

Fleming's Left Hand Rule

by Kiran Daware - Electrical laws

<https://www.youtube.com/embed/qvB1mmfo7MQ>

If a current carrying conductor placed in a magnetic field, it experiences a force due to the magnetic field. On the other hand, if a conductor moved in a magnetic field, an emf gets induced across the conductor (Faraday's law of electromagnetic induction).

John Ambrose Fleming introduced two rules to determine the direction of motion (in **motors**) or the direction of induced current (in **generators**). The rules are called as **Fleming's left hand rule** (for motors) and **Fleming's right hand rule** (for generators).

Fleming's left hand rule

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Whenever a current carrying conductor is placed in a magnetic field, the conductor experiences a force which is perpendicular to both the magnetic field and the direction of current. According to **Fleming's left hand rule**, if the thumb, fore-finger and middle finger of the left hand are stretched to be perpendicular to each other as shown in the illustration at left, and if the fore finger represents the direction of magnetic field, the middle finger represents the direction of current, then the thumb represents the direction of force. Fleming's left hand rule is applicable for motors.

How to remember Fleming's left hand rule?

Method 1: Relate the thumb with thrust, fore finger with field and center-finger with current as explained below.

- The **Thumb** represents the direction of **Thrust** on the conductor (force on the conductor).
- The **Fore** finger represents the direction of the magnetic **Field**.
- The **Center** finger (middle finger) the direction of the **Current**.

Method 2: Relate the **Fleming's left-hand rule** with **FBI** (wait! NOT with the Federal Bureau of Investigation). Here, F for Force, B is the symbol of magnetic flux density and I is the symbol of Current. Attribute these letters F,B,I to the thumb, first finger and middle finger respectively.

