



SNS COLLEGE OF TECHNOLOGY

(An Autonomous Institution)



COIMBATORE-35

Accredited by NBA-AICTE and Accredited by NAAC – UGC with A+ Grade

Approved by AICTE, New Delhi & Affiliated to Anna University, Chennai

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

COURSE NAME: 19EEB201- DC Machines and Transformers

II YEAR / III SEMESTER

Unit 1 – DC Generator

Topic 6: Armature Reaction





What We'll Discuss

TOPIC OUTLINE



A Case
Concept of Armature Reaction
Assessment



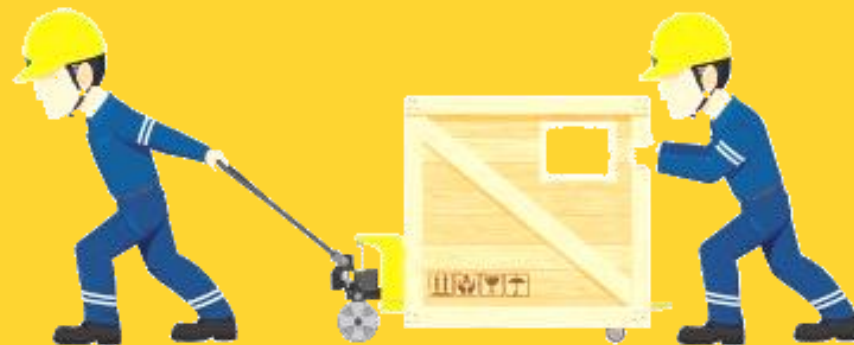
A CASE



(a) Unlike parallel forces –
Tug of war



(b) Unbalanced forces -
Action of a lever



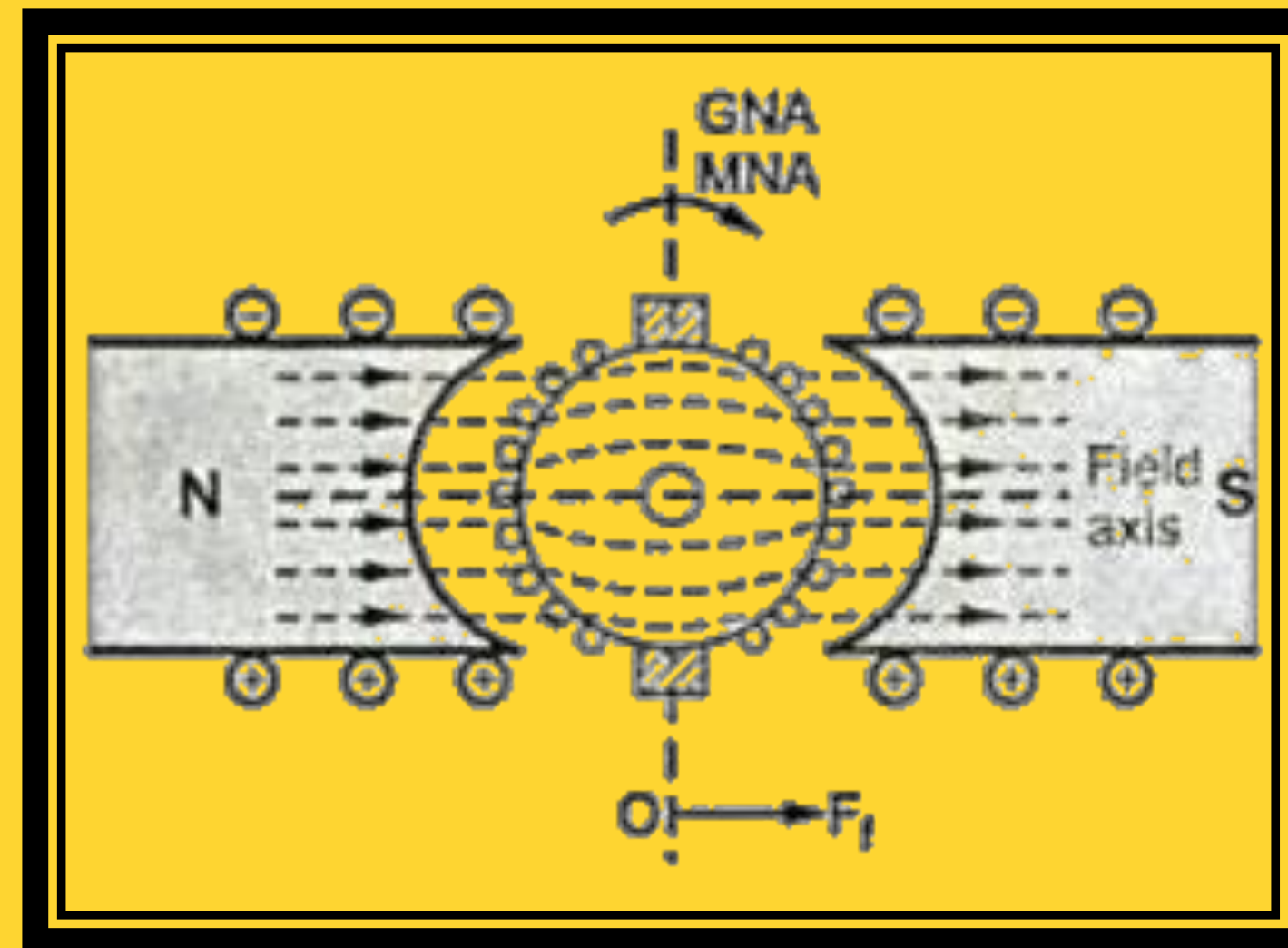
(c) Like parallel forces

- Like forces and Unlike forces



Armature reaction

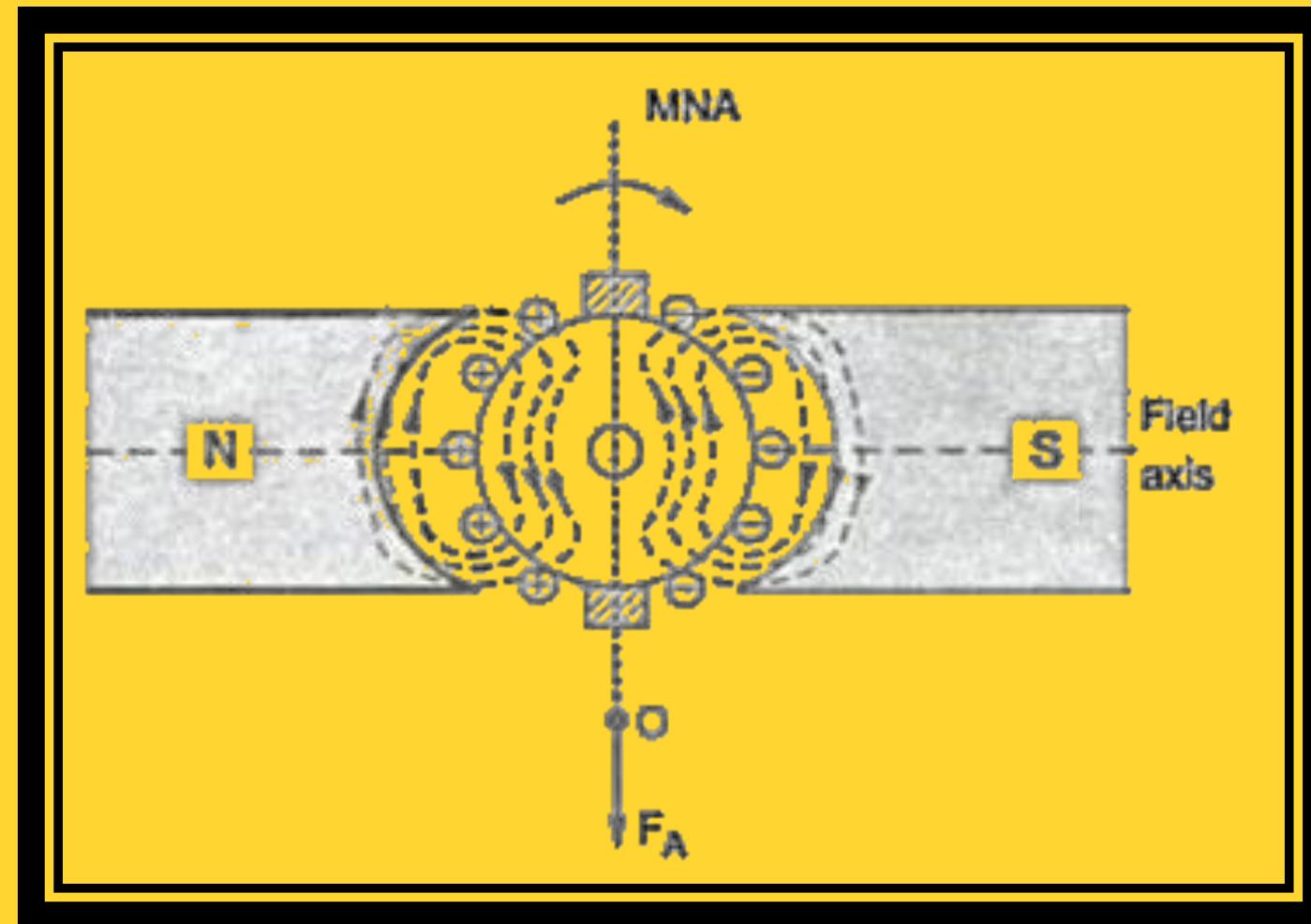
- The flux is distributed symmetrically with respect to axis called polar axis which is line joining the centres of N and S poles.
- The axis along which there is no e.m.f. induced in the armature conductors is called Magnetic Neutral Axis (MNA).
- The geometric neutral axis(GNA) is nothing but the axis of symmetry between the poles.





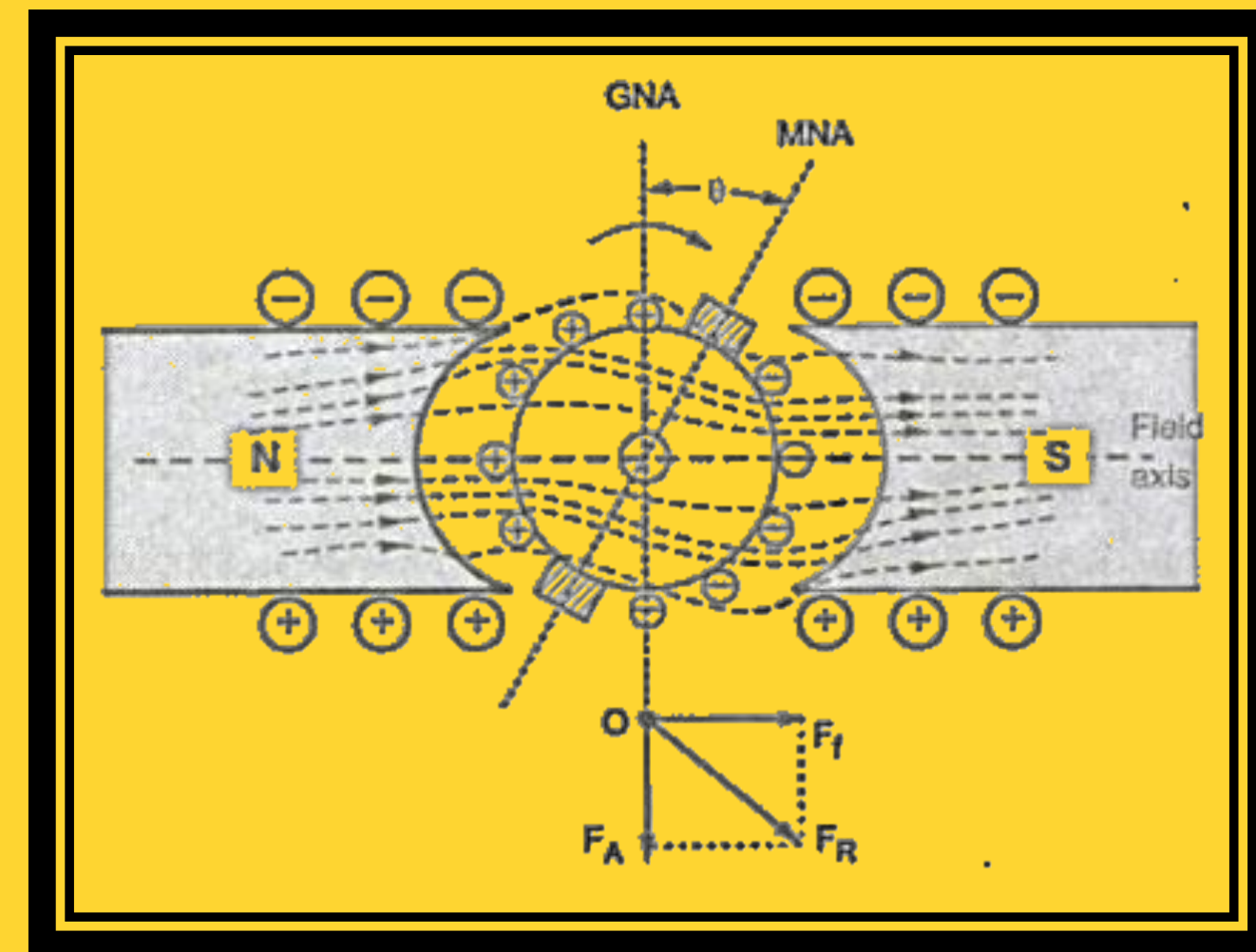
Armature reaction

- The direction of current in armature conductors can be found by applying Fleming's right hand rule.
- Under N pole, the current is flowing in downward direction whereas under S pole, the current is flowing in upward direction.
- The direction of the flux produced by current carrying conductors is vertically downwards in the armature core.



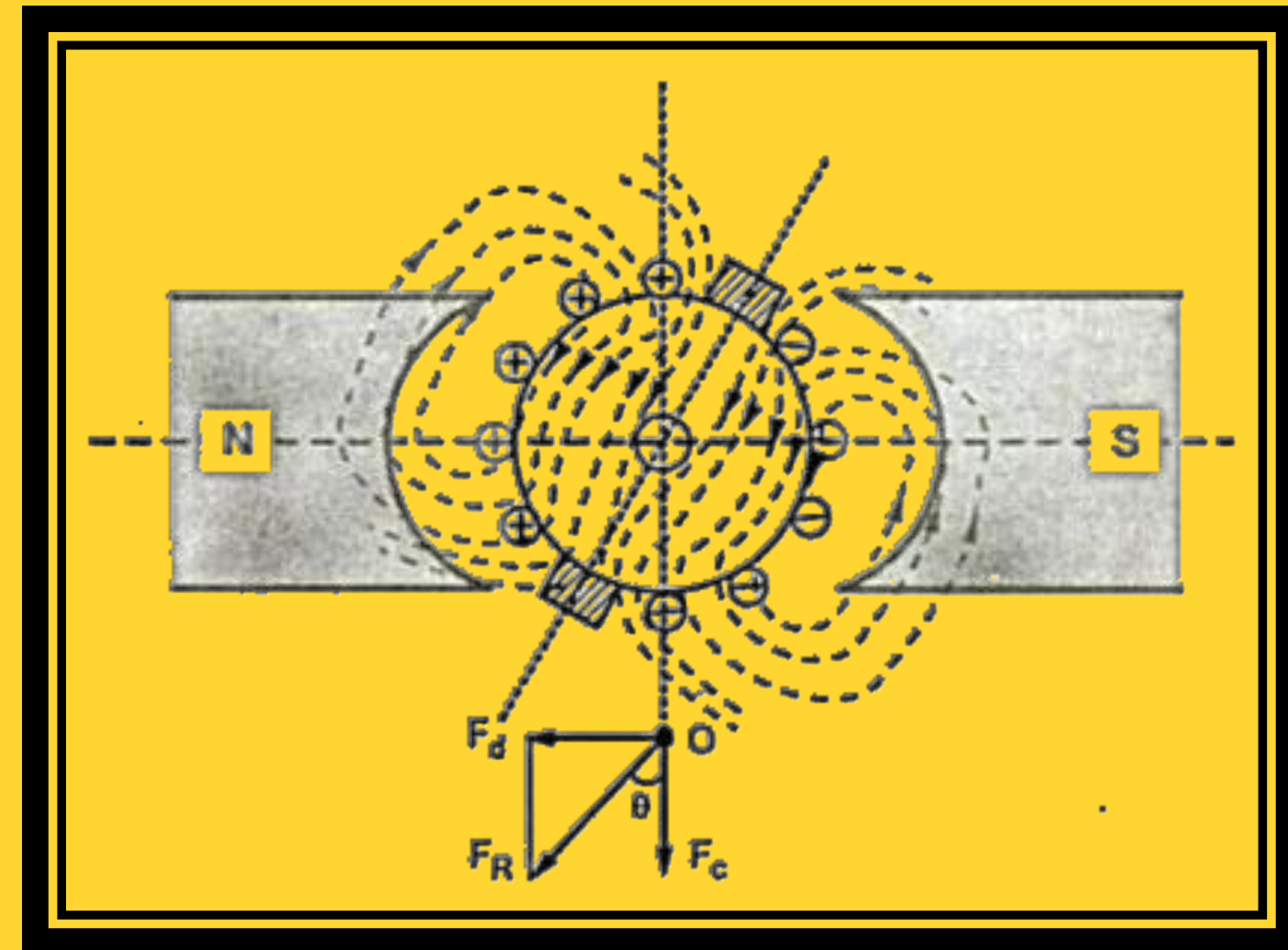
Armature reaction

- The flux gets distorted.
- Due to interaction of two fluxes, the resultant flux distribution is changed as shown in the Fig.
- The MNA gets shifted through an angle ϕ so that brushes are also shifted and are along new MNA.



Armature reaction

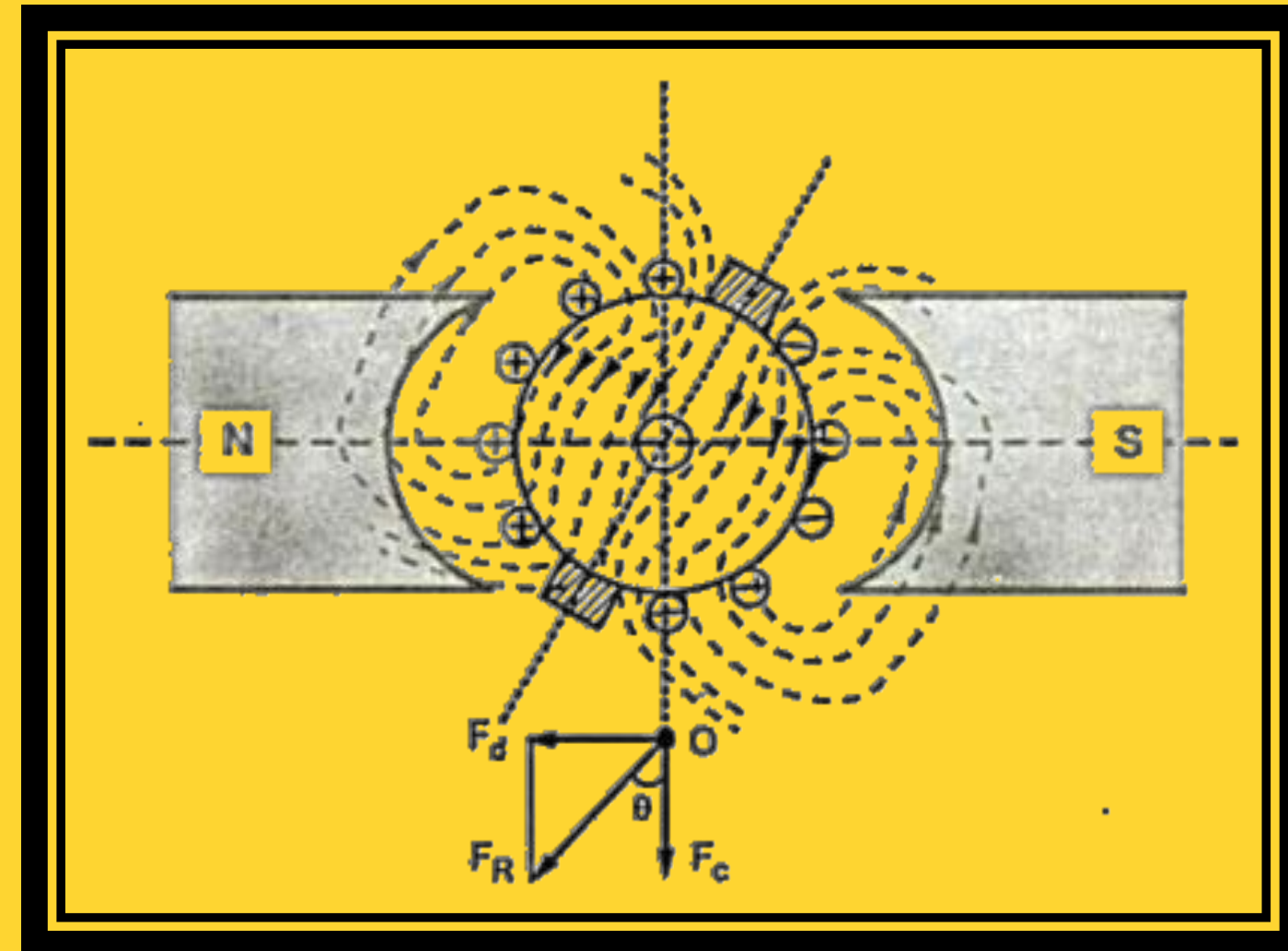
- Due to this brush shift, the armature conductors as well as armature current is redistributed.
- Some of the armature conductors which were earlier under the influence of S pole now come under N pole and vice versa.
- The conductors on the left of new position of MNA carry current downwards and those to the right carry current upwards.
- This will tend to reduce the total flux.





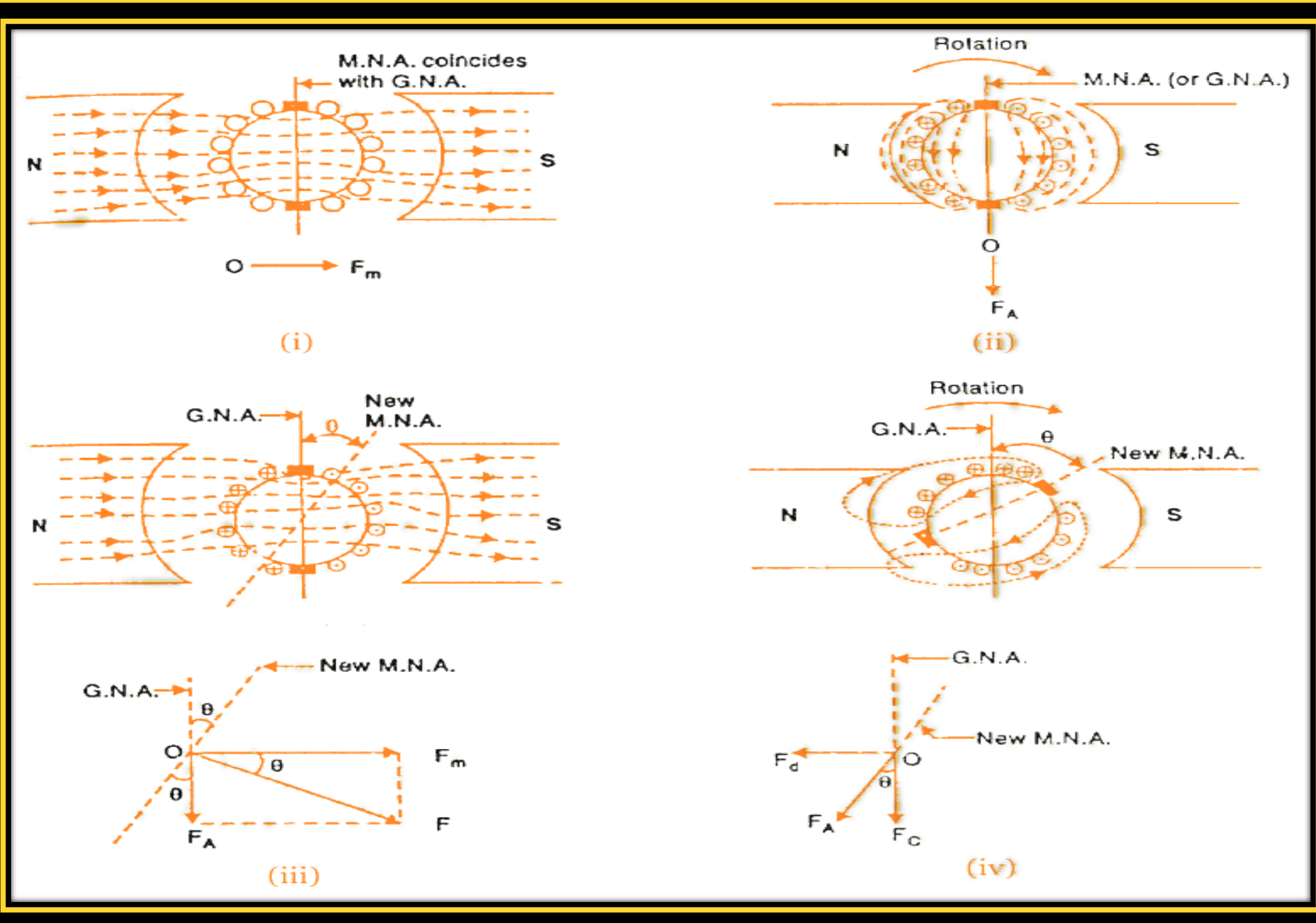
Armature reaction

- This component is called demagnetizing component of the armature reaction
- The other component OF_c is at right angles to vector OF_f . This will produce distortion in the main field. Hence this component is called cross magnetizing component of the armature reaction.





Armature reaction - Summary





Recall



Name the two major Effects of Armature reaction

Differentiate GNA & MNA



THANK YOU