

Motors & Generators

Physics

The same machine run in two directions.

Motor

- Current in, rotation out
- Force from the motor effect
- Fleming's LEFT hand rule
- Split-ring commutator reverses current each half turn
- Back EMF opposes the supply as it spins

Generator

- Rotation in, current out
- EMF from induction
- Fleming's RIGHT hand rule
- Slip rings give AC; commutator gives DC
- Output $\propto$ rate of flux change

THE DIFFERENCE THAT MATTERS

Back EMF limits a motor's current. A stalled motor has no back EMF and draws a very large current — which is how motors burn out.

The split-ring commutator is what makes a DC motor keep turning: it reverses the current at the point the force would reverse.