

Practical No. 9: Identify different types of DC motor by observing terminal connections and also identify different parts of DC motor.

I Practical Significance:

In industry it is required to dismantle machines for overhauling purpose and reassemble. Also it is necessary to identify different types of DC motor by observing terminal connections. Through this practical student identifies motor by observing terminal connections also student identifies different parts and their functions.

II Industry/Employer Expected Outcome(s)

Use electrical equipment efficiently for different electronic engineering application.
Identify parts and types of DC motor and select DC motor for particular applications.

III Course Level Learning Outcome(s)

Select the transformer and DC motor for the given application

IV Laboratory Learning Outcome(s)

LLO Identify different parts DC motor.
LLO Identify different types of DC motor.

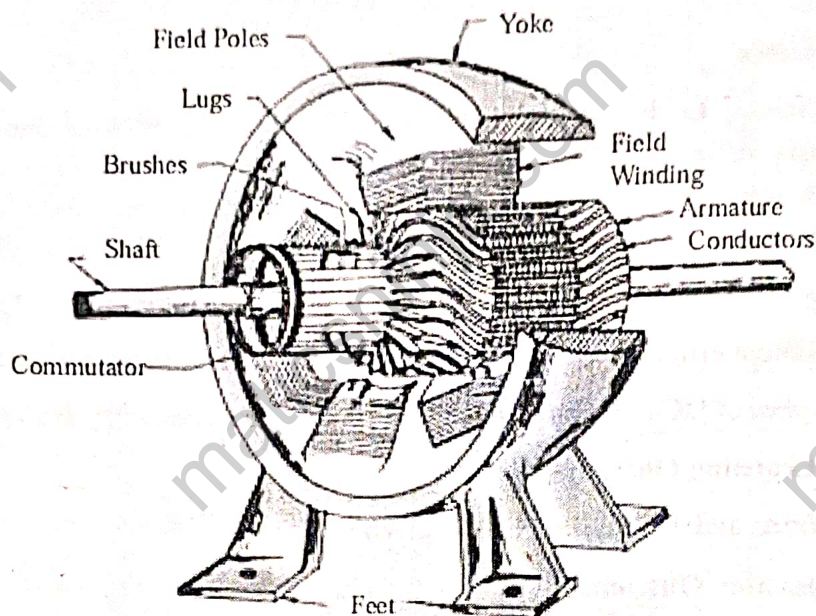
V Relevant Affective Domain related outcome(s)

Follow safety electrical rules for safe practices.

VI Relevant Theoretical Background

- When DC machine converts electrical energy into mechanical energy machine operates as DC motor.
- Principle of operation: When current carrying conductor is placed in a magnetic field, it experienced a force.
- Constructional features of dc machine.
- Functions of different parts of DC machine.

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

IX Precautions to be followed:

1. Make sure that the main switch on the panel board is in 'OFF' position and DC machine is disconnected from the supply.
2. The motor is mechanically disconnected from the load.

X Procedure

1. Remove the mechanical load of motor.
2. Observe the external parts such as frame, eye bolt and foundation plate etc.
3. Remove end covers.
4. Observe the various internal parts and their shapes, positions and material used.
5. Note the material used for each part.
6. Write down in brief function of each part.
7. Reassemble the motor by putting back the end cover in original place.

XI Required Resources/apparatus/equipment with specification:

Sr. No.	Name of Resource	Suggested Broad Specification	Quantity
1	DC motor	3 HP, 220V, DC	1
2			

XII Actual Procedure Followed:

1. Remove the mechanical load of motor.
2. Observe the external parts such as frames, eye bolts and foundation plate etc.
3. Remove end covers.
4. Observe the various internal parts and their shapes, position, material used.
5. Note the material used for each part.
6. Write down in brief function of each part.

XIII Observations:

Sr. No.	Name of the part	Material used	Function of the part
1	Yoke	Iron	
2	Eyebolt	Iron	
3	Frame	Iron	
4	Armature	Copper	
5	Armature winding	Copper	
6	Pole	magnetic material	
7	Pole shoe	Iron	
8	Field winding	Copper	
9	Commutator	Copper	
10	Brushes	graphite/carbon	
11	Brush holder	Insulated material	
12	Bearing	Iron	
13	Shaft	Iron	

Observe the terminal connections of given DC motor and state the type of the DC motor

Type of DC motor = 4

XIV Results:

from observation there are different parts of DC motor for ex: yoke, commutator etc.

XV Interpretation of results:

different parts have function which is made of Iron and copper mater.

XVI Conclusion and recommendation:

for this practical we conclude that identify different parts of DC motor and observing terminal connection it.

XVII Practical related questions (Provide space for answers)

1. State working principle of DC motor.
2. State Fleming's left hand rule.
3. State types of DC motors.
4. Write applications of different types of DC motors.

1. The working principle of DC motor is based on the interaction between a magnetic field and current-carrying conductor. When a current flows through the armature (the rotating part of the motor) placed within a magnetic field, a force is generated on the armature due to the Lorentz force law.

2. Fleming's left-Hand Rules state that, for a current-carrying conductor placed in a magnetic field, the direction of the force (or motion) experienced by the conductor can be determined using the left hand.

3. There are four main types of DC motor classified based on the way the field winding and armature are connected to power supply.

1. shunt D.C. motor
2. Series dc motor
3. Compound D.C. motor
4. Permanent magnet D.C. motor (P.M.O.C.)

VIII References/Suggestions for further reading:

1. www.electrical4u.com
2. www.howstuffworks.com
3. www.electricaltechnology.org

4. 1. Shunt DC motor

Applications.

- Fan: for maintaining a constant speed regardless of load variations.
- Lathes: used in machine tools that require a steady, consistent speed.

2. Series DC motor

- Electric trains: provides high starting torque which is necessary for moving heavy loads at low speeds.