

Practical No. 8: Operate DC series motor by connecting two point starter.

I Practical Significance:

DC series motor draws very high current during starting which may burn armature winding. Hence to protect DC series motor from damage due to heavy starting current, Two point starter is used to start DC series motor.

II Industry/Employer Expected Outcome(s):

Select and connect DC motor to DC supply using particular starter for different applications.

III Course Level Learning Outcome(s):

Use different electrical machines by making connections.

IV Laboratory Learning Outcome(s):

LLO DC series motor operation.

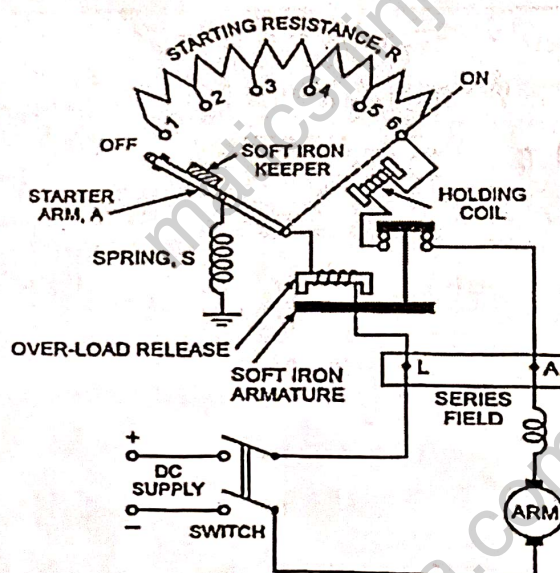
V Relevant Affective Domain related outcome(s):

Follow safety electrical rules for safe practices.

VI Relevant Theoretical Background

2 point starter is a device whose main function is starting of DC series motor. The 2 point starter connects the resistance in series with the circuit which reduces the high starting current and hence protect DC Series motor from damage. For DC Shunt motor 3 point starter is used.

VII Actual Circuit diagram used in laboratory with equipment Specifications:



VIII Required Resources/apparatus/equipment with specification:

S. No.	Name of Resource	Suggested Broad Specification	Quantity
1	DC series motor	3 HP 220V, DC	1
2	DC supply	220V DC 20 Amp	1
3	Two point starter	Suitable for 3 HP DC shunt motor	1

IX Precautions to be followed:

1. Connect the two point starter with DC shunt motor properly.
2. Do not start DC series motor without any load.

X Procedure:

1. Connect the circuit as shown in circuit diagram.
2. Switch on DC supply.
3. Move the handle of 3 point starter from Start to Run position gradually.
4. Observe the starting of DC shunt motor.
5. By using tachometer measure the speed of the DC shunt motor

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XII Actual Procedure followed:

- 1] connect the circuit as shown in circuit diagram.
- 2] switch on DC supply.
- 3] Move on the handle of 3 point starter from start to Run position gradually.
- 4] Observe the starting of DC shunt motor.
- 5] By using the tachometer measure the speed of the DC shunt motor.

XIII Observations:

Observe the starting of DC series motor by connecting two point starter.

XIV Results:

The result of operating of DC series motor with two point starter is increased starting power.

XV Interpretation of results:

Hence, we can vary the speed of DC series motor by increase & decrease the value of resistance.

XVI Conclusion and recommendation

Hence, we studied operator DC series motor by connecting two point starter.

XVII Practical related questions (Provide space for answers)

1. State types of starters used for DC motors.
2. Starter is necessary for starting of DC motors.
3. Write the functions of different parts of three point starter.

1) $\rightarrow$?

There are mainly three type of DC motor starters, such as 2 point starter, 3 point starter & 4 point starter. The basic concept behind every dc motor starter is adding external resistance to the armature winding during starting.

2) $\rightarrow$?

A starter is necessary to start a DC motor because it restricts the initial high armature current that exists as the value of starting back EMF is zero.

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3] $\longrightarrow$?

The three point starter helps in starting & running the shunt wound motor or compound wound DC motor.

A three point starter is used to reduce the starting current & it has three terminals.

- 1] 'L' line terminal (connected to L.V.E terminal).
- 2] 'A' Armature terminal (connected to armature winding).
- 3] 'F' field terminal (connected to field winding).