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Door Lock Based Ignition System

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ABSTRACT

Safety is the vital top priority when it comes to automotive. There is considerable rise in fatal accidents due to incomplete door lock of any vehicle. To avoid such unnecessary accidents, a system has been designed to overcome such problem. To guarantee add up to security to the travelers inside the vehicle this system will check for unlocked doors, incomplete door lock and will warn the driver. The particular unlocked door will be indicated on dashboard. Further, the driver will be able to turn on the start as it were if all the door are completely closed.

KEY WORDS: Automotives, Accidents, Doors, Ignition.

1. INTRODUCTION

The automotive of previous generation consist of manual entry way locks and with no proper indication on dashboard when any of the door is partially open or completely unlocked. This increase risk of fatal accident if the car is overloaded. So to avoid entryway bolt based start framework is designed. The entryway bolt based start framework consist of four limit switches which are interconnected to the doors of the car. These switches are then given as input to the microcontroller. The microcontroller checks the switch condition (pressed or not) and accordingly gives indication on LEDs. If a particular entry is open, the LED connected at the pin of microcontroller will glow, conversely if a particular entry is closed the LED on that microcontroller pin will not glow. A relay circuit is connected to the µ controller which sends signal to the relay circuit when all the switches are pressed. The relay circuit will connect the car battery and start loop. The start loop will crank the engine.

2. METHODOLOGY

The block diagram of proposed approach is delineated in figure.1. Utilizing the microcontroller we will give the info signal to the relay circuit and in addition the LED.

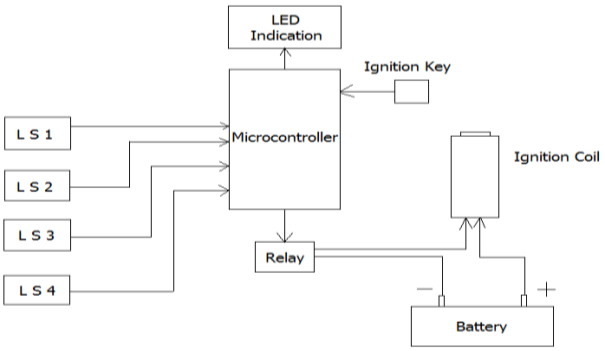

Figure.1. Block Diagram of Micro controller

The LEDs light would indicate which entry is open or closed and the relay circuit will act as an intermediate switch to connect battery with start loop. Input to the microcontroller are given to any one of the port. To that port four pins (out of eight) are used as input from limit switches and one pin from other port as output pin which is connected to the relay. When any of the entry is open i.e. limit switch is not squeezed, the microcontroller will receive input from that door and will consequently indicate by glowing that particular LED assigned to that door (switch). When all the door are closed, the output port pin will activate the relay and car battery will be connected with the start loop.

Components:

Limit Switch: The limit switch used is illustrated in figure.2. The Pin configuration of SPDT limit switch is appeared in figure.3. Here 'NO' pin is Normally Open, 'NC' pin is Normally Closed and 'Com' is Common terminal. The machinery part of the control system is controlled by these switches, as a wellbeing interlocks, or to number protests passing a point. The device makes or breaks the electrical connection when the protest interacts with the actuator.

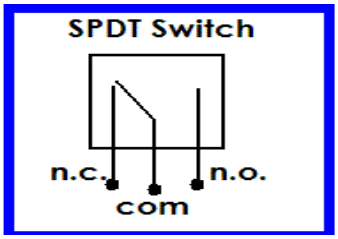

Figure.2. SPDT Pin Configuration

Limit switches are utilized as a part of an assortment of utilizations and situations in light of their toughness, simplicity of establishment, and reliable quality of operation. They can decide the presence or absence, passing, situating, end of travel of a object. They were initially used to characterize the utmost of passing of object; thus its named as “limit Switch".

Features and Benefits of Limit Switches:

- Widely used in various manufacturing industries.
- Accuracy and repeatability can be achieved.
- Less consumption of electrical energy.
- High inductance is used for load Switching.
- Multiple loads can be controlled.

Limitations of Limit Switches:

- Equipments which operates in low speeds would be restricted to use.
- Target with indirect contact is not allowed.
- Mechanical parts which were dynamic would wear out.

Relay Circuit: Relay circuit is used to turn on the circuit. Relay circuits were normally electromagnetic switches. Which will be activated when a small amount of current is passed through its coil primary windings. The secondary circuit works on current which is of huge amount, which is turned on this small current. Different relays posses various different operating voltages. Various sensors are extremely sensitive type of electronic components that may produce only least output currents. Relays helps to amplify small current to larger current. An ordinary relay circuit has two contacts called Normally Open (NO) and Normally Closed (NC) contacts. Pin Configuration of relay is shown in figure.4.

Relay Applications:

- Relays were used to prove logic functions and it performs a predominant role in ensuring critical safety logic.
- Time Delay functions can be provided by relays. Time delay open and time delay close of contacts can be made using relays.
- Relays seeks low voltage signals to control high voltage circuits.
- Relays helps in controlling high current circuits seeking low current signals.
- Relays can be used as protective relays. The faults in transmission and receiving were detected and corrected using the relay functioning.

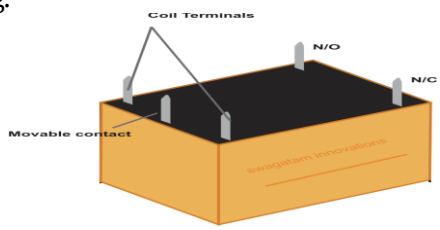

Figure.3. Pin Configuration of Relay

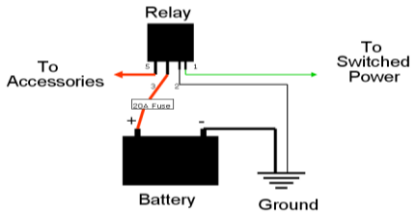

Figure.4. Basic Relay Connection

Start loop: The start loop is considered to be low current and high voltage transformer which converts 12 volts vehicle power to 2,53,000 volts power to fulfill the gap formed during the spark plug that leads to combustion.

Start loop use in cars: Gasoline or petrol internal combustion engines uses magneto ignition system. As no battery was fitted to the vehicle. Magnetos were used in piston engine aircraft. It was hard to ignite the engine when the voltage produced by magnetos was dependent on speed of engine. The battery operated coil through low speed provides high voltage spark makes ignition easier. While batteries became common in automobiles for cranking and lighting, the ignition system displaced magneto ignition.

Working of Start Loop: There are two arrangement of twisting in each begin circle covered as iron center. The "essential" windings, are in a couple of hundred, are associated with the two outside low voltage terminals of the curl. The start switch and battery are associated with the positive (+) essential terminal and the start module is associated with the negative (-) essential terminal which gives earthing. The "auxiliary" windings, which have a huge number of turns, are associated toward one side to the essential positive terminal and the high voltage optional yield terminal in the focal point of the curl at the flip side. The general proportion of optional to essential winding is 80:1. The higher the proportion, the higher the potential yield voltage of the loop. For better execution of begin circle the proportion must be higher than the routine principles. The curl essential circuit gives ground when the start module closes and after that present courses through the essential windings. This makes a solid attractive field around the iron center and energizes the curl. To achieve the greatest quality for the attractive field it takes 10 to 15 milliseconds. The essential twisting turns off when the start module opens the curls ground association. Because of this there will be sudden crumple in the attractive field. The vitality put away in the attractive field has release so it instigates a current in the curl's optional windings. This increases the voltage up

to100 times or all the more, contingent upon the proportion of turns of wire until there is sufficient voltage to flame the start plug.

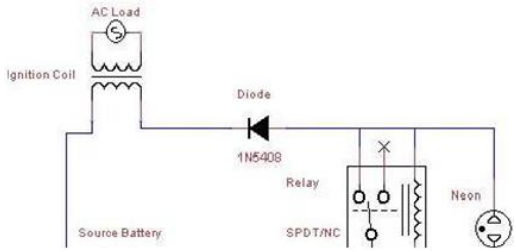

Figure.5. Schematic of Relay Charger Start loop

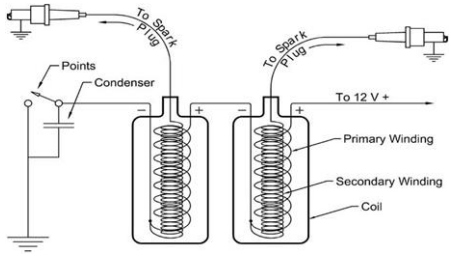

Figure.6. Working of Start loop

Caution: As the coil is now controlled by the ECU any deterioration of the coils internal insulation could result in ECU failure.

Microcontroller Atmel 432: The Atmel® 432 is an inserted ultra-low-control AVR 8-bit microcontroller ICs with incorporated RF transmission and LF getting usefulness for wake-up purposes. The programmable AVR 8-bit Flash microcontroller incorporates 8KB of in-framework self-programmable Flash memory and 320bytes of EEPROM along these lines permitting the framework integrator to introduce field programmable firmware to meet adaptable framework necessities on various stages. The Atmel 432 is configurable to meet to a great degree low-control asks for in rest mode, estimation mode and transmission mode. The AVR 8-bit Flash microcontroller additionally conveys a committed incorporated straightforward capacitive sensor interface, and in addition an on-chip calibratable temperature sensor. The Atmel 432 is hence proposed for applications requiring exceptionally outrageous low-control utilization, for example, dynamic RFID labels with a broadened benefit life.

Features:

- High execution, to a great degree low-control Atmel AVR 8-bit microcontroller
- Advanced RISC framework
- 131 intense guidelines
- 32 × 8 broadly useful working registers
- Fully static operation
- On-chip 2-cycle multiplier
- Non-volatile program and information recollections
- 8KB of in-framework self-programmable Flash
- Optional boot code segment with autonomous lock bits
- 320 (256 + 64) bytes of EEPROM
- 512-byte internal SRAM

Peripheral features:

- Programmable watch dog/interval clock with discrete inward adjusted extremely low-control oscillator
- Two 16-bit clock/counter with compare mode, capture mode, and on-chip digital information modulator hardware
- Sensor interface for external pressure sensor and motion sensor with wake-up function

Operating voltage: 1.9V to 3.6V for ADC and LF receiver; 1.8V to 3.6V all other components.
Speed: 0 to 2MHz (system clock CLK); 0 to 4MHz (timer clock CLT).
Temperature range: –40°C to +85°C.

3. CONCLUSION

At the point when any of the entryway is open means the breaking point switch is not pressed the LED gleams on the LED board. At the point when any of entryway is open or all the entryway is open the microcontroller don't send the output pulse to the hand-off circuit thus the begin circle won't turn on. In any case, when every one of the entryways are shut, every one of the LEDs won't gleam and the microcontroller sends the yield beat actuating the transfer. Lastly the battery gets associated with the curl and in this manner the begin circle turns on.

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