



## Steering Controlled Headlight Mechanism

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### ABSTRACT:

The aim is to design and develop a “Steering Controlled Headlight Mechanism” which acts as directional headlights. This is done by connecting headlights and steering. Present day automobiles don’t have effective lighting system. Due to this many accidents are taking place during night times especially in ghat sections. The

### I. INTRODUCTION:

Present day automobiles don’t have effective lighting system. Due to this many accidents are taking place during night times especially in ghat sections. Conventional Head lights tend to illuminate the side of the road while cornering or shine off the road entirely, which can lead to unsafe condition. To overcome this problem an idea has been developed by introducing “Steering Controlled Head lights Mechanism”. Steering Controlled Head light Mechanism includes Headlights, Steering System which are interconnected by using cables. The actual Steering Controlled Headlight Mechanism is the headlights follow the motion of front wheels. For this the headlights are connected to the tie rod of the steering system but not directly to the steering. Generally this can be done by using Mechanical linkages. Instead we can use cables to connect headlights to the steering. Usage of cables has a great advantage of occupying less space compared to mechanical linkages. Apart from turning the Headlights using cables mechanically, we can also turn this electrically using switches and cables as well. Electrically we can connect headlights directly to the steering by arranging a power window motor in this system. Here again, cables are used to connect power window motor and headlights. By introducing this Steering Controlled Headlights Mechanism, the Headlights cast their beam in the direction of curve and ensure better visibility during night drives on ghat roads. This provides smooth and safety ride, mind free ride for the motorist, and it is a safety system for automobile. By implementing this in the

accidents can be avoided by incorporating Steering Control Headlight Mechanism.. When the front wheels are steered, the headlights follows the same path and the light is focused on more divergent area. In the present project, it is planned to design “Steering Controlled Headlight Mechanism” and a live model unit is fabricated.

automobiles, we can provide the nation with accident free roads for some extent

### Steering System:

Primary function of the steering system is to achieve angular motion of the front wheels to negotiate a turn. This is done through linkage and steering gear which convert the rotary motion of the steering wheel into angular motion of the front road wheels. Secondary functions of steering system are:

- To provide directional stability of the vehicle when going straight ahead.
- To provide perfect steering condition, i.e., perfect rolling motion of the road wheels at all times.
- To facilitate straight ahead recovery after completing a turn.
- To minimize tyre wear.

### Requirements of a good steering system are:

- The steering mechanism should be very accurate and easy to handle
- The effort required to steer should be minimal and must not be tiresome to the driver.
- The steering mechanism should also provide directional stability. This implies that the vehicle should have a tendency to return to its straight ahead position after turning.

### HEAD LIGHTS:

A headlamp is a lamp attached to the front of a vehicle to light the road ahead. Headlamp performance has steadily improved throughout the automobile age, spurred by the great disparity between daytime and nighttime traffic fatalities: the U.S. Administration states that nearly half of all traffic-related fatalities occur in the dark, despite



only 25% of traffic travelling during darkness. While it is common for the term headlight to be used interchangeably in informal discussion, headlamp is the term for the device itself, while headlight properly refers to the beam of light produced and distributed by the device. Other vehicles, such as trains and aircraft, are required to have headlamps. Bicycle headlamps are often used on bicycles, and are required in some jurisdictions. They can be powered by a battery or a small electrical generator on the wheel. There are a number of different adaptive headlight technologies, but they are all designed to improve the driver's sight distance at night. Most adaptive headlight systems improve sight distance in corners, but some are also capable of adjusting in response to weather conditions, the presence of other vehicles, and other factors. Various types of adaptive headlights have been around throughout nearly the entire history of automobiles, but a resurgence of interest in the technology has occurred in recent years.

#### Construction:

The implementation of the steering controlled headlight mechanism requires simple construction and it is very easy process the following are the four steps that have to be followed in the arrangement of steering controlled mechanism: Step: 1 Construction of frame Step: 2 Fixing of headlights Step: 3 Imparting rotational movement to the headlights Step: 4 Connecting headlight and steering The above four steps include the building of steering controlled headlight mechanism. Working: Mechanical Working of Steering Controlled Head Light Mechanism:

Light Mechanism: Now-a-days most of the automobiles uses electrical and electronic technologies for easy and quick operation of any system. For example, wind wiper, electronic power steering etc., . So, in this project apart from working mechanically, an electrical system is also being introduced to turn headlights. The main components used in this system are power window motor, its switch and battery. Cables are used to connect the power window motor with the headlights. Also electrical wires are used to connect power window motor to the switch which has been placed at the steering column. The switch



The above figure represents the working of the 'STEERING CONTROLLED HEADLIGHT MECHANISM'. The main aim of this mechanism is to provide the improved lighting in the cornering. In the above figure the blue lines represent the old view angle of the four wheeler before imparting the steering controlled head light mechanism. The angle of the light falling range is very low and most part of the light is not useful and is not falling in required area. Due to this the drivers do not get the better vision in curvatures especially during night times. To overcome this problem steering controlled headlight mechanism is imparted in the vehicle. In this mechanism the headlight and the steering are connected to each other so that the head light take the turns along with the vehicle to improve the corner lighting.

In the above figure the red line refer the new width of the light falling on the road after introducing the headlight steering mechanism in the vehicle. After introducing this mechanism the angle of the light is increased so that the driver will have the better vision in hill areas especially during night times. In this, the light illumination from the headlights will not fall in the unnecessary region area since the control of the light is done by the driver itself (since the headlight turns along with the steering). Electrical Working of Steering Controlled

Head is also connected to the battery through electrical wires. A cam mechanism is mounted on the steering column to operate the switch. When the steering is rotated towards right, the cam mechanism operates the switch (i.e., it presses the switch) then the circuit is closed and the power is supplied. Due to this the motor operates and simultaneously the headlights operate i.e., they are tilted towards right. When the steering is rotated towards left, the cam mechanism operates the switch (i.e., it lifts the switch) then the circuit is opened and the power is supplied. Due to this the motor operates and simultaneously the headlights



operate i.e., they are tilted towards left. They auto aligns to the center when the steering wheel is at neutral position. By this we can say that in electrical system the headlights follow the motion of steering wheel but not the motion of front wheels.

#### Calculations

- 1) Size- 2\*3 feet
- 2) Dia of chain sprocket -7.63mm
- 3) Length of pedal – 16cm

#### Material Cost Analysis

S.No	Part	Qty	Amt
1	Chain	2	1000
2	Baseline sprocket	2	800
3	Pedal crank arms	2	600
4	Headlights	4	800
5	Sprocket	1	300
6	Wheels	4	600
7	Electric wire	2 Feet	40
8	Material for construction	20 kg	1500

