DESIGN AND FABRICATION OF SAFETY PROTECTING SHIELD IN TWO WHEELER

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Abstract:

Our project is about the safety protection of the human life. By applying our project we can avoid the injuries and damages from the accident. So far we using the safety instruments in the bike like air bags and protecting shield.

The air bags and protecting shield are working on the basis of the sensor control. The protecting shield is actuated by the dc motor with the sensor control. And also it is controlled by the push button switch.

And the main motive of our project is safety of our self from the surrounding environment. So as we ensure our living hood for a long period of time by avoiding the heavy injuries and damages from the accident.

- **Key words: airbag, protection shield and sensor.**

Introduction:

The safety protecting shield in Two Wheeler is not an alteration Project of an existing one. It is an new project designed by ourselves own and also implemented by ourselves own for an reason was safety aspect .In now a days we are seeing many accidents and also seeing many death by the accident. Even though we are riding the vehicle because of it is unavoidable matter. The most of the accident was mainly affecting the two wheelers.

The Majority of the accident affects the human beings life and Collapse their family also. So for an every Human soul is very important for themselves and also for their family. As we consider all those things we are decide to design safety protecting shield in Two Wheeler.

The greater importance of the environment in the world leads to an opportunity for students in our position with the economy trying to get out of one of the worst depressions of the century there are numerous opportunities for us to help out.

This is our opportunity to contribute to the society by the prevention of human life.

PRINCIPLE:

The principle of the project is to make an environment safe so as we decided to betterment and to ensure the human life safe as much as possible by avoiding the light and medium cause accidents for while in our project we ensure the two wheeler driving is to be safe because of our Project is based on the safety of human life in road accident.

Electric Theory Ohm's Law

- V = I x R, I = V/R, R = V/I
- V = Volts I = Current R = Resistance

Electric Theory Resistance

- **The unit of resistance is the ohm.**
- A potential difference of one volt will force a current of one ampere through a resistance of one ohm.
- **V = I x R**

Examples:

- 1 Volt = 1 Ampere x 1 Ohm
- 36 Volts = 10 Amperes x 3.6 Ohms 14

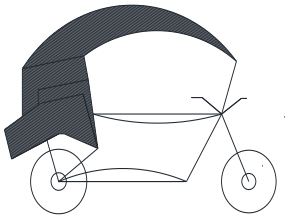
Electric Theory Power

- The unit of power is the watt
- Power equals the volts times the amps.
- **P = V x I**

Examples:

- 360 watts = 36 Volts x 10 Amps

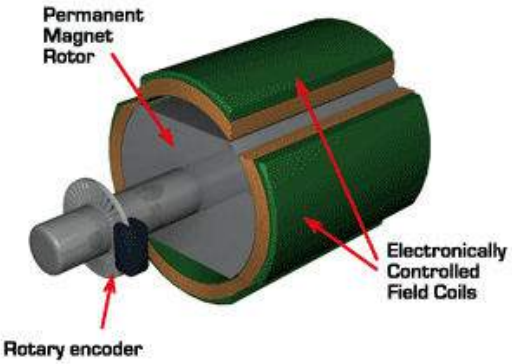
CAD DIAGRAM:



COMPONENTS OF PROJECT:

MOTOR

Brushless Direct Current (BLDC) motors are one of the motor types rapidly gaining popularity. BLDC motors are used in industries such as Appliances, Automotive, Aerospace, Consumer, Medical, Industrial Automation Equipment and Instrumentation.



Motor

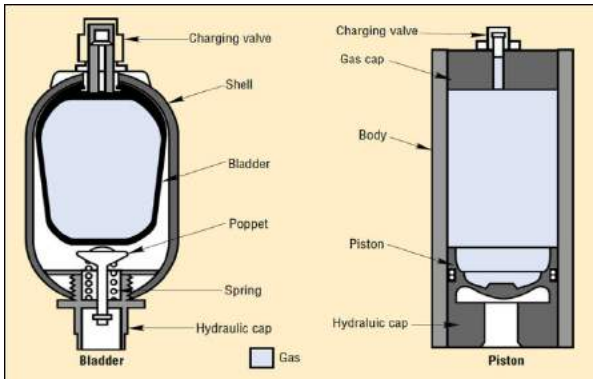
BLDC motors have many advantages over brushed DC motors and induction motors. A few of these are:

It Protect Our Whole body from the heavy injuries or light injuries and also save our life.

ACCUMULATOR

Accumulators can increase efficiency, provide smoother, more reliable operation, and store emergency power in case of electrical failure.

Accumulators usually are installed in hydraulic systems to store energy and to smooth out pulsations. Typically, a hydraulic system with an accumulator can use a smaller pump because the accumulator stores energy from the pump during periods of low demand.



Accumulator

SOLENOID VALVE:

A solenoid valve is an electromechanically operated valve. The valve is controlled by an electric current through a solenoid: In the case of a two-port valve the flow is switched on or off; in the case of a three-port valve, the outflow is switched between the two outlet ports. Solenoid valves are the most

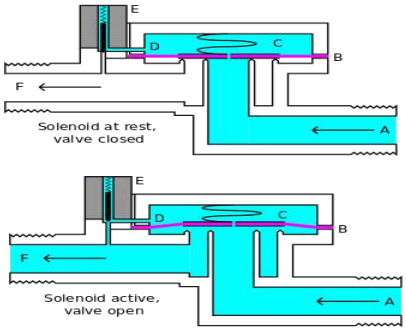
• High efficiency

• Long operating life

• Noiseless operation

• Higher speed ranges

frequently used control elements in fluidics. Their tasks are to shut off, release, dose, distribute or mix fluids.



Layout of Solenoid Valve

A- Input side

B- Diaphragm

C- Pressure chamber

D- Pressure relief passage

E- Electro Mechanical Solenoid

F- Output side

TYPES OF SOLENOID VALVE:

- ❖ 2/2 solenoid valve
- ❖ 3/2 solenoid valve
- ❖ 5/2 solenoid valve

3/2 solenoid valve

Solenoid Valve

SAFETY INSTRUMENTS

AIRBAG:

An **airbag** is a type of vehicle safety device and is an occupant restraint system It consists of the airbag cushion, a flexible fabric bag, Inflation Module and impact sensor. The purpose of the airbag is to provide the occupants a soft cushioning and restraint during a crash event to prevent any impact or impact-caused injuries between the flailing occupant and the interior of the vehicle.

AERODYNAMIC CALCULATION

AERODYNAMICS:

Every bicyclist has to overcome wind resistance. Most recreational bicycles in which the rider sits up have very poor aerodynamics. While newer bicycles are being designed with better aerodynamics in mind, the human body is simply not well designed to slice through the air

WIND RESISTANCE:

Every cyclist who has ever pedaled into a stiff headwind knows about wind resistance. It's exhausting! In order to move forward, the cyclist must push through the mass of air in front of her. This takes energy.

SENSORS

SENSOR:

In the broadest definition, a **sensor** is an electronic component, module, or subsystem whose purpose is to detect events or changes in its environment and send the information to other electronics, frequently a computer processor.

SAFETY GUARD:

In our safety bike the safety guard is the protection shield that is the plates covering the both all side of the driver.

Because of the shield the driver is protected from the accident, the whole shield is act as helmet for protecting our self .The shield not only protecting our head from the accident like in the safety gadget helmet.

Aerodynamic drag consists of two forces: air pressure drag and direct friction.

The formula for Cw-value

$F = 0.5 \times \rho \times v^2 \times Cw \times A$

For which:

- F = is the force on the motorbike + driver, in N (Newton) opposite to the riding direction.
- ρ = Rho is the air density in kg per m^3. (We took 1.23 kg/m3 as average)
- v = Velocity in m/s > 100 km/h = 27.78m/s.
- Cw=drag coefficient (0.4642)
- A = Frontal surface in m^2
- Surface area is 0.94243 m^2

$F=(0.5 * 1.23 * (27.78)^2 * 0.4642 * 0.94243)$

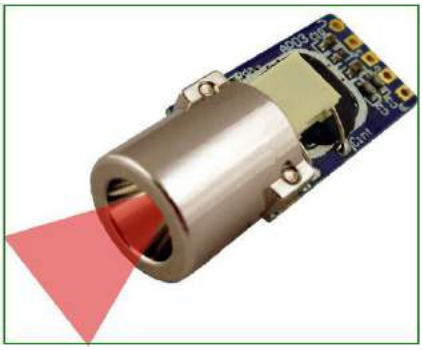
$F=207.58$

TYPES OF SENSORS:

- Proximity sensor
- Infra red sensor

Infra red sensor:

An infrared sensor is an electronic device that emits in order to sense some aspects of the surroundings. An IR sensor can measure the heat of an object.



Infra Red sensor

CONCLUSION

This project brought together several components and ideas to achieve a common goal: To prove that it is possible to build a bike with proper safety instruments. We put a lot of time into this bike to make sure that it was perform best it possibly could. Now that the project as a whole is finished, we hand it over to future generations to design and improve each component.

FUTURE SCOPE

Possibly future projects may include:

1) This bike is to become a Super bike for the future generation for both a style and also for a safety of driver.

2) Design of the programming system to program the motor controller.

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