

ABSTRACT

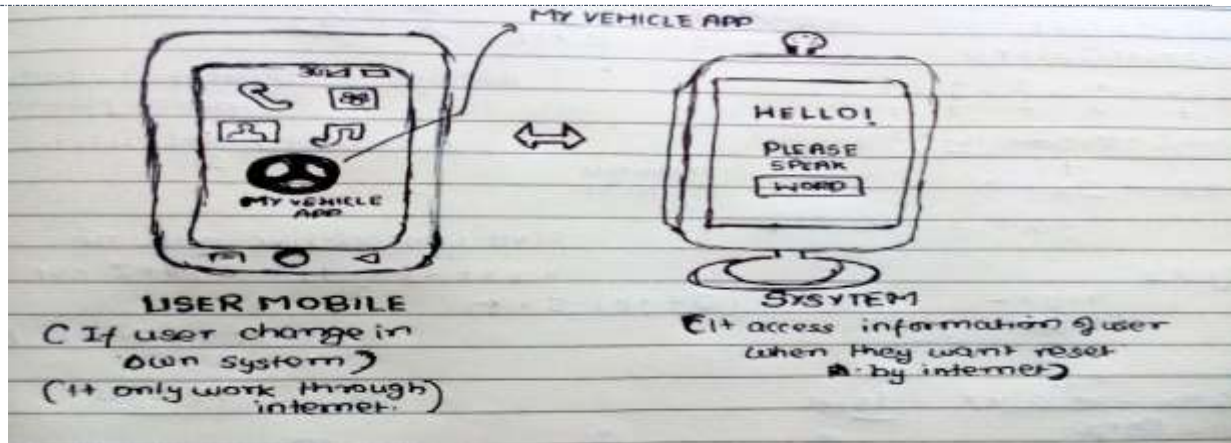
Aim of this paper is to propose a measure to reduce the road accident caused by overloading, helping to prevent damaging of roads and bridges as less overloading results in less damage, vehicle life span will be increased, less servicing will be required, keeping tyres safe from extra or less air pressure and safe from unauthorized driver inept skills. So this app is design to solve these problems.

INTRODUCTION

Nowadays, transportation and technology are increasing day by day. In transportation field, different size and types of vehicles are manufactured for human purposes to make life easier and increase the ease of transportation in less time, but all things have advantages and disadvantages, in this case one such thing is accidents. There are so many cases of accident by vehicle and somewhere the main reason is overloading. Overloading is a problem because many vehicles are used for transporting goods and drivers don't know how much they should load the goods as per the capacity of vehicle. This app helps to show that how much load goods on vehicle is not dangerous as per their vehicle capacity, if it is overloaded and dangerous to carry then red colour is shown in overload button else it shows blue colour(DIAGRAM 1). It can detect all these things when vehicle is put into ignition and starts to move. Another advantage would be security against theft of vehicle. There are so many drivers who park their own vehicle and that too at any place during their journey. They are abided to feel that their vehicle is not safe but they don't know any measures to keep their vehicle safe from threats. This app will helps in keeping it safe. It works in such a way that when vehicle is started by malicious driver then unknown face is detected by camera (camera detector check the photo storage) and if face does not match then they won't be able to start it. If it matched then it shows "driving on" and vehicle will be started. Now days people have grown careless and don't bother about the tyre's air pressure. They don't try to keep air pressure of tyre in check which might result in tyre getting puncher. This app will help them to check air pressure without watching the vehicle tyre as it can detected be by tyre pressure button once they provide/set some range for it and if air pressure is more then it will show maximum and minimum for vice-versa.



Connection between user and system:-

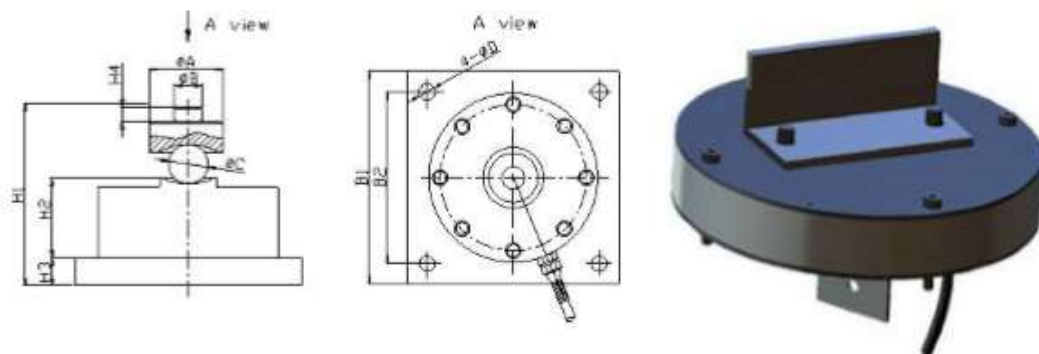


If user wants any changes in their own System, then they should follow these steps:-

1. They have to download my vehicle app in their mobile system.
2. Click on my vehicle app.
3. Enter system number & password for connection between the Vehicle System.
{ All the process have done with the help of internet facility }

Research methodology and process

WEIGHT SENSOR DEVICE:



Operating mechanism of weight sensor device:

The weight sensor (20 kilograms) is attached to the base of the vehicle from one side and to the spring valid for 20 kilograms to the other side. The other side of spring is placed on the flat spring of the vehicle. When the weight of the vehicle increases, the spring is jammed and it produces a power towards the weight sensor and changes the output resistance. The pivot in the device changes the sensor resistance into voltage in a way that the pivot shows 1 voltage if there is no load on chassis and it shows 10 if there is maximum weight on the chassis. This voltage is set on the AVL and it is sent to the central computer via wireless communication network such as GPRS, 3G, Local wireless, dedicated wireless network, other wireless networks to the central server. The central server estimates the weight according to a calibration chart.

Benefits of measuring spring pressure on weight sensor:

- Pieces are cheap
- Low depreciation of device
- Accuracy and Precision

Device Specifications:

- Safe and Non destructive

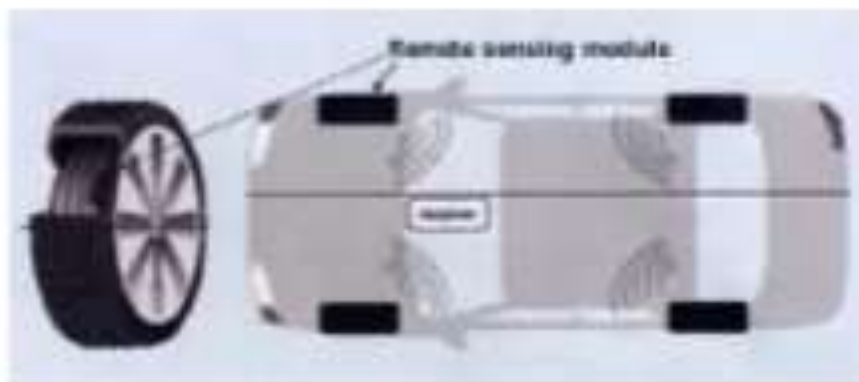
[Sharma* *et al.*, 5(12): December, 2016]
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- Waterproof and Shock absorber
- Small size
- Easy installation on all kind of vehicle
- Accuracy and Precision with minimum error
- The vehicle load at a particular instance is computed by measuring changes in the vehicle suspension system.
- The changes in the vehicle suspension system are measured by a variation in pressure applied on the load cell in the weigh sensing device at any instance.
- The weight sensing device cases a circuit board for measuring a pressure applied on the load cell and converting the applied pressure level into a resistance value.
- The weight sensor device is connected to the AVL system through a wired connection or wireless connection.
- The AVL is provided with a monitor to display the vehicle load and the vehicle location information simultaneously.
- The central computer receives the voltage data from the voltage conversion unit through the AVL system to calculate the vehicle load at any instance using a pre-calibrated chart.
- The central computer receives the vehicle location data and the voltage data from the AVL system to monitor vehicle location and vehicle load at any instance.
- The central computer receives a position data and the position data includes longitude, latitude and altitude of the vehicle at any instance, speed of the vehicle, bearing data and a time data are also received from the AVL.

Weight sensor Technical Parameter:

Sensitivity:	(2.0±0.1%) mV/V
Combined Error:	±0.02% F.S
Zero Balance:	±1% F.S
Input Resistance:	750±5Ω
Output Resistance:	702±2Ω
Insulation Resistance:	≥5000MΩ
Operating Temp. Range:	-30 ~ +70
Maximum Safe Over Load:	150% F.S
Ultimate Over Load:	300% F.S
Element Material:	Alloy Steel, Stainless Steel

Vehicle Tyre Pressure Monitoring



SYSTEM OVERVIEW

To do real time sensing of the exact pressure inside the tyre, the sensing device must be located in the tyre. This pressure measurement information must then be carried to the driver and displayed in the cabin of the car. The remote sensing module is comprised of a pressure sensor, a signal processor, and a RF transmitter. The system must compensate pressure variations due to temperature. Hence a temperature sensor is also required.

The power supply is provided by a long life battery that the embedded intelligence helps to manage as effectively as possible. The receiver could be either dedicated to TPM use, or shared with the other functions in the car.

Remote Sensing Module (RSM)

Once mounted in the tyre, the RSM is a stand-alone device. Its embedded intelligence has to independently manage the sensing functions, the measurement processing, the RF transmission, and the power management.

To address each of these functions, Motorola offers two new components as a solution. The TPMS Sensor is an integrated monolithic chip device. It is comprised of both a temperature and pressure sensor with on board circuitry.

The second component is a microcontroller and a RF transmitter, with both chips housed in the same package.

The TPM sensor

The Motorola TPM pressure sensor uses less than 0.5 μ A in standby mode. The pressure sensing cell is capacitive and requires a C to V (capacitance to voltage) conversion stage. The sensor's built-in non-volatile memory can store calibration data while the ADC allows a direct digital serial connection to the controller. In standby mode, all analogue and digital blocks are switched off, except an internal low frequency oscillator that sends a wake up pulse over an output pin to the controller periodically. A pressure measurement mode allows the pressure cell, and the C to V converter to be activated. The temperature measurement mode activates the temperature cell (a PTC resistor) and its conditioning block. Finally, the read mode enables the measurements to be stored in a sampling capacitor. The read mode activates the A to D converter and enables the controller to read serially the measurement. These four modes are coded through two input pins controlled by the microcontroller. The coding is chosen so as to make the standby mode coded with logic zero on both pins.

The microcontroller

The 68HC08RF2 device was chosen for its combination of an HC08 micro together with a RF transmitter in a single 32-pin LQFP package. The dual chip HCO8RF2 has no internal connections between the controller die and the RF die, but the pin out is optimised to Shorten the necessary external connections. The 2Kbytes of user Flash memory with embedded charge pump allow designers to implement the necessary software routines to address the TPMS application's functional requirements. The RF transmitter is PLL based, addressing both ASK (amplitude modulation) and FSK (frequency modulation) and its transmission rate is configurable up to 9600 baud. With a reference quartz oscillator of 13.56MHz, the PLL is able to generate 315, 433, 868MHz carriers.

The system architecture

The HCO8RF2 controls the sensor-state by setting the different operating modes. When the sensor is set in standby mode, its internal low frequency oscillator periodically wakes up the controller. After each wake up, the controller may run different and configurable tasks according to the software program. Between two wake up pulses, the microcontroller is in the Stop mode, all functions are disabled to minimise the power consumption, and only an external stimulus can wake it up again. To improve the battery management, an inertial switch can be employed to detect the parking mode. In parking conditions, the RF transmissions can be stopped or reduced, improving power management and reducing the data collision risk between RKE and TPM transmissions. The RSM must be as small and lightweight as possible since it is mounted inside the tyre. An oversized RSM could result in wheel imbalance.

The receiver

A single receiver can be shared between both the RKE and TPM systems since the same transmitting format is used in both. The TPM function must use as little CPU time as possible and to achieve this, a highly integrated RF receiver such as the MC33591, also called Romeo 2, is required. This RF receiver was developed in order to provide a comprehensive RF link that is integrable in RKE and TPM systems with Romeo 2 at one end, and the HCO8RF2 at the other end. Thanks to its embedded RF decoding and data registers, the chip minimises the communication with the receiver microcontroller. The MCU is not called until a valid data frame is received, validated, and stored by the Romeo 2 device.

Tyre identification

The simplest to perform tyre identification is the manual initialisation performed in the factory, or in the garage each time a tyre is replaced or moved (rotated). The second method is by automatic identification. Using this method, the system locates each tyre automatically by a learning procedure that is activated regularly, or upon request. Combining different information sources could be the path taken to meet these needs. TPM is in fact, destined to become more integrated into the vehicle architecture.

VOICE SAFE VEHICLE



The voice of the person who wishes to drive the car is stored in Voicesafe-36 by making a person read a small sentence. Once the person's voice is stored it then asks the user to verify his voice by saying any word of his choice to test if data storing is successful. Voicesafe-36 then checks for Live voice detection & it then verifies the voice with the voice sample it has stored. If both the voices match then the user is granted access & is termed as authorized user. He can now start the car. Voicesafe-36 can store 4 voice prints/voices thus enabling 4 persons to drive the car. Voices can be added & deleted by the authorized user. If the voice does not matches with those stored in "Voicesafe-36" memory then access is denied and the car cannot be started. The car does not start as it cuts off fuel supply if the voice does not match, i.e. no unauthorized person can drive the car. Fake voice or imposter is identified & auto dialing alerts the owner of the car. You can Start your car with any word or phrase of your choice. (Secret voice password) Feel free to use any word of your choice. Once stored in memory it shall use and verify that. Similarly you can use any (Secret voice password) word, number, phrase of your choice to switch off the car. After your voice is identified & verified the car will perform its respective job.

Voicesafe-36 -Live voice Detection, Identification & Verification

This features checks whether the voice is not a recorded one and is not played by an audio recorder or any other form of multimedia device. It confirms that a human being is actually attempting to gain access to the car. It then identifies if the voice belongs to the owner of the car or some unknown person by comparing it with voice sample stored in its memory bank. Thus it does 2 important functions.

- 1) Identifies if the voice is in its natural form and not merely an audio or multimedia recording. Thus it avoids manipulation of the original voice. 2) It recognises, identifies and determines if the voice or the voice command given to start the car belongs to the owner of the car & not to an unknown /unauthorized person. Hence this feature ensures that an unauthorized person does not start the car, thus enabling to increase security.

You may have question in your mind that

What is a voiceprint? How many Voice prints does Voicesafe-36 store

Voicesafe-36 has a memory to store 6 voiceprints. A voiceprint is a digital representation of some of the unique characteristics of a caller's voice. A voiceprint includes measurement of physiological characteristics, such as the

nasal passages and vocal chords, as well as the frequency, cadence and duration of the vocal pattern. A voiceprint is not a recording or sound file as it cannot be played back into a voice biometrics system by an imposter. The voiceprint is a voice biometric identifier

What is the difference between Person-Voice-Verification & Person-Voice-Identification?

Voicesafe-36 uses voice verification for genuine results & not merely identification. In voice verification, a person's identity is confirmed by matching his or her voice against a single voiceprint or voice stored in Voicesafe-36 memory bank. The voiceprint matching is done for confirmation. Voicesafe-36 operates in voice verification mode & is very accurate and safe. In Voice identification, the person's voiceprint is only matched against several voiceprints. This is typically done when no other identifying information is available, such as in the case of surveillance audio analysis or when a caller has forgotten his or her password or account number. Both speaker verification and speaker identification are types of voice biometrics.

How is voice verification different from speech recognition?

Speech recognition, sometimes referred to as voice recognition or automated speech recognition (ASR), is a technology that analyzes a voice sample to determine what was said, while voice biometrics analyzes a voice sample to determine who said it. In other words, ASR recognizes words, while voice biometrics recognizes identities.

What is the difference between text dependent and text independent voice verification?

The majority of voice verification systems are text dependent, meaning the user must state a specific word, phrase or digit sequence in order to be verified. This is ideal for combining knowledge verification (password, account number) with biometrics. There are some voice biometrics systems that are text independent, meaning a speaker can be verified based on any voice sample. This type of system is most suitable for systems that run in the background, such as for surveillance operations, where it is not possible to prompt the subject to state a specific word or phrase. Voicesafe-36 uses text independent method for 100% accuracy.

Additional Features of Voicesafe-36.

Live Voice Detection & verification:

It verifies if a human voice is actually attempting to gain access to the car. It then Identifies & Verifies if the voice belongs to the owner of the car. Thus allowing only Genuine & Authorized voice to start car.

Dual-Mode security

Voicesafe-09 is installed internally-on dash board & also externally-on car door thus securing unauthorized engine start and unauthorized car entry.

Auto Dialer Alert system

If an unauthorized person attempt's to start the car or get access inside the car by placing his finger on the fingerprint scanner on the dashboard then the inbuilt dialer system calls up on your mobile phone number or your telephone number. It then warns you that the car was attempted to be stolen but it is safe now.

Car Personal Assistant System

It helps you store your unique and secret voice messages/appointments in the memory, which are secured by your finger impression. Thus enabling you a secured message & information storage facility.

Nap Alert System

If you are driving the car & accidentally you fall asleep or start dosing off then the system will wake you up with small alarm or beeps. If you are not able to respond in three beeps then it shall with the help of Auto Dialer call the emergency number or the number of your relatives that has been stored. Thus avoiding an on-road calamity.

Valet Parking Mode

Voicesafe-36 system has a deactivation code to deactivate the system if necessary or to drive the car incase your finger is swollen due to any health issues.

Weight/Load Cell Sensors

Sensors that measure quantities such as weight and force have been a staple of industry electronics for many years. "Performance of force/weight sensors is one of the factors that influence the productivity and manufacturing cost in many industries..." [1]. Load cells have been widely used for measuring and sensing applications for decades as well. Weight and load cell sensors are utilized in most all areas of industry including the automotive and machine industry, security, medical field, and manufacturing multiple home/business appliances. This paper will focus primarily on the implementation and uses of sensors on weight bearing objects and commercial products currently on the market.

Commercial Applications

Automotive – Vehicles need effective seat belts and air bags to protect drivers and passengers, especially trucks and sports cars where there is no option to put a child in the rear seat. New air bags are being developed largely due to the number of children and small adults fatally injured by full-power air bags. New air bags will use electronic systems to identify the weight and position of seated passengers. Restraint systems in vehicles employ a load cell with a strain gauge that uses a seatbelt mechanism to secure passengers. The strain gauge measures the tension of the sensor once the seatbelt is tightened. Both the strain gauge measurements and signals are sent to a control unit that processes and directs the signal back to another sensing control unit. This information determines if the child or adult is buckled properly and controls deployment of the airbag [2]. **Security** – The United States and other countries, specifically Russia, maintain inventories of highly volatile and nuclear materials secured through several technologies, one of which includes using weight sensors. The sensors are placed under stored materials and measure the weight of each canister. If there is any tampering or unexpected change in weight, an alarm system is activated notifying security for investigation [3]. **Medical** – Load cells are used in many fluid-monitoring purposes, such as blood transfusions, dialysis, blood donations, and enteral/parenteral nutrition. Load cells are also useful in hospital bed scales for transmitting accurate patient weight. Weight sensors can be used under patient beds to monitor movement by the patient through the night. Physical therapists utilize load cells and weight sensors to monitor muscle recovery and weight bearing activity [4]. **Home/Business Appliances** – Weight or load cell sensors are used in many home appliances. Washing machines use weight sensors for maintaining proper water supply levels [5]. Microwave ovens are equipped with weight sensors that determine proper cooking times based on weight. Some hotels in Las Vegas use weight sensors in in-room refrigerators to charge hotel guests if anything is moved in the refrigerators [6]. Load sensors are used in elevators to send information to a computer that determines if the car capacity is within weight limits [7].

Underlying Technology

Weight or load cell sensors perform many functions and work in a variety of applications. The sensors are used to: "detect and measure a relative change in a force or applied load; detect and measure the rate of change in force; identify force thresholds and trigger appropriate actions; and, detect contact and/or touch" [8]. For proper calibration of the weight sensor, a dead-weight test stand is normally used in order to reach accurate and repeatable sensor loading [9]. Load cells are mechanical devices used to convert force or weight into electrical signals. Strain is the ratio of the change in the length of the spring to the initial length. A strain gauge is located within most load cells and changes resistance when pulled or pushed. "Strain is measured by attaching metal foil resistors to the area of the spring where the strain is concentrated" [10]. An electronic control unit that measures resistance changes processes the electrical signals

Building Blocks for Implementing Technology

Implementing the use of load cell and weight sensors will require analog and digital sensors. A low noise amplifier and high dynamic range A/D converter will be needed to digitize the signals. A wireless network, a data acquisition card, and software will also be needed. Implementation of load cell and weight sensors will be conducted through a group project by building an electronic dog feeder. Weight and load cell sensors will be an integral part of this project. Through successful implementation of the project, dog owners will have the capability of assessing the overall feeding patterns of their dogs and adjust feeding times by turning on their computers and visiting a website where all of this information will be just a touch away. Conclusion Load cell and weight sensors are important components used in electronics for measuring and sensing applications in almost every facet of industry. These sensors open up new, cost-effective alternatives to business procedures in many different fields. "A number of factors combined determine how well a load cell works. Orchestrating the interaction of these factors is a must for the systems engineer [4]."

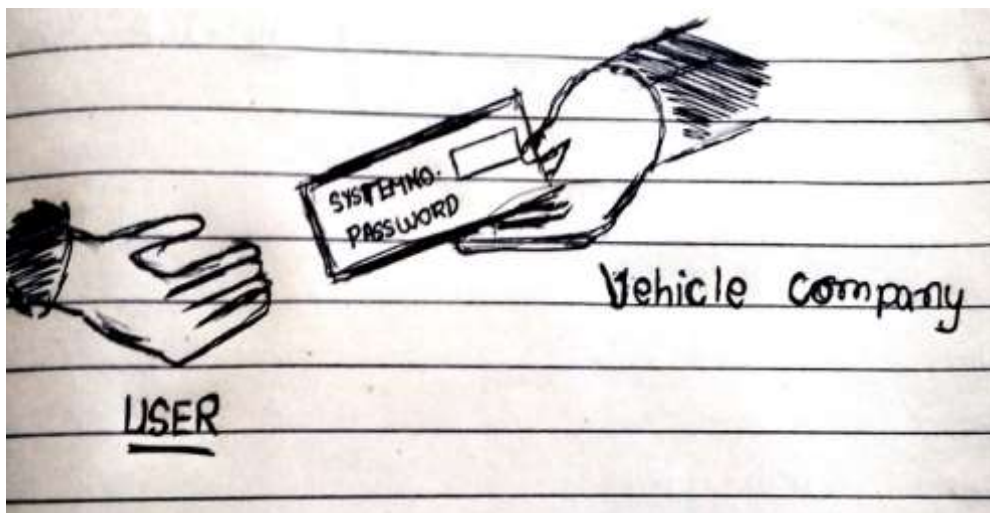
TIRE PRESSURE WARNING SYSTEM

DESCRIPTION

=> A direct-sensing type tire pressure warning system is used on U.S.A. model.
=> If the vehicle continues to be driven with 1 or more of the 4 inflated to a low air pressure that could cause problems during driving, this system will illuminate the tire pressure warning light to inform the driver of the low air pressure.
=> Furthermore, this system directly senses the air pressure of each tire through tire pressure warning system valve & transmitter that are attached to each wheel.
=> After tire replacement, firstly register tire pressure warning system valve & transmitter IDs into the tire pressure warning system ECU, and then store the appropriate tire pressure in the ECU using the tire pressure warning system reset switch.

HOW TO GET THIS SYSTEM?

If you purchase any vehicle like ,Motorbike, car, truck, bus, Tractor ,Scooter ,etc. that is already given or completely fitted in the vehicle .And vehicle seller/ manager gives you system number and password in the form of envelope , Just like banking process that gives you password in envelope form as a secret way.



CONCLUSION

In coming future, this app will be very helpful for vehicle owner that no one use their own vehicle by other malicious procedures (means no one use without permission of vehicle owner) and they feel safe to park anywhere.

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