SNS COLLEGE OF TECHNOLOGY

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DEPARTMENT OF AUTOMOBILE ENGINEERING

COURSE NAME : 23AUB201 – AUTOMOTIVE ELECTRICAL DRIVES AND CONTROLS

II YEAR / III SEMESTER

Unit 2 –Charging and Starting Systems

Topic : Capacity requirements, servicing and troubleshooting of Starter motor

CAPACITY REQUIREMENT OF STARTER MOTOR

- **Power Output**:
  - The starter motor should provide sufficient power to turn the engine over for starting.
  - This is often measured in **kW** or **HP**, and it must match the engine's displacement and compression ratio.
- **Torque Requirements**:
  - The motor must produce enough torque to overcome the engine’s initial resistance. Larger engines require higher torque.

CAPACITY REQUIREMENT OF STARTER MOTOR

- **Operating Voltage**:
  - Typically, 12V for most passenger vehicles and 24V for heavy-duty vehicles.
- **Current Draw**:
  - Depending on the engine size, the starter motor should be capable of drawing **high current**, often in the range of **150 to 400 amps**.
- **Duty Cycle**:
  - Starter motors are designed for short bursts of operation (5-10 seconds) to prevent overheating.

SERVICING OF STARTER MOTOR

- **Cleaning**:
  - Regularly clean the starter motor to prevent dust, grime, and oil buildup, which can interfere with its functioning.
- **Lubrication**:
  - Periodic lubrication of the drive gear mechanism and bearings to ensure smooth operation.
- **Brush Inspection**:
  - The carbon brushes should be inspected and replaced if worn. Worn brushes can result in poor electrical contact.

SERVICING OF STARTER MOTOR

- **Armature Inspection**:
  - Check the armature for signs of wear, such as burned-out windings or scoring on the commutator. Clean the commutator if needed.
- **Solenoid Check**:
  - Ensure that the solenoid is functioning properly as it engages the starter gear with the flywheel.
- **Drive Pinion Inspection**:
  - Check the drive pinion for wear or damage, as this part engages with the engine flywheel.

TROUBLE SHOOTING OF STARTER MOTOR

❖ **Starter Motor Does Not Turn Over**:

- **Dead Battery**: Check the battery voltage. If it's low, recharge or replace the battery.
- **Faulty Solenoid**: If the solenoid clicks but the motor doesn't engage, it may need replacement.
- **Poor Wiring Connections**: Inspect all battery and starter motor connections for corrosion or looseness. Clean and tighten as necessary.
- **Blown Fuse**: Check for blown fuses in the starting circuit

TROUBLE SHOOTING OF STARTER MOTOR

- **Slow Cranking**:
  - **Weak Battery**: A weak battery might not provide enough current to the motor. Test the battery and replace it if needed.
  - **Excessive Resistance in Cables**: Check the battery cables for corrosion or damage, which can increase resistance.
  - **Worn Brushes or Armature**: If the brushes or armature are worn, the starter might not generate enough torque, requiring repair or replacement.

TROUBLE SHOOTING OF STARTER MOTOR

❖ **Starter Motor Keeps Running After Engine Starts**:

- **Stuck Solenoid**: A sticking solenoid may cause the starter motor to keep running. Replacing the solenoid might be necessary.
- **Faulty Ignition Switch**: If the ignition switch remains in the "Start" position, the starter motor will continue to run.

TROUBLE SHOOTING OF STARTER MOTOR

❖ **Noisy Starter Motor**:

- **Worn Drive Pinion or Flywheel Teeth**: If the teeth on the drive pinion or flywheel are worn, they may grind when engaged. Inspect and replace if necessary.
- **Loose Mounting Bolts**: Check for loose mounting bolts that can cause vibration or noise during operation.

THANK YOU !!!