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Automated Power Windows with Temperature Control

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Abstract - India lies in the tropical and subtropical regions of the world. The average temperature is increasing every year in a drastic way. Considering automobiles, it becomes very difficult to keep vehicle cool during hot climatic conditions due to lack of proper parking space. Because of this, difficulty arises in cooling the vehicle. The automated power windows with temperature control, uses a temperature sensor and microprocessor to control the electric motors fitted to roll-up and down the window glasses. Due to this modification, whenever the temperature inside the vehicle cabin rises above and falls above the pre-defined temperature, the windows glasses rolls down and up automatically, to aid natural cooling. The safety of the vehicle is not compromised as the roll down of the glasses is just by a few centimetres, just to aid the flow of air. The accessories used in this addition are readily available in the market and is cost effective also. Moreover, this modification can be installed in an already power window capable vehicle.

Keywords - Automation, temperature control, enhanced feature, reliable, post manufacturing installation.

I. BRIEF HISTORY

Till the mid of 20th century, the window glasses were operated using a hand crank, by a lever placed at a convenient position. By 1960's the power windows started gaining attention and by the 1970's was considered as a common feature in automobiles. Over time rear power windows came as a feature. For the first time, Packard introduced power window in 1940 Packard 180 series car, though it was a hydraulic system. In 1941, Ford Motor company introduced power window on the Lincoln Custom (only the limousine and seven-seater sedans). Prior to World War-2, Cadillac has got driver side power window. Considering safety concerns the US government in 2008 came up with a regulation that required the manufacturers to give controls to the driver in order to avoid and misuse by children sitting behind, and to prevent injuries.

II. INTRODUCTION

Power window is a very important feature in automobiles these days. This feature reduces the effort of the user and in case of driver provides the comfort to operate all the window glasses for better convenience. The power windows have gone through many advancements and now-a-days we are able to purchase vehicles with features like auto up/down, anti-pinch window, auto window roll up when vehicle is locked, etc. But considering a country like India, where temperature in summers touches 52°C at some places and inadequate space for parking even in planned cities, it becomes difficult for the user to cool the vehicle once it is left in the sun. The automated power window with temperature control allows the glasses to roll down by few centimetres when the cabin temperature reaches a pre-set temperature and rolls up automatically when fall of temperature below the pre-set temperature is detected.

III. WORKING

Automated power window with temperature control uses a temperature sensor which detects the temperature inside the cabin of the vehicle. This sensor is connected to microcontroller which is coded to send signals to a relay switch when the temperature inside the cabin

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reaches a pre-set value. As the temperature reaches the pre-set value the microcontroller sends signal to the relay switch which will complete the circuit for a given period of time. This process will enable the electric motor to get power supply and the window glasses will roll-down. The opening of the window glasses can be varied by altering the time of supply of signal to the relay from the microcontroller. Now when the decrease in cabin temperature is detected, the microcontroller again sends the signal to the other relay switch. Due to this signal the window glasses will roll-up to the closed position.

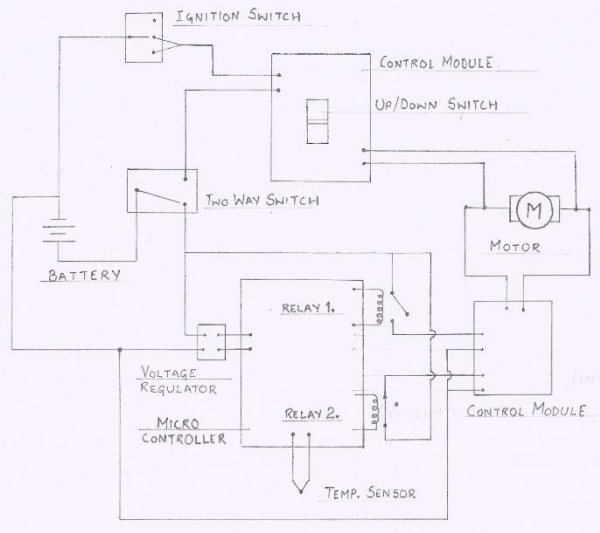

Figure 1: Circuit Diagram

The control module has connections for changing the polarity of electric current to the electric motor. The function of up/down switch is done by relay switches in automatic mode. The two-way switch lets the user to choose between automatic temperature control mode and the manual mode. This switch also works as a safety switch as only one of the functions (automatic or manual) can be performed simultaneously. A voltage regulator is an optional device. It is only required if the output voltage of battery and input required for microcontroller varies.

IV. CONCLUSION

It has been observed over a span of time that many small children have lost their lives when they were left unattended inside the car by their parents. This modification may help save the lives of young innocents if the two-way switch is kept to automatic mode.

Another advantage of this modification is that it can be installed to a vehicle which already has a power window operating system preinstalled by the manufacturer as the temperature module circuit works in parallel to the manual operation mode.

This modification lets the user to choose between automatic and manual mode. The safety of the vehicle will not be compromised as the user can lock the vehicle with window glasses fully rolled up.

V. FUTURE SCOPE

The power window control module can be fitted with a microcontroller to perform both the functions of automatic and manual control mode to eliminate the use of the parallel circuit.

The power window is temperature controlled but not humidity controlled, hence humidity sensor can also be installed to the circuit if natural ventilation is required. In order to make the cabin cool instantly the blower of the vehicle can also be connected to the circuit to aid faster flow of air and to increase the rate of ventilation.

VI. REFERENCES

[1] A. I. Pandey, K. R. PATELIY: Design of Different Parts of Power Window in Automobile, International Journal of Advance Engineering and Research Development, Volume 2, Issue 1, January-2015.

[2] Muazzin Mupit, Amir Akramin Shafie: Experimental Study of Automated Car Power Window with “Preset” Position.

[3] Mohd. Hizir Arafat Bin Tambun: Design and Fabrication of Power Window Apparatus (Frame Type), Department of Mechanical Engineering, University Malaysia Pahang, November-2007.

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