

Practical No. 7: operate DC Shunt motor by connecting three point starter.

I Practical Significance:

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

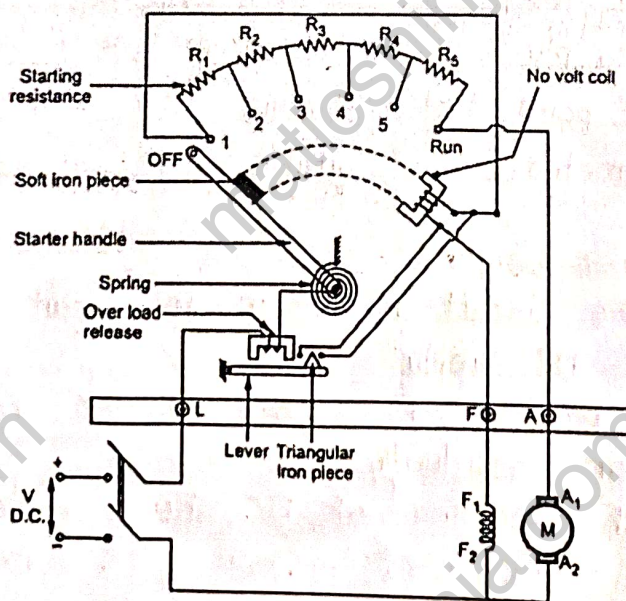
V Relevant Affective Domain related outcome(s):

Follow safety electrical rules for safe practices.

VI Relevant Theoretical Background:

3 point starter is a device whose main function is starting of DC shunt motor. The 3 point starter connects the resistance in series with the circuit which reduces the high starting current and hence protect DC Shunt motor from damage. For DC series motor 2 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 motor	3 HP 220V, DC	1
2	DC supply	220V DC 20 Amp	1
3	Three point starter	Suitable for 3 HP DC shunt motor	1
4	Tachometer	Suitable range around 0 to 5000 rpm	1

IX Precautions to be followed:

1. Connect the three point starter with DC shunt motor properly.

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 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.

XIII Observations:

At a switching resistance of the starter of maximum.....
what the motor speed up.....
.....

XIV Results:

The DC shunt motor is started the DC shunt motor without heating.....
.....

XV Interpretation of results:

Operating a DC shunt motor with a 3-point starter allows for controlled starting speed regulation & safe shutdown ensuring smooth operation & efficient use of power.

XVI Conclusion and recommendation

Hence, we learnt to operate DC shunt motor by connecting three 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.

Q.1] → ? These are mainly 3 types of DC motor starters.....

1] 2 point starter.....

L A

2] 3 point starter.....

L A F

3] 4 point starter.....

L A F N

Q.2] → Starters are used to protect DC motor from damage that can be caused by very high current and torque during startup. They do this by providing external resistance to the motor, which is connected in series to the motor's armature winding & restricts the current to an acceptable level.

3] \rightarrow ?

Following are the functions & different parts of three point starter.

1] Armature terminal : It is connected to the windings of an armature.

2] Field terminal : It is connected to the winding of field terminal.

3] Line terminal : It is connected to the positive supply.