



SNS COLLEGE OF TECHNOLOGY

(An Autonomous Institution)



COIMBATORE-35

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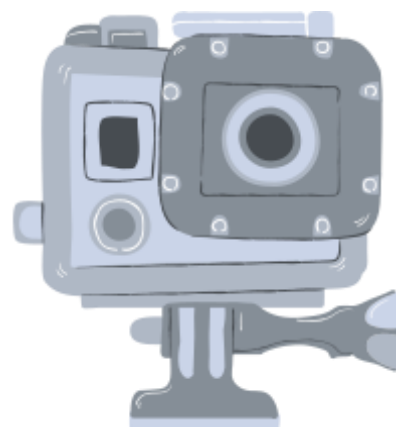
DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

**COURSE NAME: 19EET207/ SYNCHRONOUS AND INDUCTION
MACHINES**

II YEAR / IV SEMESTER

Unit 5 – SPECIAL MACHINES

Topic 10: AC series motor





GUESS THE TOPIC NAME...



- AC series motors are also known as the modified DC series motor as their construction is very similar to that of the DC series motor



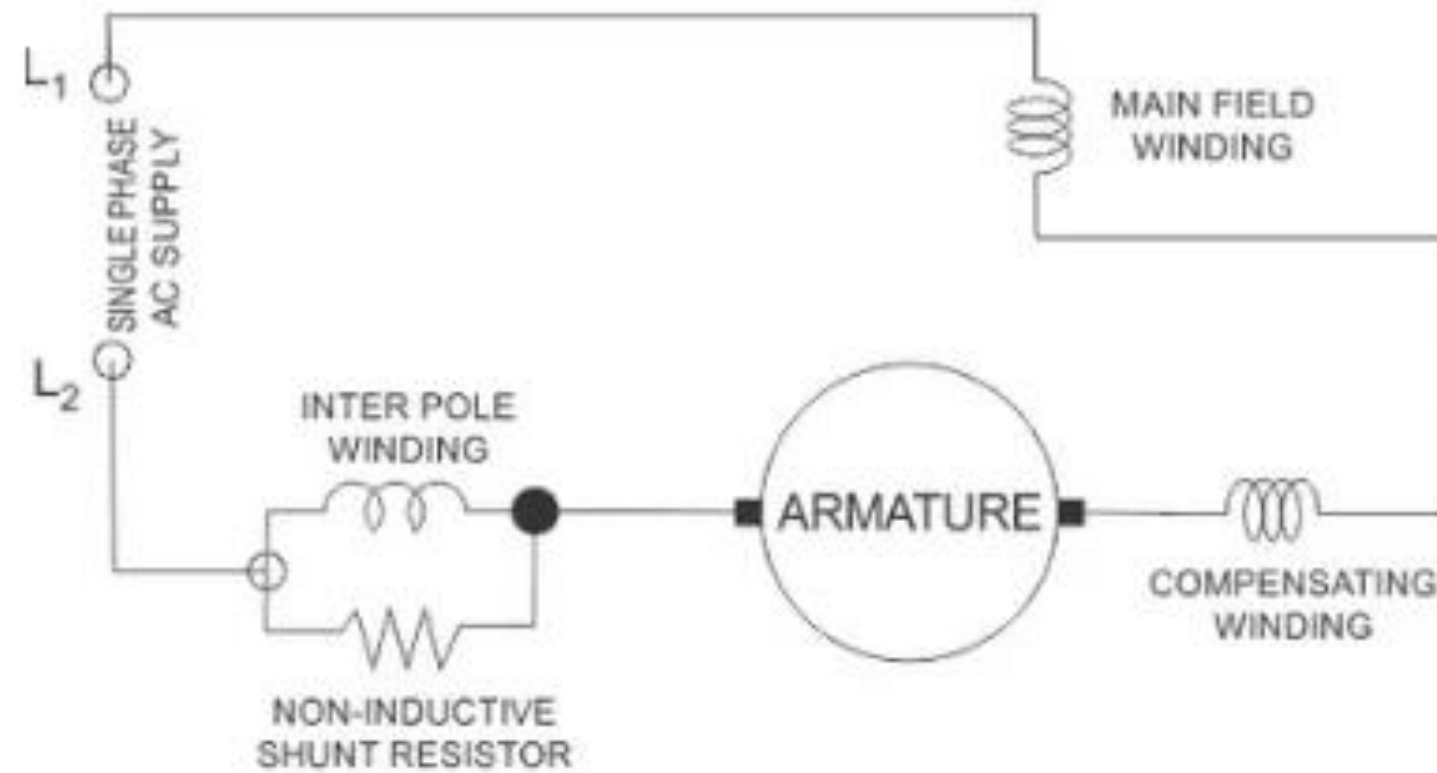
AC series motor

AC supply to DC series motor?

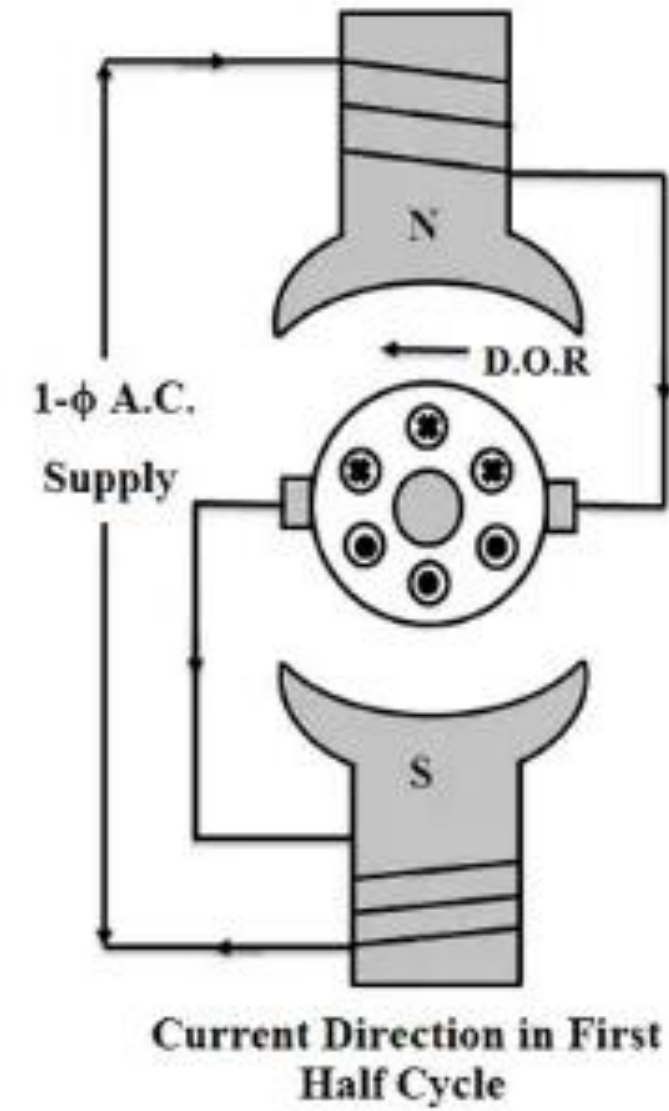
- An AC supply will produce an unidirectional torque because the direction of both the currents (i.e. armature current and field current) reverses at the same time.
- Due to presence of alternating current, eddy currents are induced in the yoke and field cores which results in excessive heating of the yoke and field cores.
- Due to the high inductance of the field and the armature circuit, the power factor would become very low.
- There is sparking at the brushes of the DC series motor.



AC series motor



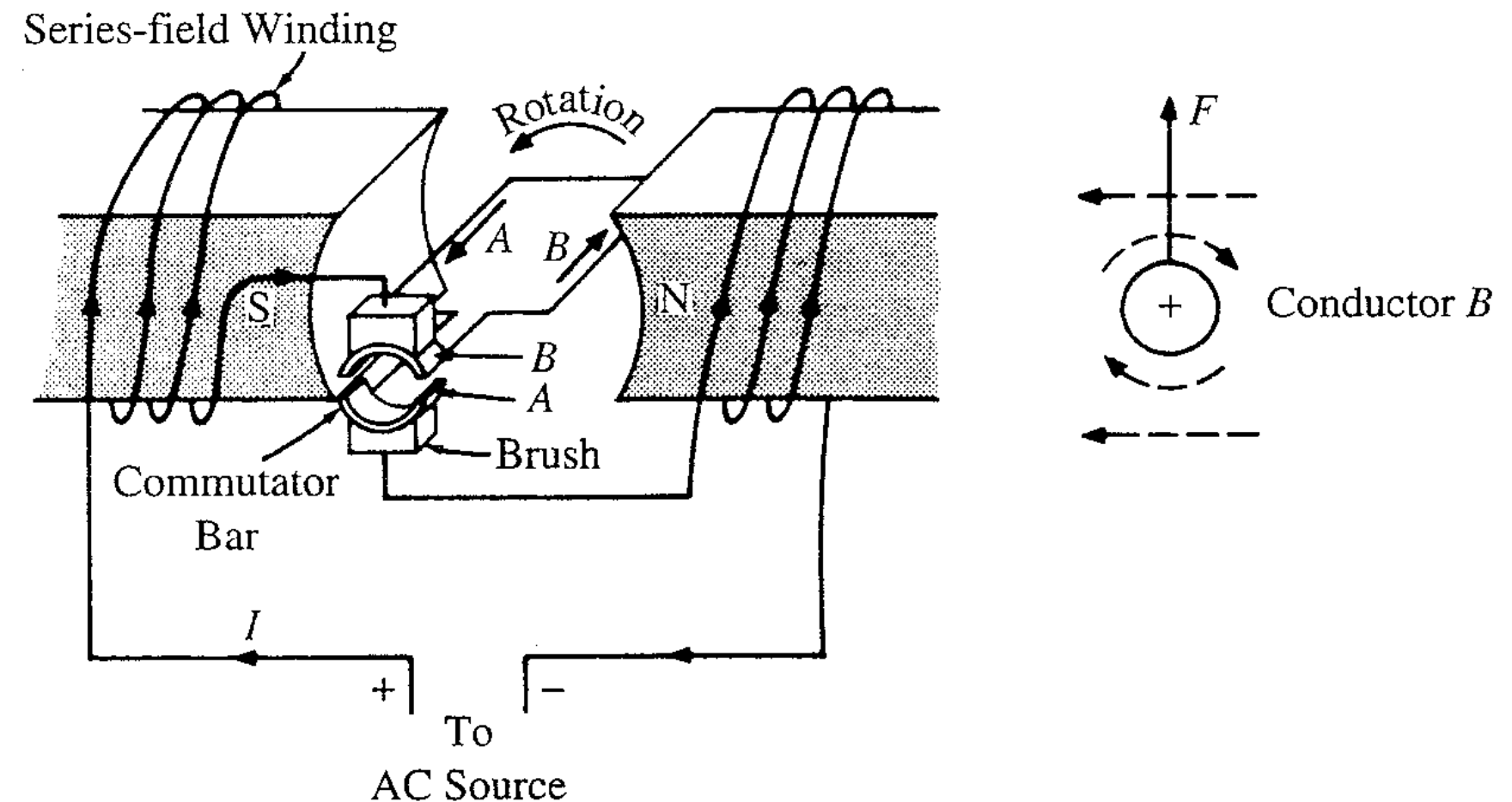
AC Series Motor with Interpoles and compensating Windings





AC series motor

- Motor that can be used with a single phase ac source as well as a dc source of
- supply voltages are called universal motor.
- The stator and rotor windings of the motor are connected in series through the rotor commutator.
- The universal motor is also known as an AC series motor or an AC commutator motor.





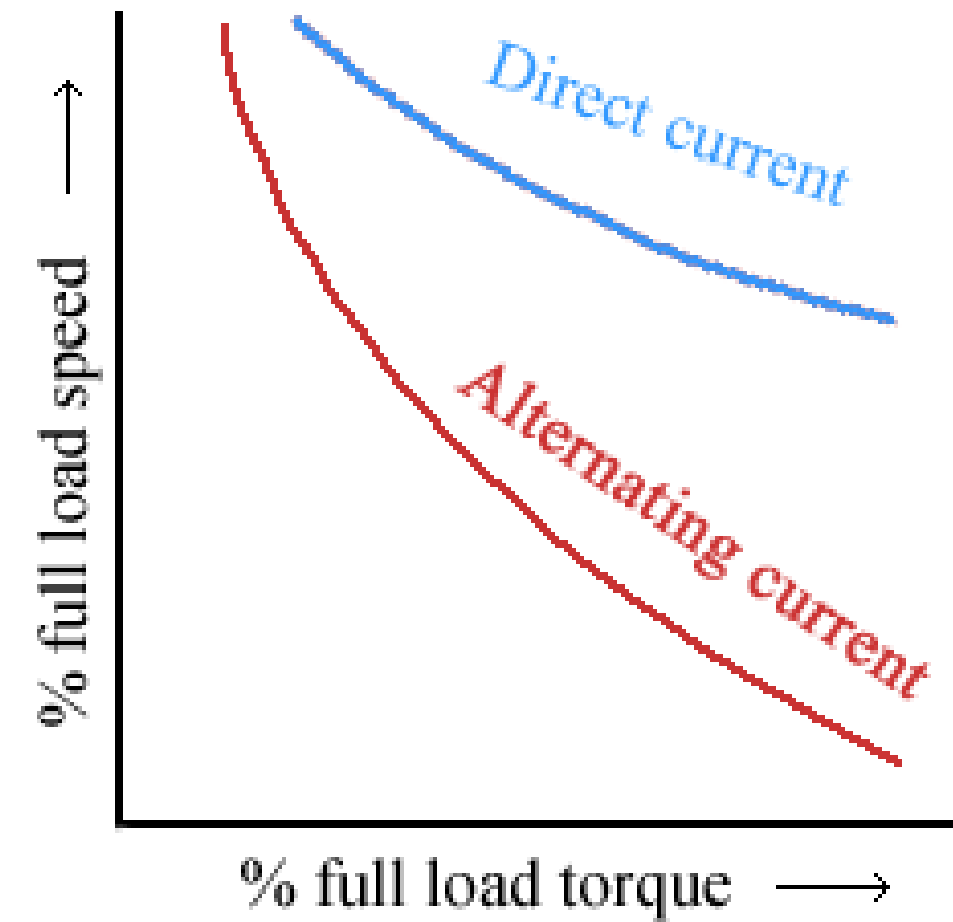
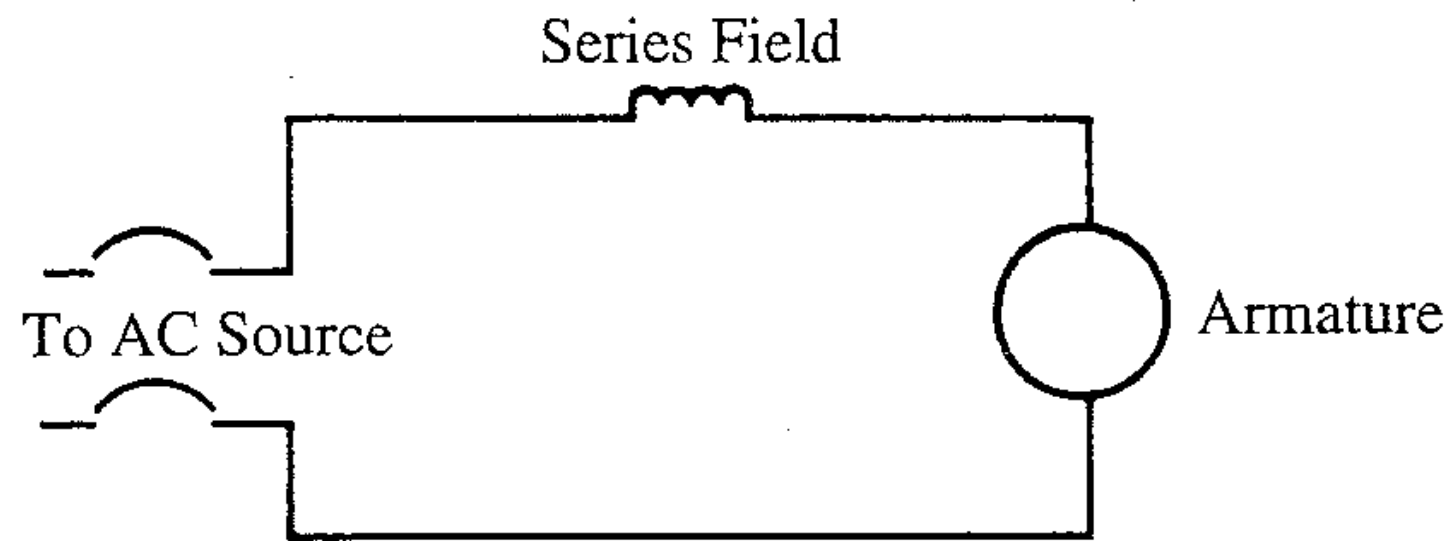
AC series motor



- A series ac motor is the same electrically as a dc series motor but construction differs slightly.
- Special metals, laminations, and windings are used which reduce losses caused by eddy currents, hysteresis, and high reactance.
- Dc power can be used to drive an ac series motor efficiently, but the opposite is not true.
- The characteristics of a series ac motor are similar to those of a dc series motor. It is a varying-speed machine.
- It has low speeds for large loads and high speeds for light loads.



SPEED TORQUE CHARACTERISTICS





Modification in Design of A.C. Separately Excited Motor



- Fully laminated poles and yokes must be used in order to reduce eddy current losses.
- The power factor can be improved by reducing field and armature reactances.

(In order to reduce field reactance, the field winding is designed with less number of turns. Lower pole flux also reduces the transformer emf in the commutating coi)

- The motor should be provided with a large number of poles each supplying less flux per pole.
- Reduction in the number of turns on the field winding would also reduce field flux. To keep the torque constant on the shaft, the armature turns should be increased proportionately. This increases the armature reaction and armature reactance.



SUMMARY

A.C. Series Motor



KEEP
LEARNING..
Thank u

SEE YOU IN NEXT CLASS