



Review Paper on Hydraulic Drum Brake System for Tractor Trailer Combination

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Abstract

Trolley tractor is a special truck that carries loads of about 6-7 tons. It has been found that due to overcrowding in the trolley in India there is an ambiguity or unnecessary in the tractor. The tractor and trailer has the power to break or fall. This causes damage to the driver, road, and lives of people near the tractor in the event of an accident. The machine relies entirely on the braking system, where the only difference is that the axis of the normal trolleys is replaced by a new axle and the front part of the trolley i.e. the connecting rod of the trolley and tractor is given an extra part. This part is the main cylinder which is the main component of braking. If the tractor applies the emergency brake due to the uncontrolled, you get over the tractor. As the spring compresses and the rod moves forward, it moves the piston rod. As the piston pushes the oil forward it holds the brakes. And the wagon stopped with the tractor.

Introduction

Currently most Trailers connected to Agricultural Trailers do not use any type of braking system which is very important for the safety of road users and Tractor-Trailer. CMVR-TSC has therefore directed AISC to evaluate the integration of these components. This standard AIS-043 recommends the type of braking system that needs to be installed on trailers connected to an agricultural tractor and its requirements when tested in conjunction with an agricultural tractor.

Installing a tractor brake will not only reduce the speed of the tractor but due to the weakness of the trailer, the tractor tends to move forward. Therefore the provision of a brake system in the trailer is necessary, as it is difficult for the tractor driver to control the tractor-trailer with the tractor brake, as the tractor has small brakes designed to stop the tractor itself.

Since the tractor and trailer have different nether, it is necessary to use the trailer braking system used in Tractor's Foot Pedal. There are many tractors with different types of brakes & foot-pedals, so installing / building different brake parts on a tractor are very difficult.

Literature Review

Researchers have done a lot of research on hydraulic braking system for tractors are as follows:

[1] **HenryJ.Levington, Snelland,**

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integration of these components. This standard AIS-043 recommends the type of braking system that needs to be installed on trailers connected to an agricultural tractor and its requirements when tested in conjunction with an agricultural tractor.

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[2] Page, Wilbur mills brcebridge heath Lincoln

According to his work, this invention relates to full power closed centre hydraulic braking systems for automotive vehicle trailer combinations and especially tractor/semi-trailer combinations. One such system which has been proposed includes both service and emergency line connections between the tractor and the trailer, each with its associated return line. The emergency line providing a constant supply of hydraulic fluid from the vehicle through a relay valve on the trailer mounted storage unit or accumulator, and a service line which, when activated by the foot or hand control on the tractor, actuates the relay valve to deliver pressure fluid from the accumulator to the trailer service brakes.

[3] D V Tretsiak, S V Kliuzovich, K Augsburg, J Sandler and V G Ivanov,

According to his work, Up-to-date automotive brake systems impose strict requirements on performance, reliability, and operational safety. Advanced systems such as antilock braking systems (ABS), electronic stability program, and anti-slip control system assist the driver in ensuring safe driving under many conditions. The impact of brake components on functional safety systems is largely determined by the width of the hysteresis loop. Among other side effects, this parameter limits the potential frequency of cyclic braking during ABS operations. This paper presents an experimental analysis of the factors influencing the loss of hysteresis pressure in the hydraulic brake system. Features under investigation are the speed of the brake pedal, the spaces between the brake pads and the brake disc, and the braking system configuration.

[4] Gong Mingde, Wang Tianxu,

According to his work, considering the high speed, heavy load, heavy load and rapid braking of a heavy vehicle, a dual brake valve-controlled full power hydraulic brake system is applied to the brake system which is able to accommodate the steering brakes and emerging engine brakes. Indirect mathematical models for parts of the brake valve, brake cylinder, connecting pipe and so on were developed in a complete underwater operating system. The directional brakes and parking brakes are discussed in Matlab / Simulink-based simulation tests.

[5] SHI Shi-hao, ZHU Xiao-ming, YANG Li-hong,

According to his work, the General breaking System of the decelerator performs the brake function of the

prime mover (motor or engine) also known as the braking force is small, however, the gear and transmission axis of the decelerator is damaged due to inertia. To solve the problem and extend the service life of the decelerator, a hydraulic Braking System for output braking was developed, which not only ensures sufficient braking force by designing symmetrical braking on the axis of the decelerator exit, but also effectively avoid damage. of gear and axis of transmission caused by braking. Emphasis is placed on the new design of the braking hydraulic cylinder, which adopts flexible piston shapes, large ends under pressure and small spring reset, greatly enhances piston-carrying radial force and is fitted with a flexible protection device. diameter piston from rotation thus improving the service life of the electric cylinder braking. This hydraulic Braking System is simple and powerful and the hydraulic cylinder is extremely innovative. It is widely used in the market and is well received.

Objectives

1. To reduce accidents occur due to lack of braking system on the tractor trolley.
2. With the use of a hydraulic braking system instant results can be obtained.
3. It is being used as a life-saving project as 80% of accidents cease to occur
4. It is widely used in the agricultural sector but can also be used in other fields.

References

- [1] Henry J. Levington, Snelland, England, HYDRAULIC BRAKING SYSTEMS FOR TRACTOR-TRALER COMBINATIONS.
- [2] Page, Wilbur mills brcebridge heath Lincoln, Tractor trailer braking system with residual (secondary) braking.
- [3] D V Tretsiak^{1*}, S V Kliuzovich¹, K Augsburg², J Sandler², and V G Ivanov² Research in hydraulic brake components and operational factors influencing the hysteresis losses
- [4] Gong Mingde, Wang Tianxu, Simulation of Full Power Hydraulic Brake System for Engineering Vehicles
- [5] SHI Shi-hao, ZHU Xiao-ming, YANG Li-hong, Development of Hydraulic braking system for decelerator.