



## TRAIN TOILET SYSTEM

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### ABSTRACT

*This paper includes how to keep solid waste away from the stations of railway tracks, for this we will use galvanized plates which will be coupled to the viper machine for the movement. The viper machine will get supply from rooftop turbine ventilator which will generate electricity due to the motion of the train, and the electricity will get stored in a battery. This energy can be used for various other purposes.*

**Keywords:** Galvanized Plates, Viper Machine, Rooftop Turbine Ventilator, Kinematic Linkages.

### I INTRODUCTION

We know that railway tracks are usually polluted by solid human waste; this causes very serious diseases to animals and humans if not cleaned regularly. For cleaning of railway tracks near stations we need ample of water, and nowadays there is a lot of water scarcity and on top of that workers who clean it, may also get infected by it.

In this modern world we should learn to maintain hygiene around ourselves.

Many ideas have come to control the amount of waste polluting the railway tracks, such as, lately bio toilets have been launched in many of the railway compartments in which waste would directly move in the anaerobic bacteria filled box rather falling down on the tracks. But its major disadvantage is that it have to be cleaned on regular interval of time, if not the waste starts floating and comes up in the toilets.

In this paper we came up with a new idea of keeping railway stations free from solid waste. We will have two galvanized plates coupled to a viper machine which will run on electricity generated by rooftop turbine ventilator. This ventilator will serve as both ventilator as well as a turbine which will generate electricity as it rotates. This energy will be stored in a battery and may be used for the viper machine. As soon as a station comes, the driver will switch on the machine button and the viper machine will shut close the opening of the toilet ducts with the help of galvanized plates. All the waste will fall on the plate, thus preventing station from polluting. As the train proceeds, away from the station the driver will press the machine button and the viper machine will come back to its original position, and all waste coming down.

This prevents the stations from being polluted by human waste,

## II ABOUT THE PROJECT

Our project mainly comprises of 3 elements, that is,

1. Rooftop turbine ventilator
2. Viper machine
3. Galvanized plates and kinematic linkages.

This above can be explained as follows:-

### 2.1 Rooftop Turbine Ventilator

Wind turbo ventilator is a wind driven ventilator that is installed on the roof of building to provide effective ventilation. It is use in all types of factories, workshops, warehouse .The air ventilation works on the simple principle of wind Assisted rotation and stack effect .The main function of the free spinning is to provide free air in living area. Air are free whole of a day on all year .The additional function of this product is to produce the electrical energy from the roof ventilator that will spin the wind is exist. This roof ventilator will be placed on the top of the train boogie, and it will rotate as the train propels. This motion of ventilator will provide ventilation in the boogie as well as it will generate electricity.

This ventilator is light in weight and can easily be mounted on the top of the train. This ventilator wil be connected to a dynamo which will roatate along the ventilator , thereby generating electricicity which will be stored in a battery . This stored energy will be used to operate the viper machine.

Roof ventilator consist of fixed part and moving part .The stationary part is composed of base and fixed shaft and rotational part is composed of fan blades and bush put on the fixed shaft on

Stationary part .The construction of roof ventilator shown in following figure:



## 2.2 Wiper Machine

There are three major components to a wiper motor:

- Motor
- Rotary to linear motion converter
- Parking button

The mechanism is used to convert rotary motion to reciprocating motion is very straight forward, and its functionality is apparent from a visual inspection of a disassembled motor view. In This topic,we will share only about the operation of the motor and the park button. Although written specifically for a TR6, it is typical for many model Great Britain cars. A detailed description is provided as follows for earlier models --TR2, 3, 4, etc.

### 2.2.1 Operation

In this mode of operation, the dash switch is in the normal, or slow speed, position, and inward, port 2 of the switch is connected to port 3. Current flows through the motor as shown by the dotted red line. The Operation of the parking button has no change in this mode, as port 4 of the dash switch is not connected to any other terminal.

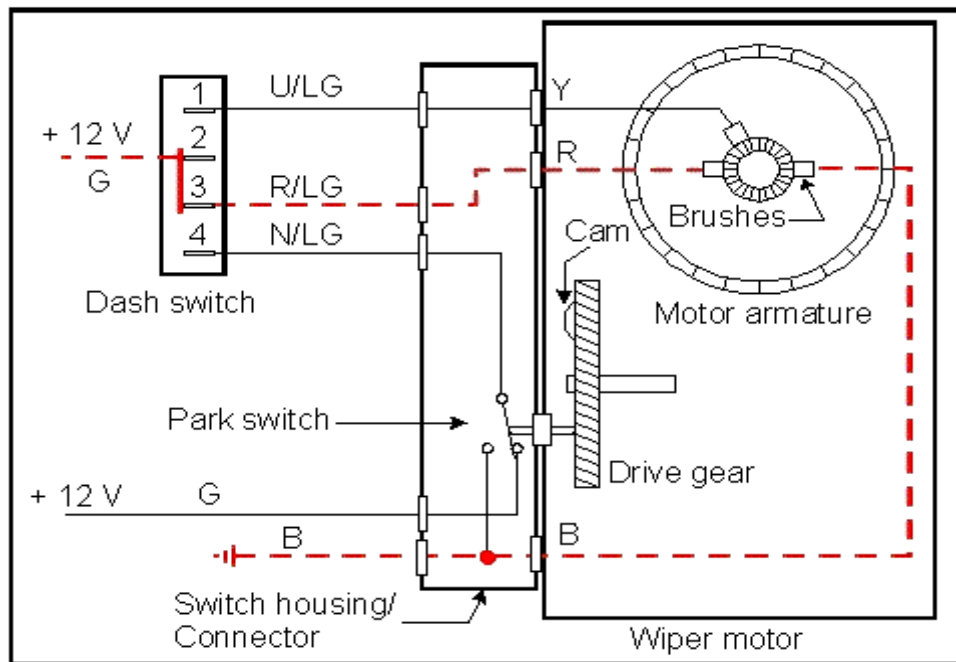
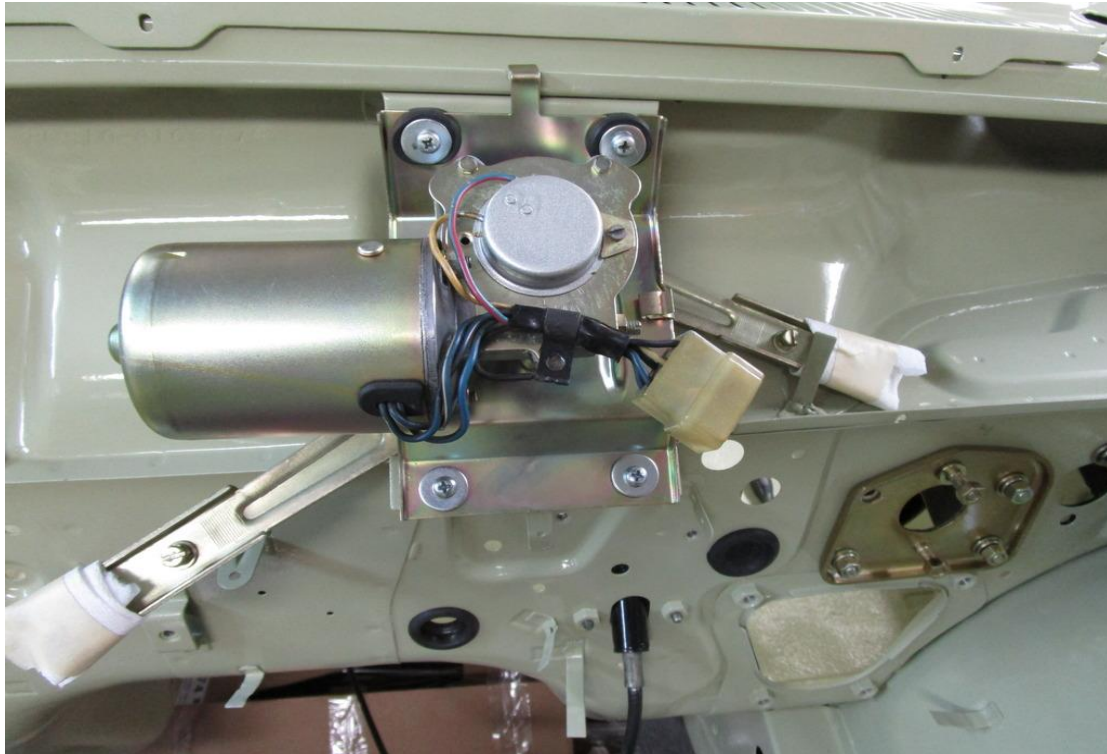


FIGURE 1 - SWITCH IN **NORMAL** (low speed) POSITION

### 2.2.2. Application

This wiper machine will be located at bottom part of the boogie. Rod of the wiper machine will be connected to the kinematic linkages, this linkage would be welded to a galvanized plate, as we turn on the wiper machine , the rod will move as well as the kinematic linkages , thus shutting the opening of the sewage ducts.



### 2.3 Galvanized Plates

**Galvanization** is the process of applying a protective zinc coating to steel or iron, to prevent corroding. One of the most famous method is hot-dip galvanizing, in which parts are submerged in a bath of molten zinc.

These galvanized plates will be welded to the kinematic linkages. These plates will be placed near to the ducts of sewage system, and all types of human waste will fall on this plate. The main motive to use galvanized plates because the plates would be in direct contact with water and human waste, so as to increase its life, galvanizing process is done.



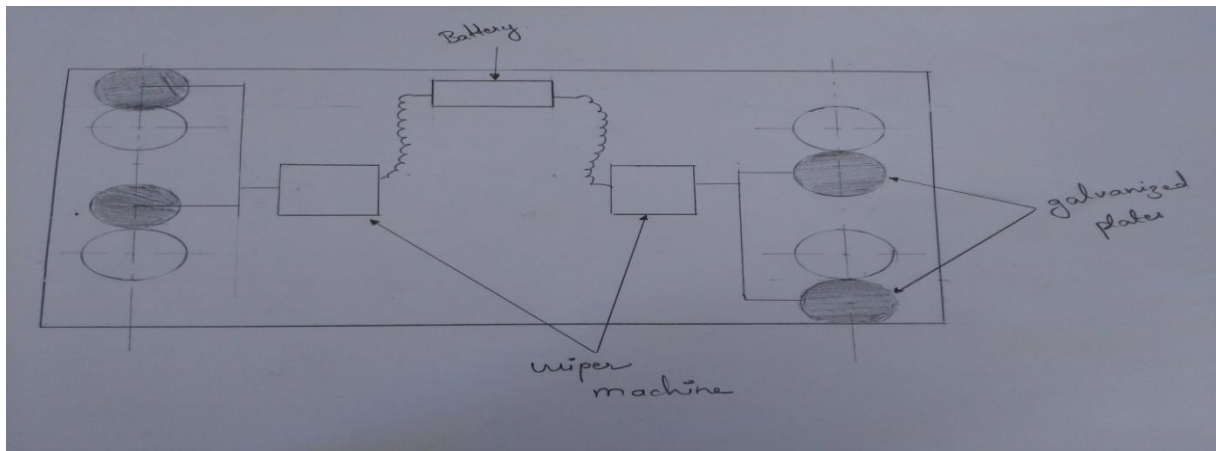
### III WORKING OF THE PROJECT

As the components of the project is described briefly above. So each of the elements are now linked together to prevent the railway station from getting polluted by human waste. Now, we will learn how it actually works? First of all, the RTV (rooftop turbine ventilator) will be situated at the top of the train compartment, so as the train propels

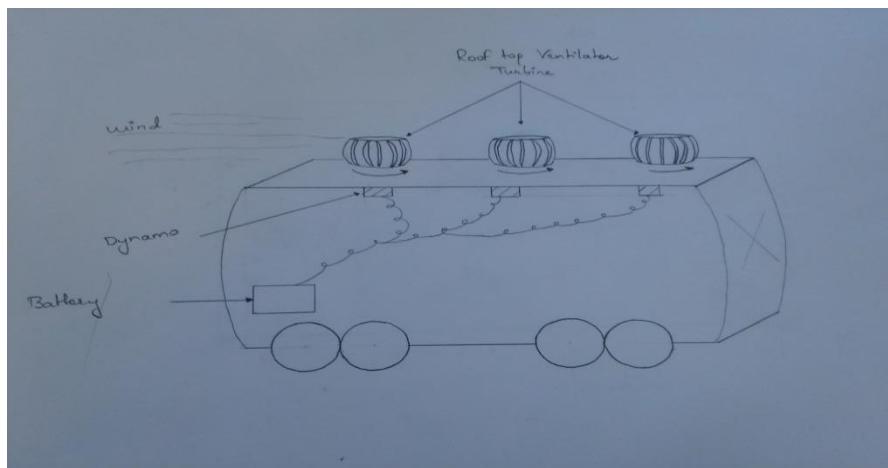
the ventilator will rotate thus creating energy with the help of a dynamometer. This energy will be stored in a battery, which will be situated near the compartment. Sooner or later, there would be enough electricity to run the wiper machine. Wiper machine will be connected to the battery with the help of wires, thus no external energy will be needed to run the wiper machine.

As the train approaches nearer to a station, the driver of the train will be aware of it and he will switch on the wiper machine, by this action the machine will deflect. The rod of wiper machine is connected to kinematic linkages which will be coupled to the galvanized plates. So as the wiper machine is switched on, the wiper rod will move in one direction, thus moving the kinematic linkages and the galvanized plates will move in left direction. By this action, the opening of sewage duct will be closed and all the human waste will fall on it, thus the tracks will not get polluted.

After some time as the train proceeds, the driver will switch off the wiper machine, and the kinematic linkages will move towards right, thus plates also moves towards right and all the waste will fall down



BOTTOM VIEW OF THE TRAIN COMPARTMENT



FRONT VIEW OF THE COMPARTMENT



#### **IV EFFECTS OF POOR TRAIN SEWAGE SYSTEM:**

As we all know that passengers don't follow instructions given to them i.e. "don't use washroom when the train is at a railway station". But still they use and railway tracks near stations gets polluted and therefore providing inconvenience to the humans as well as the animals. This is a very serious issue and can cause many health problems. This could bring an adverse effect on the people who visit our country.

Due to the bad smell of the human excreta, many flies roam around it and cause health issues.



#### **V CONCLUSION**

As the present condition, now we are noticing of poor sewage system of railways, this project is to minimize adverse effect. This paper have many advantages such as, the water needed to clean the railway tracks is minimized.

And also the salary given to the workmen who cleans the railway tracks is also decreased. By this there would be no health issues related to it. Our paper may contain some faults, but as a citizen of india, we want to take some initiative to keep our india "SWAACH" that motive which was taken by our prime minister.



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