

**Abstract**

This paper contain the information about the solar car. The solar car which runs on solar power which is given by the sun or on the electricity. In these we have to discuss about the solar car. Such as 1) What is solar car ? 2) How it works ? 3) Which solar panel is useful for these operation ? 4) Difference between solar car and gasoline car ? 5) Solar energy system in cars ?. These paper specially focused on the advantages of solar car and there working. For the solar car we used the electricity by preparing itself by the use of solar panel which has high quality and high power to absorb the sunlight and the high storage battery for storing high power in it which gives power to vehicle in emergency . This idea helps us to avoid pollution , low use of fuel which has very low in quantity nowadays. These solar vehicles are the future of automobile industries , so now we have to concentrate on the modification of their design and making them cost effective.

Keywords: Solar car, Solar panel , Lead acid batteries .

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1. INTRODUCTION

A solar car is a solar vehicle used for land transport. Solar cars combine technology typically used in the aerospace, bicycle ,alternative energy and automotive industries .The design of a solar vehicle is severely limited by the amount of energy input into the car. Most solar cars have been built for the purpose of solar car races. Since 2011 also solar powered cars for daily use on public roads are designed. Solar cars are often fitted with gauges as seen in conventional cars. To keep the car running smoothly, the driver must keep an eye on these gauges to spot possible problems. Cars without gauges almost always feature wireless telemetry, which allows the driver steam to monitor the car 's energy consumption, solar energy capture and other parameters and free the driver to concentrate on driving. In 2011 , solar cars are build for racing but now a days we have to build it for human beings . we have to build it for to protect fossil fuels. We have to build it for humans to make their life more easier and make it as a cheapest car in the world.

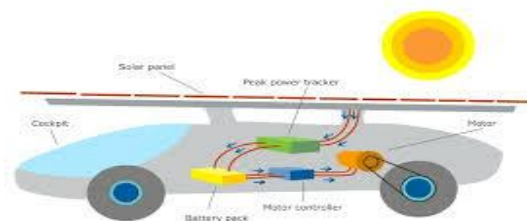
Solar car use energy from the sunrays which is absorbed by solar panel provided by sun . Solar cars depends on PV cells to convert sunlight directly in to electricity . When sunlight (photons) strikes PV cells, they excite electrons and allow them to flow, creating an electrical current. PV cells are made of semiconductor materials such as silicon and alloys of indium, gallium and nitrogen. The PV means Photo Voltaic Module may be connected either in parallel or series . But its costlier . Thus to make it cost effective , power converters and batteries are been used .

This idea will be useful in making better use of solar energy available to charge car batteries to take a step

towards pollution free and sustainable transport system. It will be effective particularly useful shuttle car services for short ranges for tourist places or large campuses. When not in use, the system will generate electricity either locally or for the grid. Therefore it is an ideal place for using the proposed system.

The solar vehicle is a step in saving these non renewable sources of energy. The solar car works on the principle that it use the energy which is stored in battery and use it after charging it from a solar panel. These charged batteries are used to move the vehicle in forward and in reverse direction .These idea may help in future to protect our fuels from getting extinguished.

These solar cars have some disadvantages also , which we discard in future . These solar car is controlled by Mechanical and Electrical engineering because it has nearly same wok in both the engineering.



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Fig.1

1.1: What Is Solar Car ?

Solar car it is a car which works on the electricity generated by itself by using sunlight by the use of solar panel and battery . Solar cars are cars powered by a type of renewable energy -- in this case solar power. This solar energy is obtained by solar panels attached to the car. Presently, solar cars are not used much for day to day transportation, but for demonstrations and

engineering exercises. This energy is then stored by batteries in the electrical system for the car to run on. The mechanical design of the car allows for maximum utility of the electric energy gathered from the sun. Solar car is a hybrid car which is generally used in tropical countries. But engineers are tried to make it available in all countries. Because solar cars makes a complete change in automobile industries and mechanical industries. These cars are very useful in India. Because India has faced a lot of problems because of the pollution created by the cars which runs on the fuels. Thus solar cars does not make any pollution. It is totally eco-friendly. It saves a lot of moneys of people which they used on their fuel cars. A solar car is a car which is used for land transport. Solar car combine the technology used in aerospace, bicycle, alternative energy & automotive industries. Solar car can depend upon PV cells to convert sunlight into electricity. When the sunlight strike PV cells they excite electrons and allow them to flow, creating an electric circuit. PV cells are made of semiconductor materials such as silicon, gallium & nitrogen. So here are some pictures of solar cars:



Fig.2

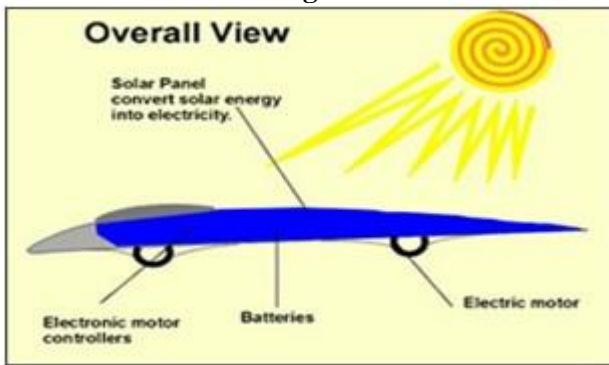


Fig.3

1.2 How It Works?

A solar car gets the energy it needs to move from sunlight. If you look at the solar car below you can see that much of its surface looks black. This helps it to absorb the sunlight-black objects absorb most of the light that falls upon them. Usually, black objects just get hot in the sun.

The solar car works on the principle that it use the energy which is stored in battery and use it after charging it from a solar panel. These charged batteries are used to move the vehicle in forward and in reverse direction. Sunlight from the sun firstly incident on the solar array then solar array absorb it and transfer to the power tracker. Then power tracker send the power to the battery. In battery convert power in to electric power. That electric power is transfer to the motor controller from batteries. Motor controller transfer the energy to the motor and then motor to wheel of the car and then our car moves. For the moving of these car we shall use a high quality solar array or panel, which absorbs much amount of sunlight from the sun. Again we need a high storage batteries which is used to store the electricity for emergency in the car. In solar cars solar array is attached to the roof of the car, it causes very less capacity for the people in the car. We shall use the solar array as a cover of bonnet and in the backside. We should replace the bonnet cover and backside by the solar array which will not cause less space for people in the car.

Solar car converts the solar energy directly in to the electricity by the PV. Electricity stored in the batteries. Solar electricity can also go directly to the motor when car is running. Electronic motor controls smoothly and control power to the motor. Speed is control by a normal accelerator pedal. IN the solar car, it does not need a gear box. gear changing is electronically in the car.

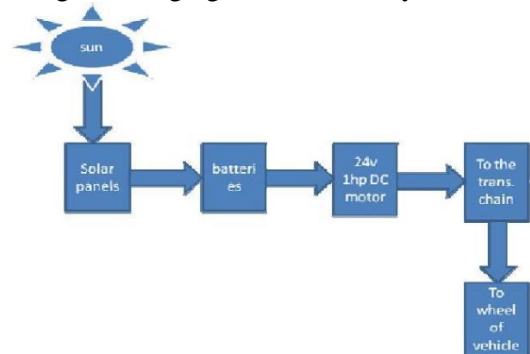


Fig. 4



Fig.5

These are some pictures of working of solar car and solar panel or array that we have to use it in solar car. Solar panel or array are black in nature but they absorb heat not reflect so the black body heats fast and reflect that phenomenon does not work here.

Cost of Driving a Car Using \$3.50/gallon gasoline for an Internal Combustion Engine:

MPG	Miles per month	\$ per gallon	Total cost for 1500 miles	\$ per mile
15 MPG	1500 miles per month	\$3.50 per gallon	\$350	\$0.23
25 MPG	1500 miles per month	\$3.50 per gallon	\$210	\$0.14
30 MPG	1500 miles per month	\$3.50 per gallon	\$175	\$0.11
35 MPG	1500 miles per month	\$3.50 per gallon	\$150	\$0.10

Fig.6

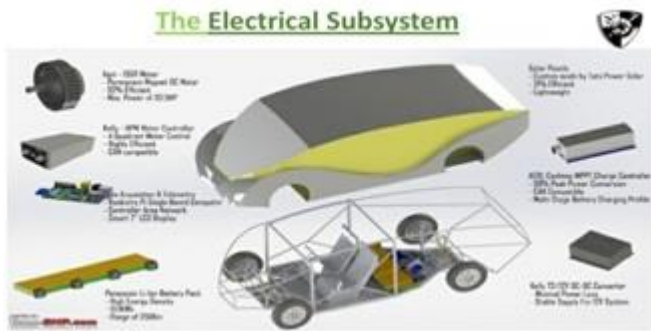


Fig. 7

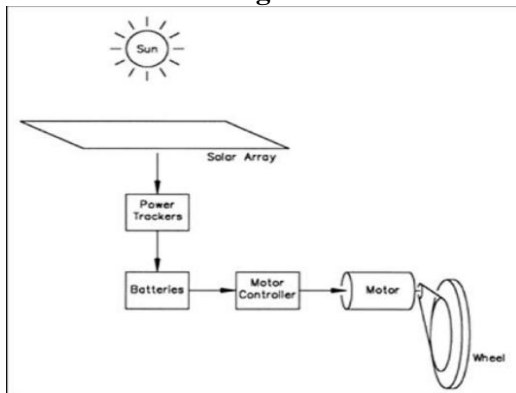


Fig. 8

1.3 Difference Between Solar Car And Gasolin Car

A) GASOLIN CAR

- 1) Infrastructure & energy cost included in gallon price of gasoline . 12000 miles driven per year , 20 mpg car , \$3.50 per gallon .
- 2) First year , 600 gal. of fuel , \$2100
- 3) 50 year , 30000 gal. of fuel \$105000 net present cost
- 4) 50 years , 3.5% annual increase .
- 5) Now, TOTAL FUEL COST = \$275000

B) SOLAR CAR

- 1) Infrastructure & energy cost included in price of solar PV.
- 2) 12000 miles driven per year 4 moles kwh = 3000 kwh per year .
- 3) 2KW solar PV system cost \$8000 production 3200 kwh per year .
- 4) First year cost \$8000
- 5) 50 year cost \$12000
- 6) 50 years , 3.5 % annual increase .
- 7) TOTAL FUEL COST = \$12000

2. CONCLUSION

Solar Cars have the cleanest and easiest energy output around, yet our technology is still far... A solar car is really an electric vehicle powered by solar energy . The solar vehicle solves many problems related to the environment and is the best pollution free method. We need to make use of them so that we can reduce our dependence on fossil fuels. Solar vehicles do have some disadvantages like small speed range, initial cost is high .As this field of automobiles will be explored the problems will get solved.

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REFERENCES

- [1]. 3rd National Conference on Recent Trends in Engg .& Tech. , 28.09.17.
- [2]. Google – Information about solar car and their pictures.