

Induction Motor Drives:- Electric vehicles use induction motors to produce driving power. The most common method for controlling the induction motor for operation of vehicles is the pulse width modulation method. This method a power electronic circuit (known as inverter) is used. Inverter circuit uses power electronics switches like IGBTs/MOSFETs.

The inverter controlled using PWM technique, gives variable voltage, variable frequency ac output to induction motor, which in turn controls the speed and torque of motor.

The induction motor drive consists an inverter supplying controlled voltage and frequency to induction motor. Thus the satisfactory operation of vehicle is obtained. The schematic of an induction motor drive is shown below:

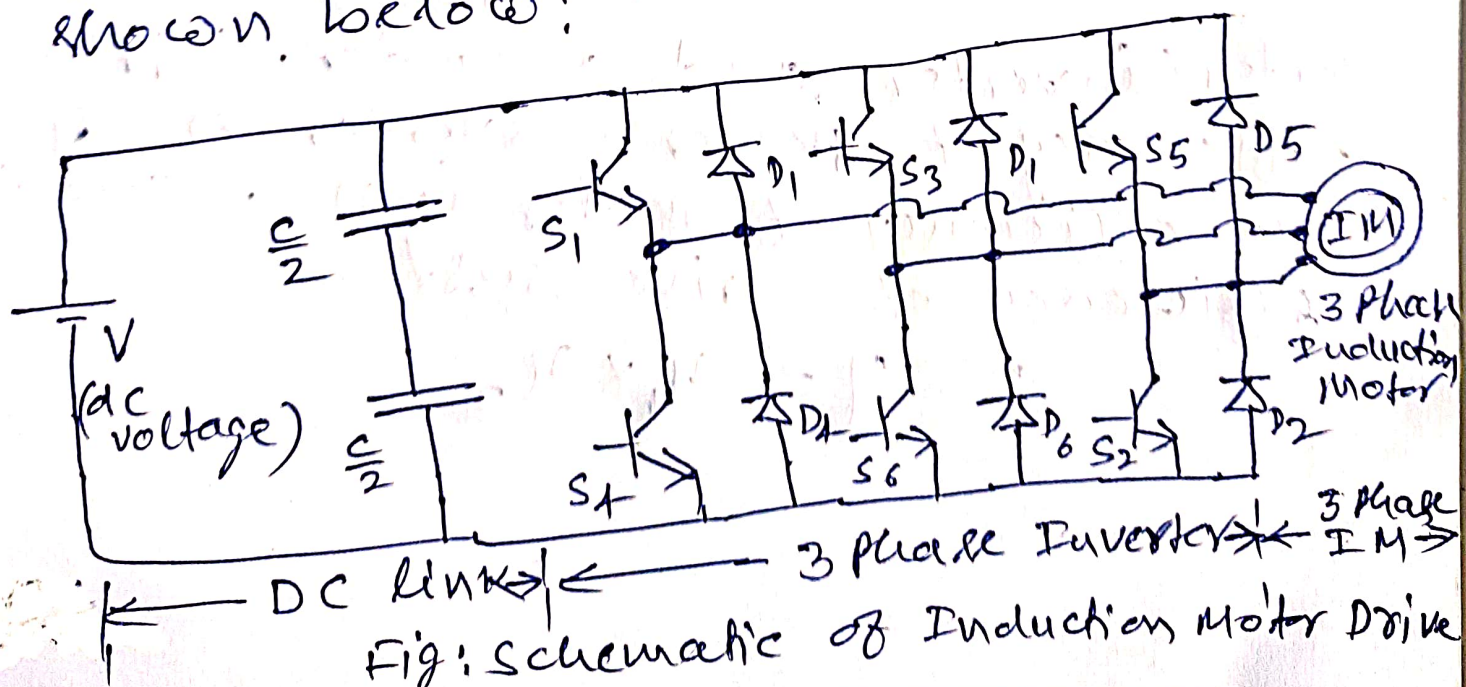


Fig: Schematic of Induction Motor Drive

Sizing the Propulsion System:— The system that converts electrical energy into mechanical energy to move an electric vehicle is known as electrical propulsion system. It consists of number of essential components that work together to propel the vehicle, these components are: (1) Electric Motor (2) Battery Pack (3) Power converter/Inverter (4) On board charger (5) controller etc.

Sizing of Propulsion motor:— The size (kW rating) of motor

depends upon: (1) weight of empty as well as loaded vehicle (2) speed at which it is to be driven (3) Acceleration time (time to reach the peak speed) (4) slope of road or hill climbing considered in design (5) Air drag (opposition) etc

Drive System Efficiency:— A drive mainly consists a power converter (inverter) and a motor. Suppose the efficiency of power converter is η_1 and the efficiency of motor is η_2 . The efficiency of drive system

$$\eta = \eta_1 \times \eta_2$$