

Telescopic Train - Collision Proof

D.Giftson Felix

Department of Mechanical Engineering. Panimalar Engineering College, Chennai-123

giftsonfelix191@gmail.com

Abstract:

Among all the modes of the transport present railways prove to be the best and cheapest one even faster. Billions of people travel by trains per day. Sometimes trains are wanted to carry uncontrolled crowd due to this busiest nature maintenance becomes lagged in most underdeveloped and developing countries. Already train and its bogie itself weighs heavy apart from this it should carry this uncontrolled crowd. Due to lack of maintenance many accidents occur which are all mainly due to improper communication among the network, wrong signaling, worst weather condition, immediate route change, brake failures....etc. due to this head-on collision, rear-end collision, derailment...etc problems occur and to prevent these accidents many new technologies are implemented in the trains but most of them are controlled only by ECU. Using ECU is a best method but there are many probabilities of failure of this because it uses only electricity. Hence to avoid such accidents this paper uses a mechanical means which will not be spoiled for its life time. In this paper usage of telescopic cylinders placed in the special dummy compartments is entertained to prevent the deaths occurred due to head-on and rear-end collisions.

Keywords:

Telescopic cylinders; dummy compartment; special single movable bogie

1. Introduction:

In today's world there are many inventions and improvements apart from these there are many process involved preventing accidents. In such process there are many ideas and projects which prevent the accidents. In such a way here is an idea which prevents two accident namely head-on collisions and rear-end collision. So that major damage like the below can be avoided.



In this a special dummy compartment which contains a pair of telescopic cylinders is attached to the back of the engines it is mentioned as special because it is somewhat larger in shape and longer in length than the normal compartments.

When head-on or rear-end collision occurs the compartments beside the engine just tries to collide with the engine but here the compartment which is behind the dummy compartment moves into the dummy compartment and its speed is reduced by the cushioning effect of telescopic cylinders and so all the other compartments behind this is saved or prevented from the major accident.

2. Previous Advancements:

[1] Creating mutual communication using embedded systems

In this research paper, every train send its track id to near trains, if the one train goes in a first track, the signal is given to the other train, if any other train come in same track and it also send first track to other, then two trains receives same track id then alert two train drivers and stop train at a distance to avoid train collisions, which could immediately stop the train.

[2] Using WiMAX

The WiMAX base station and the train (mobile stations) contribute in sending the information to

the trains whenever a train comes in its vicinity and range. The trains will be equipped with WiMAX enabled laptops/Tablets for communicating with others. The speed location and distance of other trains will be known in advance to make safe from being part of some mishap.

[3] Using path breaking technology

By placing some electronic gadgets in the trains it applies brakes without the intervention of the loco (train) pilots once it detects another locomotive on the move or stationary on the same track and avoids collision.

There are also many more advancements in the trains to avoid head-on and rear-end collision.

3. Disadvantages in the previous advancements:

The one and only main disadvantage is they all run only by the means of electricity if any short circuit or fire occurs they all gets damaged and avoid to prevent the accident.

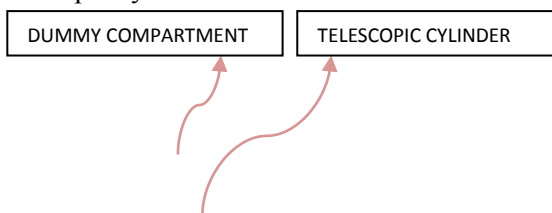
They all involve complex wiring system.

4. Principle behind our idea:

The principle behind our idea is just preventing the collision by trapping the first compartment into the dummy compartment which has a pair of telescopic cylinders to reduce the collision speed and so the damage to other compartments is comparatively reduced. The first compartment has a movable bogie so, when the first compartment enters into the dummy compartment the bogie remains undisturbed and only the body of compartment moves into the dummy compartment.

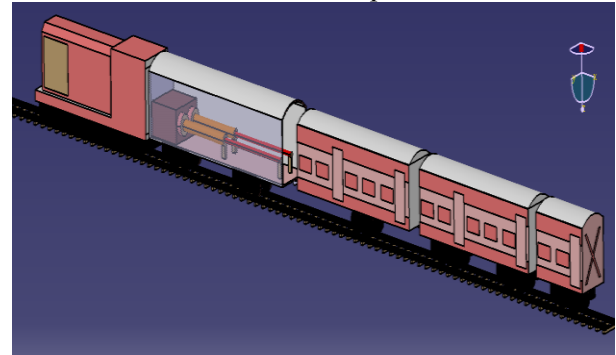
5. Construction:

A specially designed dummy compartment which is quite longer than the normal compartment is attached to the engine. This dummy compartment is fitted with a pair of telescopic cylinders.



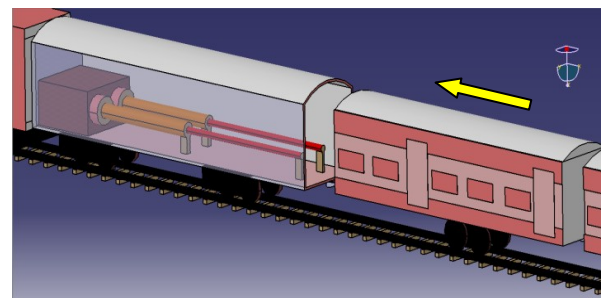
The telescopic cylinders are attached to the dummy compartment with its piston rods extruded outside and for balancing these rods are supported by wooden blocks.

Next the first compartment is added next to the dummy compartment but this compartment has a specially designed movable bogie during collision the first compartment move into the dummy compartment so during this it should detach itself from the first compartment.

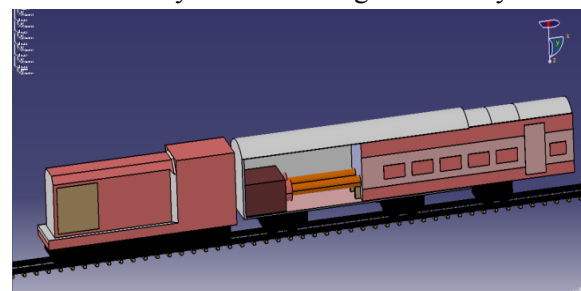


6. Working:

During head-on and rear-end collision the engine first gets hit and due to the arrest of motion the compartments at the back dashes each other at this stage the first compartment moves into the dummy compartment due to its travelling speed.



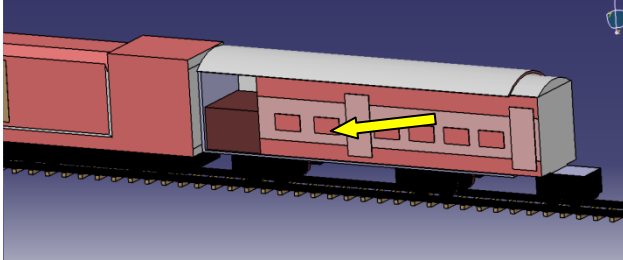
Once it enters into the dummy compartment it hits the piston rods of telescopic cylinders due to the force the rods starts to contract and by the cushioning effect of cylinders



the speed is somewhat reduced. So that the first compartment moves safely into the dummy compartment. As the first compartment moves

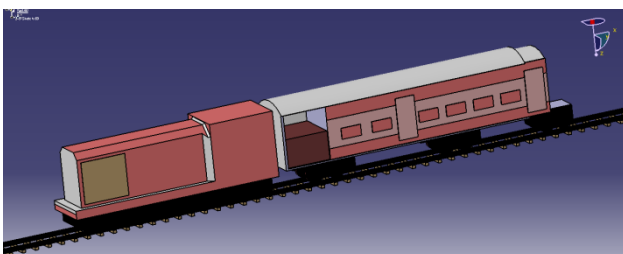
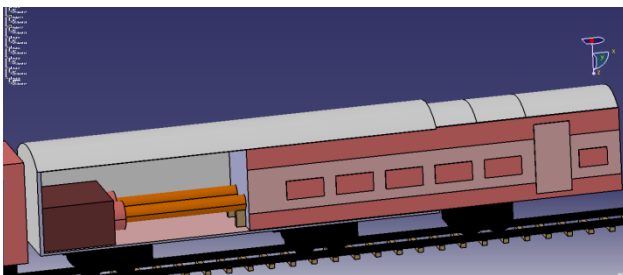
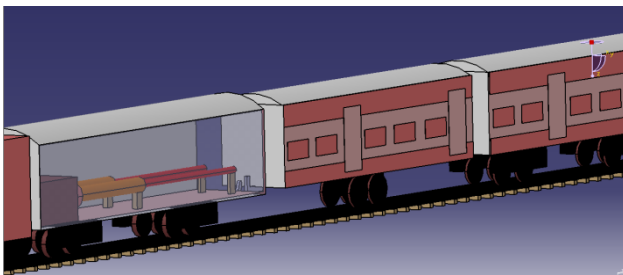
into it, the wooden blocks placed to support the piston rods breaks and permit them to contract.

During this action the specially designed movable bogie of the first compartment dashes the dummy compartment and its motion is arrested and thus it slides and permits the first compartment into the dummy compartment.



Thus due to this the speed is slightly reduced and some more time is given for other compartments to move and stop. So that the major accident can be avoided.

7. Other Images:



8. Advantages:

- ✓ Major injuries to the passengers can be avoided.
- ✓ Larger damage to the compartments is avoided.

- ✓ Simpler process.
- ✓ No need of special maintenance.
- ✓ Somewhat cheaper process.

9. Disadvantages:

- ✓ Damage to engine and driver cannot be avoided.
- ✓ Works only at some designed speed range above that range accident prevention is impossible.

10. Conclusion:

From this paper we heard a new technique of reducing the damage and injuries which occurs in the trains during head-on and rear-end collision. Lots of improvement has been made in trains by the railways department to reduce the accidents in accordance with those ideas this idea will also add some benefits to the rail safety. So implementing this idea in the field of railways will be helpful to avoid such accidents in the future.

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