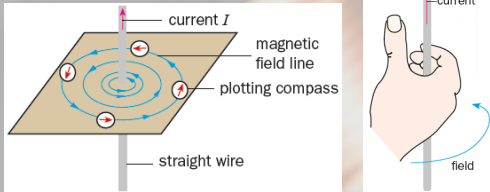


Electromagnetism

Magnetic Effect of Current

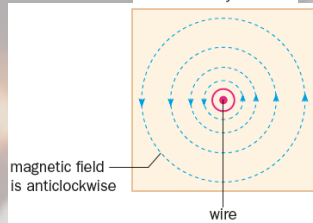


- Use right-hand grip rule to find direction of magnetic field around a wire
- Magnetic field pattern consists of concentric circles.

• Direction notation:

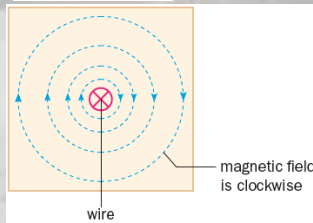
⊙ represents current flowing out of the plane of the paper towards you

⊗ represents current flowing into the plane of the paper away from you



magnetic field is anticlockwise

wire

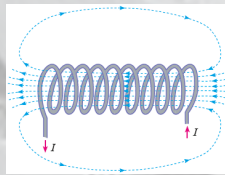


magnetic field is clockwise

wire

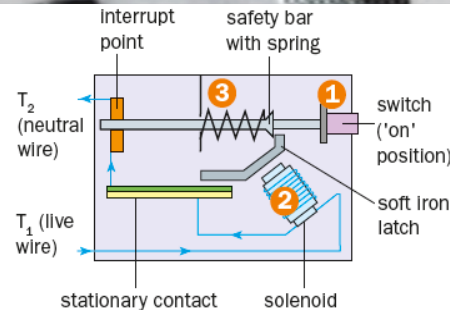
• Magnetic field strength of a solenoid increased by:

1. increasing the current
2. increasing the number of turns of the coil
3. placing a soft iron core within the solenoid



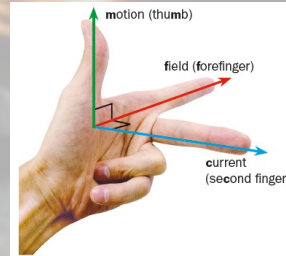
Circuit Breaker

- safety device that switches off the electrical supply when there is excessive current flow
- Figure out how circuit breaker works:
 - Locate solenoid
 - Identify "off" positions and circuit interrupt point
 - Identify reset method back to "on" position



Force on Current-carrying Conductor

- A current experiences a force in the presence of a magnetic field (motor effect).
- The direction of the force is determined by Fleming's left-hand rule.



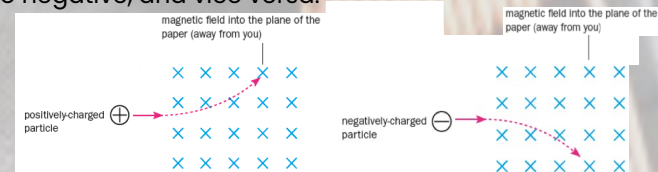
A pair of forces is experienced between two parallel current-carrying conductors:

- Conductors carrying currents in the same direction attract.
- Conductors carrying currents in opposite directions repel.

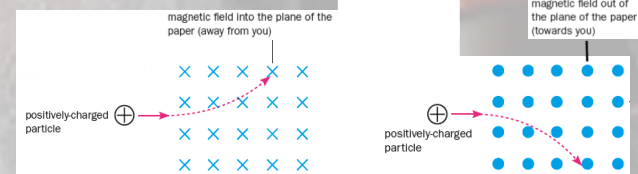


Force on a Charged Particle in a Magnetic Field

- Fleming's left-hand rule shows the positive charge is deflected upwards in a circular path.
- Direction of the force is reversed when the charges of the particles are changed from positive to negative, and vice versa.

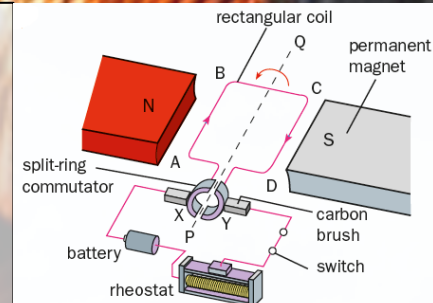


- Direction of the force is reversed when the direction of the magnetic field is reversed.



DC Motor Components

- Circuit Components
- Wire coil/Solenoid
- Permanent Magnets
- Carbon brushes – maintains electrical contact between moving coil and stationary circuit
- Split-ring commutator – to reverse the current direction in the solenoid every half rotation to keep the coil rotating continuously



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