

<http://www.youtube.com/watch?v=Xi7o8cMPI0E&feature=fvwrrel>

http://www.youtube.com/watch?v=d_aTC0iKO68&feature=related Motor & Generator 0:40 - 2:00

Simple DC Generator <http://www.youtube.com/watch?v=i-j-1j2gD28&feature=related>

Simple DC Motor <http://www.youtube.com/watch?v=yPeKC9a3WzE>

<http://www.youtube.com/watch?v=RkLfpXpO5sQ> Terminology

The parts of an alternator or related equipment can be expressed in either mechanical terms or electrical terms. Although distinctly separate, these two sets of terminology are frequently used interchangeably or in combinations that include one mechanical term and one electrical term. This may cause confusion when working with compound machines such as brushless alternators, or in conversation among people who are accustomed to work with differently configured machinery.

In alternating current machines, the armature is usually stationary, and is known as the stator winding. In DC rotating machines other than brushless DC machines, it is usually rotating, and is known as the rotor. The pole piece of a permanent magnet or electromagnet and the moving, iron part of a solenoid, especially if the latter acts as a switch or relay, may also be referred to as armatures.

Mechanical

Rotor: The rotating part of an alternator, generator, dynamo or motor.

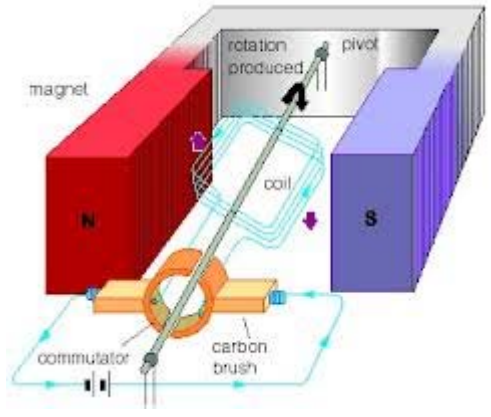
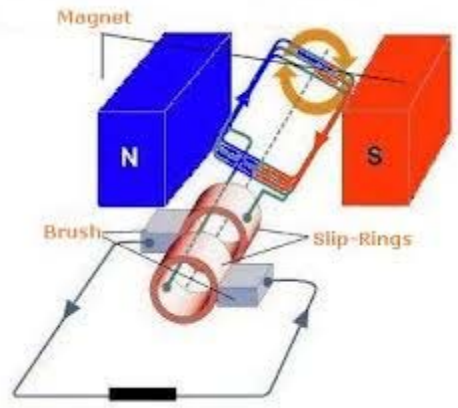
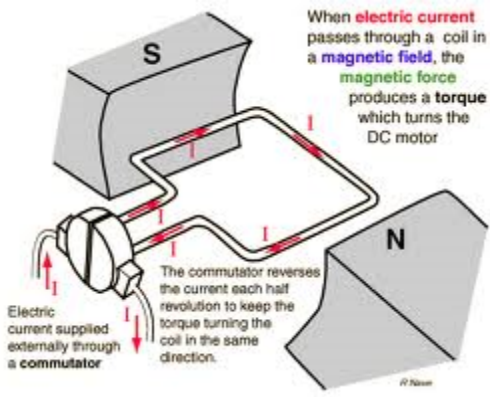
Stator: The stationary part of an alternator, generator, dynamo or motor

Electrical

Armature: The power-producing component of an alternator, generator, dynamo or motor. The armature can be on either the rotor or the stator.

Field: The magnetic field component of an alternator, generator, dynamo or motor. The field can be on either the rotor or the stator and can be either an electromagnet or a permanent magnet.

<http://www.youtube.com/watch?v=0ajvcdfC65w&feature=related>



Motors (AC & DC) and Generators (Alternators / Dynamos)

Mechanical

- Rotor - rotating part
- Stator - stationary part

Armature

- The power-producing component of an alternator, generator, dynamo or motor.
- Can be thought of as the winding in which the voltage is induced.
- The armature can be on either the rotor or the stator.

In AC machines, the armature is usually stationary, and is known as the stator winding.

In DC machines, the armature is usually is usually rotating, and is known as the rotor.

Field

- The magnetic field component of an alternator, generator, dynamo or motor.
- The field can be on either the rotor or the stator and can be either an electromagnet or a permanent magnet.

Directional and Speed Control of DC Motors

- Reverse polarity of input voltage
- Vary input voltage
 - Potentiometer
 - Pulse Width Modulation (Frequency and Pulse Width)

RC Servo Motors

- Scherz, Practical Electronics for Inventors, 2nd Edition, page 813
- Limited Torque and Rotation ($180^\circ - 210^\circ$)
- Pulse Width and Pulse Position Modulation

A typical servo-control signal and shaft-position response

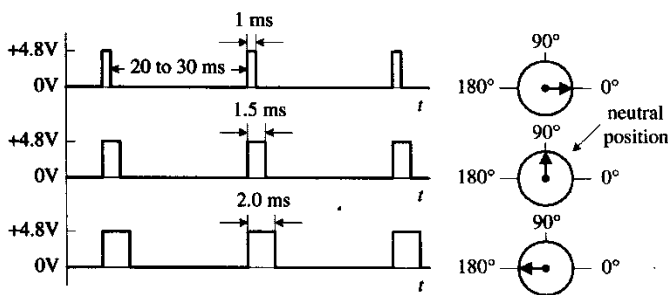


FIGURE 13.6

Stepper Motors

- Resolution (0.72° step = 500 steps per revolution to $90^\circ = 4$ steps per revolution)
- Types (Refer to Scherz, Practical Electronics for Inventors, 2nd Edition, pages 815 - 816)
 - Variable Reluctance
 - Unipolar
 - Bipolar
 - Universal