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UNIVERSITY

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FACULTY OF ENGINEERING & TECHNOLOGY

Electrical Machine-1

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Electrical Braking

Electrical Braking is usually employed in applications to stop a unit driven by motors in an exact position or to have the speed of the driven unit suitably controlled during its deceleration. Electrical braking is used in applications where frequent, quick, accurate or emergency stops are required.

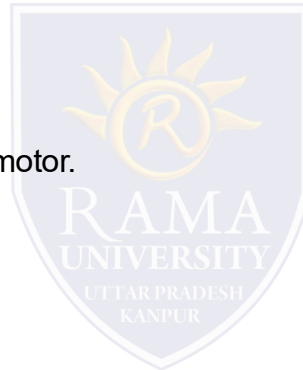
Types of Electrical Braking

There are three types of Electric Braking in a DC motor.

1. Regenerative Braking,
2. Dynamic or Rheostatic Braking
3. Plugging or Reverse Current Braking

Regenerative Braking

In Regenerative Braking, the power or energy of the driven machinery which is in kinetic form is returned back to the power supply mains. This type of braking is possible when the driven load or machinery forces the motor to run at a speed higher than no load speed with a constant excitation.

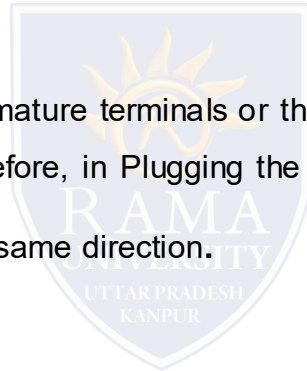


Dynamic Braking or Rheostatic Braking of DC Motor

In Dynamic Braking, a braking resistor R_b is connected across the armature as soon as the DC motor is disconnected from the supply mains. The motor now works as a generator, producing the braking torque.

Plugging or Reverse Current Braking

In Plugging or Reverse Current Braking the armature terminals or the supply polarity of a separately excited or shunt motor when running are reversed. Therefore, in Plugging the supply voltage V and the induced voltage E_b which is also called back EMF will act in the same direction.



DC MACHINES

Applications of DC motors

Type of Motor	Characteristics	Applications
Shunt	Speed is fairly constant and medium starting torque.	<ol style="list-style-type: none">1. Blowers and fans2. Centrifugal and reciprocating pumps3. Lathe machines4. Machine tools5. Milling machines6. Drilling machines
Series	High starting torque. No load condition is dangerous. Variable speed.	<ol style="list-style-type: none">1. Cranes2. Hoists, Elevators3. Trolleys4. Conveyors5. Electric locomotives
Cumulative compound	High starting torque. No load condition is allowed.	<ol style="list-style-type: none">1. Rolling mills2. Punches3. Shears4. Heavy planers5. Elevators
Differential compound	Speed increases as load increases.	Not suitable for any practical applications