

# Cruise Control System to maintain acceleration of two wheeler constant

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**Abstract**— Adaptive cruise control (ACC) is an intelligent form of cruise control that slows down and speeds up automatically to keep pace with the car in front of you. The driver sets the maximum speed — just as with cruise control — then a radar sensor watches for traffic ahead, locks on to the car in a lane, and instructs the car to stay 2, 3, or 4 seconds behind the person car ahead of it (the driver sets the follow distance, within reason). ACC is now almost always paired with a pre-crash system that alerts you and often begins braking. Adaptive cruise control is also called active cruise control, autonomous cruise control, intelligent cruise control, or radar cruise control. This is the case because distance is measured by a small radar unit behind the front grille or under the bumper. Some units employ a laser, while Subaru uses an optical system based on stereoscopic cameras. Regardless of the technology, ACC works day and night, but its abilities are hampered by heavy rain, fog, or snow. Adaptive cruise control is typically paired with forward collision warning that functions even if you don't have ACC engaged. When ACC is engaged, the car will typically slow under ACC braking at up to half its maximum braking potential. Beyond that, driver and passenger discomfort with automated braking sets in. Red lights flash at the driver, the words —Brake! or —Brake Now! show on the instrument panel or head-up display, and a loud chime sounds. When ACC isn't engaged, it's still tracking traffic in front and intervenes with the warnings if it senses a potential accident.

**Keywords**— Adaptive Cruise Control, Autonomous Cruise Control, Sensors, Ride-By Wire Technology, Automatic Braking System.

## I. INTRODUCTION

The project work presented in this report is based on Adaptive Cruise Control preinstalled in high range automobiles. Since it is not possible to buy a high range motorcycle, this project focusses on providing this feature in all the mid and low range motorcycles. With the increase in the number and quality of the highways, the passion for going long distances on motorcycles is increasing within the riders. When on a highway, most of the times the speed is to kept constant, which means that the rider has to hold the throttle in the same position for a long period of time which causes strain and fatigue to the rider. To avoid this fatigue, we need a mechanism that can lock and unlock the throttle position at the will of the rider. Cruise control is a feature which does the same electronically on motorcycles equipped with a Ride-By Wire throttle arrangement instead of a conventional throttle cable.

## II. PROBLEM DEFINITION

### 2.1 Fatigue caused by continuous riding.

For long distance touring, most of the time the riders have to keep the speed constant by holding the throttle in the same position. This causes stress, fatigue and boredom to the rider.

### 2.2 Fuel consumption due to constantly varying acceleration.

If the engine speed constantly varies, the carburetor response causes a lot of unburnt fuel pass through the exhaust. This leads to higher fuel consumption for the vehicle.

### 2.3 Lack of object detection.

Due to the fatigue and stress, the rider gets distracted and his reflex actions for panic situation slows down in case of sudden object detection.

### 2.4 Continuous maintenance of acceleration system.

Due to sudden fluctuations in the throttle the chances of breakage of throttle cable increase. Also the carburetor settings might get changed due to the fluctuating loads.

## III. OBJECTIVES

### 3.1 Highly reliable system.

The system should not break down while in operation. Even if it breaks down, it should not harm the rider by keeping the throttle in locked position.

### 3.2 Real time obstacle detection and feedback system.

The system should always be active in order to detect the sudden obstacles popping up in the path of the rider.

### 3.3 Less load on engine.

Reduction in fluctuation of speeds should ultimately result in lesser load on the engine and enhance the life of the engine.

### 3.4 Healthy acceleration system.

Reduction in constant fluctuation in load should ultimately result in lower tension on the throttle cable and should avoid frequent replacements of throttle cable due to less breakages.

### 3.5 More comfortable to the rider.

The system should comfortize the rider by reducing the fatigue, stress and boredom for the rider.

## IV. METHODOLOGY

### Design 1.

- i. Design related to the Stapler.
- ii. Simple and compact design.
- iii. Single degree of freedom.
- iv. Centre of gravity lies far from the load line.



Figure 1: Stapler based design

### Design 2.

- i. Design related to rack and pinion.
- ii. Simple and contact design.
- iii. Multiple degree of freedom.
- iv. Centre of gravity lies near to load line.



Figure 2: Rack and Pinion based Design

## V. STEP METHODOLOGY

The product is modelled in SolidWorks Software. This product is the modification to Design 1. This is called as Double Eye Stapler Mechanism.



## VI. CONCLUSION

The literature presented in this study describes the importance of Adaptive Cruise Control System. Since this system is not available for mid-range motorcycles and two-wheelers, the project invests a lot into the mankind. The automation used in this project successfully aims the safety and comfort of the rider while long touring. The combined working of mechanical component and electronic automation accomplishes the objectives and satisfies the problem statement.

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