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Passenger Safe Car

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Abstract- In today's world there are more and more cars in the road. For the past few years the amount of automobiles in the road has been increased at the same time number of accidents is also increased. We cannot blame anyone for buying a car it's their wish. Now-a-days many automobile companies are manufacturing cars with high safety for passengers by placing front and side air bag but all these prevent him from a major accident. During accident the injuries to the passenger especially to the driver are caused only by the place where he sits (i.e.) due to the steering column. Hence apart from air bags this idea moves the passenger's seat little backwards so that they move away from the accident zone hence injuries can be reduced. This is done by the use of two master cylinders and two slave cylinders.

Keywords: *master cylinder, slave cylinder, base plate.*

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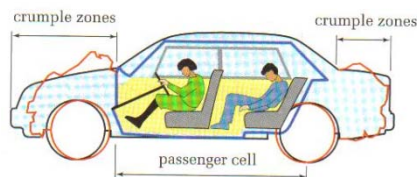
I. INTRODUCTION

Today the number of cars has been increased due to the congestion many accidents occur here and there and many lose their life in this. To overcome this many automobiles are now assisted with air bags, anti lock system, etc. yes, this prevents but it does not moves the passenger from things which hit them especially steering column, Dash board, etc. Hence in this idea the passenger seat itself moves so that injuries are reduced. This in turn saves many lives.

a) Disadvantages of previous improvements

i. Crumple Zones

- Passengers are still at risk due to the small distance of the car moving even after the crumple zone acts.
- Crumple zones can cause glass to shatter which can cause more injury to the passenger.



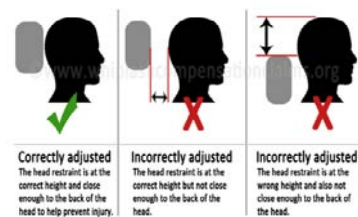
ii. Air Bags

- The impact of an airbag can hurt a passenger who is improperly positioned.
- Injuries from airbags include chest injuries, concussions and whiplash.



iii. Head Rests

- It should be in position to prevent whiplash the head rest should be at least as high as the head's centre of gravity (eye level and higher) and as close to the back of the head as possible.
- But we adjust it often for our comfort and now-a-days TV is fitted in it so the position is completely altered.



II. COMPONENTS PRESENT



MASTER
CYLINDER



SLAVE
CYLINDER



FLEXIBLE
HOSE

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III. PRINCIPLE BEHIND OUR IDEA

The working principle of the idea presented in this paper is when a speeding car hits an object or another vehicle the very first part which hits is the bumper hence behind this there will be a master cylinder which has a piston rod in the extended form so that as soon as the car hits the object the bumper presses the piston rod so inside so that the fluid inside it gets compressed and moves to actuate the slave cylinder, this slave cylinder has a piston rod attached to the passenger seats assembly so that it moves backwards thus the injuries during the accident can be minimized.

IV. CONSTRUCTION

The construction of this idea is very simple the passenger seats are welded or joined to a movable plate which moves on a sliding bearing. The master cylinder is placed at the front end at the backside of the bumper so that during collision the bumper touches the master cylinders piston rod. Then the plate in which the passenger seats are welded (or) joined is attached to the piston rod of the slave cylinder. Then the both cylinders are joined by means of flexible hosing or by a solid one with a check valve in it so that it allows the fluid in only one direction. To the same hosing after the check valve a variable orifice is attached so that the fluid returns at slow speed.

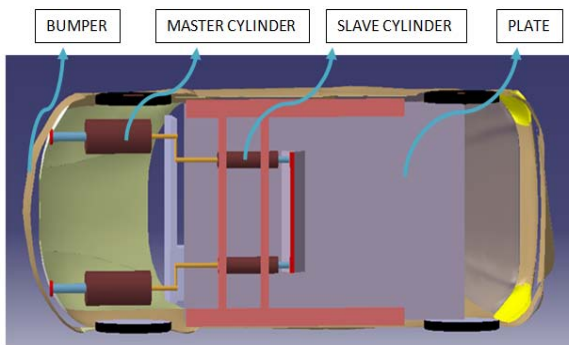
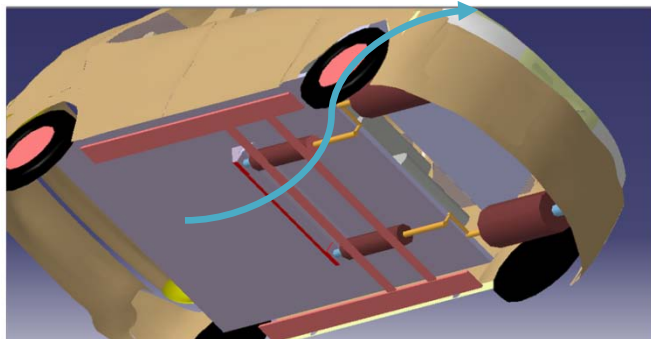
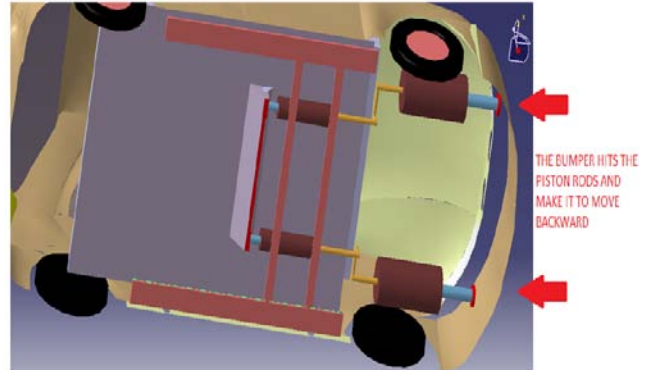


Plate in which seats are welded

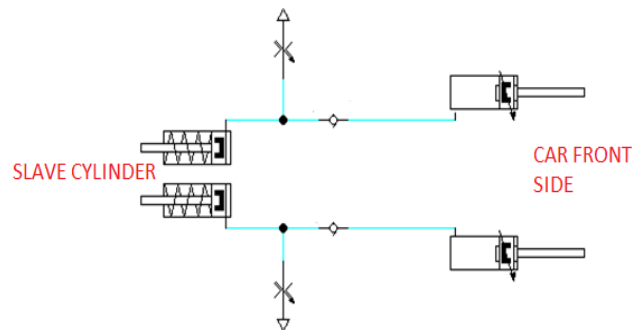


V. WORKING

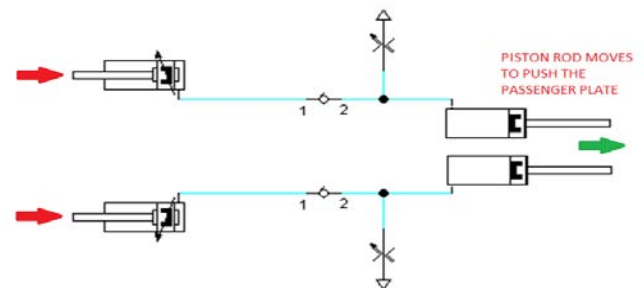
- ✓ When the car hits an object or another car bumper is the first part which faces the collision.
- ✓ As soon as it hits the bumper deforms inside so that it pushes the piston rod of the master cylinder.



- ✓ Below diagram shows the circuit of the above diagram.

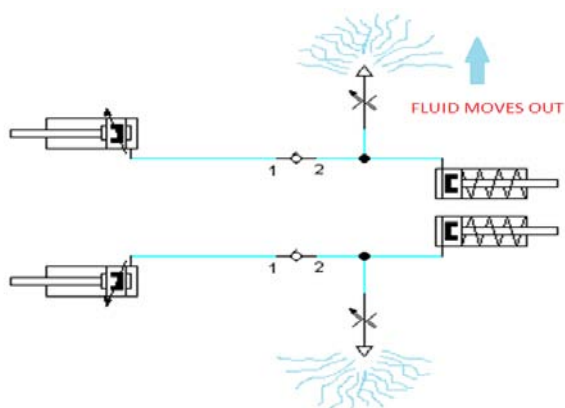


- ✓ When the piston rod of the master cylinder moves it compresses the fluid which is present inside the cylinder so that it sends the fluid to the slave cylinder.
- ✓ Due to the pressure of the fluid it pushes the slave cylinders piston rod.

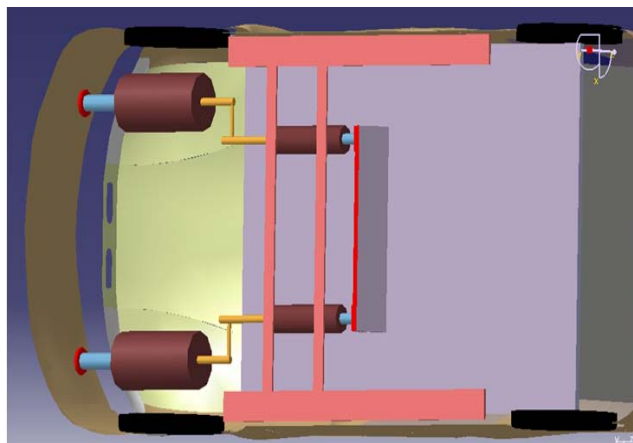
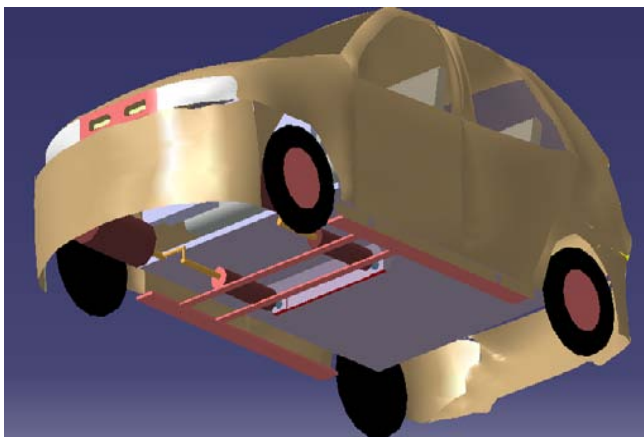
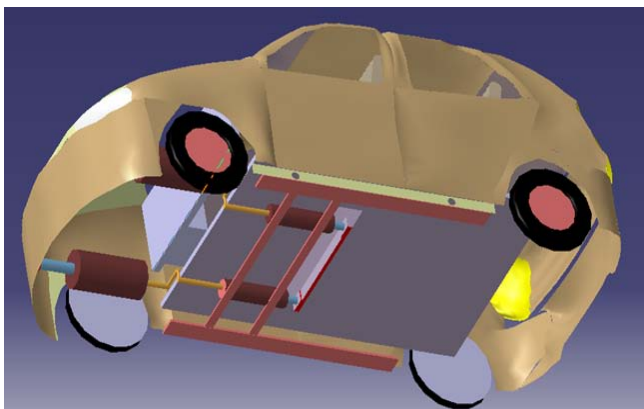


- ✓ Thus the plate in which the passenger seat is welded or joined moves backward and so the passenger especially the driver moves away and avoids major injuries like finger, hands fractures, etc.

- ✓ During minor collisions also this process takes place but this has to be recovered (i.e.) the plate should again come to its original position so that the driver can drive away during minor accidents. For this process to occur a check valve is provided the single acting cylinder is spring return one so its moves to its original position automatically.
- ✓ But the return stroke must be at very low speed hence the fluid is bypassed through a variable orifice valve it allows a very small amount of fluid to move out so the return stroke is achieved at very slow speed.



VI. OTHER IMAGES



a) Advantages of this idea

- ✓ Prevents the injury to the passenger by 80%
- ✓ Simpler process
- ✓ Easy construction and assembly
- ✓ Process is quite cheap

b) Disadvantages of this idea

- ✓ The fluid pressure must be checked frequently
- ✓ May result in vibration

VII. CONCLUSION

On the way of many improvements to increase the safety of passengers now we have found a new way to reduce the injuries caused during accidents. By implementing this idea in the automobiles will be very useful and so the loss of lives can be somehow prevented.

VIII. ACKNOWLEDGEMENT

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