



# INTERNATIONAL JOURNAL OF PURE AND APPLIED RESEARCH IN ENGINEERING AND TECHNOLOGY

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## REVIEW OF LITERATURE SURVEY ON TAIL LIFTS FOR TRUCK

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**Accepted Date: 22/11/2014; Published Date: 01/12/2014**

**Abstract:** Transportation is seen as one of the basic human needs and has a significant impact on a country's economy; productivity usually correlates well with the amount of transportation of goods and people. Transportation takes place on the ground, sea, and in the air and can be subdivided into the areas automotive, railway, naval, and aero-space. The development of logistics and transportation is expanding with an incredible speed in the recent decennium, especially from 2003 to 2014. With expansion of total transportation, enormous potential of logistic market, and ascendant of third-party logistics, numerous and high technologic logistic equipment and systems were definitely needed to promote the higher work efficiency, more company benefit, and less labor. From literature survey, to analysis of research area in trail lift for truck. To identifying proper mechanism.

**Keywords:** Transportation, Literature Survey, Trail Lift, Efficiency, Mechanism

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PAPER-QR CODE

Access Online On:

[www.ijpret.com](http://www.ijpret.com)

How to Cite This Article:

Dhaval P Patel, IJPRET, 2014; Volume 3 (4): 411-418

## INTRODUCTION

Transportation is seen as one of the basic human needs and has a significant impact on a country's economy; productivity usually correlates well with the amount of transportation of goods and people. Transportation takes place on the ground, sea, and in the air and can be subdivided into the areas automotive, railway, naval, and aero-space.

The development of logistics and transportation is expanding with an incredible speed in the recent decennium, especially from 2003 to 2011, the highways total was lengthen form 1,809,900 km to 4,106,400 km, in addition, there were 6,406,600 transport vehicles until the end of 2006. Nevertheless, China's logistic systems have generally inferior technology and substandard equipment, especially in the aspect of handling appliances; there are manual handling cars, hand push forklifts and simply normal lifting appliances still accounted for more than 70%.

With expansion of total transportation, enormous potential of logistic market, and ascendant of third-party logistics, numerous and high technologic logistic equipment and systems were definitely needed to promotes the higher work efficiency, more company benefit, and less labor.

With the development of India's economy, modern logistics and transportation sector has also been a rapid development, as one of the essential equipment of modern cargo transport vehicles, vehicle tail lift, has also got the attention of a lot of research departments. The tail lift is the lift which is equipped on the stern of truck, it is able to automatically lift as well as able to load and unload. It is also a highly regulated piece of ancillary equipment for fitment to a vehicle. One kind of tail lift is shown in Figure 1.1. Tail lift designers have a legal duty to ensure that tail lifts are constructed and installed to appropriate standards and that they are supplied with information to allow them to be used safely. Cargo tail lift, can not only greatly improve the handling efficiency, saving human resources, but also can improve the handling personnel security as well as reduce cargo damage rate.

Locomotion of a mechanical system consisting of two rigid bodies, a main body and a tail, connected by a cylindrical joint, is considered. The system moves in a resistive fluid and is controlled by periodic angular oscillations of the tail relative to the main body.



**Figure 1 Tail lift**

### **[1] Literature survey**

Ashwani Kumar, Himanshu Jaiswal, Avichal Pandey, Pravin P Patil [1] is presented the Transmission housing protect the components of gearbox. It provides the fluid tight casing to hold the lubricants and provides support to moving components. Transmission housing or gearbox casing failure is the main problem for the vehicle manufacturer. Noise and vibration are the main reason for failure. So it is required to reduce the level of noise and vibration. In order to prevent failure the natural frequency and natural mode shapes should be known. In this paper, the vibration analysis of transmission housing was performed by finite element simulation using ANSYS 14.5 software. The vibration pattern for first twenty mode was studied. The analysis show that the natural frequency of vibration varies from 1306.3 Hz to 3879 Hz. The External excitation on transmission housing must be eliminated to prevent the fracture of housing. The reason for the fracture is matching of external excitation frequency to natural frequency of transmission housing. Transmission housing design is a complex procedure. Design of transmission housing was done using Solid Edge software and the model is imported in ANSYS14.5 (FEM based software) for vibration analysis.

Mikhail Batsyn and Alexander Ponomarenko [2] in this paper we suggest a multi-start greedy heuristic for a real-life truck and trailer routing problem. The considered problem is a site dependent heterogeneous fleet truck and trailer routing problem with soft and hard time windows and split deliveries. This problem arises in delivering goods from a warehouse to stores of a big retail company. There are about 400 stores and 100 vehicles for one warehouse. Our heuristic is based on sequential greedy insertion of a customer to a route with further

improvement of the solution. The computational experiments are performed for real-life data. We also provide a mixed integer linear programming formulation for precise and clear description of the problem.

Huai-bin Wang, Hao Xie [3] presented the specific parameter and relevant property of a heavy compressed air foam truck and combining the situation of lacking of water supply and difficulties of the inside fire attack in high-rise buildings, the relevant data of the heavy compressed air foam truck's capability of providing extinguish ants in the scene of a fire is calculated and the advantage of the heavy compressed air foam truck in the high-level fire rescue is analyzed. Finally, determine the fire combat formations of high-rise building fire in different fire grounds through investigation and qualitative analysis.

Yaowu Wang, Chuan Ding, Chao Liu, Binglei Xie [4] presented Freight mode choice is a critical part in modeling freight demand. Due to limited freight data, considerably less research has been conducted on freight mode choice than that in passenger demand analysis. This paper investigates unobserved factors influencing freight mode choices, including truck and rail. Revealed preference data is collected from Freight Analysis Framework database and aggregated to be used in this study. Binary probit and logit models are developed to compare the modal behavior and to verify the differences of mode choice behavior among the three zones in Maryland. Different factors which are significantly influencing the freight mode choice can be found for the shipments originated from these zones. Identifying these factors may help the freight modelers to establish and calibrate better freight demand models for Maryland, and can help the policy makers to take actions to reduce highway congestion and air pollution which is caused by trucks.

Marcelo Norsworthy, Elena Craft [5] presents three incentive-based, voluntary vehicle replacement programs underway at US ports using fleet baseline and program completion data and an emissions standard-based emission estimation methodology. The principal findings demonstrate that best management practices for voluntary clean truck programs can substantially reduce truck drayage emissions, although not to the level achieved through mandatory programs. Emissions reductions were found to be 1–4% as compared to potential reductions of 12–15% for particulate matter and 31–34% for nitrogen oxides.

Xiaoju Zhang, Qingcheng Zeng, Wenhao Chen [6] investigates many ports are facing heavy truck congestion in the terminal, which leads to longer truck waiting time and lower operation efficiency. To alleviate congestion and decrease truck turn time in the container terminal, an optimization model for truck appointment was proposed in this paper. In the model, the

appointment quota of each period was optimized subject to the constraints of adjustment quota. And a BCMP queuing network was developed to describe the queuing process of trucks in the terminal. To solve the model, a method based on Genetic Algorithm (GA) and Point wise Stationary Fluid Flow Approximation (PSFFA) was designed. GA was used to search the optimal solution and PSFFA was designed to calculate the truck waiting time. Finally, numerical experiments were provided to illustrate the validity of the model and algorithm. The results indicate that the proposed PSFFA method can estimate the queue length accurately and the model can decrease the truck turn time efficiently.

Nagaswetha Pasupuleti, Srinivas S. Pulugurtha [7] this paper focuses on examining the role spatial extent in capturing off- and on-network characteristics and developing macro-level intracity truck crash estimation models. A Geographic Information Systems (GIS) based method was developed to identify intracity truck crash zones, capture spatial data within 0.25-, 0.5- and 1-mile buffers for each selected zone, and examine relationships between demographic, socio-economic, land-use, and on-network characteristics and intracity truck crashes. Non-linear truck crash estimation models (Negative Binomial with log-link) were then developed using selected independent variables that are not correlated to each other. The working of the method and development of models is illustrated using 2008 data for the city of Charlotte, North Carolina located in the United States. Spatial characteristics extracted using 0.5-mile buffer width was observed to provide more statistically meaningful results to model intracity truck crashes. They were found to be positively correlated to industrial areas and areas with large residential lots but negatively correlated to densely populated areas. Zones with a median and inadequate turning radius seem to be more prone to intracity truck crashes. The method and findings from this research assists practitioners to proactively identify potential high risk areas, to understand the role of various factors on intracity truck crashes, and to develop plans to enhance safety.

Eugene J. Obrien, Albert Daly, Alan J. O'Connor, Fergal Cahill, John E. Arrigan [8] presents changes in motor vehicle size and weight regulations have historically been driven by external forces. These limits have changed continually throughout historic development of the highway system worldwide. Issues arising from the legal weight limits on trucks include trade and productivity, climate change, competition with rail freight, pavement wear and bridge safety concerns. Some European countries are considering the introduction of the European Modular System (EMS) which would allow long distance freight vehicle length up to 25.5 metres long, typically with 8 axles. There is some debate in the industry on whether this should be done

while upholding existing gross weight limits or if it should accompanied by a corresponding increase in allowable mass to about 60 tonnes.

Zhang Xiu-qin, Yang Bo, Yang Chao, Xu Guanneng [9] presents the anti-lock braking system based on multi-body dynamic and control theory is researched. Multi-body vehicle dynamic model is built in ADAMS/Car and suspension system, tire model, braking system, engine system, steer system, vehicle frame are included. The non-linear characteristics of tire, bushing, spring and damper is considered, so it can accurately express the dynamics performance of the vehicle. Besides, logic threshold control model of ABS based on wheel deceleration and slip rate is designed under Matlab/Simulink environment, and the two models are integrated and co-simulation by the interface of ADAMS/Control. Simulation results that based on different arrangement of ABS system are compared with general brake results. Analysis results indicate that vehicle braking performance is improved with shorter braking distance and less lateral displacement, so vehicle with ABS has much more practical significance.

Liu Xinhua., Li Qi, Liu Youhui, Yin Jilin [10] presented to improve the design efficiency of aerial work truck sub frame, on the analysis of geometric features of aerial work truck sub frame, the parametric modeling process for aerial work truck sub frame was proposed, and the rapid design prototype system for aerial work truck sub frame based on UG Secondary development platform and VC6.0 compiled environment was developed. Finally, the correctness and effectiveness of the system are verified by an application.

Chen Yanhong, Zhu Feng [11] describes the YJ3128-type dump truck's sub frames, for the fatigue crack occurred in the Subframe which has worked in bad condition for 3 to 5 months, the truck's working conditions and the load features are researched, and ANSYS is used to analyze the stress of the sub-frame. According the deferent stress, the reason of the fatigue cracks occurring is researched too. At last an improvement and optimization to the structures of the frame is provided. For the stress of YJ3128-type dump truck there is no improved research methods and theoretical support, so the analysis in this paper and the proposed improvement scheme has important reference value.

André Luiz Cunha, José Reynaldo Setti [12] presented trucks represent a high proportion of highway traffic in Brazil and are longer, heavier and have smaller engines than the trucks used in the development of HCM2000. Some users try to account for these differences by combining HCM2000 procedures with truck PCEs from prior versions. Generally, both this crude adaptation and use of the HCM2000 produce unsatisfactory results. This study focuses on estimating truck PCEs for divided multilane highways in Brazil. Truck characteristics (power,

weight, etc.) were observed at several weigh stations on multilane highways. A sample of these trucks was tracked along road segments with multiple grades, using GPS units to collect vehicle performance data. Data on traffic composition and truck fleet mix were obtained from 17 toll plazas and a four-class truck classification scheme was created. Afterwards, CORSIM's heavy vehicle performance and car-following models were recalibrated using a genetic algorithm with truck performance data and traffic data collected on a divided multilane highway. The recalibrated CORSIM was then used to derive new PCEs using density as the measure of effectiveness, for scenarios in which grade magnitudes varied between 0% and 8%, with grade lengths between 0.5 and 2.0 km and truck percent ranging from 0% to 50%. Equivalence factors ranged from 1.0 to 10.9 pc. PCE tables for specific grades and for extended segments were created to replace those used in the HCM2000. The results point to the need for development of a Brazilian HCM.

### **ACKNOWLEDGMENT**

It is indeed a great pleasure for me to express my sincere gratitude to those who have always helped me for this dissertation work.

I am extremely thankful to my thesis guide Prof. Nayana B. Gandhi, Assistant Professor in Mechanical Engineering Department, SAL College of Engineering, Ahmedabad are valuable guidance, motivation, cooperation, constant support with encouraging attitude at all stages of my work.

### **CONCLUSION**

A mechanical system which includes the board, rocker, pin, hydraulic cylinder and the frame has been created according the dimensions of a specific type truck. The foundation drawing was built and the models of parts can be derived from it. So it is easy to modify the dimensions of design parameters.

From literature survey had reflected there was so many works done on engine side, transmission system, tail attachments, weight, multi axel , Frame of truck which also different model of truck but there no works done on tail lift for material handling.

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