International Research Journal of Engineering and Technology (IRJET) e-ISSN: 2395-0056
Volume: 09 Issue: 01 | Jan 2022 www.irjet.net p-ISSN: 2395-0072

Comparative Study of Different Motors for Electrical Vehicle Application

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Abstract - Relative investigation of various motors assists us with deciding the benefits of each motor and its appropriateness for electric vehicles(EV). Motors are sorted in different kinds like AC, DC, Synchronous, Switch reluctance, brush-less DC and so on These motors are utilized in different EVs according to the qualities necessities. Conventional vehicles are driven by IC Engines and consequently they consume gas, petroleum into carbonic acid gas in this manner influencing the climate. The utilization of EVs decreases the utilization of petroleum products and eventually diminishes the unfavorable impact of it on the climate. Hence, these vehicles replace the internal combustion engine inside the vehicles and cars with electric motors

Key Words: BLDC Motor, DC Motor, Simulation, Matlab Simulink, Electrical tricycle.

1. INTRODUCTION

Electrical vehicle is an elixir of life considering the distant pollution. I have made this tricycle after studying all the benefits of electrical vehicle in order to reduce the pollution in the environment due excessive use of fuel peoples attention has been shifted from ic engine vehicles to electric vehicles.the ic engine is running on internal combustion engine so their was lot of change in the environment but electrical vehicle is run on various types of motors. Their are many types of electric vehicle available in the market but according to its effect different types of motor are used for different types of electric vehicles the eclectic motor is compared with the other eclectic motor so that one can choose the best motor among them. Their are five main eclectic motor types,dc motor, induction motor permanent magnet synchronous motor srm motor & BLDC motor .after studying all of them & decided to go with BLDC motor and make a proper prototype model of it ,which i shown in my project in electric tricycle electrical strength is changed over into mechanical strength .this rotational strength is carried out to a vehicle wheel through the best possible transmitting device. And the other is that the proper type of electric bicycle that i have made with the help of MATLAB software & simulation result is given below with feedback .

2. SELECTION OF A SUITABLE MOTOR FOR ELECTRIC VEHICLES

Three bikes with Internal Fuel Engine (ICE) and flexible / electric engines have two rear wheels, front or four wheels. The engine with new wheels uses different engines fitted inside the wheel to propel the EV. Internal tire engines have been the test site for the past decade. The use of wheelchair design is effective in the life and production of electric vehicles. Better control of electric vehicles can be considered with four-wheel drive engines. This strategy works by controlling each haggle full load setting. It is possible to improve speed, power control and also reduce speed on electric vehicles using tricycle configurations inside the wheels. The essential components of a thirteen electric bicycle generating are summarized as follows Non-perilous security and assurance of the climate; Independence;

Appropriate distance (minimum distance at around 50 miles where two travelers weigh 166 pounds and are driven at 45 mph1)

 Accelerated charging time (Battery charger will actually need to recharge a large battery with full charging mode in any uncharged mode for less than 121 hours);

10-15 seconds at a speed of 0 to 100 Km / h has the option to drive a slope of 5 to 10 percent at a permissible speed under full load conditions (minimum compensation of 4001 pounds)

3 BESIC ELECTRICAL TRICYCLE (PROTOTYPE)

Fig 1 : Schematic diagram of the Tricycle drive EV model

Project hardware are as shown in fig in this project i used 6 inch of iron mold for shaft connection .the left right shaft is connected to the BLDC motor and that's why this hardware made back wheel drive prototype hardware in this prototype i have also connected ultra sonic sensors for recognizing obstacle-and avoiding accidents feedback is given to the feedback controller by logic controller

SR NO	DISCRIPTION	VALUE	UNIT
1	MASS	2	KG
2	NO OF IN WHEEL MOTOR	1	-
3	HORIZONTAL DISTANCE FORM CG TO FRONT WHEEL	9.5	CM
4	HORIZONTAL DISTANCE FORM CG TO REAR WHEEL	7.5	CM
5	LENGTH	44	CM
6	WIDTH	30	CM
7	HIGHT	22	CM
8	RADIUS OF WHEEL	7	CM
9	DIAMETER OF WHEEL D=2*R	14	CM

Table 1 : Specification of hardware

4. RESULTS

1. STATOR CURRENT-

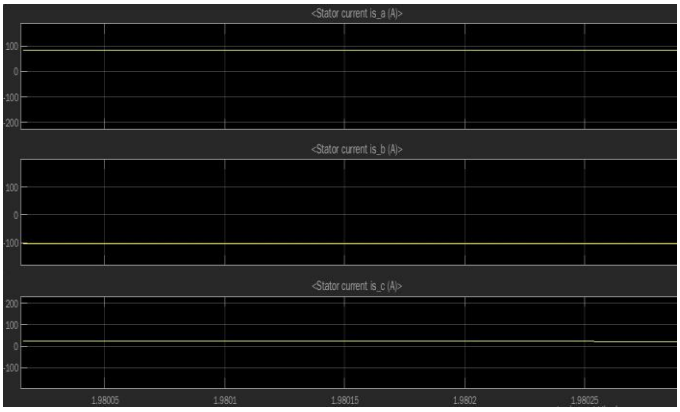

Fig 2 : Stator Current

2. BATTERY VOLTAGE-

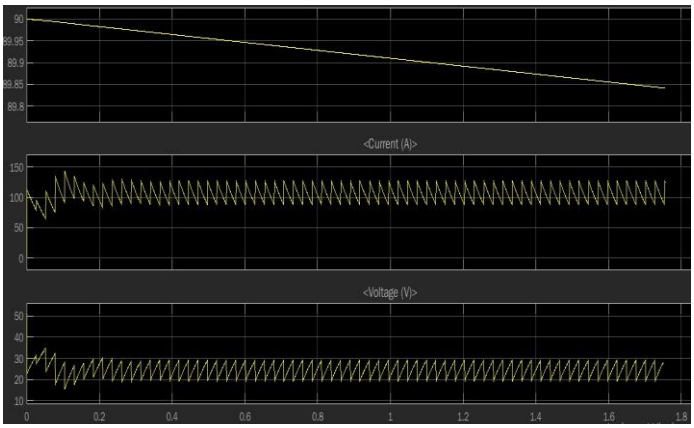

Fig 3 : Battery Current - Voltage

3. HALL EFFECT -

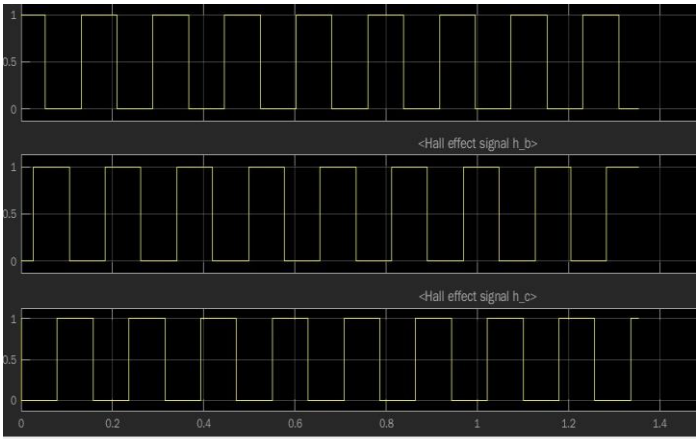

Fig 4 : Hall Effect

4. BACK EMF

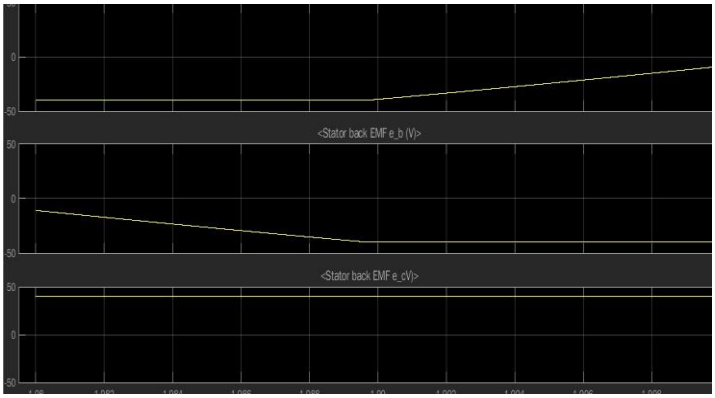

Fig 5 : Back EMF

5. ROTOR SPEED AND ELECTROMAGNETIC TORQUE

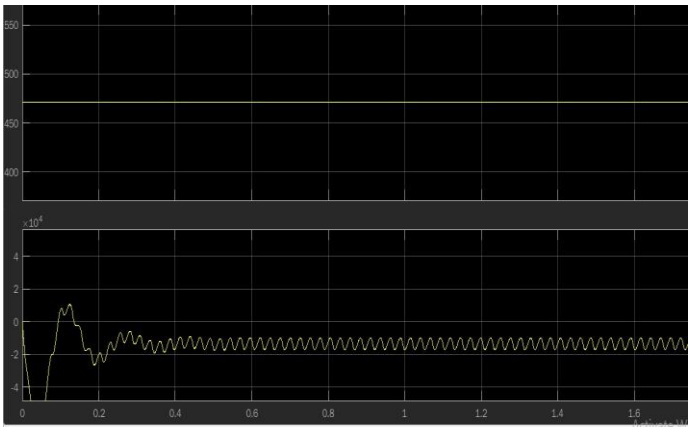

Fig 6 : rotor speed&electromagnetic torque

SIMULATION DISCRIPTION

As per the result of the simulation i will try to give a information about it. Stator current is as shown in fig 2 in a stator current simulation result, all the result appear to be a little bit constant .In fig 3 shows battery current and voltage as well as our result show that the graph of its action is slight slop in that direction and voltage fluctuates .When you look at fig 4 you can see the result of the hall effect signal. Similarly we find the result of back emf in fig 5 and in fig 6 it shows the rotor speed and electromagnetic torque.

6. CONCLUSION

An electric tricycle has been tested in the field and performance has been tested. The results show that a three-wheeled electric bike has a better chance in rural and urban areas than lightweight grid bikes. The battery bank in this electric tricycle, will really help reduce the pressure on the grid and at the same time provide a green transport solution for the country. Also, the initial cost of cycling and the low complexity of the system make the system more economically viable than other solutions.

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BIOGRAPHIES

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