

AUTOMATIC HEAD LIGHT ALIGNMENT AND AUTOMATIC HAND BRAKE RELEASE

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Abstract – The point of this project is guided controlled (or directional) headlights, that are generally a different arrangement of headlights fitted to street vehicles besides the typical low bar/high pillar headlights and their feature is that they turn in the direction of steering, so that the driver of the vehicle can see the curve, what he is actually turning into. Because the static headlamp just provides certain illuminating fields for drivers in the night time and is insufficient to serve for curved roads and intersection. The headlights can be associated with the guiding linkage by method for bars or links.

Automatic hand brake release is nothing but one of the braking systems in automobile at the time of vehicle switched off condition. This braking system is motorized operated. The automatic hand brake release mechanism is one of the most effective hand brake systems over the conventional systems. In this, the control unit gets the signal from the key switch. The key switch is 'ON' at the time of vehicle start condition. The key when switched 'OFF' the motor rotates in reverse direction for two sec to apply the brake. The key when switched 'ON' the motor rotates in forward direction for two sec thus releasing the brake. (Already wheel is in braking condition). Comparing with manual handbrake system it has a compact design.

Key Words: Headlamp, Steering Mechanism, Hand Brake. Control Unit, DC Motor.

1. INTRODUCTION

1.1 AUTOMATIC HEAD LIGHT ALIGNMENT

Auto wellbeing is the shirking of car crashes or the minimization of destructive impacts of mishaps, specifically as relating to human life and wellbeing. Extraordinary wellbeing highlights have been incorporated with autos for a considerable length of time, some for the security of auto's tenants just, and a portion of the security of others. One of the decisions accessible is Design and manufacture of directing controlled head light framework.

Headlamp execution has constantly upgraded all through the vehicles age, goaded by the enormous uniqueness amidst daytime and night time development fatalities: the US National Highway Traffic Safety Administration communicates that very nearly half of all action related fatalities happen negligently, notwithstanding

only 25% of development going in the midst of lack of clarity. Distinctive vehicles, for instance, prepares and flying machine, are required to have headlamps.

IMPORTANCE

Auto security is the evasion of car crashes or the minimization of hurtful impacts of mischance, specifically as relating to human life and wellbeing. Uncommon security highlights have been incorporated with autos for a considerable length of time, some for the wellbeing of auto's tenants just, and some for the security of others.

1.2 AUTOMATIC HAND BRAKE RELEASE:

"Programmed hand brake discharge", which is totally arranged by means of modified structure. It is a wander which is totally arranged and expected for Automobile vehicles. This structures a fundamental bit of best quality. This thing experienced strenuous test in our Automobile vehicles and it is extraordinary. In cars, the ceasing brake, in like manner called hand brake, emergency brake, or e-brake, is a locking brake by and large used to keep the vehicle stationary. It is once in a while also used to shield a vehicle from rolling when the manager needs the two feet to work the grip and throttle pedals.

In autos, the stopping brake, likewise called hand brake, crisis brake, or e-brake, is a hooking brake generally used to keep the vehicle stationary. It is once in a while additionally used to keep a vehicle from rolling when the administrator needs the two feet to work the grasp and throttle pedals. Vehicle hand brakes more often than not comprise of a link straightforwardly associated with the brake system toward one side and to a lever or foot pedal at the driver's position.

IMPORTANCE

Customary stopping brake activation includes the human obstruction. Without pulling or pushing the lever, the stopping brake won't work. Additionally, at times because of carelessness or in crisis conditions, we people regularly neglect to apply stopping brakes. This may prompt moving of vehicle if there should arise an occurrence of slants and impact with different vehicles in stopping zone. Consistent upgrades in dynamic wellbeing and changes as for the dependability and solace of task

imply that mechanical handbrakes are progressively being supplanted by electromechanical frameworks.

1.3 PROBLEM STATEMENT

- Design and build up the model of vehicle which will have the vehicle security arrangement of programmed head light arrangement framework and hand brake discharge for directional headlights and programmed hand brake discharge which helps for programmed.
- Also to create the model of the same that would demonstrate the attributes of both the frameworks and their individual; working as indicated by require.

1.4 OBJECTIVES

- In Four wheeler application for safe stopping of autos on slants, when driver overlooks or deliberately stays away from to utilize the hand brake.
- To give computerization to physically worked hand brakes that will decrease human endeavors and give comfort in driving.
- To anticipate street mischance on sharp turning around evening time particularly in uneven zones.
- To adjust the headlights in two ways (Left, right).
- To configuration, create and manufacture the model that showcases both the frameworks.
- To enhance the perceivability region of driver during the evening so the driver can judge street turning admirably.
- To increment security amid evening voyaging.

2. LITERTURE REVIEW

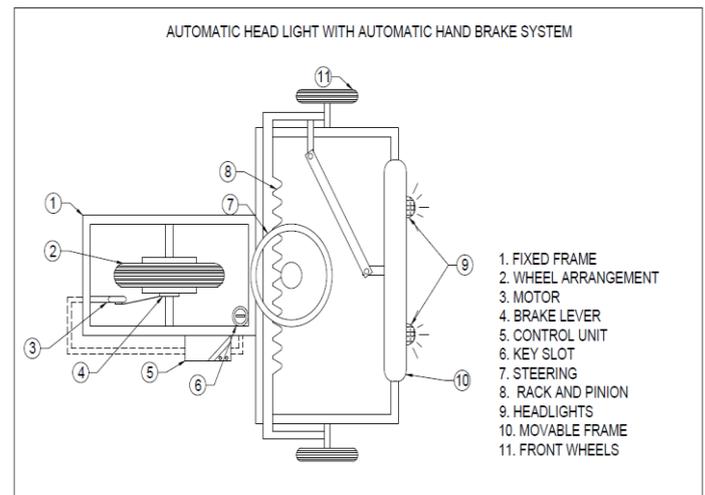
2.1 S.Karaman T.Hacibekir E. Kural E. S. Öztürk, M.Demirci B. Aksun Güvenç [6] presents the hardware in the loop simulation of an Adaptive Headlight System for motor vehicles. The headlamp orientation control system rotates the right and left low beam headlights independently. It also possesses an automatic headlamp leveling system, which, in addition to compensating for different loads, also cancels out the pitching effect during acceleration or braking to provide better night time visibility.

2.2 Yi-Shun Chen; Sheng-Chien Chiu [11] describes a new method and control process for an optical headlight design. A series of experiments were conducted to demonstrate the projection angle of headlights using this method. In addition, the dynamic model of the headlight control system was discussed. Several parameters were considered, including the uphill and downhill road conditions and vehicle speed, to understand the multistage variations of the new headlight control system.

2.3 Chien-Tai. Huang, Chien-Tzu Chen, Shou-Yi Cheng, Bo-Ruei Chen and Ming-Hu Huang [4] provide a new concept design of the EPB system that has simple and low cost characteristics. The testing results have proved the feasibility of this design. First they describe the working principle of this new design, and then introduce the arrangement of the testing system, followed by the discussion of experimental data.

3. SYSTEM DESCRIPTION

3.1 WORKING DIAGRAM



3.2 WORKING PRINCIPAL

- The working standard of fog light arrangement framework depends on the rack and pinion system.
- The pinion which is gathered to the directing. When controlling will be turned haggles will be pivot with same bearing.
- In hand break discharge framework is the blend of gadgets and mechanical framework.
- This framework comprises of MS outline, wheel, engine, lever and drum brake and gadgets circuit.
- Electronics circuit is utilized to control the mechanical framework by utilizing arduino controller.
- Automatic hand brake discharge is only one of the break frameworks in car at the season of vehicle turns off condition. In this break framework mechanized worked one.

3.3 COMPONENTS DESCRIPTION

3.3.1 Frame

A casing is frequently a basic framework that backings different segments of a physical development and additionally steel outline that constrains the development's degree. This is made of gentle steel material.

Specification

Frame design for safety of 25*25*3 L angle mild steel channel

b = 25 mm, d= 25 mm, t = 3 mm.

Consider the maximum load on the frame to be 15 kg.

3.3.2 Rack and Pinion

A rack and pinion is a sort of direct actuator that involves a couple of riggings which change over rotational movement into straight movement. A round rigging called "the pinion" connects with teeth on a direct "apparatus" bar called "the rack"; rotational movement connected to the pinion makes the rack move in respect to the pinion, consequently deciphering the rotational movement of the pinion into straight movement. Rack-and-pinion guiding is rapidly turning into the most well-known sort of directing on autos, little trucks and SUVs.

Specification

1. Diameter of pinion=30mm
2. Module of pinion=1.66mm
3. Module of rack=1.66mm
4. Length of rack=300mm

3.3.3 Arduino

The Arduino Uno is a microcontroller board in view of the ATmega328 (datasheet). It has 14 computerized input/output pins (of which 6 can be utilized as PWM yields), 6 simple information sources, a 16 MHz gem oscillator, a USB association, a power jack, an ICSP header, and a reset catch. It contains everything expected to help the microcontroller; essentially interface it to a PC with a USB link or power it with an AC-to-DC connector or battery to begin.

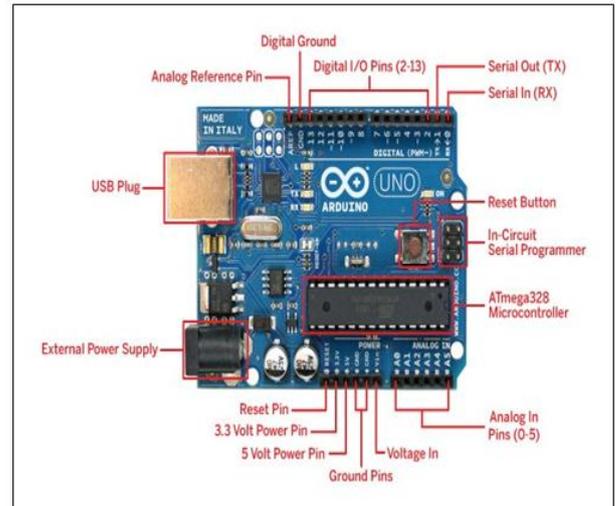


Fig.3.3.3 Arduino

3.3.4 DC Motor

DC engines were the main kind broadly utilized, since they could be fueled from existing direct-current lighting power appropriation frameworks. A DC engine's speed can be controlled over a wide range, utilizing either a variable supply voltage or by changing the quality of current in its field windings.



Fig.3.3.4 12volt, 10 rpm geared DC motor

3.3.5 Relay

Two channels Relay driver project can be controlled by feeding 2-12V trigger voltage, Very useful project for application like Micro-Controller based projects, Remote controller, Lamp on off, and any circuits which required isolated high current and high voltage switching. Two LED works as operation indicator while in, 3 pins screw terminals to connect load and provides both normally open and normally closed switching.

It is an electrically operated switch. Many relays use an electromagnet to mechanically operate a switch, but other operating principles are also used, such as solid-state relays. Relays are used where it is necessary to control a circuit by a separate low-power signal, or where several circuits must be controlled by one signal. The first

relays were used in long distance telegraph circuits as amplifiers they repeated the signal coming in from one circuit and re-transmitted it on another circuit. Relays were used extensively in telephone exchanges and early computers to perform logical operations.

4. CAD MODEL

CATIA MODEL

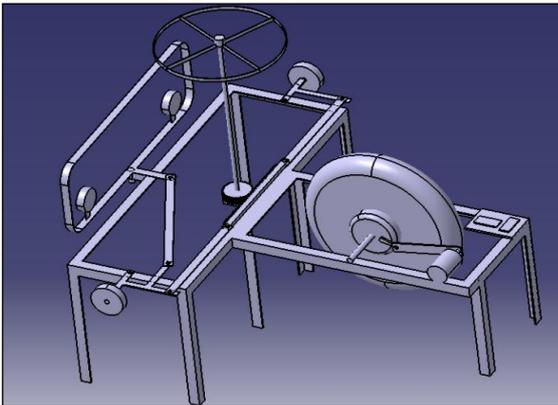


Fig. 4 Catia Model

5. ADVANTGES AND APPLICATION

ADVANTAGES

1. Manual effort in engaging the hand brake is reduced thus completely avoiding human error, reduce the manual work
2. Even though the driver forgets to pull the hand brake in regular car, the driver can be in any critical situation but by using the concept of automatic handbrake system, there is no possibility of risk because by putting the ignition switch OFF, the hand brake system automatically gets locked.
3. Automatic Headlight alignment is a cost effective solution for the problem of night time accidents occurring during two way roads.
4. Improves parking performance on hilly slopes.
5. Simplified Installation is possible.

APPLICATION

1. Four wheeler application for parking purposes on hill slopes.
2. This system can be used in heavy duty vehicles such as buses, trucks etc.
3. To act as steering fog headlamps in foggy areas.

CONCLUSION

The present existing customary light frameworks in vehicle don't give brightening the correct way on bend streets. The theme of this venture is guiding controlled (or directional) headlights, that are typically a different arrangement of headlights fitted to street vehicles next to the standard low shaft/high bar headlights and their element is that they turn with the guiding, so the driver of the vehicle can see the curve, what he is really transforming into.

In this project we have investigated that many of the parking accidents happen due to lack of attention on pulling the hand brakes on slopes. So we did the project of automatic hand brake system to avoid such accidents. The electromechanical parking brake helps with automatic parking brake application based on engine ignition condition. Our system assures safe parking on slopes and hill starts.

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REFERENCES

1. "ADVANCEMENTS IN AUTOMATIC HAND BRAKE SYSTEM" Sachin S. Dharia, Sachin S. Bhopale² Prathmesh P. Kumbhar³, Kedar S. Pathak International journal of advance research science and enggining.
2. Tatsuya Yamasaki, Masaaki Eguchi, Yusuke Makino, NTN technical review No.75 (2007), "Need of an Electromechanical Brake", Link- www.ntn-snr.com/portal/fr/enen/file.../NTN_TR75_en_P0531.pdf
3. IJARIE-ISSN(O)-2395-4396 4158 www.ijarjie.com 961 "FRONT WHEEL STEERING SYSTEM WITH MOVABLE HEADLIGHTS" Gadhave Yogesh V. 1, Jadhav Chakradhar R. 2, Aher Ravindra T. 3, Sonawane Umesh A. 4, Mali Praveen K.
4. Chien-Tai. Huang, Chien-Tzu Chen, Shou-Yi Cheng, Bo-Ruei Chen and Ming-Hu Huang, Design and Testing of a "New Electric Parking Brake Actuator", Paper #:2008-01-2555, Published on 2008-10-12, SAE Int. J. Passenger Cars-Mechanical system in Automotive Research & Testing Center (ARTC), Taiwan. Link- <http://papers.sae.org/2008-01-2555/>
5. Wolfsburg, "The electro parking brake-Design and function, Volkswagen AG", Technical status: 03.2005 Volkswagen AG Service Training VK-21. Link- www.volkswagen.net/technik/ssp/ssp/SSP_346.pdf