

COMPACT FOOTBOARD IN BUSES

Aravind V¹, Mohan raj N², Sibichandan S S³, Vijay P⁴

¹ Under Graduation Scholar, Department of Mechanical Engineering, Knowledge Institute of Technology, Salem, India.

² Under Graduation Scholar, Department of Mechanical Engineering, Knowledge Institute of Technology, Salem, India.

³ Under Graduation Scholar, Department of Mechanical Engineering, Knowledge Institute of Technology, Salem, India.

⁴ Assistant Professor, Department of Mechanical Engineering, Knowledge Institute of Technology, Salem, India

ABSTRACT

To prevent the footboard accidents in buses is the objective of our concept. Bus plays an important role in the public transportation. Many people take a risky ride by travelling on foot-board. To increase the passenger safety our compact foot-board system is very useful. The reason for this risk is due to both the driver's and the passenger's negligence. Even though we have automatic doors and other safety systems the accident occurs. So the footboard system is controlled by driver with the help of three by two lever mechanism. It also has some extra features by reducing the ground clearance. We assure that our system will avoid foot board accidents and save many people lives in their day to day transportation.

KEY WORD: foot board, pneumatic cylinder, passenger safety, ground clearance.

INTRODUCTION

Our aim is to redesign the available steps and to implement our idea to get the

desired output. In India almost all the areas are connected through roadways. In that roadway transportation, bus is very economical and easier to travel. In this 21st century many technologies are have been employed in buses for the comfort of the passengers and also for the safety purposes. But in some places some accidents have been occurring in the bus for the persons who are travelling on foot board. Some people also felt that the steps are too height to climb. To remove these difficulties we designed a compact foot board.

This set consists of totally four steps. Normally three steps are available in the bus but this fourth step is provided to decrease the height between the ground and the step. This step has the control from driver when control is given the steps came down and again the control is given the steps go up thus covering the step area as a flat plate. It is done with the help of pneumatic cylinders. Totally we have placed two pneumatic cylinders which act oppositely.

DESCRIPTION

A.3/2 Air Controlled Valve

Our main aim is to control foot-board setup by driver. With help of 3/2 air controlled valve it can be done. 3/2 air controlled valve means 3 ways two positions operated by lever. It made up of Anodized Aluminum body, and is sealed with Oil resistant rubber. It operates in Filtered air (lubricated or oil free) and Operating at Pressure Range of 0 to 130 PSI and at Temperature Range -10 to 60 °C.

B. Air Compressor

A compressor gives high pressure air by changing its volume. As volume reduced, the pressure increases. A compressor may be reciprocating, rotary type.

C. Pneumatic cylinder

Both extend and retract strokes, moving the rod back Double acting cylinders use compressed air to power and forth. This arrangement makes them ideal for pushing and pulling loads. Controlling the rate at which air exhausts determines rod speed.

D. Available Foot Board Design In The Bus

We will begin first, by discussing the available design already employed in the bus. It has totally three steps fixed to the body of the bus. The design of bus consists of three steps of length 50 cm and breadth 20 cm and height of 20 cm each. The steps are rigid fixed.



E. Modified Design

We changed the design slightly that we modified rigid mounting into an adjustable one. Between the steps, cotter joint is used for the mounting purpose. The number of steps is increased from three to four. pneumatic cylinders which are fixed on the frame which is connected to the second and fourth step. Thus our design has the capability of moving within the space with help of pneumatic cylinders which take air as an input from air compressor already placed in the bus.



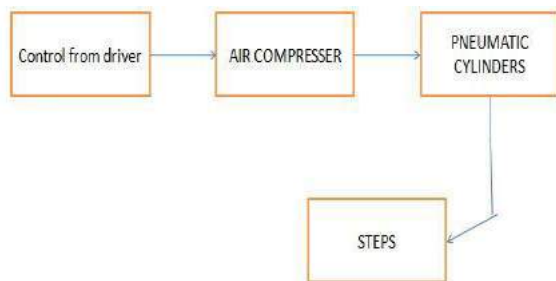
Side view

In this side view the mounting of both pneumatic cylinders are visible.



WORKING

When the driver operates the lever air from the compressor enters into the 3/2 valve followed by pneumatic cylinder and the step moves. The cylinder connection is given as parallel, but its motion is in opposite direction. Before operating the lever the foot board is in flat position to the bus body surface. Here the cylinder 1 is contraction and cylinder 2 is in expansion. The step 1 and step 2 are lye in same line and step 4 is in folded condition. After operating the foot board comes down as a normal one. Here the cylinders are in opposite condition. The four steps are in the form of normal step to climb.



CONCLUSIONS

By implementing our project in the buses we can reduce the foot-board accidents. It also provides comfort to the passengers who travel in the bus. It also improves the passenger safety. Though many writings and advice that are given by the elders and parents about not to take foot board travel many of the youngsters take it as a thrilling journey. But this action causes fatal injuries even sometimes it takes the life by causing death. This project will have a great scope when it comes to existence as it can be redesigned from existing one.