



**CHITTAGONG UNIVERSITY OF ENGINEERING AND TECHNOLOGY**  
**DEPARTMENT OF ELECTRONICS & TELECOMMUNICATION**  
**ENGINEERING**  
**CHITTAGONG-4349, BANGLADESH.**  
Course No. EEE-184  
Course Title: Electrical Drives Sessional

**Exp. No. 3: STUDY OF LOAD CHARACTERISTICS OF A D.C. GENERATOR.**

**OBJECTIVES:**

- i) To measure the load voltage, load current and field current of a d.c. generators for obtaining the load characteristics.
- ii) To the load characteristics by plotting different curves.
- iii) To observe the degree of compounding through diverter resistor.

**INTRODUCTION:**

The load characteristics of a d.c. generator at particular speed is the relationship between the armature voltage of the generator and its load current at the speed. It is called the external characteristics if the plot is between the terminal voltage and the load current and the internal characteristics if the plot is between the generator e.m.f. and load current. In a separately excited d.c. generator, the field current is independent of armature conditions. For self-excited generators at constant field current and constant speed, the terminal voltage dropped as load current increases because of the increased armature resistance drop and reduction in flux due to armature reaction.

With shunt generator the fall in terminal voltage with increase in load current is more remarkable, then with the separately excited generator because of the decrease in the field current accompanying the drop in terminal voltage.

**REQUIRED EQUIPMENTS:**

- i) D.C. generators
- ii) Voltmeter (0-600 volts)
- iii) Ammeter(0-10 amp)
- iv)Resistance

**CIRCUIT DIAGRAM:**

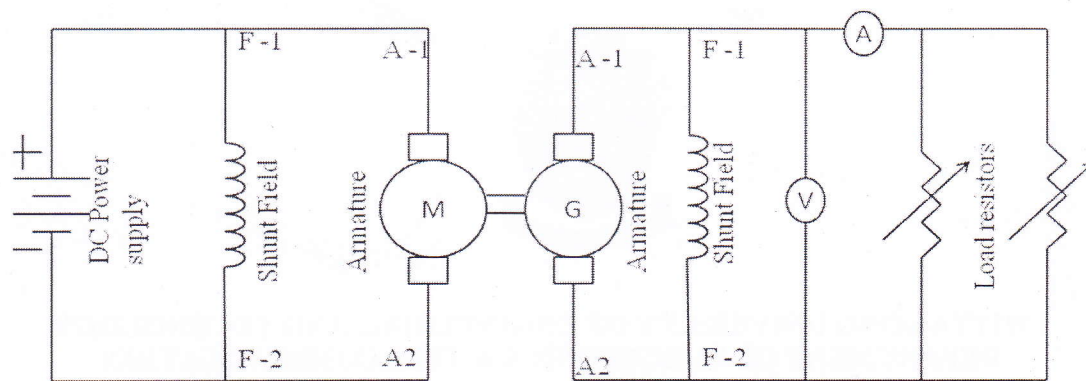


Fig1: A d.c. shunt generator run by a dc shunt motor.

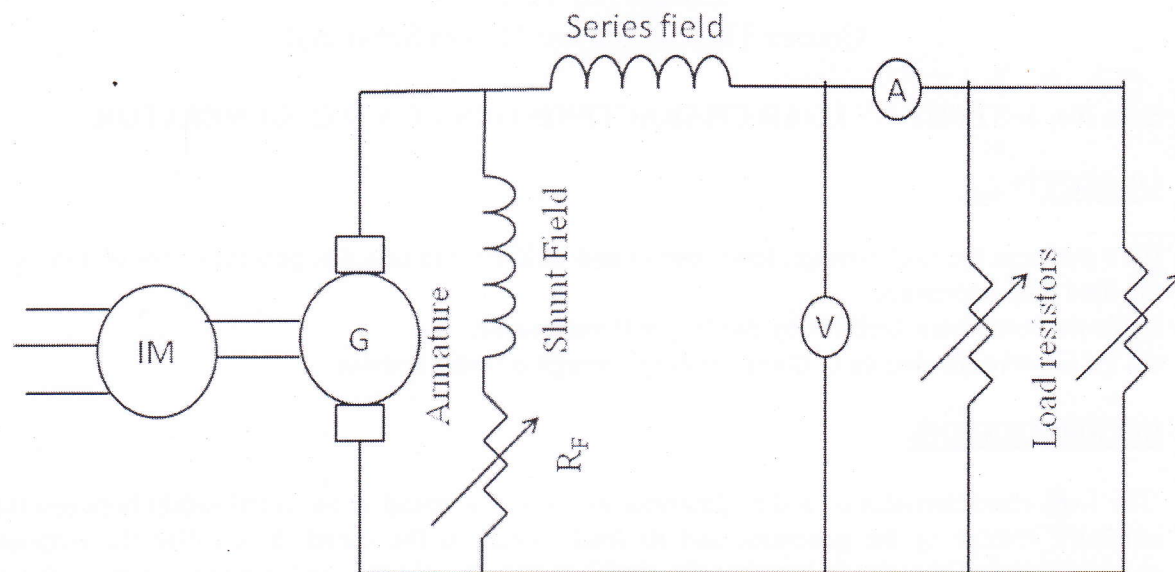


Fig 2: A d.c. compound generator run by an induction motor.

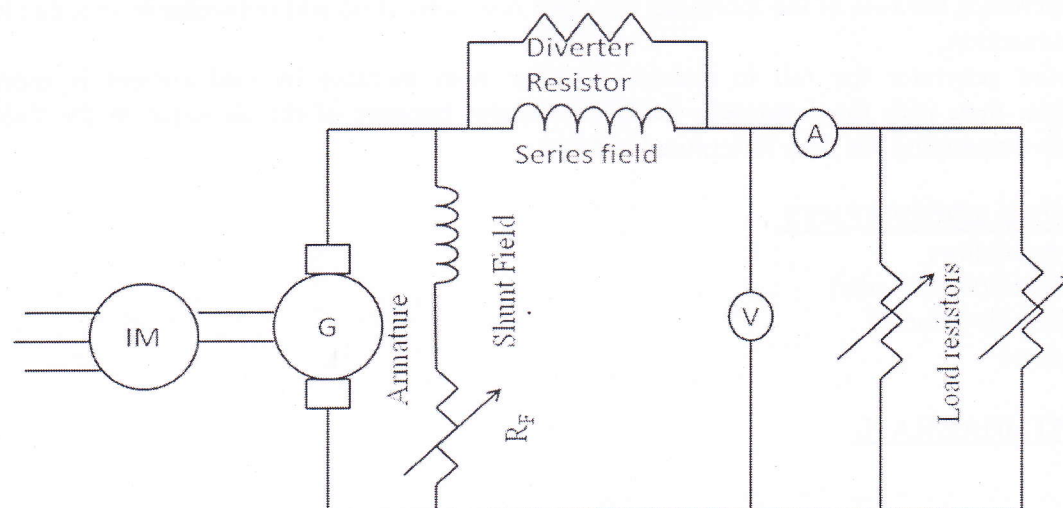


Fig 3: A d.c. compound generator with diverter resistor run by an induction motor.

**PROCEDURE:**

- i) Connect the machine for each type of its operation.
- ii) The prime mover is activated and allowed the generator to build up voltage.
- iii) By closing switch the load is inserted and reading of generator terminal voltage  $V$  and line current  $I$  are taken. Then over reading are taken for the rest loads inserted one after another and tabulated the result as per table shown. It should be noted that the speed of the rotor should be constant.
- iv) Finally measure the resistance of the armature, the shunt field and series field by a suitable ohm-meter.
- v) Plot  $V$  and  $I$  for each type

**EXPERIMENTAL DATA( For Shunt Generator):**

$I_L$																				
$V_t$																				

**EXPERIMENTAL DATA (For Compound Generator):**

$I_L$ (amps)									
$V_t$ (volts)									

**Questions:**

- i) Why is it necessary to maintain the speed constant during the test?
- ii) Can a series generator be operated on no load?
- iii) What is the effect of the load on the terminal voltage?
- iv) How will you check which is the series field and which is the shunt field?
- v) How can you select the degree of compounding?

**Report:**

- 1) Draw the actual connection diagram (schematic) you used in lab.
- 2) Plot the obtained graphs.
- 3) Write the answers of the questions.
- 4) Write Discussion about this experiment