

# To Combine Clutch and Accelerator Pedal in Single Pedal in Manual Transmission System

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**Abstract**— In the present day, transportation is the foremost need for the development of civilization. Passenger vehicles play a vital role in moving people quickly and conveniently for short distances. Day by day traffic is increasing on the roads which make driving manual cars a tiring task. So we need an effortless system to make driving easier. Proposed design will combine the function of the clutch pedal and the accelerator pedal by a single pedal for both functions and eliminating the clutch pedal. This simplifies things for driver as he has to swap leg from clutch cum accelerator pedal to brake pedal only. This design may simplify the driving experience.

**Keywords:** Combined Clutch and Accelerator Pedal; Semi-Automatic Transmission System; Two Pedal System in Car

## I. INTRODUCTION

Presently, the power transmission systems that are majorly used in four wheeled vehicles are manual transmission and automatic transmission system. The former one consists of three pedals viz. accelerator, brake and clutch whereas the later one has only two pedals viz. accelerator and brake. There is a lot of swapping between the pedals in the case of manual transmission system which makes driving an arduous task for learners and old age people. Also, partial engagement of clutches enervates the frictional properties of clutch plate due to the slip produced and reduces its life. This also lead to serious accidents. Hence, it becomes necessary to find a substitute for the three pedals system. Therefore, in last decade the automatic transmission system came into existence for common people. This new transmission system served as proper substitute for three pedals system as it become easier to drive with two pedals. In this type of transmission system, the clutch pedal has been removed and gear box has been swapped with a planetary gear system. The major drawback of using an automatic transmission system is that it provides low power and consumes more fuel as compared to that of a traditional manual transmission system. One of the major reasons for having lower efficiency in case of automatic transmission system is the use of 'Torque convertor' which is used to control torque variations. In this work, we are proposing new design of the clutch which will allow us to combine accelerator and clutch pedals into a single pedal. This design is required to assuage the problem of controlling clutch and accelerator pedals at the same time during changing gears and driving at slopes and hilly areas. There will be two pedals in the vehicle. One will control the braking system of the car and the other that is provided with the new design will control the clutch as well the accelerator of the engine.

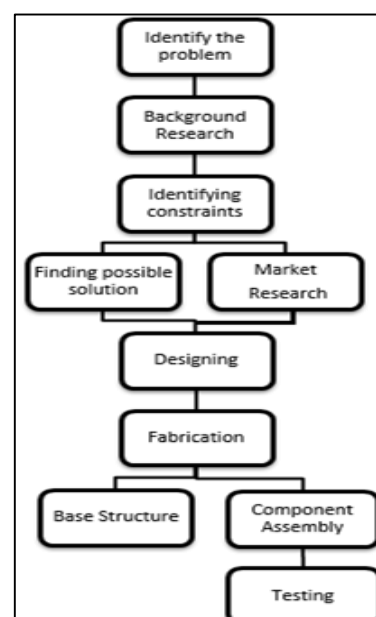
In the current system if the gears are engaged, it is require to press the clutch pedal to start the engine but in proposed design even if the gears are engaged, engine can be started without pressing any pedal. Manufacturing of clutch

plate is slightly costly in current system as flexed fingers are present for engagement of clutch while in proposed system completely solid clutch plate is used, therefore it is slightly cheaper to manufacture.

## II. LITERATURE REVIEW

This project combines the function of the clutch pedal and the accelerator pedal by a single pedal (new pedal) for 2 functions, and deleting the car clutch pedal. Actually at standstill, the clutch disc in the car is permanently connected and we must at first need to press the clutch pedal to engage first gear. With this innovation disc clutch is disconnected permanently by a spring or other mechanical or hydraulic means, unlike the actual situation. The movement of the clutch pedal and the movement of the accelerator pedal are always in the opposite direction and the two movements are never in the same direction. According to this innovation, the beginning of the pressure on the new pedal will cause the beginning of the connection of the clutch disc and the total connection will be entirely at the end of the first third of the way of the pedal (clutch and acceleration) and the clutch disk remains in 100% connection during the last 2/3 distance of the new pedal. At the beginning of the movement of lifting the foot of the new pedal, the clutch will remain in connection to 100% for the 2/3 of path, and the separation of the clutch disc will start at the beginning of the last one third path of the new pedal and disconnection will be 100% at the end of the last one third path. To change the speed of the car or brake the car, we remove the foot from the new pedal: this action will disconnect the clutch, so we can change the speed or stop the car safely.

## III. METHODOLOGY



#### IV. RESULT ANALYSIS

We used an electric motor initially in place of an engine to check engagement of clutch plates and we were successfully able to transmit the power from one shaft to another which justified our designs.

As we can observe that springs used in our model having low stiffness can perform their function conveniently so looking at a broader prospective we can say that if we use springs of high stiffness or hydraulic mechanism then it can easily perform its function in passenger vehicle.

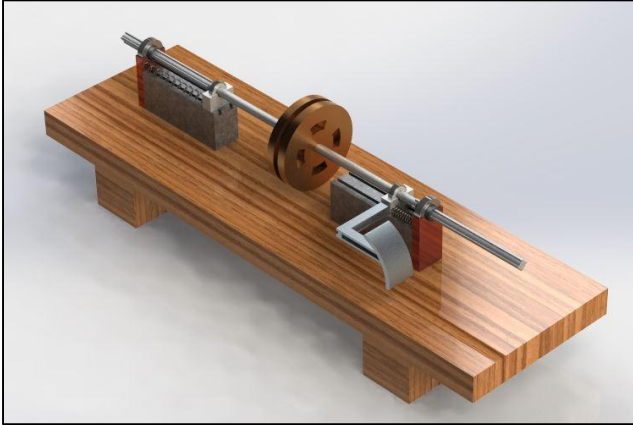


Fig. 1: Pedal at Initial Stage

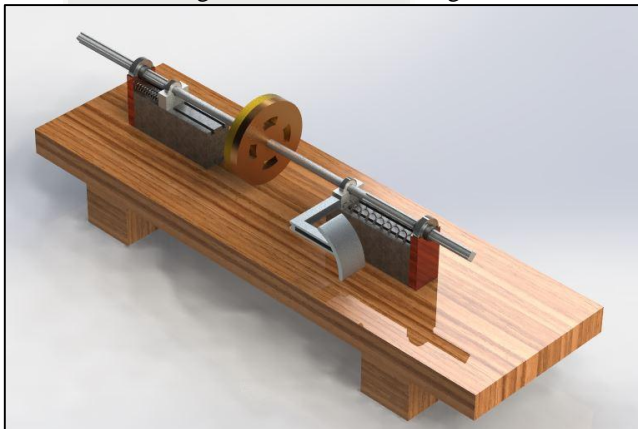


Fig. 2: Pedal at Final Stage

#### V. CONCLUSION

The proposed design may be able to combine the clutch and accelerator pedal into one for a manual transmission system gear box, therefore reducing the complexity of driving with 3 pedals. The left pedal will control the braking system of the vehicle and the right pedal will be the proposed clutch cum accelerator pedal. This system will help drivers especially learners and old age people in driving without using automatic transmission system. This design may help to shift gear without pressing separate clutch pedal. If the car is in gear, the driver may be able to start the engine without pressing clutch pedal. From starting the car to actually moving the car (including change of gear), one simply does not need to press any pedal. During sudden braking, in current design of manual transmission system, driver must press clutch and brake to stop the vehicle without shutting the engine down and causing harm to it. Whereas, the proposed design simplify things for driver as he has to move leg from clutch cum accelerator pedal to brake pedal. When the driver

starts taking off his leg from clutch cum accelerator pedal the clutch starts to disengage after minimum acceleration point. The proposed design may simplify the driving experience and may also increase the clutch life.

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