SNS COLLEGE OF TECHNOLOGY

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Coimbatore-641035

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

19EET301 / POWER ELECTRONICS AND DRIVES

III YEAR / V SEMESTER

UNIT – IV : A - INTRODUCTION TO ELECTRIC DRIVES

Characteristics of Load

TOPIC OUTLINE

What we'll discuss?

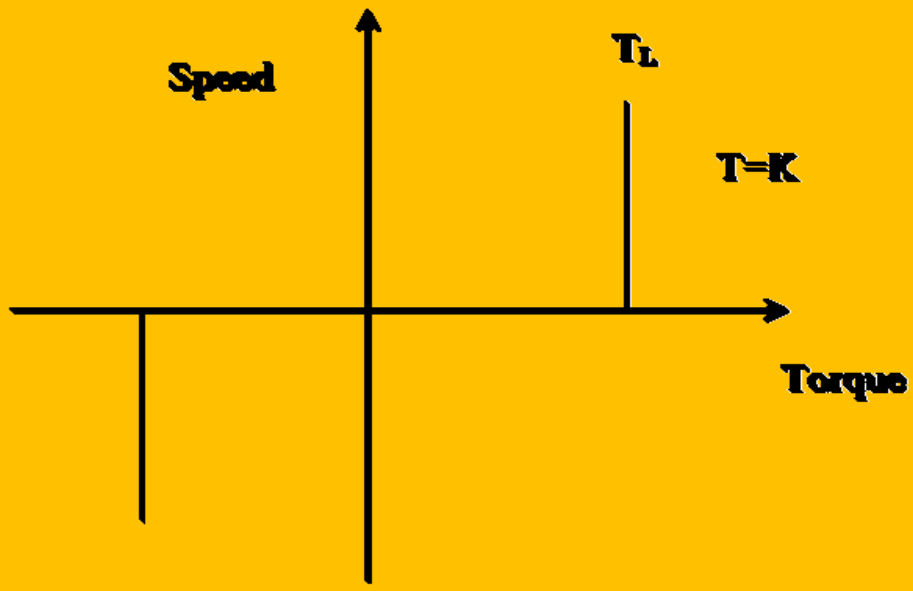
Characteristics of Load - 4 types

Mechanical Ch. of Motor

Example of loads

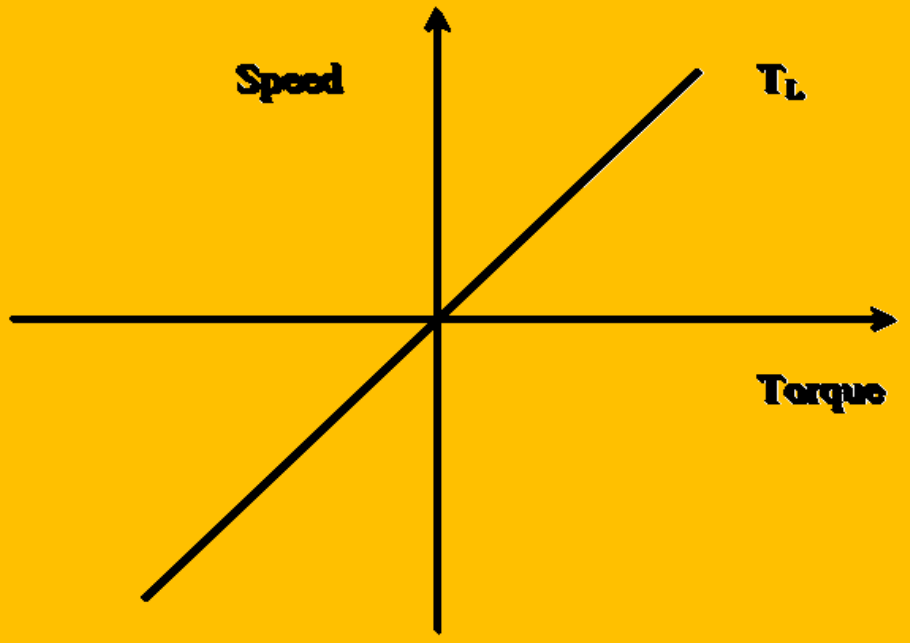
1.Constant torque

Mostly - Mechanical nature of load - shaping, grinding or shearing, require constant torque irrespective of speed. **T = k**



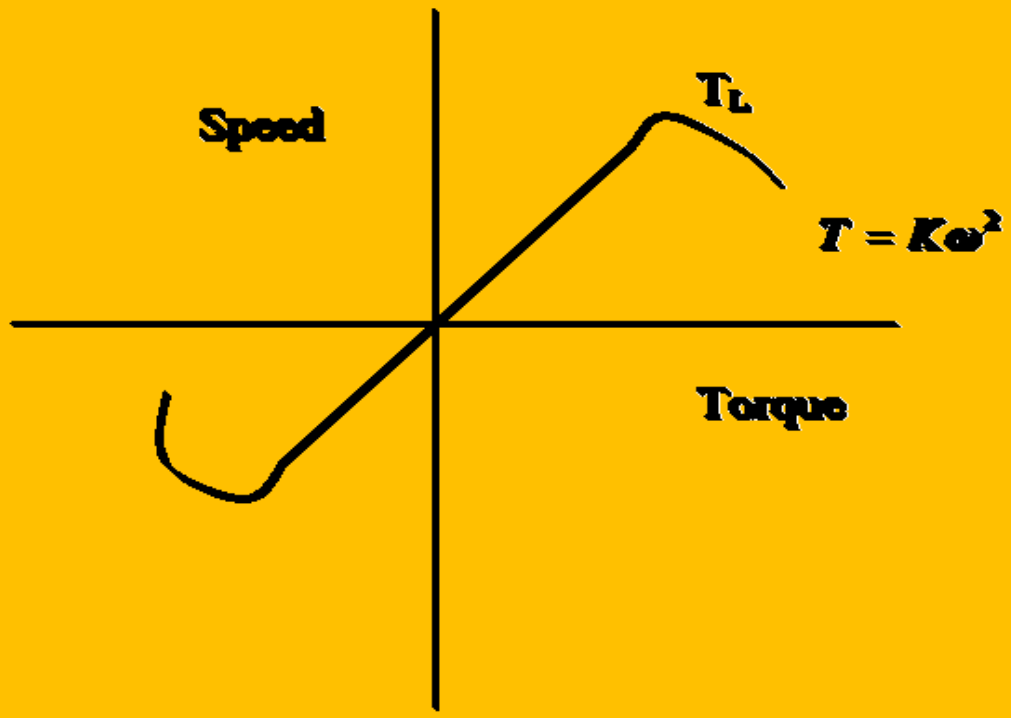
2.Torque proportional to speed

Generator type load - constant resistance load – Friction load – Cutting Machine : $T \alpha \omega$



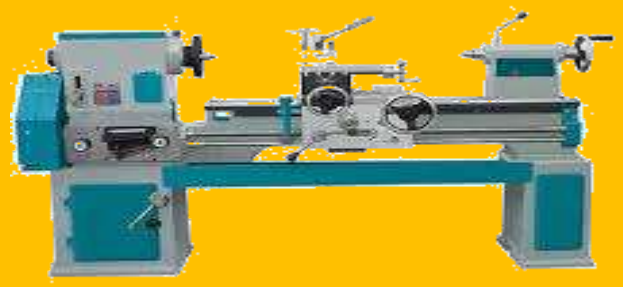
3.Torque proportional to square of the speed

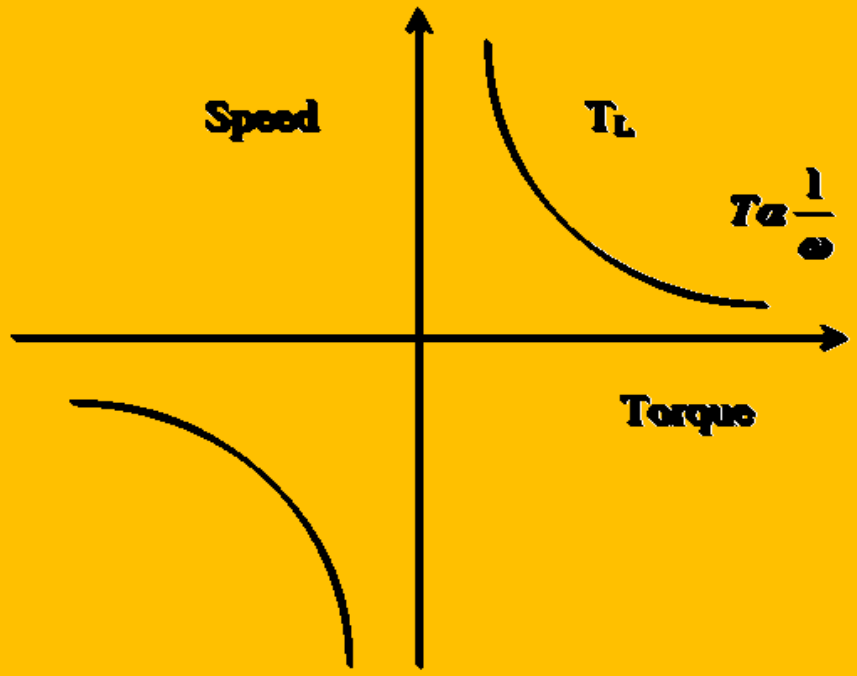
Fan type load - Fans, rotary pumps, compressors and ship propellers.



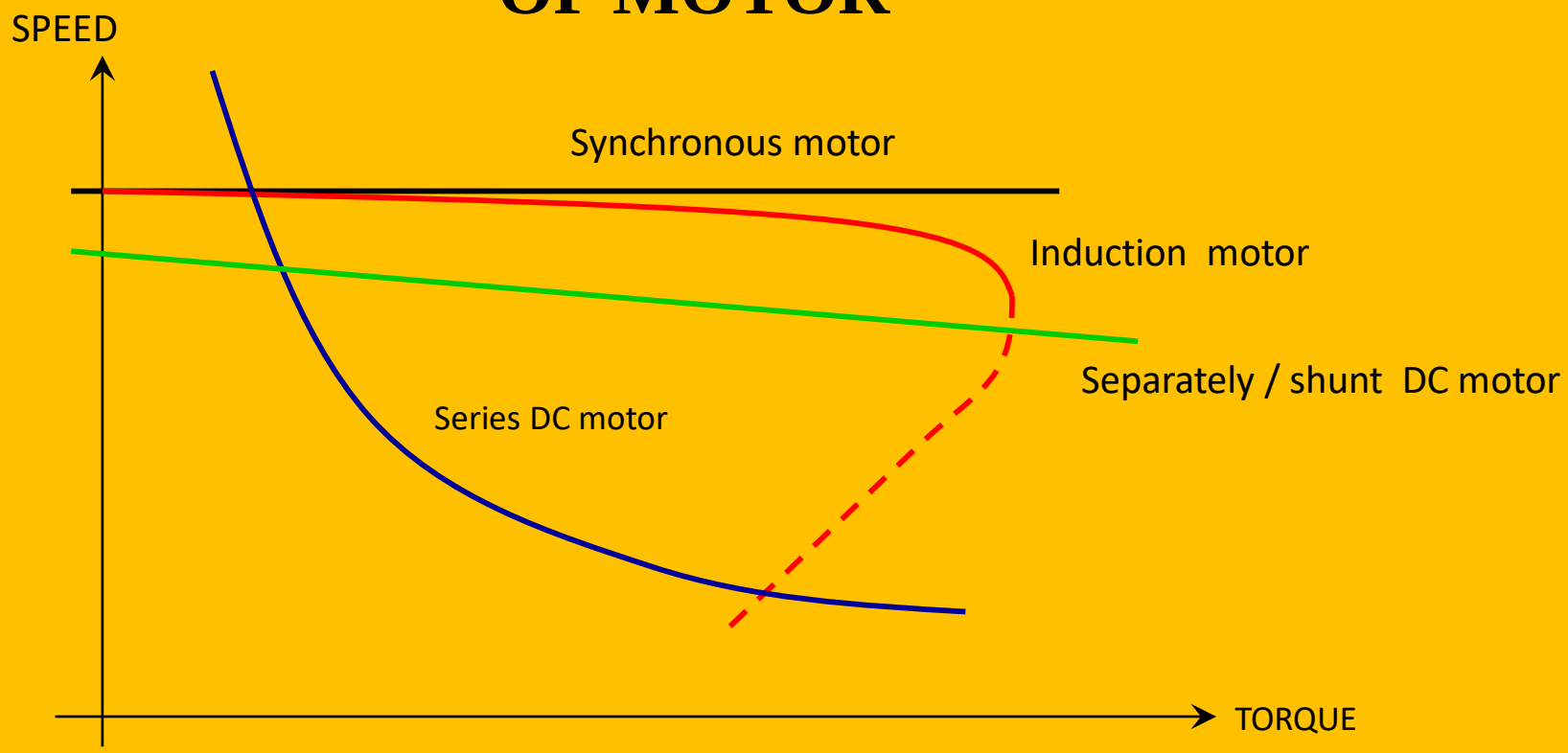
4.Torque inversely proportional to speed

Constant power type load - Lathes, boring machines, milling machines, steel mill coiler and electric traction.



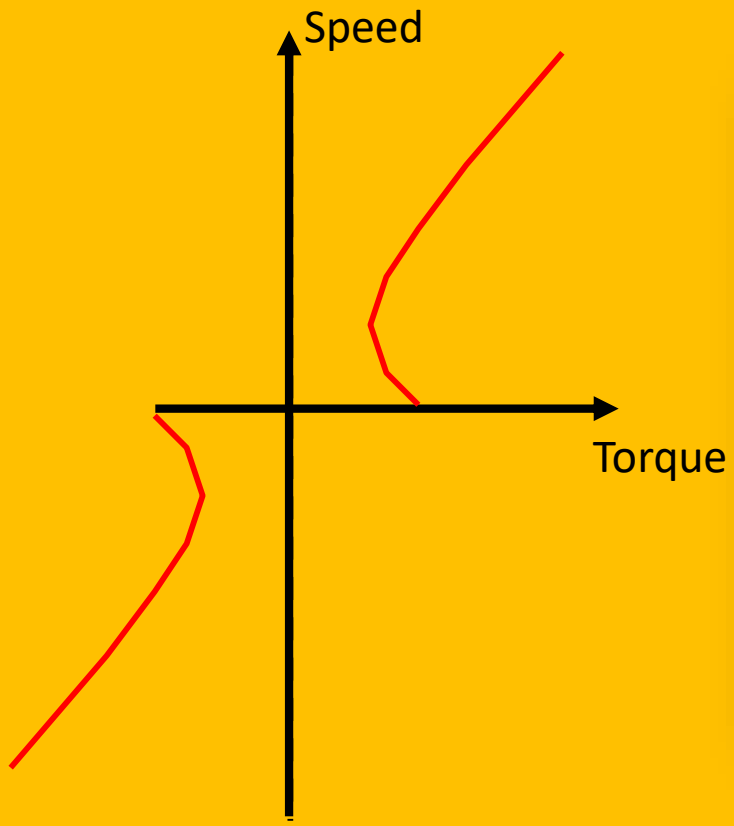


MECHANICAL CHARACTERISTICS OF MOTOR



By using power electronic converters, the motor characteristic can be change

Eg: Hoist Load torque-speed characteristic



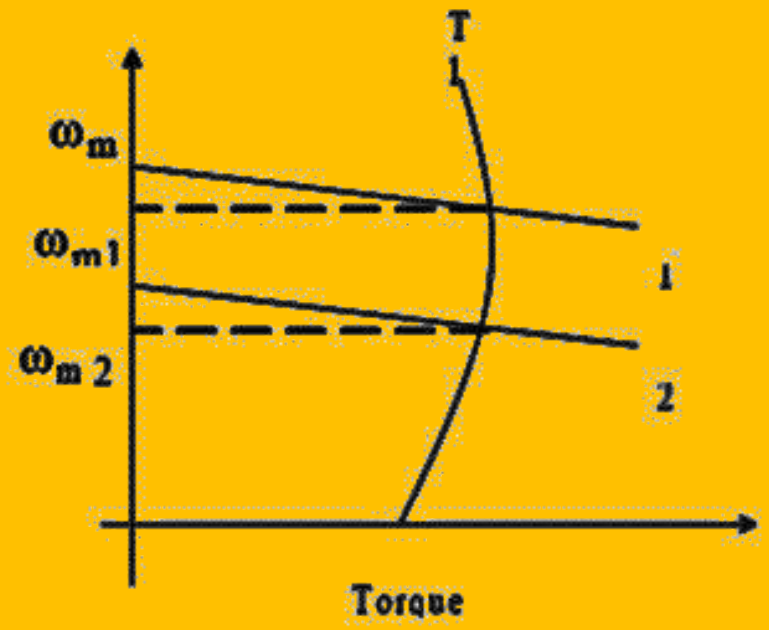
Hoist drive

MODES OF OPERATION

An electrical drive operates in three modes

1. Steady state
2. Acceleration including Starting
3. Deceleration including Stopping

(a) PRINCIPLE OF SPEED CONTROL



Speed Vs Torque Ch.

- Steady state :

Motor torque = Load torque

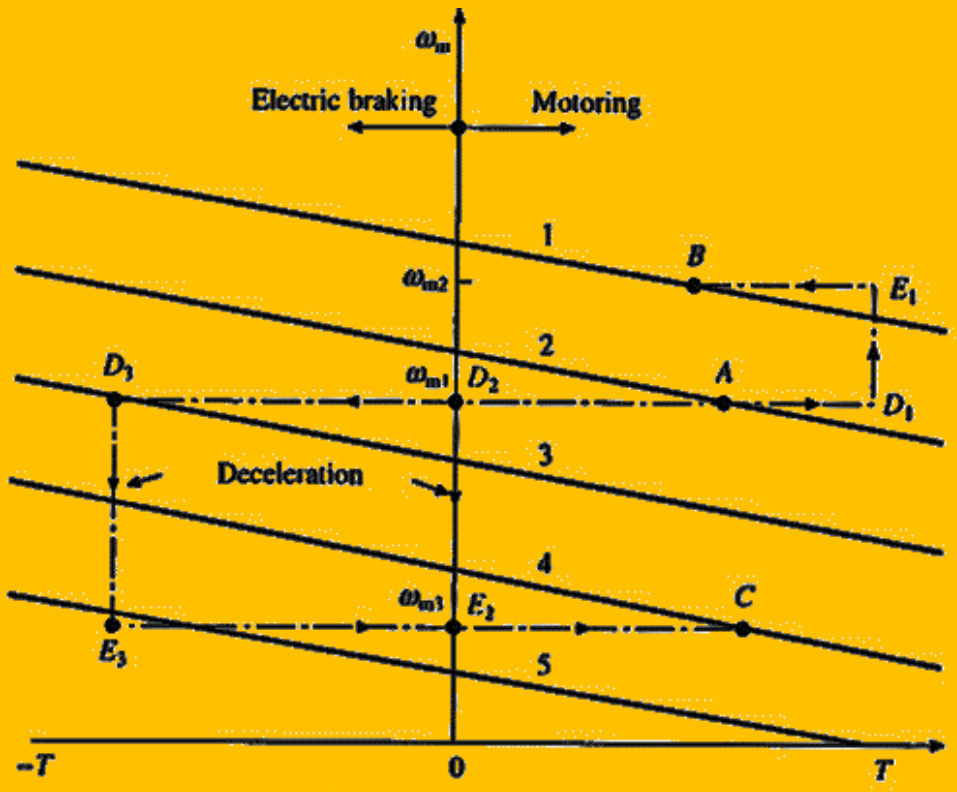
- Acceleration : $T_m > T_L$

Quad I or III

- Deceleration : $T_m > T_L$

Quad II or IV

(b) SPEED TRANSITION PATH



- A to B – Acceleration
- A to C - Deceleration

QUERIES / DISCUSSION

- Recall…

Thank you