

ADVANCING IN EV TECHNOLOGY

It ^{seems} is ~~seems~~, the Electrical vehicles can become best alternative of Internal Combustion (IC) engines. Basically the IC engines required petroleum oil for generating power (energy). petroleum product are exhaustable in Nature so, **IC** can be replaced by EV. EV have a lot of advantages over than IC engines :-

1. NO ANY CARBON EMISSION
2. NOISE FREE
3. EV IS EASY TO DRIVE.

A lot of advantages of EV but few ^{disad} ~~advantages~~ makes the EV less popular :-

1. It takes longer time to charge.
2. It doesn't give sufficient RPM and Torque (When Needed)
3. It is ^{for} too shorter distance :-

To overcome from above disadvantages we should to work on two main component of vehicles :-

- 1) Motor
- 2) Battery system

For solution of these main disadvantages we work on motor design and Battery system.

We have done advancing in motors are mentioned below:

Basically we know that, the motor is the main motive parts of vehicles. motor consists of two components :-
1. Internal combustion engine.

- 1) Stator $\div$ Immovable parts, producing electromagnetic field
- 2) Rotor $\div$ Movable parts, Runs Influence of EMF.

Generally the Motors are two types in terms of position of Rotor and Stator.

- 1) Inrunner motor
- 2) Outrunner motor

Some specific Features of Inrunner and outrunner motors are:-

1) In Runner Motor:-

- Power Density is high.
- High RPM
- Better efficiency
- Heat dissipation is Good.
- Less Torque

2) Out runner Motor:-

- Low RPM
- High torque
- Heat dissipation is bad
- Efficiency is less than inrunners.
- Noise is more.

A lot of advantages and Disadvantages of these both type Motor.

Innovation in motor design. We have taken a lot of sample of motors and make comparison them and at last we have designed a "Binary Rotor motor" for EV. A lot of advantages of these binary rotor motor are mentioned below:-

- (i) It gives sufficient RPM (Speed) { When needed }
- (ii) Generally it have more torque { When needed }
- (iii) These motor design is more efficient for long and short distance.
- (iv) It gives better braking system and vehicle can easily stopped.
- (v) It increases the efficiency of Regenerative braking system and a lot of energy can be restored in battery pack.
- (vi) It is suitable for both highways & in cities also.

Working Principle :- When the vehicle starts, then it requires more than little torque so, at this moment the outrunner of the motor will get start rotate. It gives sufficient torque to move the vehicle forward. After attaining the running speed (36-40 km/h), then the outrunner will stop and at that moment within a seconds the inrunner get started rotate. It given better speed than outrunner.

Its Another Application :

When we applying the mechanical brake (drum) at this time, we lose a lot of kinetic energy, for saving this energy we can use re-generative braking system for conservation of energy. When we apply brake then both Inrunner and outrunner come close both will get starts, at this moment the motor acts as a generator. It is achieved by using Transmission system (clutch). When the motor act as a generator then this energy is collected at super Capacitor. From super - Capacitor the energy is slowly transferred to the Battery. In this we can conserve a lot of energy for further journey.

