

# Diesel generator



# 1.Introduction to Generators

- The device which converts mechanical energy to electrical energy is called generator



# 3. History and evolution of Generators



- Michel Faraday and Hippolyte Pixii were pioneers who invented early machines like generator. There are following stages of evolution of Generators.
- Electrostatic generators.
- Principle of electromagnetic induction.
- Invention of Dynamos.
- Alternators and their evolution.

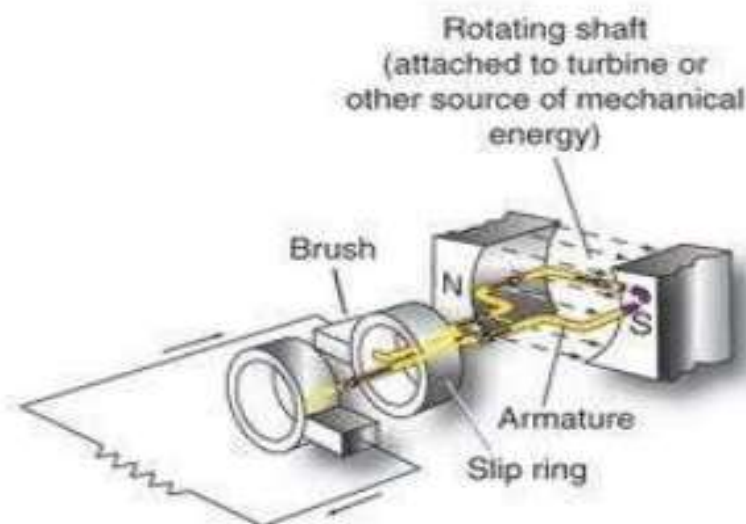


## 2.Principle of working:

- In generators mechanical energy is transformed into electrical energy.
- The principle of all of the generators is same, although the detail of construction may be differ somewhat.
- A generator has two main parts:
  - Coil
  - Magnet

## 2.Principle of working:

- Generator works on Faraday's law of electromagnetic induction. When coil is rotated in a magnetic field by some mechanical means magnetic flux is changed through the coil and consequently EMF is induced in the coil.

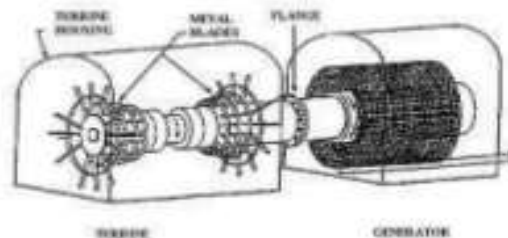
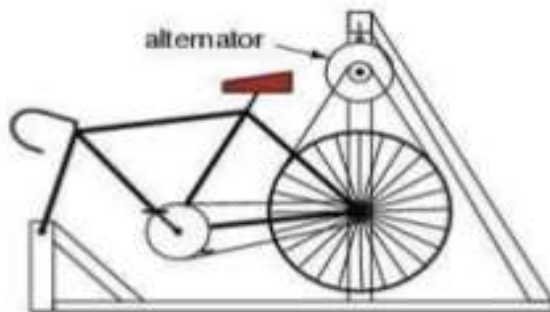




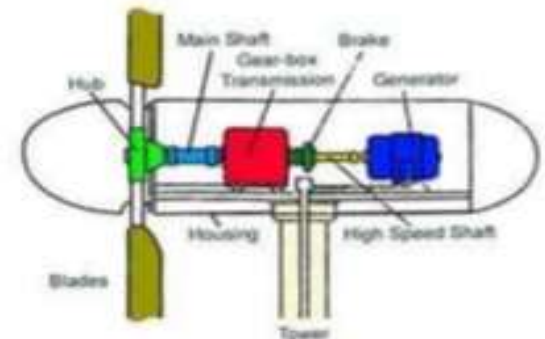
## 4.Types of Generators:



- According to output generators are of two yes AC generators and DC generators.
- According to mechanical work input generators can also be classified. As engine generators , human powered generators , turbine generators and wind mill generators.



When a turbine is attached to the electrical generator, the kinetic energy (i.e., motion) of steam pushes against the fan-like blades of the turbine, causing the turbine, and therefore the attached rotor of the electrical generator, to spin and produce electricity.





## Types of Generators:

- Mainly used generators are engine generators. They are also known as Gensets. They use engine, which provides mechanical energy by use of chemical energy provided by different chemicals as Gasoline, Propane, Diesel fuel and Natural gas.
- They can further be classified into 3 main types.
- 1.Standby Generators
- 2.Portable Generators
- 3.Commercial Generators



# Standby Generators:

- These are large, often permanent units often stationed outside a building and like to provide backup power in case the in electricity switches off.
- They can sense when a power interruption has occurred and automatically start to provide emergency power





- backup generators' or 'emergency power systems', Standby Generators are commonly used by hospitals and key government buildings to provide replacement power when the National Grid supply fails.
- These power failures are far more common than ever before.
- Generators may be gas or diesel powered and have a large external tank that will usually allow them to run for up to 48 hours before refuelling.
- A Standby Generator power back-up system is also becoming more common for banks, distribution centres and private businesses that cannot allow any disruption in their critical systems, especially if they are locked into a 'supply from stock' contract with their key customers.



## Portable Generators:

- These generators are designed to be transported whether on cart trailer or by hand where there is no utility of power.
- They are capable of providing up to 1000 kilowatts of power. They use either diesel natural gas , gasoline or propane as fuel



# Commercial Generators:



- In areas where power supply is intermittent or lacking as in THIRD WORLD provincial areas, generators can also be set up to provide additional power.



- Batteries are an integral part of a generator set. Many generator service providers report the most common reason for generator failure is a failed battery.

# Size of battery in commercial

- The size of the battery is dictated by generator size and configuration the battery is connected in.
- Example: A 350 kW generator has only one 4D battery while a 1500 kW and 2MW units have two 8Ds or four 4Ds depending on the enclosure. Below are examples:
- • 4D and 8D batteries are mostly used for larger generator applications (500 kW and above).
  - Batteries can cost up to \$500 each.
  - Batteries are heavy.
- 3100 Series batteries are used for smaller units (30 to 150 kW).
- 535 Series batteries are often used in mid-sized gensets (150 to 500 kW).



# APPLICATIONS

- They are used for general lighting.
- They are used to charge battery because they can be made to give constant output voltage.
- They are used for giving the excitation to the alternators.
- They are also used for small power supply (such as a portable **generator**).