system is an arrangement of various linkages and parts which works together in co-ordination to stop or restrict the motion of vehicle. The braking system is the most importance in accordance of conforming the driver's safety.so the components were manufactured after the design and analysis of the brake parts are properly done and also proper material selection is done for parts to manufactured there are three parts of brakes which are manufactured which the other parts are purchased from the market so the brake pedal , brake disc and brake mountings are components which are manufactured by using different manufacturing process, machines etc. [1]. The parts are efficiently manufacture so there is no wastage of material so proper dimensions with weight is calculated and after manufacturing of these parts proper arrangement is the major issue in the Electric ATV as there is a space related constraints and also the drivers ergonomics is taken into consideration after manufacturing of certain parts certain brake parts are arranged such as brake lines so while manufacturing braking parameters all these parameters are taken into consideration so this paper tells how "how fabrication and assembly of braking system is done in Electric ATV" so this paper tells about in short how the production of certain parts takes place and how properly he parts can be arranged in an assembly*

Keywords—*Braking system, brake disc, brake pedal, brake mountings.*

I. INTRODUCTION

The work presented in this report is based on how the fabrication and assembly of Hydraulic Braking system is done in electricATV. First thing before manufacturing and fabricating the components are designing and analyzing the components of braking system by the design and analysis department is done and according to that the material selection and also proper manufacturing technique is selectedand main focus proper arrangement of brake assembly according to driver ergonomics .driver safety is the main reason for which this system is manufactured so the main factors for selecting the material is good machinability,magnetic properties,good thermal conductivity we selected different material for brake disc for testing purpose.

1.1 Project Objective: -

proper working of braking system i.e. subsystem like brake pedal, brake disc and master cylinder mount should not fail at any condition and also the brake assembly should be done in such a way that it should not affect the driver ergonomics and also the assembly should not affect the fabrication of other department in electric all-terrain vehicle. So, we consider all the parameters while fabricating it in our electric ATV.[2]

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1.2 About Project: -

we are doing our project on electric ATV which is an all-terrain vehicle in these we have[various people working on varioussystem of ATV but we are actually focused on driver safety that is basically provided by the hydraulic braking system so we have design and analyzes this system parts in cad software's parts such as brake disc, brake pedal and master cylinder mount and brackets required for braking which are manufactured while the remaining parts are brought or directly purchased from car market that are called oem's. In our ATV there is an inboard braking system used in rear side so as to reduce the weight and cost of the vehicle. In these inboard system the brake disc and caliper assembly is mounted on the gearbox basically on the drive shaft so that while braking it would actually stop the transmission system for transmitting the power to the rear wheels of vehicle so for that parts of system the manufacturing is done according to the need of for transmission and brake department work together for that kind of case.[3],[7] Material selected for manufacturing of components are SS 420 and EN8 and the machining technique used for making those components by the help of this material is laser cutting brake disc along with spares were made in laser cutting the time consumption while using this technique was less so other parts were also manufactured by using those technique the after that proper assembly of the parts was done in the vehicle by the help of brackets which were welded on the vehicle for assembly of the components and for connecting the components to the bracket Allen bolts were used for that purpose after assembly of all brake parts bleeding was done and checked whether the braking system is working properly in steady condition that while pressing the actual pedal assembly the and actual testing we see whether the braking system work is properly when the vehicle is in moving condition.[4]

II. PROBLEM DEFINATION

Manufacturing is a critical phase which should be properly done if any problem takes place while selecting any manufacturing process it may lead to failure of the brake component as in the case we made the pedal assembly components by plasma arc welding but there were some problems in the components which were manufactured by this process and also while welding the brackets or mount of brake assembly there were some issues such as excessive material was introduced in the welded section or due to this expansion or retraction of those brackets takes place which leads to improper assembly or disturb the entire braking system[5]

III. PROPOSED METHODOLOGY

The braking system can be properly manufactured and assembled by overcoming the above problems by bringing effective solution over this basically first step by selecting proper material for manufacturing of brake components such as brake pedal, brakedisc, brackets and mounts for the brake assembly so for brake disc only ss420 sheet was used while the other parts such as pedal, brackets and mounts are made up of en8 sheet as the cost of the material is less and also easy availability after selecting and buying the next step is selecting proper machining operations for manufacturing brake components so laser cutting was considered as plasma arc produced some changes in dimensions so for getting those dimensions we used laser cutting instead of laser cutting but after laser cutting also there were problems so as there were deflection in brake disc due to that high intensity laser so this can be done by using lapping process and then the brackets were welded by the help of normal welding by some packing were placed between the brackets before welding so that the expansion or contraction of the brackets may not place and also due to this proper braking assembly can be done in rear side to reduce the weight inboard braking system is used to make the rear disc the we discussed this with the transmission and according to that the disc is manufactured as this brake disc is to be attached togear box so if the proper clearance is maintained and main factor is if this is working properly or know. And other parts of braking system are purchase from markets and assembled to the electric ATV so this are the parameters which are considered.[8]

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IV. MATERIAL SELECTION AND METHOD USED

PARTS	MATERIAL	PROPERTIES	MACHINING
Disc brakes	SS420	Yield strength-380Mpa,density-7.74 g/cm^2,thermal conductivity-24.9 W/m/k	Laser cutting
Brake pedal	EN8	Yield strength-450Mpa,Maximum stress-700 to 850 Mpa	Laser cutting
Brackets	EN8	Yield strength-450Mpa,Maximum stress-700 to 850 Mpa	Laser cutting

PARTS	MANUFACTURED /PURCHASED
Master cylinder	Purchased
Brake caliper	Purchased
Brake switch	Purchased
Brake line	Purchased
Brake light	Purchased
Brake oil	Purchased
Brake disc	Manufactured
Brake pedal	Manufactured
Brackets	Manufactured

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FIGURE 1:DISC BRAKE

FIGURE 2:DISC BRAKE

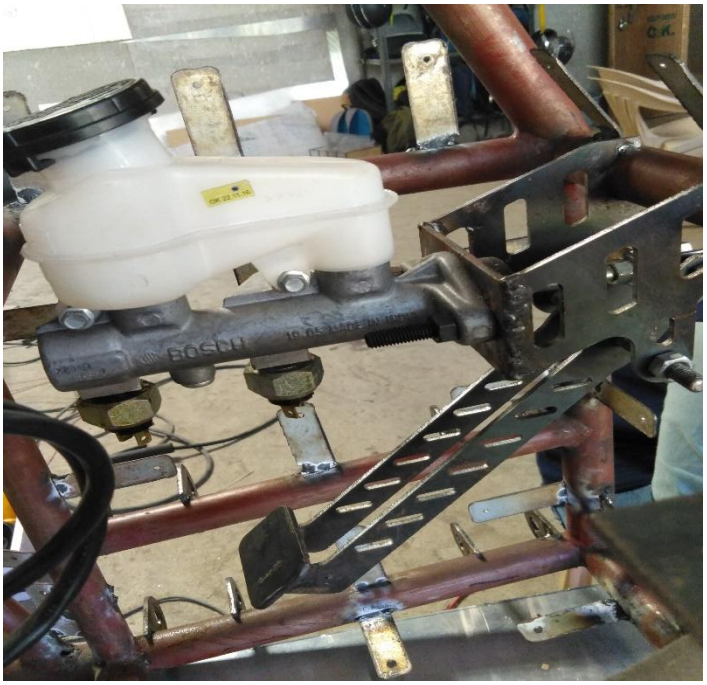

FIGURE 1:DIFFRENTIAL BRAKE SYSTEM

V. CONCLUSION

As per the actual design there were some problems while manufacturing the parts so some iteration were done and also we came to know how much material is required and according to that proper arrangement is done in laser cutting display and before actual manufacturing of the design part so the expert in that machining technique help us in changing the design and also told us the problem by this parameters or factor present in this design how the manufactured part may be affected or how the

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manufacturing technique is affected and the next part is assembly of the parts we came to know what precaution should be taken while welding the brackets.so according to this we conclude that proper precautions must be taken while fabricating and assembling the parts.

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