

Hybrid Electrical Vehicle (HEV)

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Abstract: — In 1901 FERDINAND PORSCHE developed the LOHNER- PORSCHE, the first gasoline- electric hybrid automobile in the world

In 1990 BMW developed the 5- SERIES (E34),but it is not widely available

In 1997,Japan after the release of TOYOTO PRIUS, the HEV become wide popular

I. INTRODUCTION



In 1901 FERDINAND PORSCHE developed the LOHNER- PORSCHE, the first gasoline- electric hybrid automobile in the world
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II. HEV

- ❖ A Hybrid Electrical Vehicles(HEV) is a type of hybrid vehicle and electric vehicle
- ❖ Which combines a conventional internal combustion engine (ICE) propulsion system with an electric propulsion system
- ❖ HYBRID-combination of source(battery and engine)



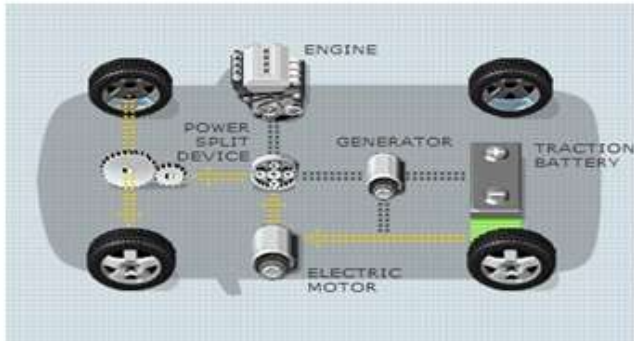
III. REASON FOR USING IT

- ❖ Efficient
- ❖ Pollution free
- ❖ Repetition of fossil fuel
- ❖ Reduce global warming
- ❖ Provides renewable energy resource
- ❖ Decrease green house gas



IV. COMPONENTS IN EHV

- ❖ Electric motor
- ❖ Batteries
- ❖ Gas tank
- ❖ Power electronics(ECV)
- ❖ Alternator
- ❖ IC engine



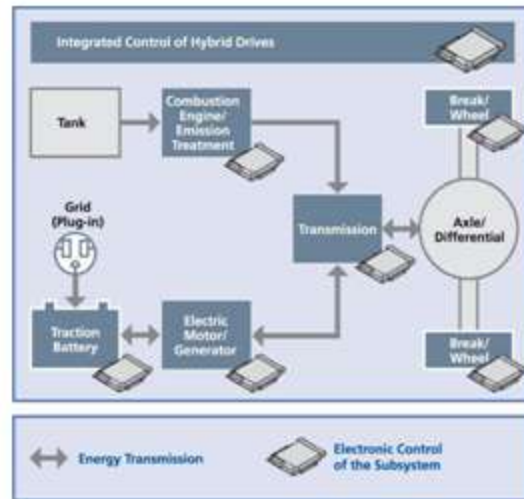
VII SERIES HYBRID

- ❖ Motor and the engine are connected in series
- ❖ Engine is coupled with the generator to produce the power to run the motor
- ❖ Power which produced is stored in the battery
- ❖ At low speed it is powered by the electric motor

V. MOTOR TYPE

- ❖ BLDC types motor
- ❖ (PMSM)Permanent Magnet Synchronous Motor
- ❖ Motor torque= motor force & wheel radius
- ❖ Induction motor are commonly used
- ❖ Motor force > (Air resistance + Rolling resistance)

AC permanent-magnet motor cutaway



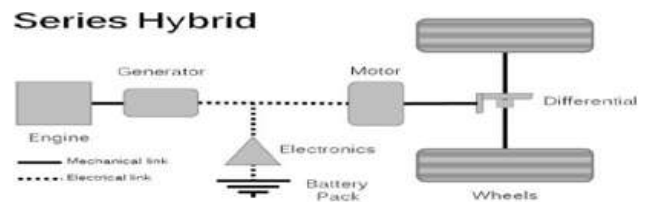
VIII PARALLEL HYBRID

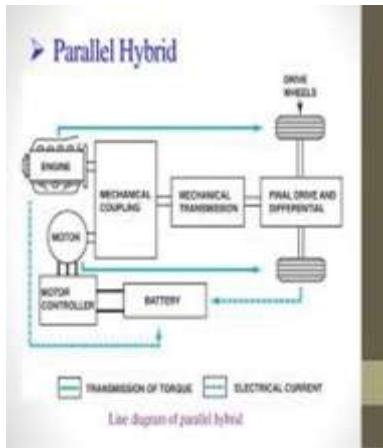
- ❖ Motor and engine are connect in parallel with the drive system



VI TYPES OF HYBRID

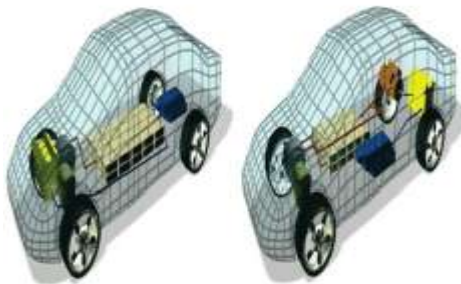
- ❖ Series hybrid
- ❖ Parallel hybrid
- ❖ Series parallel hybrid
- ❖ Complex hybrid





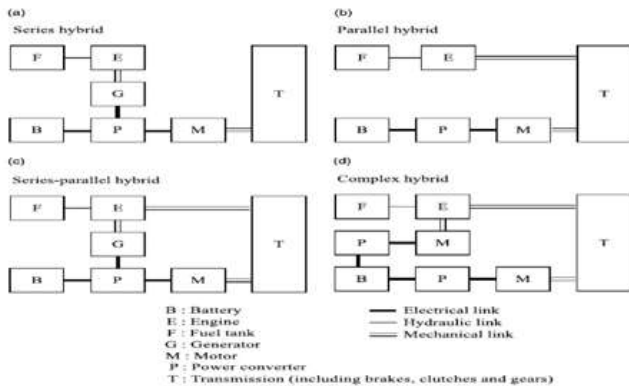
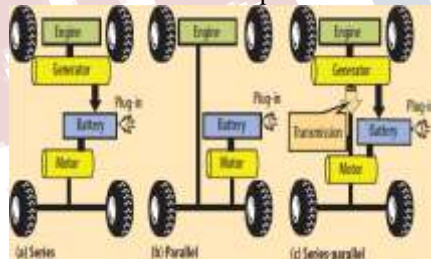
Parallel hybrid car

Series hybrid car



IX SERIES PARALLEL HYBRID

- It has both series and parallel combination



X COMPLEX HYBRID

ELECTRONIC CIRCUITS

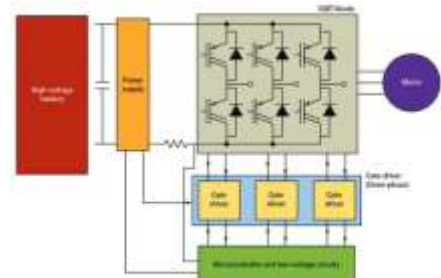
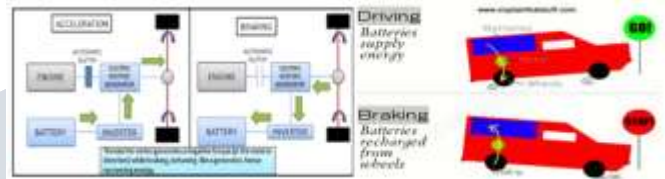


Figure 2. In electric and hybrid electric vehicles, the most challenging power-management task will be the system controller which is implemented in a system that drives the wide propulsion system of the power system.

XI REGENERATIVE BRAKING

- Regenerative braking is the process of charging the battery while applying the break
- Its more efficient and economy



BATTERIES

- Batteries are used to store the charge which is used for driving the motor
- NiCd, nickel metal hydride, lithium ion, Li-ion polymer, zinc-air and molten salt batteries



HEV IN INDIA

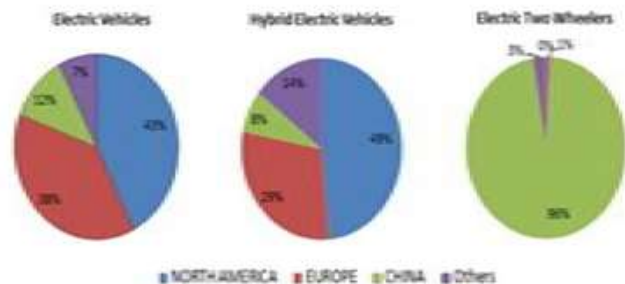
- Mahindra e2o – 48v lithium ion battery -58Nm torque- 81 Km/hupto6lakhs
- Toyota prius –Ni-MH battery -142Nm torque- 3 modes(ev,eco,power)upto40lakhs

- ❖ Toyota camry hybrid(ev,eco,normal)
- ❖ BMW i8-7.1kWh Li-ion,120Km/hr-2.3crore
- ❖ Maruti Suzuki ciaz hybrid-fuel efficient-upto 10lakhs

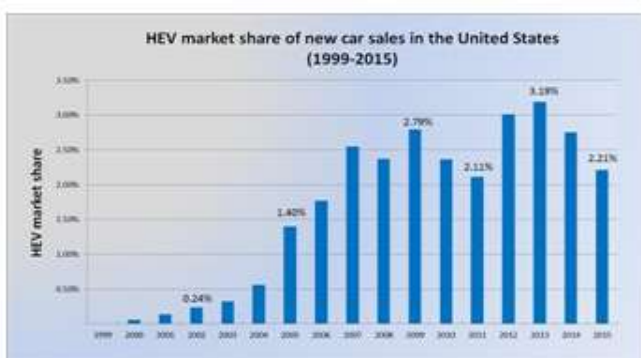
the usage of fossil fuels and to reduce the pollution



HEV IN WORLD MARKET



THANK YOU FOR SPENDING YOUR GOLDEN TIME FOR US



ADVANTAGES OF USING HEV

- ❖ Decreases green house gas
- ❖ Easy to run and maintain
- ❖ Provides renewable energy resources
- ❖ Reduces risk of such health problems
- ❖ Does not contribute to acid rain
- ❖ Reduce expensive oil imports from other countries

DISADVANTAGES OF USING HEV

- ❖ High cost
- ❖ It does not totally eliminate the burning of fossil fuels
- ❖ Power provide by vehicle might not be ideal for mountain regions,or area with severe winters
- ❖ HEV are smaller, less comfortable than conventional automobile
- ❖ Body may not be strong

CONCLUSION

- ❖ Eventhough HEV has several demerits,it very important thing to save our planet by reducing