



SNS COLLEGE OF TECHNOLOGY

(An Autonomous Institution)

COIMBATORE-35.



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DEPARTMENT OF AUTOMOBILE ENGINEERING

COURSE NAME : 19AUB204 – AUTOMOTIVE ELECTRICAL AND ELECTRONICS ENGINEERING

II YEAR / IV SEMESTER

Unit 3 – Charging System

Topic : Cutout Relay



REGULATOR



- ❖ In a charging system, the regulator is a crucial component responsible for controlling the voltage output from the generator or alternator to ensure it stays within safe limits for the battery and the electrical system of the vehicle or device.
- ❖ The regulator ensures that the voltage doesn't rise too high, which could damage the battery or connected electrical components, or drop too low, which could lead to insufficient charging.
- ❖ In automotive applications, the regulator is typically integrated into the alternator.
- ❖ It can be either internally or externally mounted.



REGULATOR



- ❖ Internally regulated alternators have the voltage regulator built into the alternator housing, while externally regulated alternators have a separate regulator unit usually mounted elsewhere in the engine compartment.
- ❖ The regulator monitors the voltage output of the alternator and adjusts it by controlling the field current to the alternator's rotor.
- ❖ This regulation ensures that the output voltage remains within a specified range, typically around 13.5 to 14.5 volts in most automotive applications.



CUTOUT RELAY



- ❖ A cutout relay, also known as a voltage-sensitive relay or a voltage regulator relay, is a component often found in older charging systems, particularly in automotive and small engine applications.
- ❖ Its function is to disconnect the battery from the charging system when the engine is not running or when the generator output voltage drops below a certain threshold.



COMPONENTS



- ❖ **Coil:** The coil is an electromagnetic winding that, when energized, generates a magnetic field. This magnetic field is what activates the relay's switching mechanism.
- ❖ **Contacts:** The contacts are the switch within the relay. When the coil is energized, the magnetic field pulls the contacts together, allowing current to flow through the relay. When the coil is de-energized, the contacts spring apart, interrupting the flow of current.



COMPONENTS



- ❖ **Spring Mechanism:** The contacts are typically held apart by a spring mechanism when the coil is not energized. This ensures that the relay defaults to its open (disconnected) state when no power is applied to the coil.
- ❖ **Terminal Connections:** The relay will have terminal connections for connecting it into the electrical circuit. These terminals allow for the connection of wires from the battery, charging system, and any control circuitry.



CUTOUT RELAY



- ❖ When the engine is running and the generator (or alternator) is producing sufficient voltage, the cutout relay remains energized.
- ❖ This allows the current from the generator to flow to the battery, charging it.
- ❖ If the engine is turned off or if the generator output voltage drops below a predetermined level, the cutout relay detects this drop in voltage.
- ❖ Upon detecting the low voltage condition, the cutout relay opens its contacts, disconnecting the battery from the charging system.
- ❖ This prevents the battery from discharging back into the generator, which could potentially damage it.



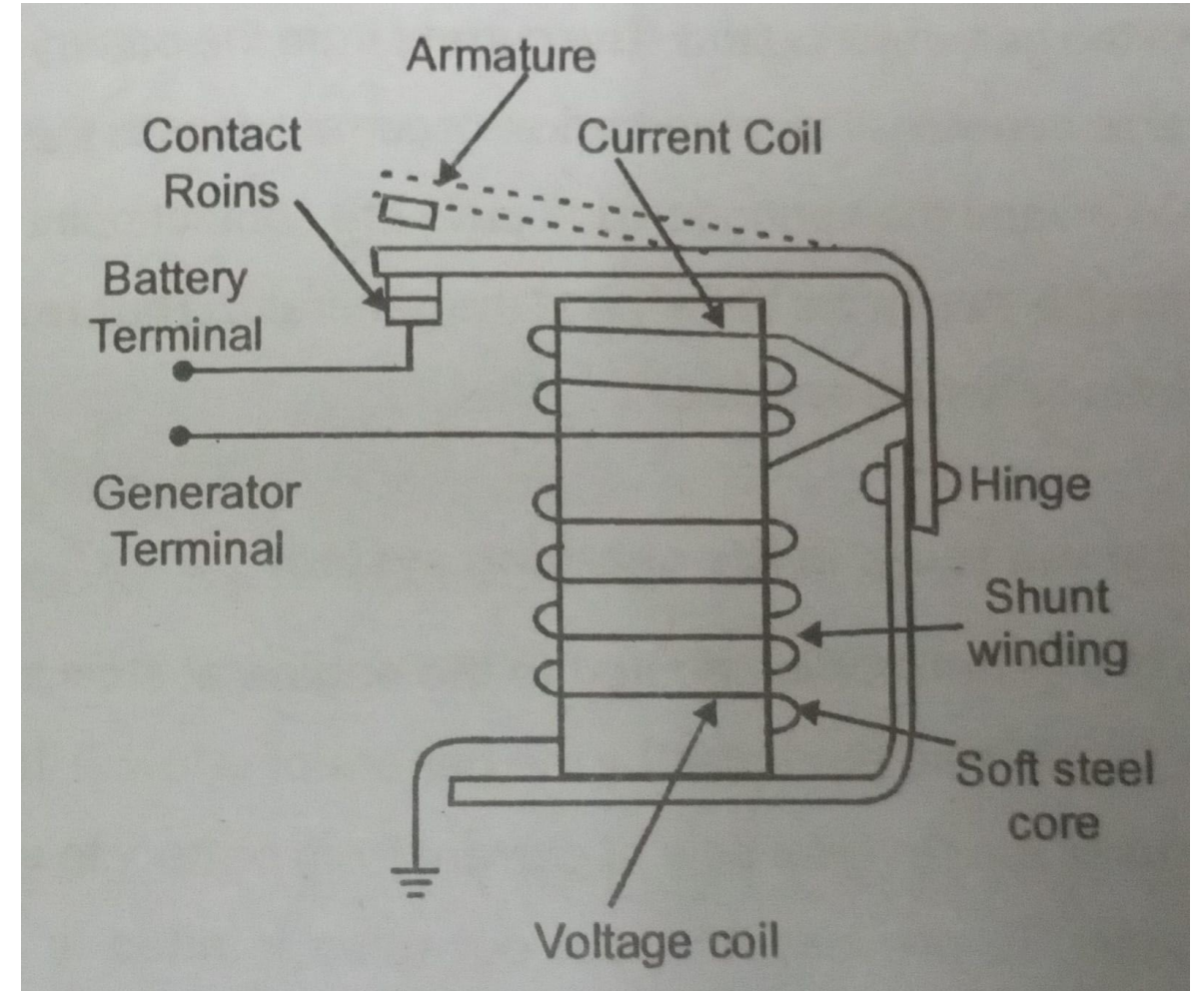
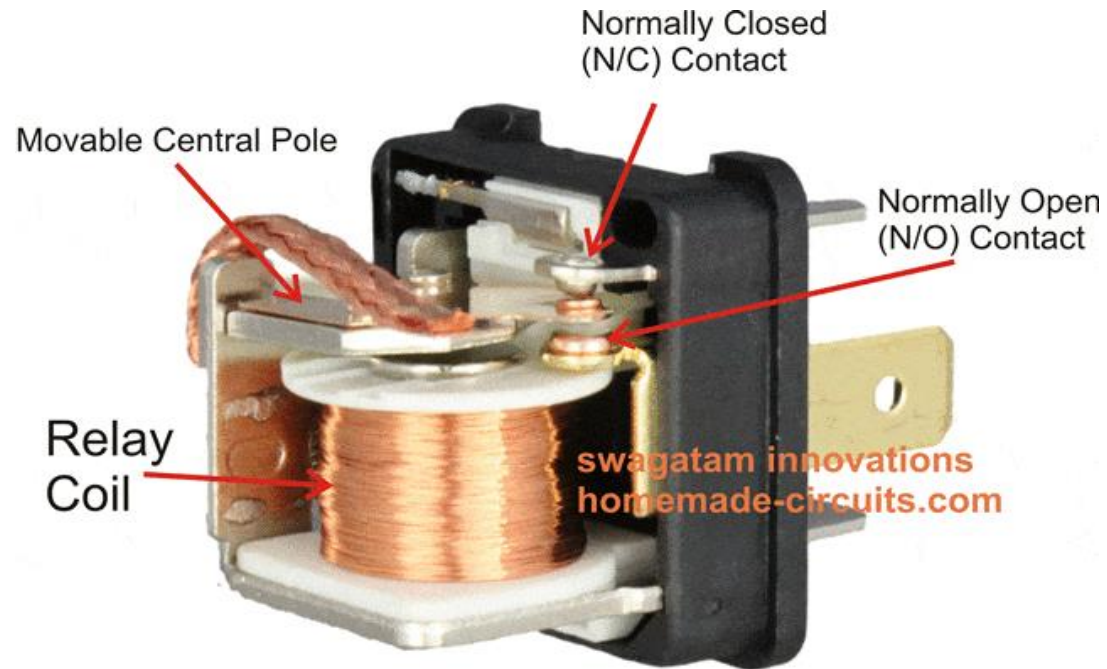
CUTOUT RELAY



- ❖ When the engine is started again and the generator output voltage rises to an acceptable level, the cutout relay closes its contacts, allowing the charging system to supply current to the battery once more.
- ❖ Cutout relays are simple and reliable devices, but they are gradually being replaced by more sophisticated solid-state voltage regulators in modern charging systems.



CUTOUT RELAY





THANK YOU !!!