



SNS COLLEGE OF TECHNOLOGY

(An Autonomous Institution)

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Coimbatore-641035

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

19EET301 / POWER ELECTRONICS AND DRIVES

III YEAR / V SEMESTER

UNIT – IV : B - DC DRIVES



BASICS OF DC DRIVE



TOPIC OUTLINE

What we'll discuss?

DC drive – Advantages

DC drive – Limitations

Will AC drive replace DC drive ?

DC Vs AC drive

Principle of Operation of DC Motor

Torque Speed Characteristics





DC DRIVE - Advantages

Electric drives that use DC motors as the prime mover

Advantage:

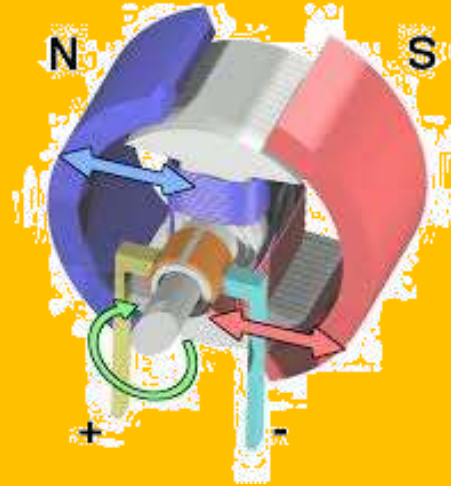
- Simple speed control
- Finite adjustable drive
- More reliable
- Dominates variable speed applications before PE converters were introduced



DC DRIVE - Limitations

Limitations:

- Regular maintenance
- Expensive motor
- Commutation issues



Will AC drive replaces DC drive ?

- Predicted 30 years ago
- DC strong presence – easy control – huge in numbers
- AC may eventually replace DC – at a slow rate



DC Vs AC DRIVES

DC drives

- Motor is costly
- More maintenance
- Consume more power
- Used in few locations – supply constraint
- Limitation of speed
- Low dynamic response

AC Drives

- Motor is cheap
- Less maintenance
- Consume less power
- Used in any locations – supply available
- No upper limit for speed
- High dynamic response



DC Vs AC DRIVES

DC drives

- Control circuit simple in design
- Converters do not produce harmonics
- High starting torque is possible
- Less noise
- Power to weight ratio is small

AC Drives

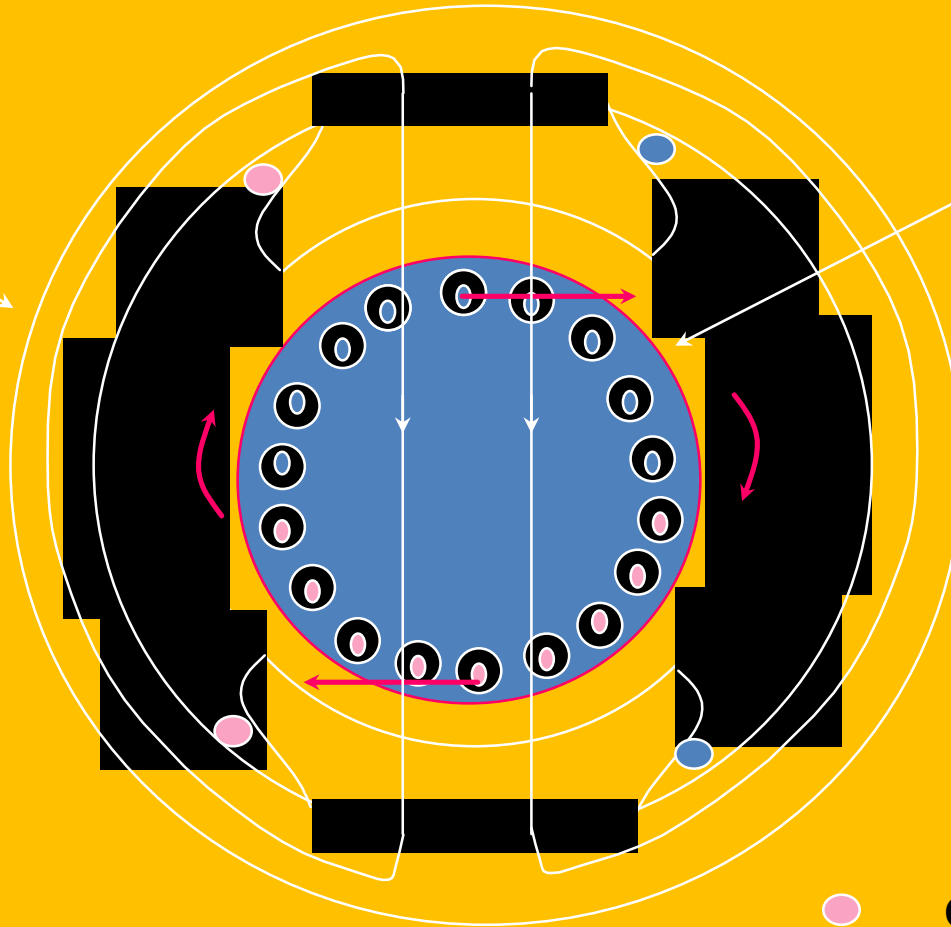
- Control circuit complex in design
- Converters produce harmonics problems
- High starting torque is difficult to achieve
- Noisy operation
- Power to weight ratio is large



PRINCIPLE OF OPERATION – DC MOTOR



Stator: field windings

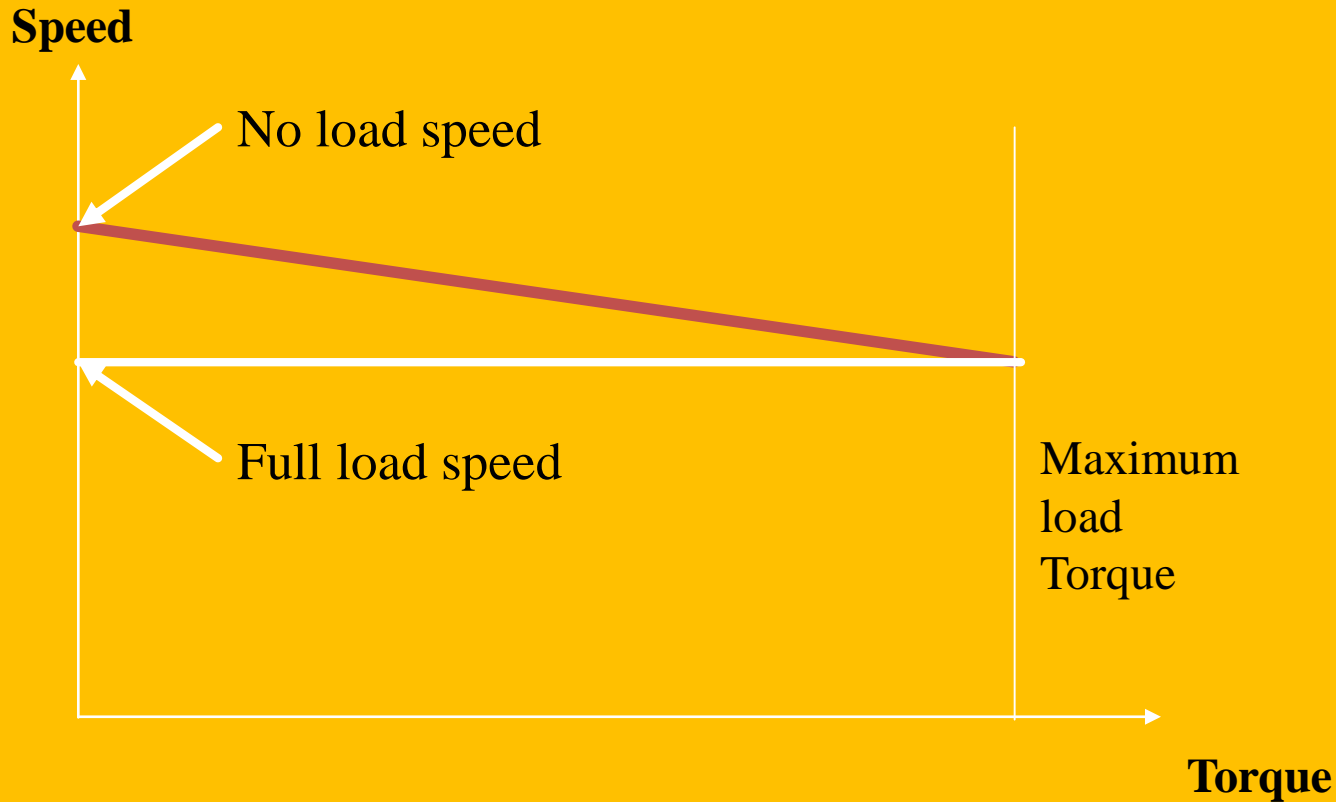


Rotor: armature windings

- Current in
- Current out



TORQUE-SPEED CHARACTERISTICS OF DC MOTOR



Separately excited DC motors have good speed regulation



Evaluation Time

Summarize the
content...

MCQs



Thanking You.