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CONVERSION OF SCRAP IC SCOOTER TO EV SCOOTER

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ABSTRACT

Reduced Emissions, Sustainable Transportation, and Lower Running Costs: Electric motors are typically cheaper to operate than gasoline engines. The cost per kilometer traveled is significantly lower with an EV scooter due to lower electricity prices compared to gasoline

Keywords: EV Vehicles, EV Scooter, Go Green, Save The Environment.

I. INTRODUCTION

An EV is defined as a vehicle that can be powered by an electric motor that draws electricity from a battery and is capable of being charged from an external source. An EV includes both avehicle that can only be powered by an electric motor that draws electricity from a battery (all-electric vehicle).

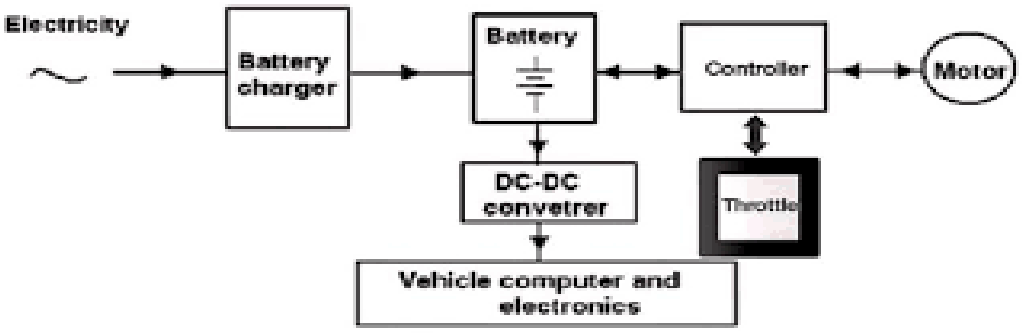
Rider Input: When you twist the throttle, you send a signal to the controller.

Power Delivery: The controller regulates the flow of electricity from the battery to the motor based on the throttle position.

Motor Action: The motor receives the electrical current and converts it into rotation, propelling the scooter forward.

Braking: When you squeeze the brake lever, the controller cuts power to the motor and may also activate regenerative braking.

II. BLOCK DIAGRAM OF POWER TRANSMISSION



E-Scooter

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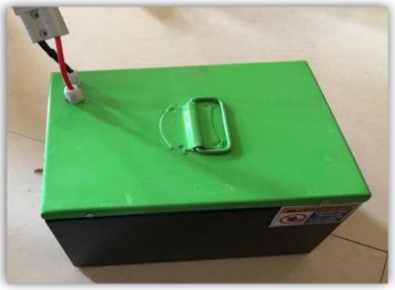
III. IMPORTANT COMPONENTS

Hub Motor (1500W) 10 inch Rim size

DC/DC Converter
(Input Volt 36V to 72V
Output Volt 12V +- 0.5V)

Controller or Control Unit (Rated Voltage 48-60V) Current: 30A



Battery Pack Li ion 48V 30 ah

Charger

Display and Ignition

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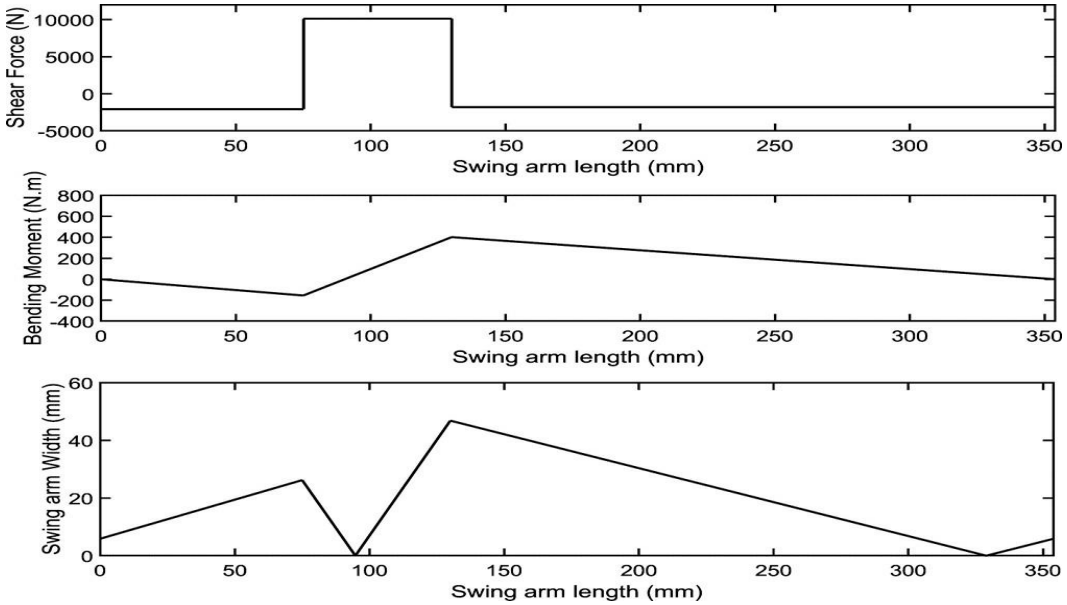
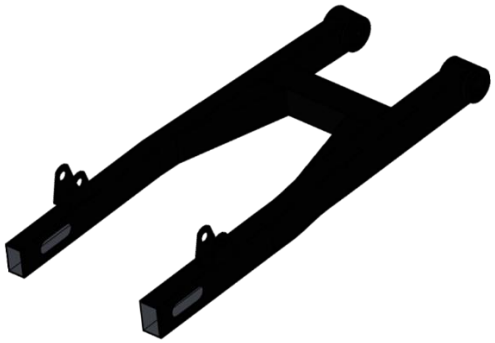
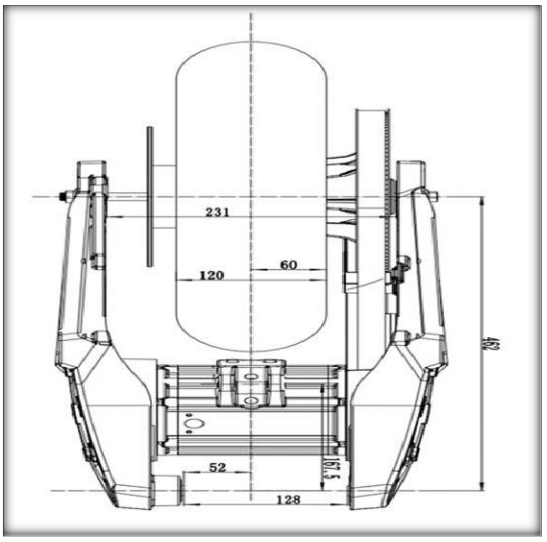
IV. DESIGN AND FABRICATION OF SWING ARM







V. MODELING AND ANALYSIS

The specifications of motor are as follows: Speed of Motor (N) = 960 rpm, Volt (V) = 48V and Power (P) = 1500 W

Power = I * V

Therefore Current (I) = 1500/48 = 31.25 ATorque of motor, T = (Px60)/ (2x3.14xN)

T = (1500x60)/(2x3.14x960)

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T = 14.92 N-m

Therefore the torque at the motor, T = 14.92 N-mThe specifications of motor are as follows:

Speed of Motor (N) = 4000 rpm, Volt (V) = 48V andPower (P) = 1500 W

Torque of motor, T = (Px60)/(2x3.14xN)T = (1500x60)/(2x3.14x4000)

T = 3.58 N-m

Therefore the torque at the motor, T = 3.58 N-m

CALCULATIONS OF BATTERY

The specifications of battery are as follows:

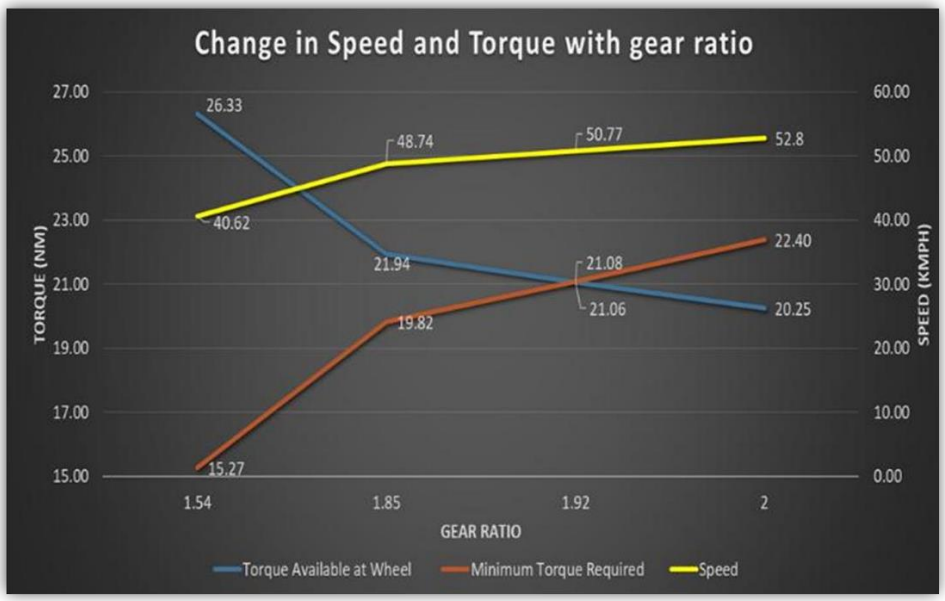
Volt (V) = 48V, Power (P) = 1500 W and efficiency is 90%AH= time x rated output power / voltage x efficiency = 1 hr. x 1500w / 48 x0.9AMP hour= 34.72 ah

Therefore, to run the 1500w motor for 1 hour, 48V & 34AhBattery is needed.

ADVANTAGES AND DISADVANTAGES OF EV

Advantages	Disadvantages.
1. Environmentally Friendly.	1. Limited Range.
2. Lower Running Costs.	2. Safety Concerns.
3. Convenience & Urban Mobility.	3. Weather Dependence.
4. Fun & Recreational Activity.	4. Regulation and Infrastructure.
5. Reduced Traffic Congestion.	5. Uneven Availability and Accessibility.
6. Sustainable Transportation Option.	6. Charging Infrastructure.
7. Space-Saving & Efficient Parking.	7. Potential Battery Issues.
8. Potential Health Benefits.	8. Longer charging time.
9. Quieter Operation.	9. Electricity isn't free.
10. Technological Advancements.	10. Potential for Improper Use.

VI. TORQUE VS SPEED CHARACTERISTICS



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COST ESTIMATION

COMPONENT	QUANTITY	PRICE
SCRAP SCOOTY	1	6,000 RS
HUB MOTOR	1	7,000 RS
LI.ION BATTERY	1	18,000 RS
DC TO DC CONVERTER	1	3,000 RS
THROTTLING LEVER	1	1,600 RS
FABRICATION OF SWING ARM	1	3,500 RS
OTHER SMALL COMPONENT		3,000 RS
TOTAL	6	40,100 RS

ACTUAL COST

COMPONENT	QUANTITY	PRICE
SCRAP SCOOTY	1	6,000 RS
HUB MOTOR	1	9,000 RS
LI.ION BATTERY	1	22,000 RS
DC TO DC CONVERTER	1	3,000 RS
THROTTLING LEVER	1	1,600 RS
FABRICATION OF SWING ARM	1	5,500 RS
OTHER SMALL COMPONENT		3,000 RS
TOTAL	6	48,100 RS

VII. CONCLUSION

- The decision to convert an IC to EV depends on priorities and resources.
- Good Option If: You're environmentally conscious, prioritize low running costs, and have the budget and technical skills (or access to a qualified mechanic) for the conversion.
- Convert Your Scooter if: You have the technical skills or can hire a professional for conversion.
- Before You Decide: Research conversion parts for your scooter model. Evaluate your technical skills and tools. Consider the scooter's condition and value.
- Resources are available online: Find communities of EV enthusiasts for specific advice on your scooter model.

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