

Automatic Functioning of Vehicle's Headlight for Accident Prevention

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Abstract: *Nowadays, there are very high intensity LEDs or Halogen lights used in headlight of vehicles. These high intense lights fall on eyes of opposite driver and it creates temporary blindness in his eyes and this situation becomes responsible for the major road accidents. To avoid such accidents to some extent, I have made automatic switching of upper and dipper lights of vehicle which will reduce the possibilities of accidents by their operation in response to with Light dependent resistor (LDR) as a light sensor. Whenever there will be another vehicle coming towards it from front side, LDR will respond to the headlight and upper headlight will turn off and dipper will turn on for specific period of time until that another vehicle passes away.*

Keywords: road accident, prevention, light sensor, switching circuit, headlight.

1. Introduction

This project is basically made with the purpose of avoiding accidents of vehicles on roads. Automatic functioning of upper and dipper lights of vehicle can reduce the possibility of accidents. We can reduce the frequency of daily accidents using this basic idea.

I have used transistor as a switch in this project and switching controls the relay action. Here, the role of light dependent resistor (LDR) is most important as it shows sensitivity towards light. Along with this, I have used voltage divider biased circuit for proper transistor biasing which provides better stability factor. Relay is providing electrical connection between headlight & battery. Transistor CK100 is specially selected for proper current gain and good thermal stability.

Objectives

- The first and foremost objective of this project is to avoid the accidents of such vehicles happening due to high intensity headlights which causes temporary blindness in eyes of driver.
- To design proper biasing circuit for this project.
- To design and construct the circuit which can be easily detect the specific light intensity and automatic activate relay.

- To install such automatic functioning circuit of upper and dipper headlight in new vehicles with better stability and low power consumption.

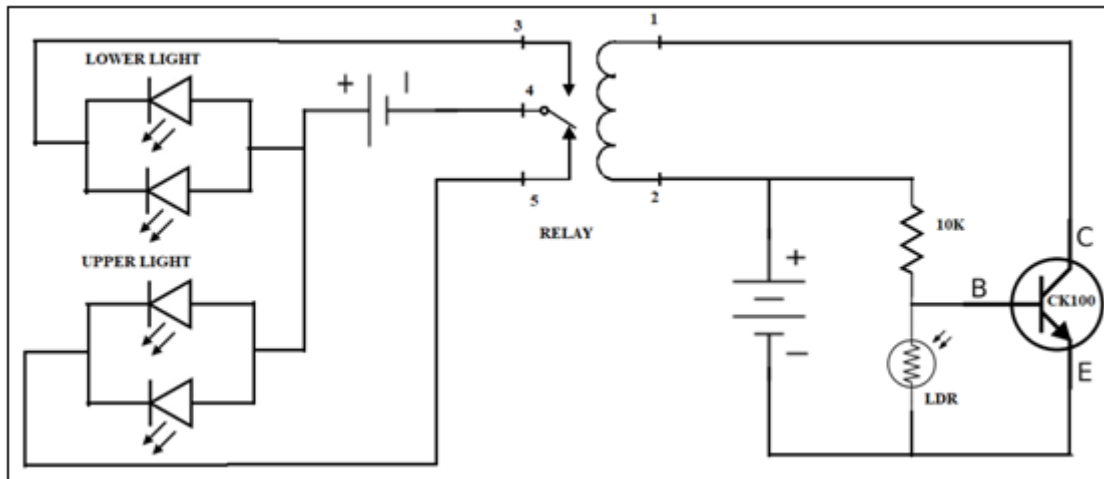
2. Methodology

This research work was totally laboratory work. The research work was completed by following methods:

- Proper circuit diagram was designed by considering transistor as a switch.
- Selection method: An appropriate sensor was selected. A Light Dependent Resistor (LDR) with voltage divider mode was selected for light sensing purpose. And for switching purpose a N - P - N type CK100 transistor was selected.
- By verifying variation of LDR's resistance to light intensity, the proper and fix value of resistor was selected.
- Whole circuit was connected on breadboard and verified the automatic functioning of circuit related to project.
- A model of vehicle with proper circuit connection was designed and demonstrated.

3. Experimental

A) Circuit Diagram: This is the circuit diagram for automatic functioning of upper and dipper bulbs of vehicles when LDR sense specific intensity of incident light.

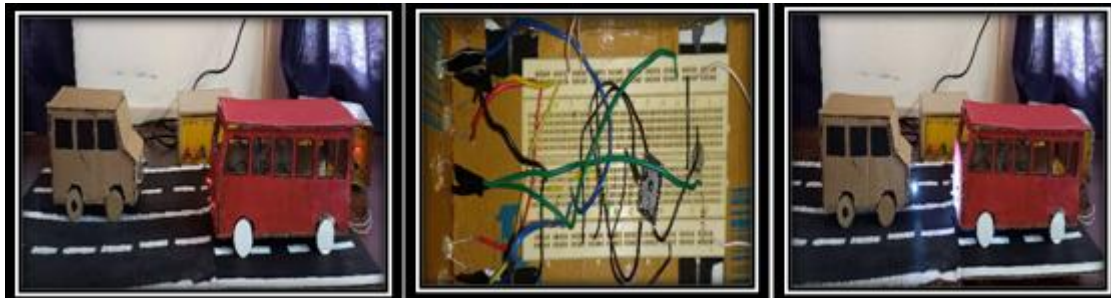


B) Construction: The electronic circuit is constructed for above circuit diagram with the help of following electronics components on breadboard.

- **LDR** - light dependent resistor
- **CK 100** – N - P - N Germanium Transistor
- **Resistor** – 100 K Ω
- **Relay** – 6 Volt (coil) 5 pins
- **LEDs** - Total 2 pairs of LEDs for upper and dipper light separately
- Power Supply – Two DC 5 Volt voltage power supply
- Connecting Wires

C) Operation

The above electronic circuit is properly connected and biased with proper dc voltages. Then it is observed that, whenever the light falls on LDR, the upper LED's get switched off and dipper LED's get switched on. Once the light moves away from LDR, the dipper again get switched off and upper get switched on. In this way, this automatic upper - dipper light woks for vehicle on road during night.



Advantages

- 1) This circuit can be used in vehicles for avoiding accidents of vehicles on roads during night times. Automatic functioning of upper and dipper lights of vehicle can reduce the possibility of accidents. We can reduce the frequency of daily accidents using this simple circuit.
- 2) Cost effective circuit with safety.
- 3) Easy to install in any vehicle's current system.
- 4) To move the robot, we can use such automatic system.

4. Conclusions

This project will provide cheap and easy installation circuit for automatic functioning of headlights of vehicles. This project "Automatic Functioning of Vehicle's Headlight for Accident Prevention" works on response of LDR. It is useful for society to control the number of accidents during night. This project will provide simple and cost - effective circuit for automatic functioning of headlights of vehicles.

5. Limitations

Though the LDR responses to the light falling on it, it is difficult to process this operation when two or more than two vehicles come in front of our vehicle and having headlights on different heights.

LDR may find it difficult to respond perfectly to the incoming lights with different intensities and at different heights.

6. Future Enhancement

- 1) We can use another Transistor of greater efficiency.
- 2) We can use photo diode instead of Light Dependent Resistance.
- 3) By using the idea in this project, we can avoid many accidental situations in future. We can implement this in the vehicles by modifying some things which are lacking for this time. We can try to make it more efficient by considering the incoming lights from different heights.

References

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