DESIGN OF SEMI AUTOMATIC SIGNAL INDICATOR FOR A TWO WHEELER

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Abstract

This project deals with the semi-automatic mechanism of indication of signal lights of a two wheeler, in order to prevent the accidents which are prone only due to negligence in following few traffic rules, due to the laziness shown by the drivers in order to indicate the signal lights while shifting of lanes or turning on roads etc. This project makes sure that this mechanism will function with respect to the few basic principles related to mechanical ways of movement. It is made sure that it should be semi-automatic as automated system incurs high cost. This system functions with idea of the rider i.e., it's like a chain link logic, as the rider thinks to turn right or left he turns the handle of the wheeler with his hands as controlled by his brain, now this moving handle controls this system. This system has many applications in future with respect to different fields as per requirement and usage. The objective of this project is to design a semi-automatic signal indicator for a two wheeler and to make this service available at ease in adverse conditions. It aims to use simple mechanism and to make it available at least cost so that it can be installed in large number.

Index Terms: Mild Steel, Stress, Yeild Stress, Elongation

I.INTRODUCTION

Each year nearly 1.2 million people die and millions more are injured or disabled as a result of road traffic crashes**.** There is one other major factor that is, 78% of the people are lazy enough to turn on the signal lights while taking a turn, jumping or shifting the lanes there by resulting in accidents. Installing a Semi-automatic mechanism indicates the signal lights automatically as per the movement of the wheeler handle as result of movement of the rider hands there by making sure that people behind this vehicle understands that this vehicle is turning so that the rider can freely ride the way he wants in order to reach the place as early as possible. In order to install a spring two ends are made to support it. Then a reference is fixed to support in order to avoid the problem of unnecessary indication of signal light when both the sides of signals are considered. So it is decided to make the movement of each side of signal light indication separately. In this softwares are used to model and analyze the diagrams for a perfect view in fixing of semi-automatic mechanism in automobiles.

Material used.

In manufacturing of this component the material used is mild steel. It has high strength and moreover easy to be welded**.**

Mild steel is the most widely used steel which is not brittle and cheap in price. Mild steel is not readily tempered or hardened but possesses enough strength. The modulus of elasticity calculated for the industry grade mild steel is 210,000 Mpa. It has a average density of about 7860 kg/m3. Mild steel is a great conductor of electricity. So it can be used easily in the welding process. Mild steel is very much suitable as structural steel. Different automobile manufacturers also use mild steel for making the body and parts of the vehicle. Mild steel is very much prone to rust because it has high amount of carbon. When rust free products are needed people prefer stainless steel over mild steel.

TABLE1-CHEMICAL COMPOSITIONS OF MS

chemical composition	
Carbon	0.16-0.18%
Silicon	0.40% max
Manganese	0.70-0.90%
Sulphur	0.040% Max
Phosphorus	0.040% Max

TABLE 2- MECHANICAL PROPERTIES OF MS

Mechanical properties		
Max Stress	400-560 n/mm^2	dependent on ruling section
Yield Stress	300-440 n/mm^2 Min	dependent on ruling section
0.2% Proof Stress	280-420 n/mm^2 Min	dependent on ruling section
Elongation	10-14% Min	dependent on ruling section

II. DESIGN ANALYSIS

Softwares used

1. **Auto CAD (2D)**

AutoCAD is a computer aided design program used by every engineering industry all over the world.

Commands used

Workspace:

Workspaces are sets of menus, toolbars, palettes, and other control panels that are grouped and organized so that you can work in a custom, task-oriented drawing environment. The menus, toolbars, palettes and ribbon panels are known as user interface elements.

In this many commands like **line,** Snap and Grid Tab Polar Spacing, Object Snap Tracking Settings, Polar Angle Measurement, Object Snap Tab, Dynamic Input, **Circle [C]. Hatching Utilities:** In addition to using a pattern to define an area you can use gradient or solid fill.

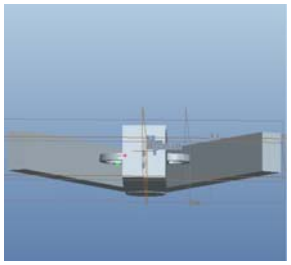
2. **PRO-E**

The Sketcher Interface

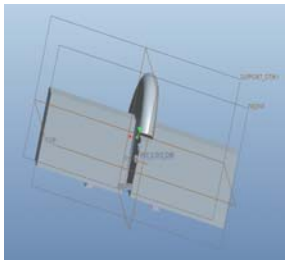
Creating Geometry:

Sketcher mode enables the creation of a variety of geometrical shapes and entities. The basic ones –Lines, arcs, and circles, Dimensioning, Mirror

- Choose Feature > Create > Solid > Protrusion.
- Specify a method of adding material by choosing an option from the SOLID OPTS menu. The options are Extrude, Revolve, Sweep, Blend, Use Quilt, Advanced.



Front view of model-1

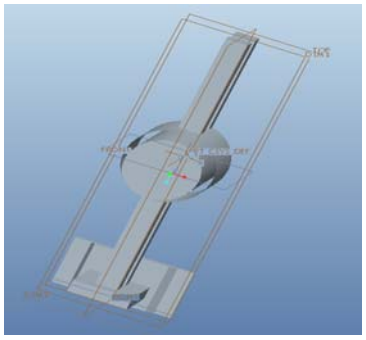


Front view of model-2

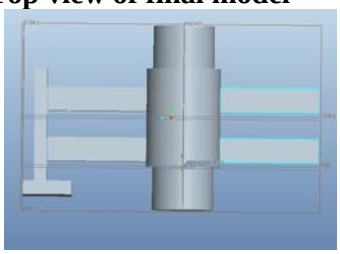
Model-1 – it indicates front view of the model

Model-2 - Redesign on the existing design came to a conclusion and made a simple design

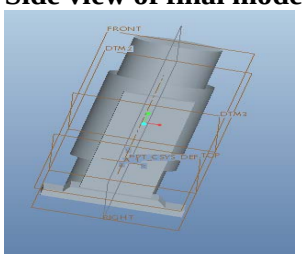
Model-3 With the observations of the outcomes of model 2. A free movement of the link is needed in order to retract the path



Top view of final model



Side view of final model



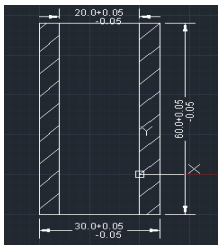
front view of final model

III. EXPERIMENTAL WORK

According to the design analysis the components are assembled together to form a final product. For the assembly pro-e software is used.

Hollow cylinder

This Hollow cylinder shown below forms the heart of the component, to which all other parts are assembled to it.



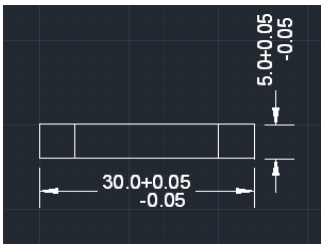


Fig-1 **Fig-2**

Rings

These rings are used for a special purpose, in which 4 of them are welded to wings (i.e. 2 rings to each wing) in order to impart rotary movement to the wings.

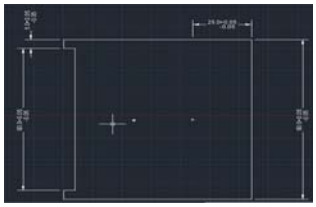


Fig-3 **Fig-4**

Solid cylinder

This solid cylinder passes into the hollow cylinder. This is used in order to restrict the movement of wings expect the rotary movement. This is fixed in its position only when the supporting rings of the wings are placed in along the axis of hollow cylinder.

Wings 1 and 2

Two rings are welded to this wing on the other side of the wing one at the top and the other at the bottom along its breadth, in order to give it rotary motion when assembled.

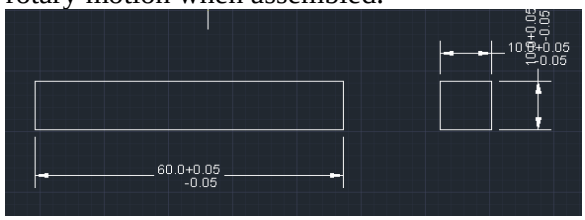
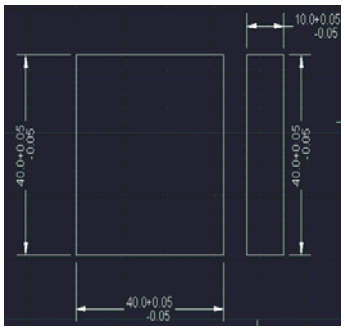


Fig-5

Square bar

It is used to connect the hollow cylinder and the rectangular support bar, which in turn is connected to base in order to provide rigid support to the component.



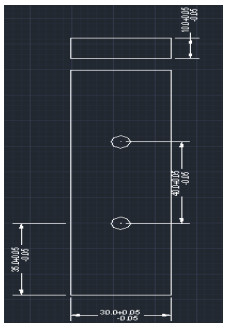


Fig-6 **Fig-7**

Square piece

It represents the design of a support, which functions as a base and as a reference to the whole component. This design is in such a way that it can be fixed to two wheelers with the help of screws etc.

supporter

This supporter is connected to the base. Then square bars are used to connect the hollow cylinder and this supporter, the main use of this supporter is to provide elevation and rigid support to the cylinder with the help of square bars.

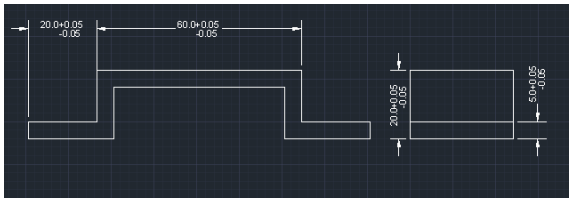


Fig-8

Base

The function of this part is to provide reference to the wings and is used to provide movement to wings with the help of a spring, this part is fixed permanently to the hollow cylinder.

VI. Results and Discussions

From the day of Designing and to the day of completion of the project each and every stage of the project is analyzed, in order to improve it.

During the analysis of Model 1 after its design is completed, it is observed that during the rotary movement of the wings, the wings may collide with each other. So, in order to overcome this drawback in the design Model 2 is designed.

During the Analysis of Model 2 it is observed the there is a lack of rigid support in the system, even though the rotary movement is achieved. Hence in order to solve this problem Final Model is created.

Final Model is a perfect design according to our project, as it possess all the requirements as per our required mechanism.

Hence, after the final design is completed, the line diagrams are drawn and sent for the manufacturing of the component and finally after the component is manufactured.

Fig-9 Component Prototype Made with MILD STEEL

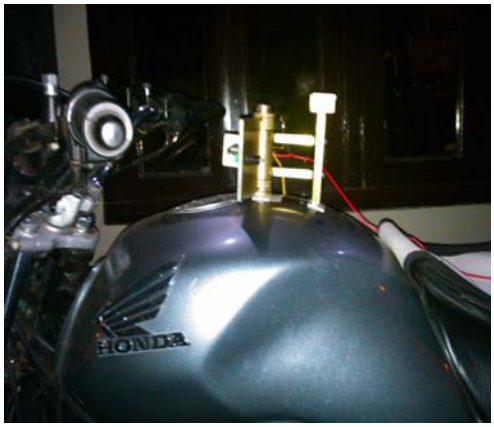


Fig-10 Position of Component on the petrol tank of a two- wheeler

1 APPLICATIONS

- By using this mechanism, we can prevent accidents.
- We can ensure safe driving while jumping of lanes, as there is no need to worry about switching On/Off of signal indicators.
- This can be extended to the use in medical field as emergency service to rescue any victim.
- This can be used even in Defense field with respect to certain application.
- With the help of Government permission, the siren can be installed in the vehicle and provide quicker road transport services.

2 ADVANTAGES

- It is even easy to maintain this system.
- It can easily be produced at low cost when being produced in huge quantities.
- It can be repaired as early as possible.
- This can be installed on different types of two wheelers. Provides job opportunities for many people.

VII. CONCLUSION

"**DESIGN OF SEMI-AUTOMATIC SIGNAL INDICATOR FOR A TWO-WHEELER**" has been successfully designed and experimentally manufactured and studied on two wheelers. It has been observed that its design is as per the objective of the project.When compared to the existing mechanism, it is quick in response.This model uses simple mechanism which can be repaired soon if any problem occurs during its use.The component can be manufactured at low cost when being manufactured with heavy plastic.Even it can be modified and placed as per the requirement.Every part of the design has been reasoned out with its dimension and placed carefully thus contributing to the best working of the system.

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