Faculty of Engineering and Technology

University of Lucknow

Lecture Notes

Subject Code: EE–303

Electrical Machine-I

Topic Name

(Interpole Winding)

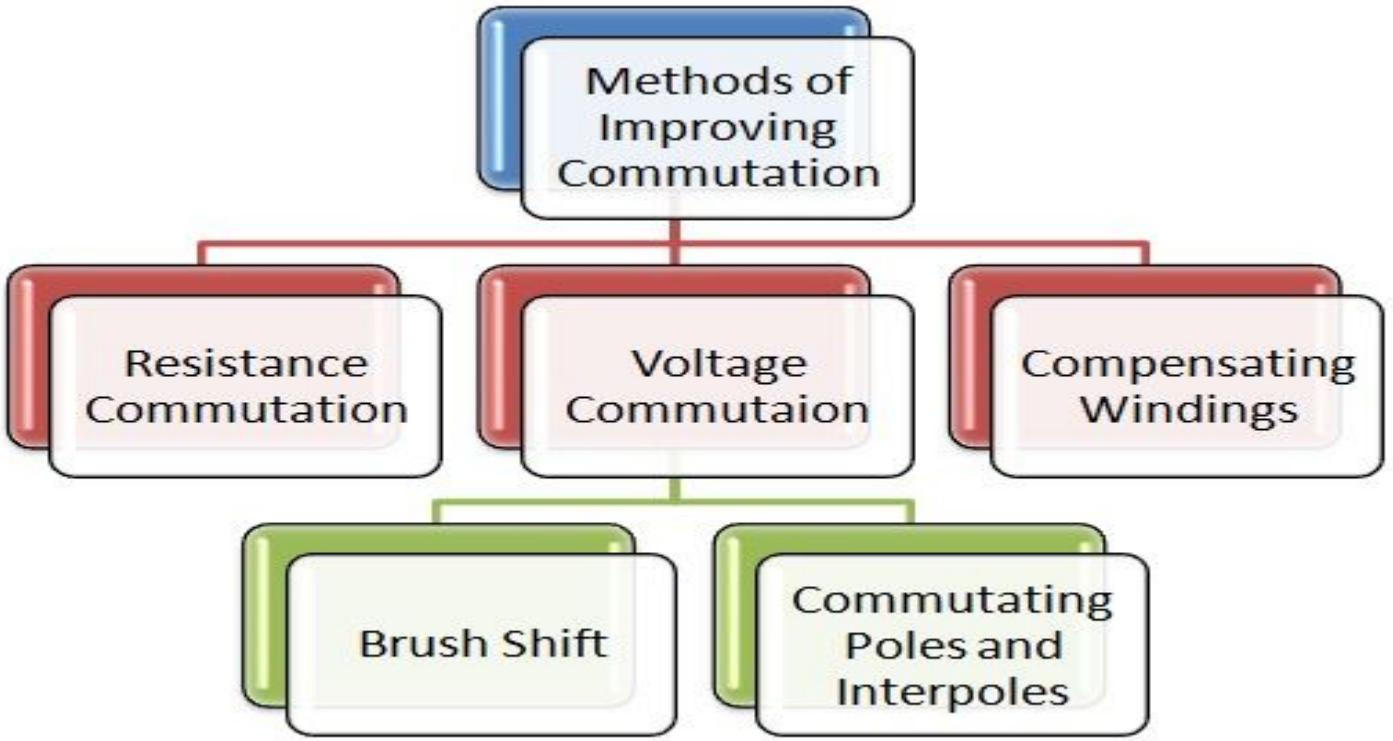
By:

Er. Wazid Ali

Assistant Professor

Deptt. of Electrical Engineering

Methods of improving commutation

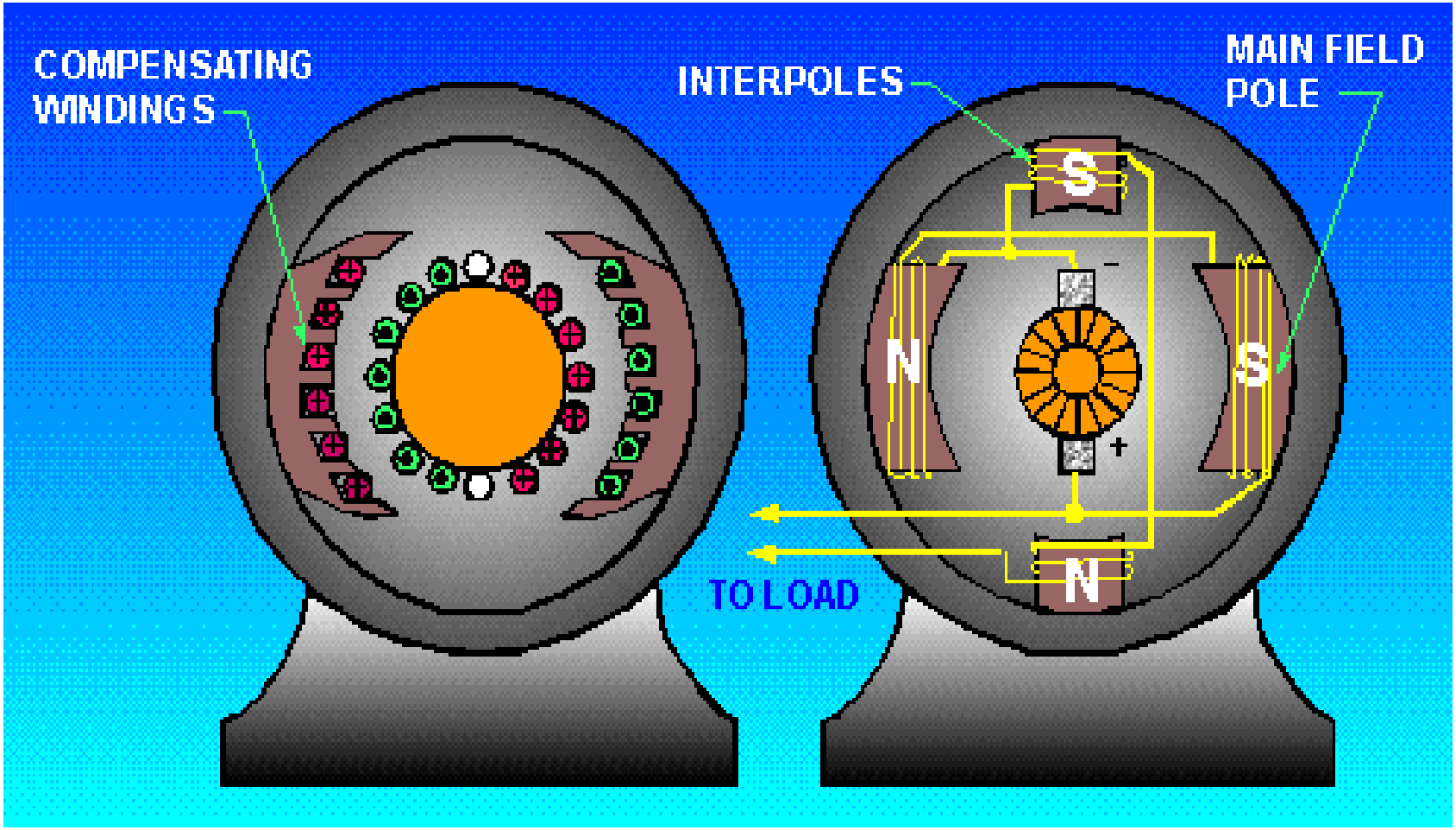


Drawbacks of brush shifting

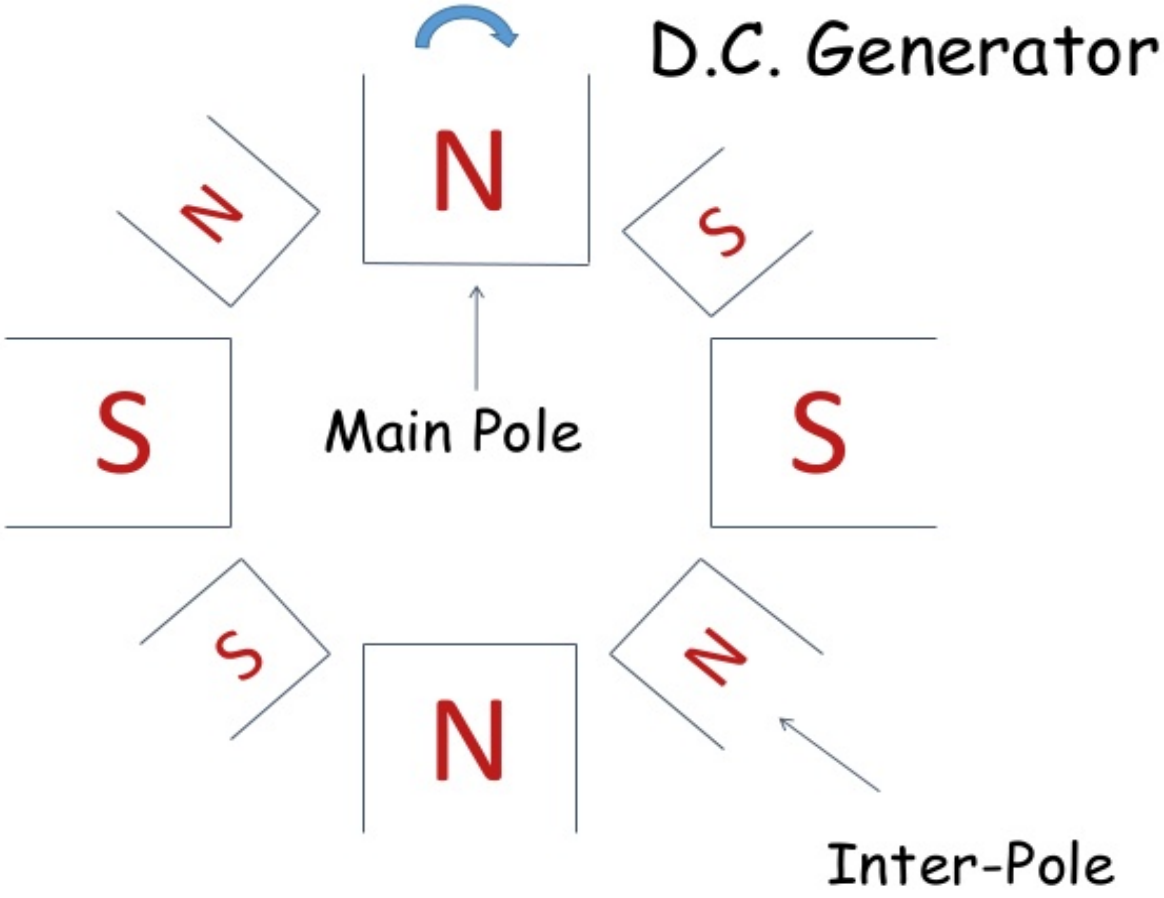
- For improving commutation the brushes will have to shifted for every changes in load, because angle theta depends on load current
- For larger shift of brushes demagnetizing ampere turn increases and main flux reduced

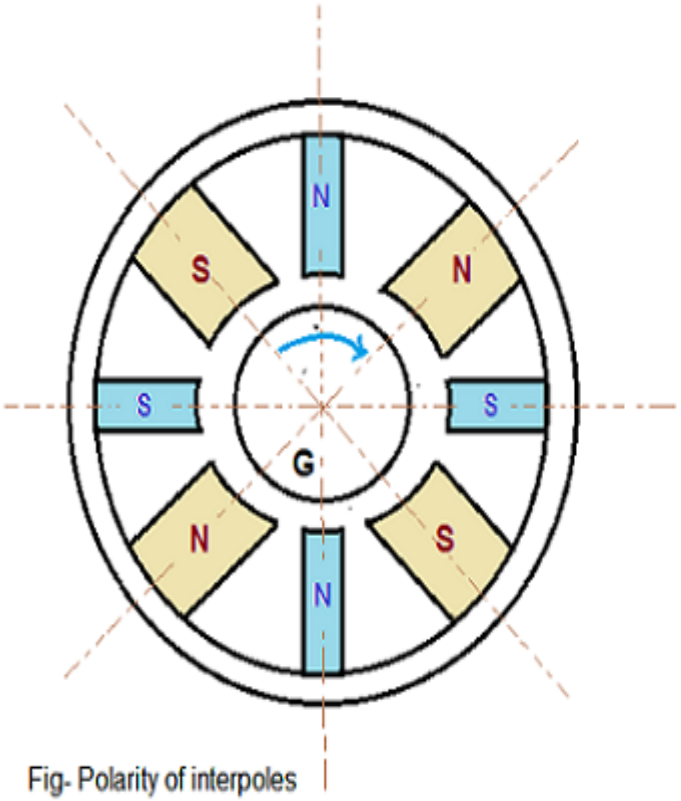
Ineterpoles

- Interpoles are narrow poles placed excalty midway between main poles
- The inerpoles are to the fitted yoke and are also knowns as commutating poles or compoles
- For generator, the polarity of Interpoles must be same as that of main Pole ahead of it in the direction of rotation.
- For Motor, the polarity of Interpole must be same as that of Main Pole behind it.


COMPENSATING WINDINGS
INTERPOLES
MAIN FIELD POLE
S
N
S
N
TO LOAD

Polarity in case generator





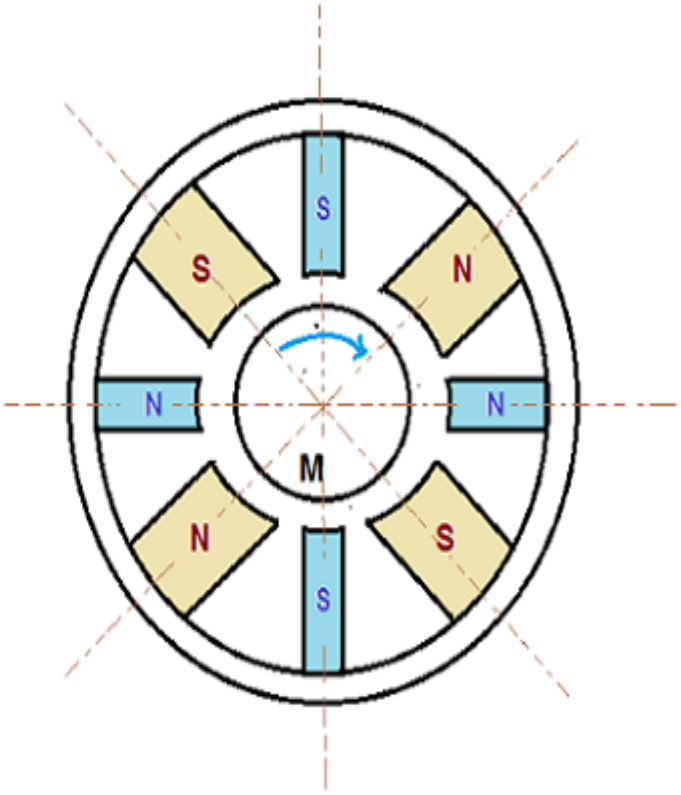
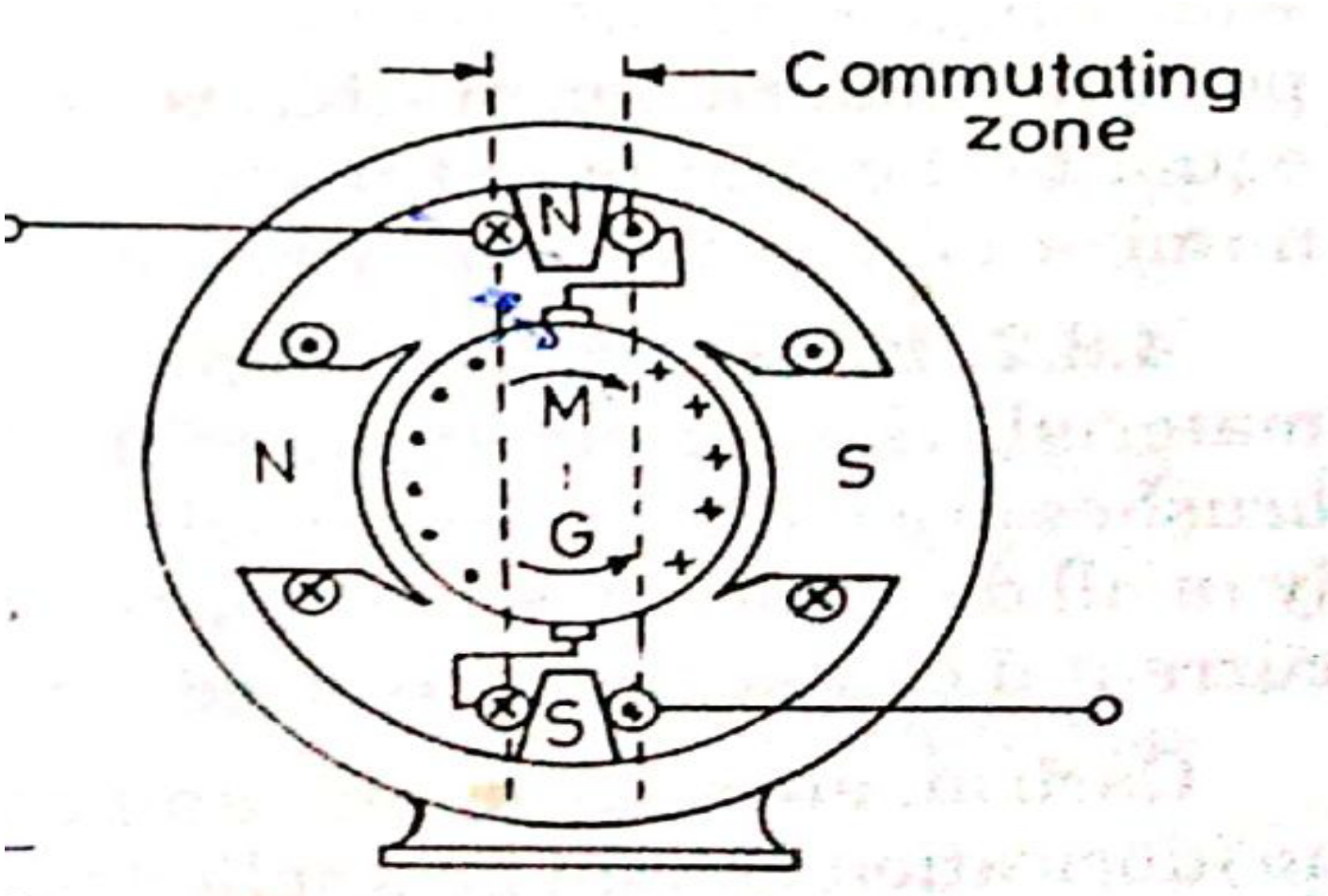


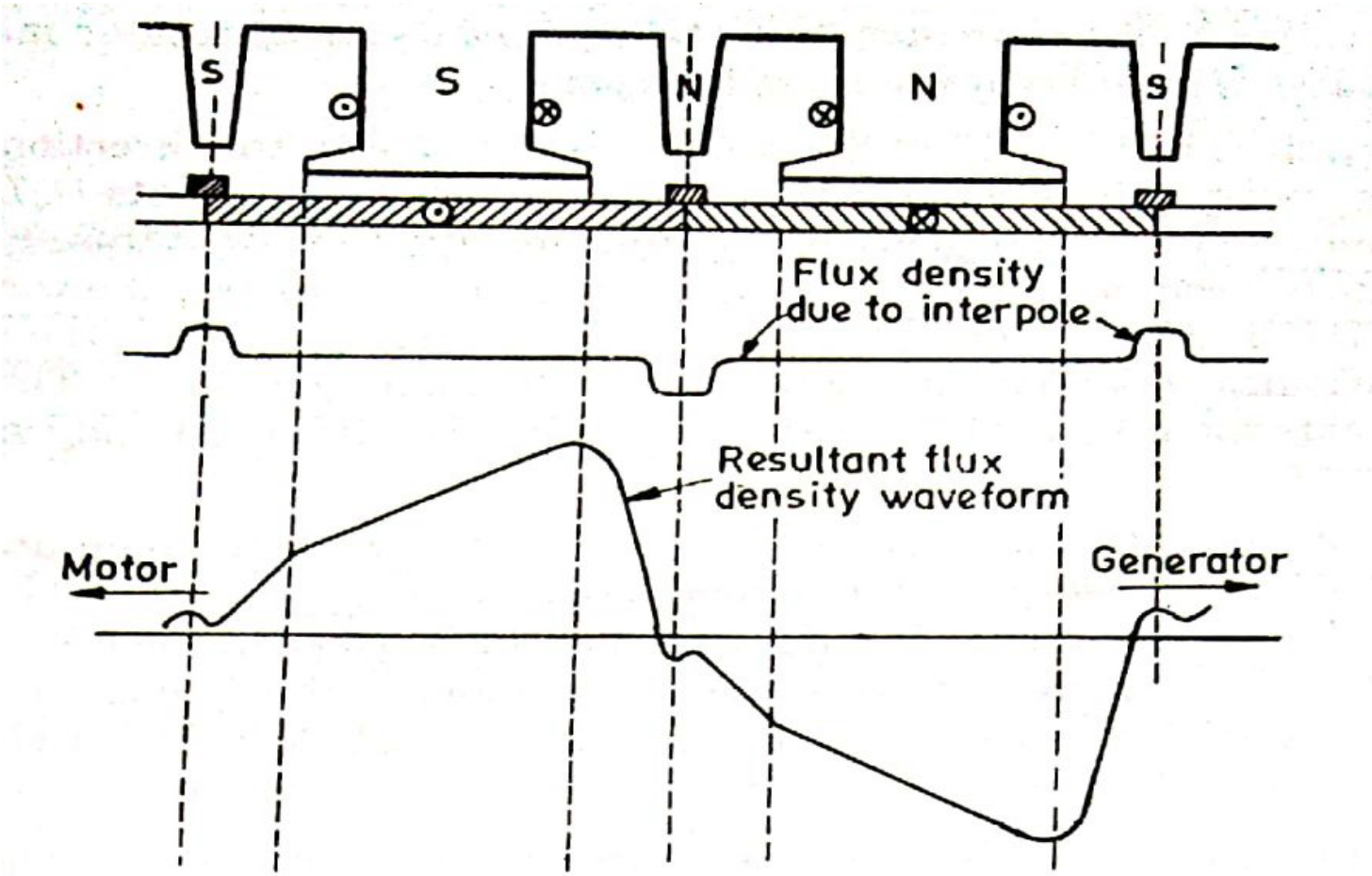
Fig- Polarity of interpoles

Interpole winding connected in series with armature winding



- Interpole do not only nullify the effect of armature reaction but in addition, produces some extra mmf in the interpolar zone. This extra mmf in the interpolar zone induces rotational EMF in the short circuited coil undergoing commutation in such a direction to oppose the reactance voltage in the coil. Thus the resultant the resultant voltage in the short circuited coil becomes zero and the commutation is spark less.
- Interpole mmf = 1.2or 1.3 times armature mmf per pole
- In order to enables the interpoles to do their duty faithfully the interpole winding is connected in series with armature .

Resultant flux density waveform with interpoles



Disclaimer- *This content is solely for the purpose of e-learning by students and any commercial use is not permitted. The author does not claim originality of the content and it is based on the references as listed.*

References:

Text Books:-

1. *I.J. Nagrath&D.P.Kothari,‖ Electrical Machines‖, Tata McGraw Hill*

2. *Husain Ashfaq ,‖ Electrical Machines‖, Dhanpat Rai & Sons*

3. *M. G. Say, —The Performance and Design of AC machines‖, Pit man & Sons*

Reference Books:-

1. *A.E. Fitggerald, C.Kingsley Jr and Umans,‖Electric Machinery‖ 6th Edition, McGraw Hill, International Student Edition.*
2. *Irving L. Kosow, —Electric Machine and Transformers‖, Prentice Hall of India.*
3. *P.S.Bhimbhra, Electrical Machinary, Khanna Publications*
4. Open Source contents available on google and youtube.