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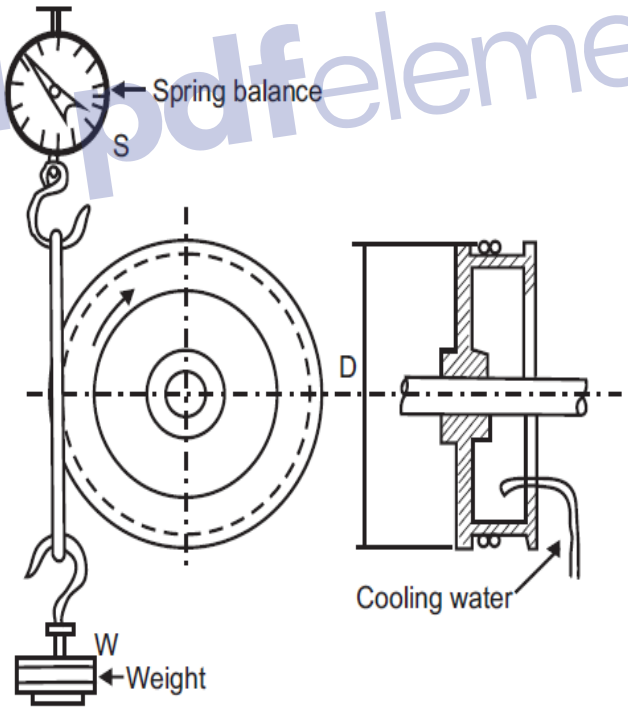
FACULTY OF ENGINEERING & TECHNOLOGY

Rope Brake Dynamometer:

The **rope brake** as shown in below figure is another device for measuring brake power of an engine. It consists of some turns of rope wound around the rotating drum attached to the output shaft. One side of the rope is connected to a spring balance and the other side to a loading device. The power is absorbed in friction between the rope and the drum. Therefore drum in rope brake requires cooling.



Rope brake dynamometers are cheap and can be constructed quickly but brake power can't be measured accurately because of change in the friction coeffiecient of the rope with a change in temperature.

The brake power is given by the formula

Brake Power (bp) = π DN (W − S)

where D is the brake drum diameter,

W is the weight of the load and

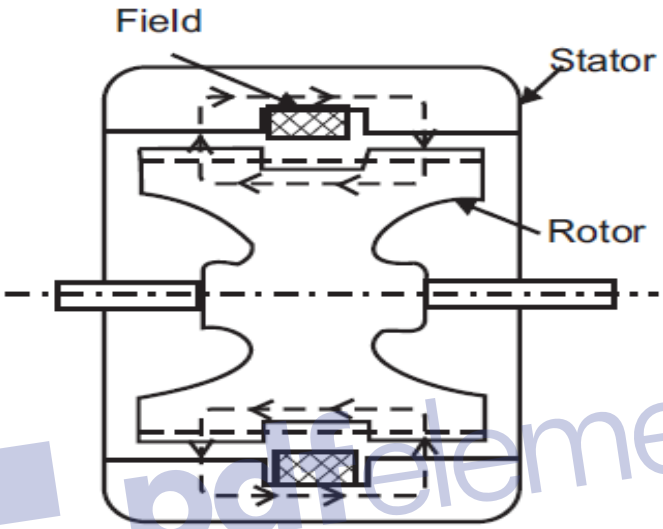
Eddy Current Dynamometer:

The working principle of **eddy current dynamometer** is shown in the figure below.

It consists of a stator on which are fitted some electromagnets and a rotor disc made of copper or steel and coupled to the output shaft of the engine. When the rotor rotates, eddy currents are produced in the stator due to magnetic flux set up by the passage of field current in the electromagnets.

These eddy currents are dissipated in producing heat so that this type of dynamometer requires some cooling arrangement. The torque is measured exactly as in other types of absorption dynamometers, i.e., with the help of a moment arm.

The load in internal combustion engine testing is controlled by regulating the current in the electromagnets.



The following are the main advantages of eddy current dynamometers:

1.High brake power per unit weight of dynamometer.

2.They offer the highest ratio of constant power speed range (up to 5 : 1).

3.Level of field excitation is below 1% of total power being handled by the dynamometer. Thus, they are easy to control and operate.

4.Development of eddy current is smooth hence the torque is also smooth and continuous under all conditions.

1.Relatively higher torque under low-speed conditions.

2.It has no intricate rotating parts except shaft bearing.

3.No natural limit to size, either small or large.

Hydraulic Dynamometer:

A hydraulic dynamometer as shown in the figure below works on the principle of dissipating the power in fluid friction rather than in dry friction.