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Projecttital:Lanesafty System Bylow Cost……Automation…….....

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ABSTRACT
Accidents have become major issue in Developing countries like India now a day. As per the Surveys 60% of the accidents are happening due to over speed. Though the government has taken so many initiatives like Traffic Awareness & Driving Awareness Week etc., but still the percentage of accidents are not getting reduced. In this paper a new technique has been introduced in order to reduce the percentage of accidents. The new technique is implemented using the concept of Intelligent Speed Braking System. The Intelligent Speed Braking systems can be implemented any where essential in order to avoid the accidents. The main objective of this system is to calculate the speed of the vehicle at three different locations based on the place where the vehicle speed has to be controlled and if the speed is greater than the designated speed in that road then it will automatically open up the speed breaker to control the speed of the vehicle. If the speed is less or equal to the designated speed in that road then the vehicle will be passed without any disturbance. This system though it won't avoid 100% accidents at least it will reduce the percentage of accidents. This is system is not only to avoid accidents it will also intelligently controls the speed of the vehicles and creates awareness amongst the drivers.
We all have a vision of what the future will look like and when it comes to technology we all have some Visions of robots performing the job that most of us would happily pass up. The industrial, Green and Digital Technological Revolutions have driven automobile output to levels capable of feeding the exponential growth in human population to date. With a predicted world population increase from the 6.8 billion today to over 10 Billion by 2050, growth in automobile output will need to continue. This combined with an ever declining rural labor force and the need for greater efficiencies will inevitably lead to increasing level of in-field automation.we have all seen video clips of modern factories ,with their robots doing the intricate and repetitive tasks faster and more consistently than possible with manual labor. In this what the automobile of the future will look like.
To operate without constant supervision. After studying these Visions of the future in is need to creat a concept for future automobile technologies that will be able to handle automobile taske while serving people in many other ways as well. One thing won't change: in the future our costmers will still want tailor their autombile industry according to their indivisual needs in order to perform specific tasks as efficiently as possible.
Hence there is a need of a automobile automation with new tecnologies.
Keywords: Analysis, investigation, research

I. INTRODUCTION

Except for the Autobahn one in Germany, almost all road have specific speed limits. and it is difficult for the driver to always look out for speed limit sign an adjust his spirits accordingly. Over speed indicator is a device that tell the driver is he exceeding the particular speed limit with the over speed indicator in your car you work can be sure that you are not going get yourself booked for over speeding at the same time it will guarantee against any road accidents due to word speeding of the vehicle.

In Developing countries like India the only solution to avoid accidents or any incidents which are happening either knowingly or unknowingly is by providing smart solution to it. In this paper the solution which is discussed is very smart way of controlling the speed of the vehicles whenever or whereverIt is essentials.

Objective of Project.

(A) development of mechanism for over-speed sensing.

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(B) Over speed indication by flashing lamp and or hooter.

(C) Breaking using Disc break and electromagnetic solenoid actuator by E_BX technology.

(D) Simultaneous Power regulation to avoid power wastage break wear.

II. LITERATURE SURVEY

Speed thrills but it also kills! Without indicator signal Lane changing and Over Speeding made people to lose not only their life and also the people who are on the road and coming opposite side. As per the statistics available with the Traffic police of Bangalore, it shows that out of 1647 road accidents that took place last year, 456 accidents were caused due to over Speeding. It shows more than 25% accidents are due to over speeding and lane changing.

10% accidents out of 25% which happened last year not to repeat this time.

III. METHODOLOGY

The Lane safety by low cost automation system and accident prevention system comprises of the following:

- (a)Chasis or Frame : The Chasis or frame is fabricated structure that carries the entire system, rear wheel shaft is the driver shaft that carries the reduction pulley driven by motor using open belt drive the end carries the steering mechanism in front of ackerman steering with the central steering wheel controls the steering angle using the slotted lever arrangement.
- (b)Motor : Motor is the prime mover it is single phase AC motor 50 watt , to 6000 RPM variable speed motor speed is regulated using electronic speed regulator.
- (c)Over speed sensing mechanism : The overspeed sensing mechanism is a mechanical linkage based on the Bob-weight type centrifugal governor only that is used to vary the proxamal distance between the probe and the sensor which is inductive type.
- (d) Electronic proximity sensor : The electronic proximity sensor is mounted under sheet metal panel on the base frame by means of an OZ shaped clamp the proximity sensor as the name suggests senses the proximity of the indexer buttons which act as stop , such that when they come in front of the proximity sensor the table the realy is operated to stop the table motion. the proxy meeting sensor is connected to the electronic relay and power source.
  Sensor type: : Inductive type proximity sensor size – M18.
- (e)Electronic Really : 8 pin electronic Realy MK2PN -5-I-S,230V AC, 10 A. Electronic Realy is used for the sequencing of the actuation mechanism.
- (f) Electronic speed Regulator : Motor is an commutator motor ie , the current to motor is supplied to motor by means of carbon brushes. the power input to motor is varied by changing the current supply to this brushes by the electronic speed variator, thereby the speed is also is changes.
- (g)Braking mechanism : The breaking mechanism which is a disc brake and brake caliper arrangement . the disc brake is used with the view to maximize the breaking and ensure safety the brake caliper is actuated electrically using an solenoid with electromagnetic operation.
- (I) Overspeed indicator lamp and or hooter : This is indication or alarm system the lamb is an red LED lamps that flashes when overspeed occurs similarly the hooter is a horn or buzzer arrangement that goes of after over- speed of course there by alarming the driver.

WORKING .

System start with motor starting……motor speed controlled by electronics speed regulator….. as speed increases the dead weight of the centrifuge governor fly's out making the probe the slide back……at Overspeed level the resultant gap between probe of the slider and the proximity sensor exceeds the permissible limit….. which make the relay to operate and….. consequently the following action takes place….

a)Visual over speed indicator is the from of over speed indication lamp lights.

b)Audio over speed indicator in the from over speed indication hooter goes on

c)Braking mechanism actuated to operate the shoe brake cam linear actuator Mechanism.

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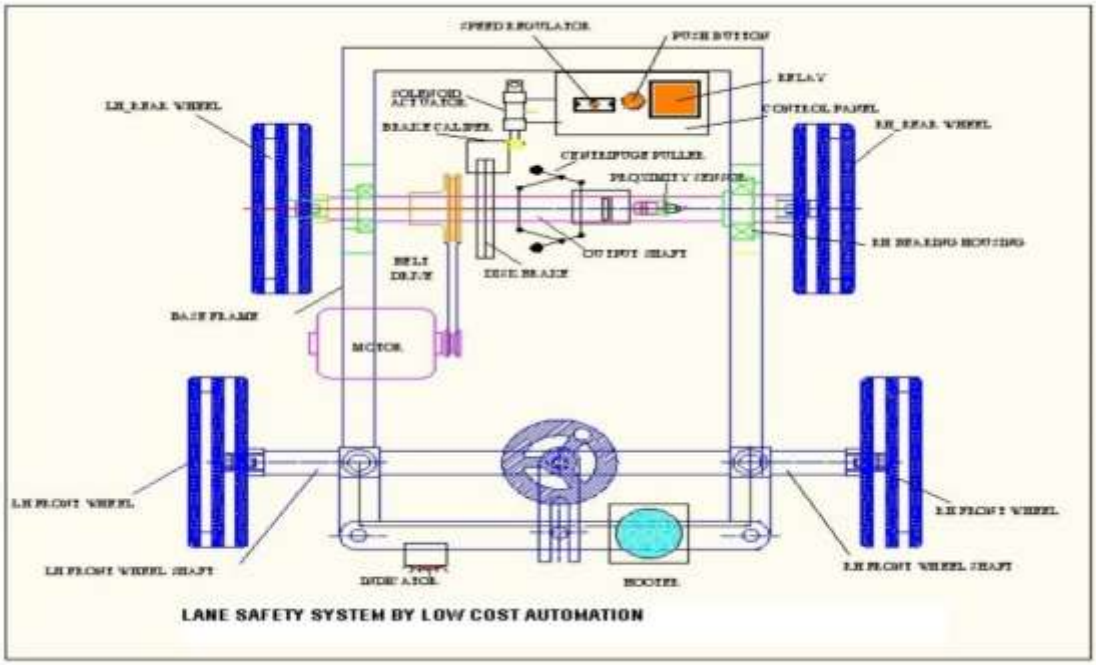
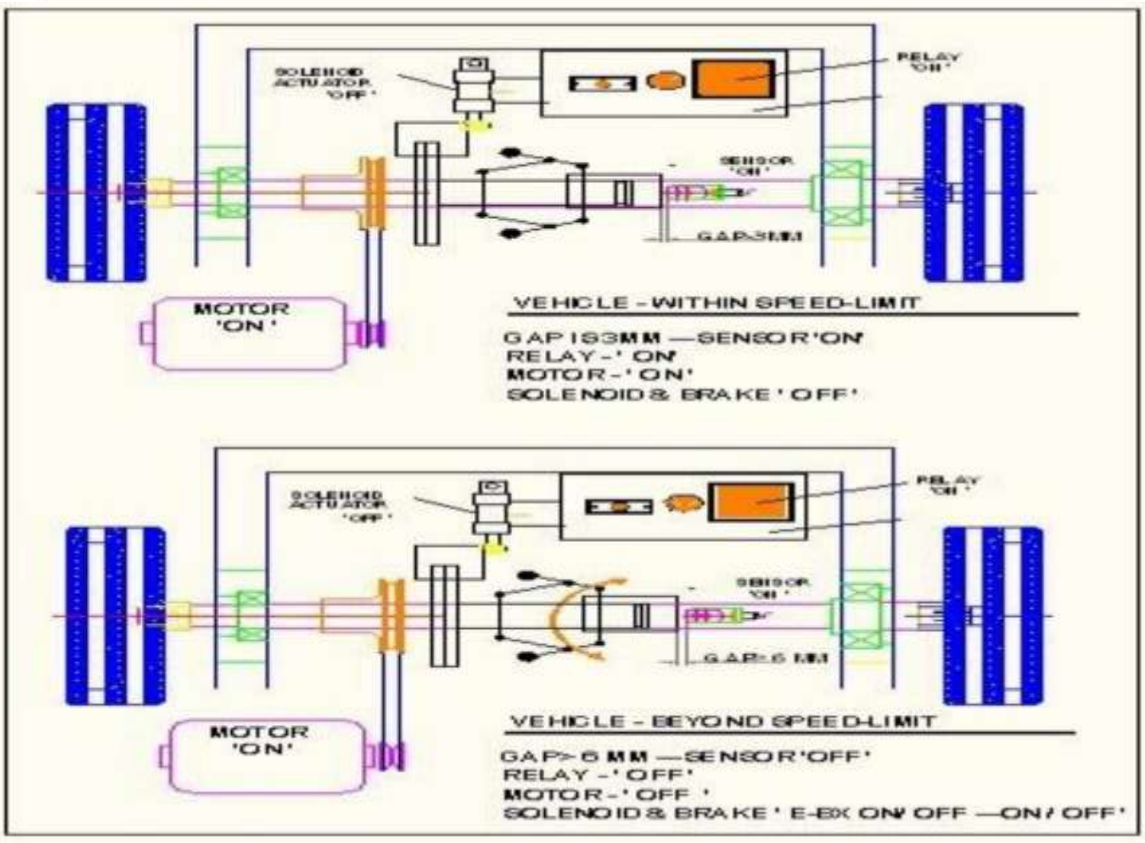
IV. MODELING AND ANALYSIS





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V. RESULTS AND DISCUSSION

DESIGN OF BELT DRIVE

Selection an open belt drive using V-belt ;

Reduction ratio = 5

Planning an 1 stage reduction;

A) Motor pulley (Ø DI) =20mm
B) Main shaft pulley ¿ D2) =100mm

INPUT DATA

INPUT POWER = 0.05KW INPUT SPEED = 1000RPM
CENTERDISTANCE =210 MM

MAX BELT SPEED = 1600 MIMIN =26.67M/SEC

GROOVE ANGLE (2) = 40^0

COEFFICIENT OF FRICTION = 0.25

BETWEEN BELT AND PULLEY
ALLOWABLE TENSILE STREES = 8 N/mm^2

Section of belt section

Ref Manufacturers Catalogue

C/S SYMBOL	USUAL LOAD OF DRIVE (KW)	NOMINAL TOP WIDTH (Wmm)	NOMINAL THICKNESS T mm	WEIGHT DER METER Kgf
FZ	0.03 - 0.15	6	4	0.05

$$\sin \propto = \frac{Ø_1}{Ø_2} = \frac{R_{2-R_1}}{x} = \frac{D_{2-D_1}}{2x}$$

$$= \frac{100-20}{2 \times 210}$$

$= 10.98^0$

Angle of lap on smaller pulley; ie; motor puller ;

$$\theta = ¿180 - 2 \propto$$

$= 180 - 2(10.98)$
$= 158.04$

$= 2.75^0$

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Now;

Mass of belt /meter length = 0.05 kgf

- Centrifugal Tension (Tc)= MV2

∴ Tc = 0.05 (26.67) ^{2}

Tc 35.56 N

Max Tension in belt (T) = f x Area

=8 x 20
=160N/mm^2

A) Tension in Tight side of belt = Tl = T-Tc

T= 160 - 35.56

T= 124.4N

B) Tension in slack side of belt = T2

$$2.3 \log\left(\frac{T_1}{T_2}\right) = \theta_x \mu \text{ x cos sec } \beta$$

$$= 0.25 \text{ x } 2.8 \text{ x cosec } 20 \log \frac{T1}{T2}$$

= 0.86

T_1/T_2= 7.75

T = 16N

POWER TRANSMITTING CAPACITY OF BELT;

P=(T1- T2)v

= (124.24 - 16) 26.67

P=3.13 kw

- Belt can safely tansmit 0.05 kw power

SELECTION OF BELT .

Selection of belt 'FZ 6 x 600 ' from std manufacturers catalogue

RESULT TABLE

1.	BELT SELECTED	FZ 6 x 600
2.	Tight side Tension	T_1 = 124.24 N
3.	Slack side Tension	T_2 = 16 N
4.	Motor pulley did	D1= 20 MM
5.	Pulley (a) diameter	D2 = 100MM

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DESIGN OF INPUT SHAFT

Motor Torque

$$P = \frac{2\pi NT}{60}$$

$$T = \frac{60 \times 60}{2\pi \times 6000}$$

T = 0.095 N-m

Power is transmitted from the motor shaft to the input shaft of drive by means of an open belt drive.

Motor pulley diameter =20 mm

IP_shaft pulley diameter =110 mm Reduction ratio = 5

IP shaft speed = 6000/5 = 1200 mm

Torque at IP_shaft = 5 x 0.095 = 0.475 Nm

T_{Design} = 2 x T -0.95 Nm. FOS -2

= 0.95 $X10^3$ Nmm

Selection of input shaft material

Ref. PSG Design Data

Pg No: - 1.10 & 1.12.0 1.17

Designation	Ultimate Tensile Strength N/mm2	Yield strength N/mm-
EN 24 (40 N; 2 cr I Mo 28)	720	600

Using ASME code of design;

Allowable shear stress; F_{sat} is given stress;

$^{F}_{sat}$ = 0.30syt = 0.30 x 600

= 180 N/mm2

$^{F}_{sat}$ = 0.1 8 x Suit - 0.18 x 720

= 130 N/mm2

Considering minimum of the above values;

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f_{sd} = 130 N/mm^2

As we are providing dimples for locking on shaft;
Reducing above value by 25%

$\Longrightarrow f_{sd}$ = 0.75 x 130
= 97.5 N/mm^2

a) Considering pure torsional load;

$$T_{design} = \frac{\pi}{16} f_{sd} d^3$$

$$= \frac{16 x 0.95 x 10^3}{E\pi \times 97.5}$$

d = 7.0 mm

selecting minimum diameter of spindle 16 mm from ease of construction because the standard pulley has a pilot bore of 12.5 mm in as cast condition, and a bore of minimum 16 mm for keyway slotting operation.

DESIGN OF GOVERNOR:

Here the approach is to select the spring directly as per geometrical constrains and calculate the mass of the centrifugal bob weights to deflect the spring according to requirements of the governor set-up
Assuming minimum cut off speed for model = 60 kmph
Wheel diameter = 300 mm
Hence speed of wheel shaft =1060 rpm
Radial speed = ω = 111 rad/sec
According to the Geometry of setup the spring used in the governor setup is mounted on the wheel shaft, hence minimum diameter = 16 mm , assuming rod diameter = 1.2 mm and no. of turns to be 10 , both end ground, free length = 20mm.

The function of the spring is to maintain the gap between the sensor and the probe below 3mm, hence in order to cut-off to occur the spring has to be deflected by at least 4mm

Hence specifications of spring selected •

VI. CONCLUSION

Million by 2050, growth in Automobile output will need to continue this combined with an ever declining rularlebourforsce end need of greter efficiencies will inevitably lead to increasing levels of in-field automation.Is this what the automobile industries of the futur will look like

This system may not reduce 100% accidents which are happening due to over speed. At least we can reduce 30 to 40% accidents which are happening due to high speed to save the lives of the people.

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