

Vehicle Driven By Solar Power

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ABSTRACT: *At present, solar vehicle is employed together of the cardinal energy saving vehicle where the appliance of renewable energy meets sustainable energy demand with reduction of fuel cost plus purification of atmosphere. During this vehicle, solar power powers all or a part of a vehicle's propulsion. For running a model car or vehicle which may be a miniature representation of an automobile, electric power is required to run the car. As there lies shortage of electric power in Southeast Asian country, it's become an important issue to initiate the utilization of renewable energy in developing countries like Bangladesh for reducing the demand of electricity. This paper deals with an effort to research the energy recovery possibilities from the solar power by employing a solar array which converts light energy from the sun into electric power. That power is transmitted to the accumulator. The stored power of battery is employed to run the car. Speed to weight ratio of vehicle illustrates comparatively more flexible and straightforward than any other design when load is varying. Aerodynamic drag, weight, and rolling resistance all influence the car's design. Due to its simplicity and fewer bulkiness this design also reflects cost effectiveness and user friendliness.*

KEYWORDS: *Battery, Exhaust manifold, Light Weight Vehicle, Motor, Solar Panel, Renewable Energy.*

INTRODUCTION

At present time, energy crisis has become a bulk throughout the planet. Besides resources are decreasing with population increase. Also more energy is required to sustain the current human development. In 2012, world averaged energy demand is 17 TW and 85% of this comes from fossil fuels (coal, oil, and natural gas) For 2050 the demand are going to be as much as 30 TW [1]- [2]. The planet energy demand vs. Production difference. World energy demand vs. production comparison burning more fossil fuels isn't best solution for meeting future energy demand. By doing this nor mal condition of environment is diminishing gradually, beside world fuel reserve is degrading significantly[1]. To beat this problem and taking account of healthy environment concern, clean and renewable sources of energy are the sound alternative of present and future energy crisis because renewable energy is regenerated after regular time cycle and constantly replenished, will never run out.

There are different sources of renewable energy among which solar power is that the most available renewable energy source. Solar power exerts energy from the sun within the sort of solar diffusion for warmth or to produce electricity (figure 1). It's found from a search that in many developing countries like Bangladesh, crisis of electrical power is one among the main problems[2]. For terminating this crisis, to supersede the normal energy source by the renewable energy source should give more priority and also utilize that energy to the machines and devices to decrease the pressure of the national grid. By taking account this problem in mind, an attempt has given on designing then fabricating a simple and low cost vehicle by using solar energy as its main impetus which may be afforded by all class of individuals[3]. Many systems are already designed around globe about vehicle powered by solar power. Many of those utilize monocrystalline or polycrystalline silicon panels. Monocrystalline panels have a return electricity rate of anywhere from 14 to 18 percent. Besides, Polycrystalline silicon panel has an electricity return rate of about 12 to 14 percent and fewer efficient than monocrystalline silicon solar

panels[4]. On the opposite hand, Monocrystalline panels aren't economical for future use. To beat these shortcomings, this proposed system is mounted with amorphous silicon solar panels. These sorts of solar panels are comparatively powerful than other structure with crystalline silicon output, structure, and manufacture plus lowest electricity return rate than any sort of solar panels having return rate of between 5 to six percent [5]. Also wheels and tires of this technique has been chosen in such how that traction frictional force working on it helps it to stop from slipping while rolling along the road than other existing conventional vehicle[6].



Figure 1: Solar powered vehicle[7]

Low weight of car is taken as important design consideration of proposed system for traveling at a constant speed. Reduced frontal cortex of the car and little openings design for wheel are often capable for overcome drag force at high speed and makes it unique than other available vehicle in some extents. Moreover, in maximum developing countries like Bangladesh, there's no such toy business which can produce vehicles by their own[8]. All of them are imported from other different countries. The planning of those cars may be a bit complex and their spare parts aren't always available in everywhere. These vehicles also are of excessive weight[9]. On the other hand, the worth of those cars is above the acquisition limit of maximum customer with lower financial condition. In this paper, an attempt has been made to form a vehicle which is straightforward in design, cost effective, light weight and solar energy is employed to run this car.

In car designing, a system gathers the fumes gases from different chambers into one line. alludes to the collapsing together of numerous data sources and yields . The exhaust manifold gathers the fumes gas and removes it through the fumes pipe. As of now, the exhaust manifold should be equipped for withstanding persistent working temperatures as high as 900 °C. Nonetheless, natural and financial prerequisites will bring about higher fumes gas temperatures, so the warm unwavering quality of the exhaust manifold should be improved further. Customarily, full burden air/fuel conditions have been working in the locale of $\lambda = 0.9$ for most extreme motor force

yield and to keep up motor strength. Under these conditions, overabundance fuel cools the motor, keeping the fumes gas temperature under 1,000 °C. Moves towards working conditions where $\lambda = 1$ will take out this fuel cooling impact and fumes temperatures will go up to 1,050 °C.

The area and light-up season of the impetus are significant variables given the undeniably rigid guidelines on startup emanations. To enact the impetus during startup, the fumes gas temperature should be kept high until it arrives at the exhaust system, requiring the exhaust manifold to have warm protecting properties. Temperature conveyance in the complex is convoluted by fumes gas distribution and the establishment of sensors, which bring about enormous virus working territories, just as the air infusion needed for hydrocarbon ignition in the exhaust system.

Exhaust manifold materials should have great weakness strength under rehashed warm pressure and be impervious to consumption. Warm pressure causes plastic deformity and breaking happens at low and middle of the road temperatures, so the yield strength and flexibility ought to be raised to confine weakness disappointment. Oxidation consumption diminishes the divider thickness of the complex and the oxide buildup that isolates harms the turbine haggle. Inhomogeneous consumption additionally starts weakness breaks. Consumption obstruction is especially significant in diesel motor manifolds, as a result of the persistent progression of profoundly oxidizing gas created by lean ignition. Vibrational stacking is inescapable in the responding motor. The hefty turbocharger and extra fumes gadgets appended to the complex increment the heap, so high weariness strength under vibrational stacking is likewise fundamental.

The mind boggling state of the complex can be made effectively from cast iron. High-Si ferritic nodular cast iron is utilized for working temperatures up to 800 °C. Added Mo raises heat opposition and strength. Expanding V in the cast iron (Fe-3.3%C-4.2Si-0.5 V-0.5Mo-3Mn) is another technique for improving halfway temperature strength. This iron has a higher warm conductivity and lower warm development coefficient than Niresist cast iron. For a lot higher working temperatures, up to 1,000 °C, Niresist nodular cast iron is utilized.

Exhaust systems are by and large straightforward cast iron or tempered steel units which gather motor fumes gas from numerous chambers and convey it to the fumes pipe. For some motors, there are reseller's exchange rounded exhaust systems known as headers in American English, as extractor manifolds in British and Australian English, and essentially as "cylindrical manifolds" in British English.[citation needed] These comprise of individual fumes head pipes for every chamber, which at that point ordinarily meet into one cylinder called a gatherer. Headers that don't have gatherers are called zoomie headers.

The most widely recognized sorts of secondary selling headers are made of gentle steel or tempered steel tubing for the essential cylinders alongside level spines and conceivably a bigger breadth authority made of a comparable material as the primaries. They might be covered with a fired sort finish (now and then both inside and outside), or painted with a warmth safe completion, or exposed. Chromed headers are accessible however these will in general blue after use. Cleaned hardened steel will likewise shading (generally a yellow color), yet not as much as chrome by and large.

LITERATURE REVIEW

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DISCUSSION

The proposed system handle just one motor which is connected to at least one of the rear wheels i.e. this car has one power wheel. Thick plastic or other lighter material are often wont to make the car as lighter as possible. Despite several advantages, there's no system for controlling the rpm of the motor, sometimes it creates problem during turning. Because during turning, the rpm of inner wheel must be lower than outer wheel. A controller should install to regulate the rpm of wheels while turning to beat this problem. Also power tracker isn't used with the battery. Moreover, the speed of the car are often increased by changing the car shape to airfoil. Because the worth of coefficient of drag is extremely small and this reduces the drag force. During this system, no power tracker is added to the battery. When the solar array is charging the batteries, power tracker will help to guard the batteries being damaged by overcharging. An easy transmission by using 2 meshing gears also can be installed for creating the car more efficient.

CONCLUSION

The proposed solar vehicle runs efficiently using solar power effectively with none basic problem. In Bangladesh, there is no such an enormous toy company where engineers can work and apply their engineering knowledge to form innovative toys. As most of the vehicles are imported from abroad, their price is extremely high. So, maximum bourgeoisie people cannot afford to shop for these toys for his or her children. If these types of vehicles can produce industrially in Bangladesh by using local equipment, the value are going to be low.

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