Design And Implementation Of High Efficiency Solar Electrical Vehicle System By Using SRM Drives System

BHARGAV KUMAR BHUKYA

N. SRINIVASA RAO
Assistant Professor, Department Of EEE, Narsimha Reddy Engineering College, Hyderabad, T.S, India.

Abstract: Electric cars are motors, which is probably powered by the use of the electrical engine and electric energy. Due to the catch 22 situation of modern battery technologies, the driving range could be very short. In strengthen, in terms of motor drives, immoderate-universal overall performance everlasting-magnet (PM) machines are drastically used. In PM machines there can be no problem winding and the sphere is supplied by means of the external magnet. Most commonly rare earth materials are used. But they may be very costlier. To conquer those problems a photovoltaic panel and a switched reluctance motor may be used to power transport and motor energy. In order to lower the strength conversion processes, one approach is to remodel the motor to encompass some onboard charging features. The solar power usage and most strength factor tracking (MPPT) are the correct factors for the PV-fed electric powered cars. In order to achieve low-price and bendy energy flow modes, a novel low-price tri-port converter is proposed in this paper in a manner to coordinate the PV panel, SRM, and battery. To help flexible manage energy flow six operational modes are evolved.

Keywords: SRM; Permanent-Magnet (PM); Maximum Power Point Tracking (MPPT);

I. INTRODUCTION

Electric motors have taken a big leap ahead, with the useful resource of advances in motor drives, electricity converters, batteries and strength manipulate structures. Be that as it can, due to the problem of cutting-edge battery generation, the using miles in all fairness quick that limits the massive utilization of EVs. In phrases of motor drives, high-performance permanent-magnet (PM) machines are usually utilized while unusual-earth substances are required in large quantities, limiting the wide usage of EVs. Keeping in mind the quit purpose to defeat the one’s problems, a photovoltaic panel and a switched reluctance motor (SRM) are brought with delivering strength supply and motor drive, respectively. Firstly, by means of collectively with the PV panel on top of the EV, a sustainable energy supply is done. Nowadays, a fashionable passenger car has a surface sufficient to put in a 250-W PV panel. Second, an SRM desires no uncommon-earth PMs and is moreover sturdy so it gets growing interest in EV programs. While PV panels have low energy density for traction drives, they may be used to price batteries the more part of the time. For the most element, the PV-fed EV has a comparable form to the hybrid electric vehicle, whose inner combustion engine (ICE) is supplanted by the PV panel. The PV-fed EV device is printed in Fig. Its key additives include an off-board charging station, a PV, batteries and strength converters. In order to lower the power conversion techniques, one approach is to upgrade the motor to consist of a few onboard charging capabilities. For instance, paper designs a 20-kW cut up phase PM motor for EV charging, but it endures from excessive harmonic contents in the again electromotive pressure (EMF).

Fig.1.1. PV-fed HEV.

II. PREVIOUS STUDY

Electric cars are powered with the useful resource of an electrically powered motor in the area of an internal combustion engine. Electric cars are 100% green and that they do not emit any toxic gases like CO2, N2 and so on. Which reasons Global warming? But there are a few downsides in the case of electrical motors. Due to the hassle of present day-day battery technology, the using variety will be very brief. This will lessen the big software program of electrical vehicles. In earlier, in phrases of motor drives, excessive-traditional typical performance permanent magnet (PM) machines are significantly used. In PM machines there may be no location winding and the arena is provided via the external magnet. Most normally unusual earth substances are used. But they’re very dearer. So with the useful resource of the usage of PM machines, it will additionally lessen the widespread utility of electrical motors. To overcome those problems a photovoltaic panel and a switched reluctance motor may be used for energy supply and motor pressure. By introducing PV panel at the top of the automobile, a suitable power supply may be finished. PV panel has low electricity density for traction drives; they can be used to rate the batteries. Also, the SRM need no uncommon earth materials. The switched reluctance motor (SRM) is a shape of a stepper.
motor, an electrically powered motor that runs through reluctance torque. Unlike not unusual DC motor sorts, energy is delivered to windings within the stator (case) instead of the rotor. This appreciably simplifies mechanical layout as strength does now not must be delivered to a transferring aspect, but it complicates the electric format as a few kind of switching tool desires to be used to supply power to the precise windings. With current digital devices, precisely timed switching is not a problem, and the SRM is a well-known design for contemporary-day stepper cars.

III. SRM DRIVE SYSTEM

The above diagram offers a pinnacle-stage view of the operating of the solar vehicle. Sun is the main supply of strength for the auto. Energy from Sun is captured via the solar panels and is converted into electrically powered electricity. The electric strength for that reason usually is being fed to the batteries that get charged and is used to run 24 V DC excessive torques DC series motor. The shaft of the motor is mounted to the rear wheel of the car through chain sprocket. The batteries are initially absolutely charged and thereafter they may be charged with the aid of panels. This helps in completing the charging-discharging cycle of the batteries, which may be very important for correct strolling of batteries. DC motors were the popular preference in variable-speed operation packages earlier than the improvement of advanced energy electronics. The principal dangers are low energy density compared with alternative technologies, expensive protection of the coal brushes (about every 3000 h), and espresso performance, despite the fact that efficiency values over 80-5% are feasible. DC motors still have a huge marketplace of decrease and middle strength range commutation cars. In advance, in phrases of motor drives, immoderate-overall performance permanent-magnet (PM) machines are drastically used. In PM machines there can be no area winding and the arena is supplied thru the everlasting magnet. Most typically uncommon earth substances are used. But they're very costlier. So with the resource of the usage of PM machines, it'll additionally reduce the extensive software of electric cars.

IV. SIMULATION RESULTS

When S0 and S1 spark off, the PV panel costs segment inductance; even as S0 and S1 turn off, the phase inductance discharges energy to the battery. According to the kingdom-of charging (SoC), there are 3 stages to make full use of solar energy and moreover, it's going to preserve the battery healthy situation. During level 1, the battery is in particularly inside the lack strength condition, the MPPT manage method is employed to make whole use of solar electricity. During degree 2, the steady-voltage manipulate is accompanied to charge the battery.

Fig.4.1. Simulation Diagram.

V. CONCLUSION

In order to increase the variety of EVs and reduce the device price, an aggregate of the PV panel and SRM is proposed because the EV using the machine. DC vehicles were the favoured opportunity in variable-velocity operation applications earlier than the improvement of advanced electricity electronics. The fundamental risks are low electricity density in contrast with alternative generation, the luxurious safety of the coal brushes (approximately each 3000 h), and espresso performance, regardless of the fact that performance values over eighty-five% are possible. The low usage issue of private automobiles makes the coal brushes essentially preservation loses. DC cars still have a wide market of lower and middle electricity range commutation automobiles. In earlier, in phrases of motor drives, high-overall performance everlasting-magnet (PM) machines are extensively used. In PM machines there may be no discipline winding and the world is provided thru the eternal magnet. Most usually uncommon
earth materials are used. But they may be very costlier. So with the aid of the usage of PM machines, it'll additionally lessen the extensive application of electric automobiles. To triumph over the ones issues a photovoltaic panel and a switched reluctance motor can be used for strength supply and motor strain.

VI. REFERENCES


