

Electrical Machines

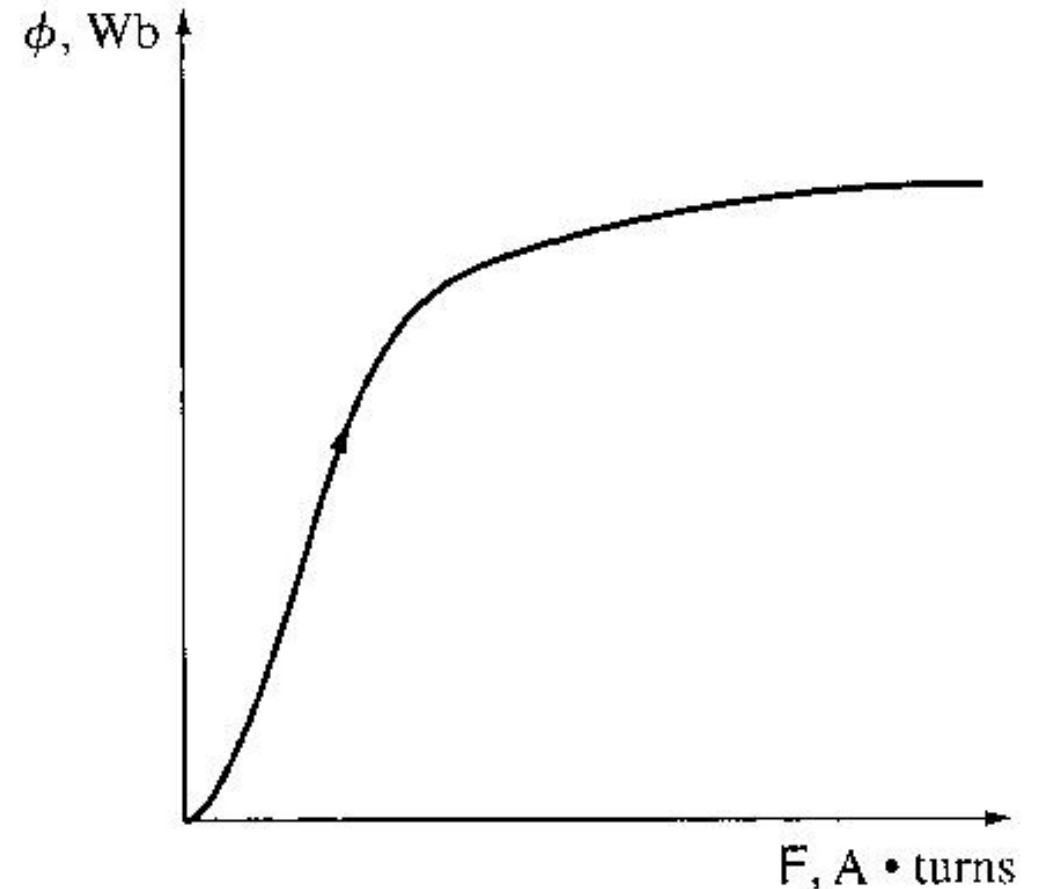
- Converts mechanical energy to electrical energy (Generator) or vice versa (Motor) through the action of magnetic field
- Almost all electric machines rotate about an axis (shaft)

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Magnetic Field

- Saturation Curve

- a small increase in the mmf produces a huge increase in the resulting flux (unsaturated region)
- After a certain point, further increase in the mmf produce relatively smaller increase in the flux (knee)
- Finally, there will be no change at all as you increase mmf further (saturated region)

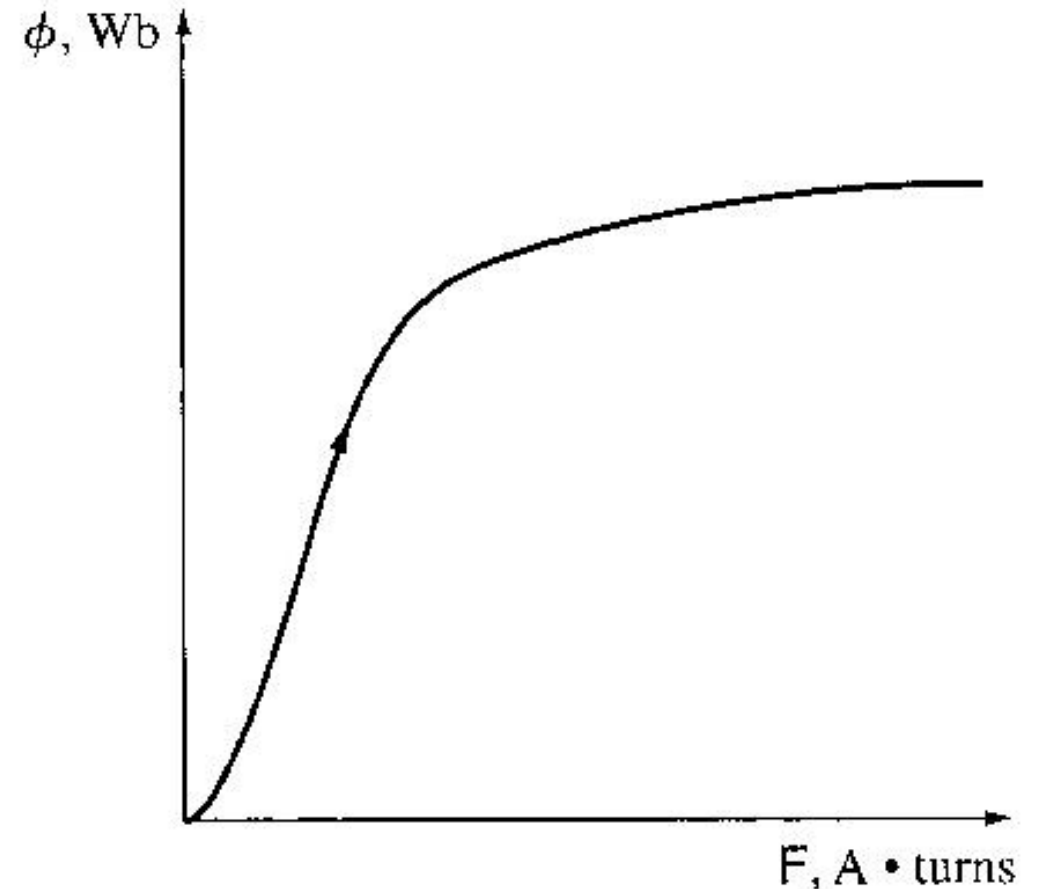


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Magnetic Field

- Saturation Curve

- If the resulting flux has to be proportional to the mmf, then the core must be operated in the unsaturated region
- Note that flux is not linearly related to the mmf



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Energy Losses

- Eddy Current Loss

- To minimize the amount of energy lost, the ferromagnetic material is broken down into small strips or laminations with very thin layers of insulating material inserted between each pair of the laminations.
- The insulation presents high resistance and this reduces any induced eddy currents.

