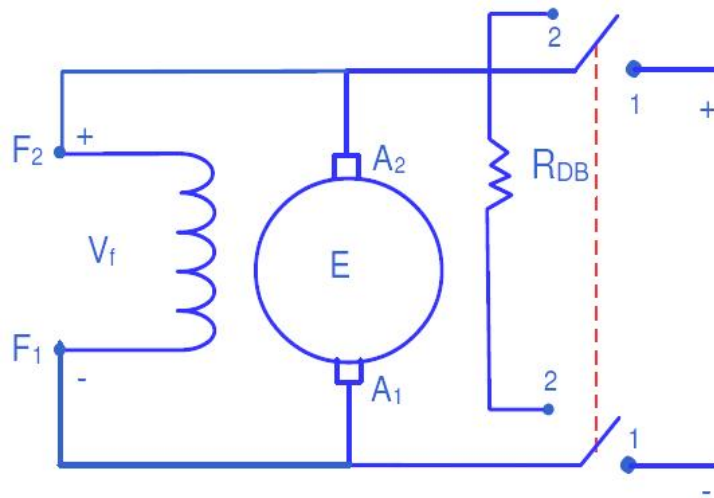


DYNAMIC BRAKING OF SHUNT MACHINE, SERIES MACHINE & COMPOUND MACHINE

Shunt machine

In dynamic braking the motor is disconnected from the supply and connected to a dynamic braking resistance R_{DB} . In and Fig. 49 this is done by changing the switch from position 1 to 2. The supply to the field should not be removed. Due to the rotation of the armature during motoring mode and due to the inertia, the armature continues to rotate. An emf is induced due to the presence of the field and the rotation. This voltage drives a current through the braking resistance. The direction of this current is opposite to the one which owed before change in the connection. Therefore, torque developed also gets reversed. The machine acts like a brake. The torque speed characteristics separate by excited shunt of the machine under dynamic braking mode is as shown in Fig. 49(b) for a particular value of R_{DB} . The positive torque corresponds to the motoring operation. Fig. 50 shows the dynamic braking of a shunt excited motor and the corresponding torque-speed curve. Here the machine behaves as a self excited generator. Below a certain speed the self-excitation collapses and the braking action becomes Zero.



(a)Connections

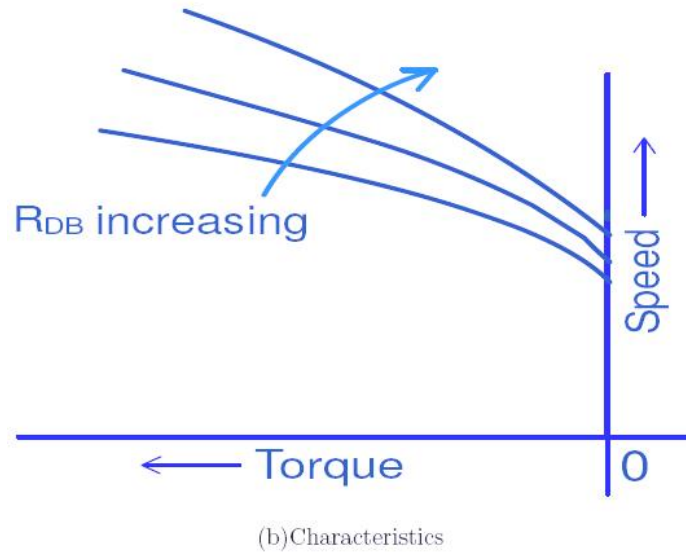


Figure 49: Dynamic Braking of a shunt motor

Series machine

In the case of a series machine the excitation current becomes zero as soon as the armature is disconnected from the mains and hence the induced emf also vanishes. In order to achieve dynamic braking the series field must be isolated and connected to a low voltage high current source to provide the field. Rather, the motor is made to work like a separately excited machine. When several machines are available at any spot, as in railway locomotives, dynamic braking is feasible. Series connection of all the series fields with parallel connection of all the armatures connected across a single dynamic braking resistor is used in that case.

Compound machine

In the case of compound machine, the situation is like in a shunt machine. A separately excited shunt field and the armature connected across the braking resistance are used. A cumulatively connected motor becomes differentially compounded generator and the braking torque generated comes down. It is therefore necessary to reverse the series field if large braking torques are desired.

Source : <http://mediatoget.blogspot.in/2011/07/dynamic-braking-of-shunt-machineseries.html>