

# Measuring mileage using an encoder

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## 1. Introduction

Wouldn't it be great if we could have a device that could, by using math formulas, measure mileage in a vehicle? As the technology progresses, more and more people are returning mileage to earn more money when they are selling their cars. That behavior causes people to give more money for a car that is worth less because it had crossed more than it is showing on its control panel. When a car crosses more miles it has a higher chance of breaking down. Because of that I decided to make a device that measures mileage that is irreversible. There weren't any previous solutions for this. There are made for measuring speed and mileage but they didn't solved the problem.

## 2. Method of work

System has few key sections: power source, encoder, and enclosure with processing units and electronics. If broken down to simple parts there are: Arduino UNO, and one PHOTO ENCODER, potentiometer and one stepper. At the place where the control spots are, there is LED light is which is lighting always when the car is working, the machine is able to detect light with the photo encoder. Arduino is used to do signal coming from the photo encoder. When the encoder have seen all control spots it activates the algorithm which calculates the mileage. System uses a pair of potentiometers for the arm position information. Job is done when the mileage have been written in variable. The massage tool attached to the end of the arm in direction of muscle fibers across the point. It is important how to find power source in the vehicle. That's why the system has a cable that is attached to lighter in the car below the driver seat. Also it's important how to keep values when device shuts down. That's the reason why I am using EPROM for keeping variables when the vehicle has been shut down, but there is another problem how to keep device protected from connecting to EPROM. I will submerge the electronics in resin to prevent hacking and if

protective layer is damaged the service station fixes the problem and marks the vehicle for change of mileage.

## 3. Results

Because of the special design and hardware, the device is able to properly treat this problem. For example, when the user buys a car seller must show the paper with the mileage. That paper is taking from workshop where they were reading from the device. When you have the paper you now know how many kilometers vehicle crossed. If the vehicle crossed more than 700000 kilometers there is a law in EU - the vehicle that has reached this kilometer point goes to junkyard, whereas some parts will be recycled.

## 4. Conclusion

As this project can be efficiently applied to measure mileage, it can also inspire people to do more research and come up with new innovative ideas where this device can be used. The next step is to include connecting with GPS in this project. The GPS will also store the mileage because it has been developed. Also it can be combined with speedometer in vehicle to make system more perceptive.

## 5. References

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