

# DIRECT LOAD TEST ON A DC SHUNT MOTOR

Exp No:3

Date:

**Aim:** To conduct load test on A DC shunt motor and to find its Speed torque characteristics and efficiency.

## Apparatus required:

S.no	Name of the Apparatus	Range	Type	Quantity
1.	Ammeter	(0-20)A	MC	1
2.	Volt meter	(0-300)V	MC	1
3.	Rheostat	1000Ω/1.2A	Wound type	1
4.	Tachometer	(0-3000)rpm	Digital	1
5.	Connecting wires	2.5sq.mm	Copper /Aluminum	Few

## Name plate details:

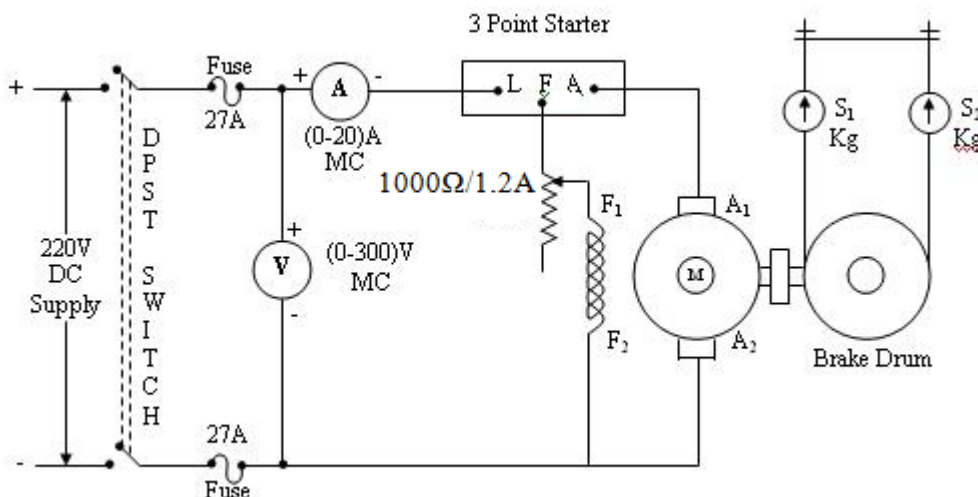
## Precautions:

1. DC shunt motor should be started and stopped under no load condition
2. Field rheostat should be kept in the minimum position.
3. Brake drum should be cooled with water when it is under load.

## Procedure:

1. Connections are made as per the circuit diagram.
2. After checking the no load condition, and minimum field rheostat position, DPST switch is closed and starter resistance is gradually removed.
3. The motor is brought to its rated speed by adjusting the field rheostat.
4. Ammeter, Voltmeter readings, speed and spring balance readings are noted under no load condition.
5. The load is then added to the motor gradually and for each load, voltmeter, ammeter, spring balance readings and speed of the motor are noted.
6. The motor is then brought to no load condition and field rheostat to minimum position, then DPST switch is opened.

## Circuit diagram:



**Observation Tables:**

S.No.	Voltage V (Volts)	Current I (Amps)	Spring Balance Readings		(S <sub>1</sub> ~ S <sub>2</sub> )Kg	Speed N (rpm)	Torque T (Nm)	Output Power P <sub>m</sub> (Watts)	Input Power P <sub>i</sub> (Watts)	Efficiency η%
			S <sub>1</sub> (Kg)	S <sub>2</sub> (Kg)						

Diameter of the Brake drum = \_\_\_\_\_ cm.

**Formulae used:**

Torque T = (S<sub>1</sub> ~ S<sub>2</sub>) x R x 9.81 Nm

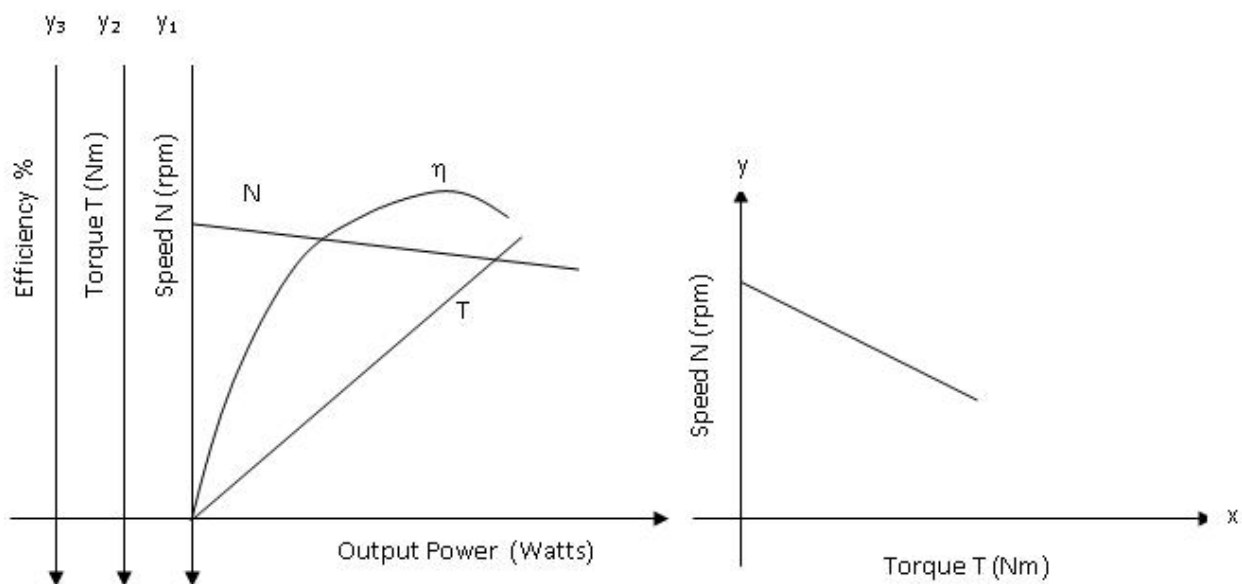
Input Power P<sub>i</sub> = VI Watts

Output Power P<sub>m</sub> = 2πNT/60 Watts

Efficiency =  $\frac{\text{Output Power}}{\text{Input power}} \times 100$

**Model Calculations:**

**Model Graphs:**



**Result:**