SNS COLLEGE OF TECHNOLOGY

Coimbatore-35
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DEPARTMENT OF AGRICULTURE ENGINEERING

19AGB301-FARM TRACTORS

III YEAR V SEM

Topic : Case study of Ev tractors

ABSTRACT

A farmer always tries to make farming easy and accomplish it in a way so that less amount of money or labour is needed. The main cost due to which Farming becomes expensive is the use of Tractors. Tractors consume a lot amount of fuel which adds to the cost. But tecnology has came to rescue and provided a solution. The use of DC Batteries in place of Fuel proposed by Electrical Engineering world has given Farmers a less expensive and reliable machine known as Electric Tractor. Due to Electric Tractor, Farming becomes easy and economical.

INTRODUCTION

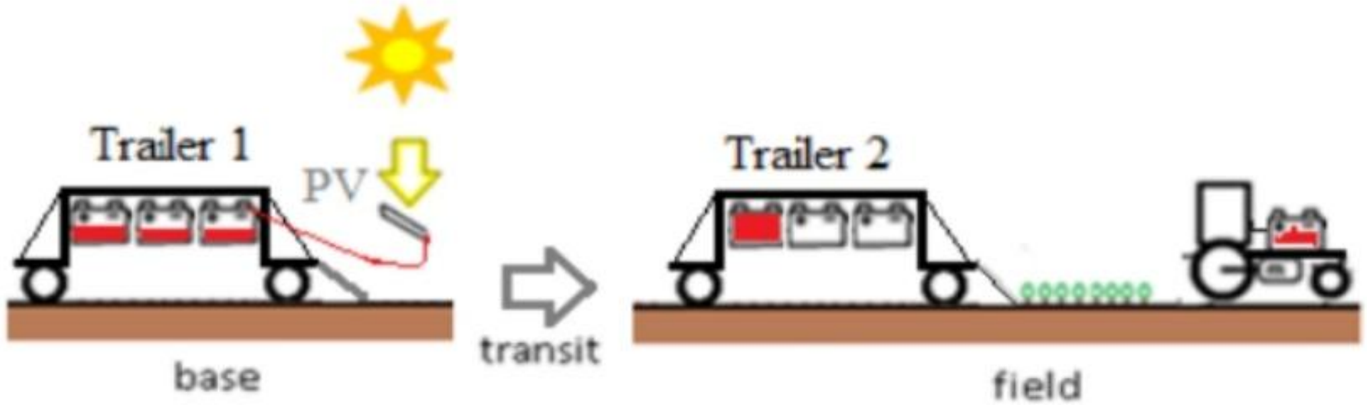
With the deterioration of environments and increase of energy depletion, developing agriculture with environmental friendliness, resource conservation and high efficiency is prospective and necessary. Some special ag ricultural environments such as greenhouse and courtyard agriculture, have more and more urgent needs for agricultural machineries with zero emission, no pollution and low noise. By using a tractor, tasks like ploughing, tilling and planting etc. have been carried out every day. These tractors cause a lot of pollution due to emissions from diesel engines, which may directly affect t he crop. Tractors use petroleum based fuels mainly diesel.

ELECTRIC MOTOR

In Sonalikas Tiger Electric, the motor selected is a 11 kW, three- phase induction motor, the motor is rated to be IP67 water and dust resistant, this will make sure that electrical systems are not affected by the splashing water while working in mud and flying dust while working in dry field. The Sonalika Tiger Electric tractor is equipped with an Etrac motor that is claimed to offer high power density and high peak torque with zero RPM drop for optimal performance

BATTERIES

A battery is a device consisting of one or more electrochemical cells with external connections for powering electrical devices. In Tiger Electric, the motor is paired with an IP67-compliant 25.5kW natural-cooling compact battery that can be juiced up to 100 per cent using a regular home charging point in 10 hours. Sonalika is also offering an optional fast-charging system, which can charge Tiger Electric's battery in four hours. The new Tiger Electric tractor is equipped with the Sonalika transmission. It offers a top speed of 24.93kmph and a battery backup of 8 hours while operating with a 2-tonne trolley.



MOTOR CONTROLLER

Motor controller is the electronics package that operates between the batteries and the motor to control the electric vehicle‘s speed and acceleration much like a carburetor does in a gasoline powered vehicle. The controller transforms the battery’s direct current into alternating current and regulates the energy flow from the battery.

BATTERY MANAGEMENT SYSTEM

A Battery Management System is an electronic system that manages a rechargeable battery (single cell or battery pack) by monitoring its state, calculating secondary data, reporting that data, protecting the battery, controlling its environment, and/or balancing it.

MAXIMUM POWER POINT TRACTOR

In case we have Hybrid Electric Vehicle using Battery and Solar power both, then we have to install MPPT in it. MPPT regulates the current generated by the solar panels, if solar panels are working at maximum efficiency then MPPT supplies current directly from Solar panels to motor cutting of the supply from battery, if solar panels are not at full efficiency then it charges the battery and does not provide supply directly to the motor. If the tractor is not working then it charges the battery

ADVANTAGES

- ECO- FRIENDLY
- COST – EFFECTIVENESS
- EFFICIENCY
- REPAIR ANDMAINTENANCE

CONCLUSION

Electricity is provided at very low cost and also free in some states of India for Agricultural purposes. Hence the operation cost of tractors for the farmers will be bare minimum as all the states provide electricity at a subsidized rate. There won't be any direct emissions unlike diesel powered tractors due to which environmental damage and carbon emission will be substantially reduced. Reduced pollution will also result in better crop yield.

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YOUTUBE LINK

https://youtu.be/3YMQqe2nIiI

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Thank You