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Energy harvesting from braking System

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ABSTRACT

As in today's world, there is energy crises and therefore the resources are depleting at a faster pace, there need of new technology that recovers energy, which usually gets wasted. So, in case of automobiles we can have energy harvesting from braking system. It involves, energy harvesting mechanism that slows a vehicle or object by converting its Kinetic Energy (K.E) into a form which will be either used immediately or stored until needed. Energy harvesting through braking system in automobiles enables us to recover the K.E. of the vehicle to some extent that's lost during the braking process.

INTRODUCTION

The system will generate electrical energy while the wheel is about to stop when brakes are applied. The model comprises a moving wheel arrangement with induction braking system that generates electrical energy which can be stored in a battery. In this system, the electric motor that is responsible for all or part of an electric or hybrid-electric vehicle's propulsion, also does most of the braking. When the driver steps on the brake pedal, instead of activating a conventional friction-based braking process, it sends an electronic signal to the electric motor, directing it to run in reverse mode, which creates resistance to slow the vehicle through a process that is analogous to down-shifting a standard transmission vehicle

LITERATURE REVIEW

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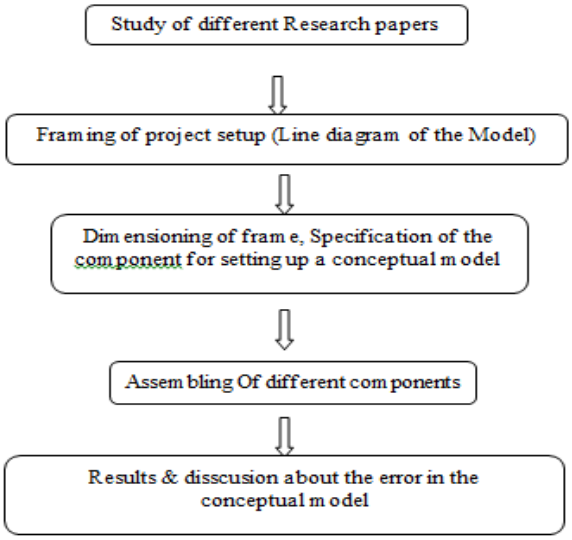
METHODOLOGY

Methodology of working process



RESULT

Energy harvesting from braking system technology is one more positive step forward in Toyota's quest to realize the ultimate ecocar. By working in concert with previously developed electric motor technologies, its application helps Toyota's electric vehicles and hybrid vehicles (including the recently released Prius) to achieve extended ranges and to be friendlier to the environment than ever before. At the same time, this new technology remains unobtrusively in the background; drivers benefit from this technology while enjoying the same firm braking feel found in conventionally equipped vehicles.

CONCLUSION

Theoretical investigations of a shows about 25% saving in fuel consumption. The lower operating and environment costs of a vehicle with this braking system should make it more attractive than a conventional one. The traditional cost of the system could be recovered in the few years only.

The exhaust emission of vehicle using this braking concept would be much less than equivalent conventional vehicles as less fuel are used for consumption.

These systems are particularly suitable in developing countries such as India where buses are the preferred means of transportation within the cities.

This braking system used in the vehicles satisfies the purpose of saving a part of the energy lost during braking. The braking system is designed to partially recover the battery charge wasted in braking of the vehicle. The energy is converted into heat by friction brakes which are dissipated to the environment. This Energy is utilized to rotate the rotor of generator converting mechanical energy of wheels into useful charge of battery. This braking system cannot be used as main braking system of vehicle as it cannot bring the vehicle to rest.

Experimentally it is found that, on increasing the speed of the wheel (rpm) the voltage generated will also be increasing and vice-versa. As other researchers had used stepper or servo motors as regenerative motor, so in this project, it is replaced with D.C motor. Motor with gear. It has been found that the voltage generated by the D.C motor with gear is higher than that of voltage produced by those two motors.

Hence, if this system is installed in the actual vehicles minimum 11% battery energy can be recovered using this braking system which would otherwise be wasted to heat in friction brakes. So, the distance travelled between two successive charging requirements can be increase to 10 to 15 % using this braking.

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