

A STUDY ON THE DRIVER'S EXPERIENCE REGARDING RE-TREADED TIRE ON HEAVY COMMERCIAL VEHICLE

A. A. A. Aziz^{1, a}, J. M. Ghazali^{2, b}

¹Industrial Logistics, Universiti Kuala Lumpur, Malaysian Institute of Industrial Technology, 81750 Masai, Johor, Malaysia

*Corresponding author's
email:
jamilah@unikl.edu.my

^aazim.aziz01@s.unikl.edu.my, ^bjamilah@unikl.edu.my

Abstract

This research is case study about the experiences among the heavy vehicle's drivers during their operation regarding the use of retreaded tires which is to find out the experience of a heavy vehicle driver with the use of retread tires, and what actions are taken by the respondents if any unwanted things happen and the impact that can occur to other road users and the environment. The rate of road accidents that involved heavy vehicle and commercial vehicle such as lorries and cars is increase. One of the factors that found in recent cases is the usage of retreaded tire by the heavy vehicle. A lot of pieces of broken tire are on the road either on a regular road or on a highway which is because of tire fragments or burst tires. The objectives are to investigate the driver experience while using retreaded tires, and to identify the impact of tire fragment on the road and to the environment. In this study used qualitative method as a methodology tools to collect the data in which interview session with the respondents. The result from this research shown on how the action of the respondents to control the situation when unexpected event occurs during operation, and impact to the road user and environment. Subsequently, the findings of the research and several suggestions for improvement are given to improve for future research about the experience of the heavy vehicle's drivers.

Keywords: Retreaded tire; Heavy vehicle; Experience; Safety

1.0 INTRODUCTION

This research primarily focused on experience as a driver driving a heavy vehicle using retreaded tires on their vehicle. Basically, retread tires also known as recap tires or remolded tires that have been remanufactured to replace worn tires on used tires with new soles to help prolong the tire's life. In the Malaysian truck tire industry, the retread tire is also a well-known tire. They are suitable for both drive and trailer positions, as well as the steering position on non-passenger transport vehicles. Besides, using retreaded tires which is a cheaper tire compared to new tires, and retread tires that pass specification approval from the government can ensure the safety of heavy vehicles and drivers in a safe condition while operating.

This study was conducted to find out how heavy vehicle's driver experience with the use of retreaded tire on their vehicle during their operation. This research is aimed to reduce the rate of road accidents which involving heavy commercial vehicles.

In addition, it can aware the driver to know pros and cons of using retreaded tires and its impact towards road user.

This to ensure the safety of road which to prevent from accident occur either during journey or other vehicle accidents. This idea also can help in solving many problems in terms of customer and road user satisfaction. Besides, it can reduce the number of road accident that happen because of pieces of broken tires. This research will help to improve the quality of the work and reduce cost that may involve the company in the event of a road accident.

Tire retreading is a process whereby utilized tires are subjected to a set of additive value processes and transformed to a new tire. This process involves many benefits such as expense reductions, resource efficiency, and environmental emission reduction. The collection of used tires from the customers is defined by quantity volatility, price of used tires, and procurement timing. The collected used tires are

subjected to two sets of procedures, separated by an inspection stage and subsequent rejection of tires, if

1.1 PROBLEM STATEMENT

The rate of road accidents that involved heavy vehicle and commercial vehicle such as lorries and cars is increase. Accident can be caused by many factors. [1] One of the factors that found in recent cases is the usage of retreaded tire by the heavy vehicle. A lot of pieces of broken tire are on the road either on a regular road or on a highway which is because of tire fragments or burst tires. Based on the Metro news on 7th January 2019, the Road Transport Department (JPJ) will work with the Ministry of Works and the Standard and Industrial Research Institute of Malaysia (SIRIM) on the issue of the use of retreaded tires which is the main cause of more than 10,000 accidents annually in Malaysia. [1] Besides, the statistic of an accident occurs in Johor which is because of loss control is 653 cases (32 percent) and does not see objects in front is 115 cases (5.6 percent) in year 2019.

1.2 RESEARCH OBJECTIVES

Author has set up two main objectives for this study as a guideline throughout the study to make sure the write up follows and continuously answering the objective. The objectives are as follows: 1. To investigate the driver experience while using retreaded tires. 2. To identify the impact of tire fragment on the road and to the environment.

2.0 LITERATURE REVIEW

Driver Experience

The use of retreaded tires by large commercial vehicles like lorries, trailers, and buses is seen as a danger to road users' safety. Heavy vehicle owners are known to use tires that have not been certified by SIRIM because they are less costly than new pneumatic tires, which can cost up to RM2,000 depending on the size and model.

Based on the statement from [2] stated that, one of the causes of incidents involving lorries and trailers is some employers' attitude of preferring tires to save money on running costs. Tires are particularly dangerous because they can burst at any moment during operation and, even worse, tire debris can crack a car mirror that near a large vehicle. Retreaded tires are manufactured from recycled tires that have been modified by applying rubber material to make them look like new tires, and they can be bought for as low as RM500 to RM600. The government should also ensure that vehicles are not older than 15 years to ensure that they are in good condition to be guided at distant distances.

Besides, the demand from the boss, who wants the load to arrive at the destination soon, is one of

they are found to be non-retractable.

the other reasons that contributes to incidents involving lorry drivers or trailers. Each employer should monitor and ensure that their employees obey traffic laws, especially speed limits and the use of permitted lanes [3]. Regular training for heavy vehicle drivers is also required, especially for low-performing drivers.

Safety of Retreaded Tire

According to [4], the use of retreaded tires is not a major contributor to the risk of accidents, in fact it is safe to use by buses and lorries, if it is handled properly on the roads, especially highways in the country. Retreaded tires work like new tires, and all tires involved in an accident are caused by less wind pressure and exceeding the set speed limit [4].

Tires that are always maintained, whether new or retreaded tires do not cause an accident. Drivers need to know the suitability of tires such as size, safety marking, wind pressure, tire flower thickness limit, flower type and installation method [4]. Some commercial companies use wind pressure monitoring systems, to make it easier for drivers to monitor wind pressure continuously. Most importantly, the driver does not exceed the speed limit and load that allowed by law.

It is safe to use on the road as they have been tested using the same performance tests as the new tires, namely the durability test according to MS1394 quality for truck tires and the MS149 high speed capability test for car tires [5]. Physical tests on retreaded tires are performed to ensure that the tires reach a minimum level of safety when used on the road.

The retreading tire industry has been growing in the country for a long time and there are over 60 local retreading tire companies registered for MS 224 certification with over two million retreaded tires produced annually [5].

Tire Maintenance

Tires are the most important and most important components of a vehicle, if damaged or not well maintained, it can cause accidents and worse, can threaten their own lives, passengers, and other road users. Tires that have adequate air pressure will last longer than tires with less air or too much air pressure. For the conversion we usually need to change the same pair of tires in front or behind instead of a tire once changed.

Therefore, according to [15] said that the vehicle tires should be given serious attention by the owner and employer. Inspection of tire pressure and regular maintenance such as making a balance and wheel alignment is very important. Depending on the condition of the tire, sometimes the tire position should also be changed position to extend its life. All tires on vehicle and trailer must be in good condition and should be checked weekly. Besides, wearing an unbalanced or excessive tire means that there were

errors with tires, brakes, steering wheel, suspensions, wheel alignment or wheel balancing [15]. If the driver sees the abnormality of the tire, the vehicle shall inspect by the mechanic as soon as possible so that any offense can be done correctly.

Malaysia Standard

The high rate of accidents in the country was partly attributed by a road safety specialist to a lack of understanding among road users about the right use of retreaded tires. According to [14], who is the board of the Malaysian Institute of Road Safety Research, said that when it comes to purchase and testing retreaded tires, many customers are unaware.

All retreaded tires must adhere to the Malaysian Standard (MS) 224:2005 on tires which certified by SIRIM QAS International. The standard states a specification for materials, examination, and selection of casings for retreading, the procedure involved, and the specified labelling and warranties. It forms part of the International Certification Network, where, by meeting these requirements, grants these products permission to 37 global markets [11].

This ensures that the products are stable, supervised and have a sufficiently high quality for international export. Each product must meet high requirements to comply with MS 224, unlike ISO standards [11]. The retread manufacturing process conforms to ISO 9001:2015, a process built in the supply of retreading tires for 'quality management systems'. This is a very systematic procedure and is adhered to internationally to deliver retreads of top quality.

Impact to the Road

Waste of tires are difficult to transport and properly dispose, cause certain health and environmental issues, and are an additional expense for departments of highway maintenance. Tire fragment is often commonly identified as a safety threat on the highway, causing an extra danger for motorists [6].

Tire fragment is the unsightly rubber shreds or debris collected on the pavement or rough shoulder areas along arterial or interstate roads. A belief among many highway users is that heavy trucks driving on retread tires produce such tire fragments mainly. According to [7], most accidents occur because of the driver of a car and motorcycle cannot avoid colliding with the object.

Impact to the Environment

Tire fragments often face environmental concerns because as small landfills, tires decompose very slowly and move upwards which disturbing the landfill cap and are also banned from many permitted landfills. Therefore, many used tires end up

in overground dumps that can also create hazards [8].

Based on the [9] stated that the distribution of tires fragment size and chemical composition at present has gained adequate attention to claim that they may influence the environment. Inorganic and organic tracer species can be detected by tires fragment particles. Tire-tread compounds have been reported to typically contain around 2.5 percent zinc [10]. Tire wear items have been known in the environment for several years as a source of zinc, and it has reportedly been calculated that 10 percent to 40 percent of zinc has been extracted from soil-applied tires material into a soil organic matter lake.

In leaching tests using tires rubber and artificial rainwater, elevated amounts of zinc were found to be mobile and bio-available in rubber tires. By modifying local environmental factors, such as by reducing pH, zinc leakage can be indirectly increased, and tires wear has been found to be harmful to algae, daphnia and fish species. This toxicity is due to the presence of zinc in it, and the concentration of the zinc extraction process is often greater than that found hazardous to aquatic species.

3.0 METHODOLOGY

This research used both primary and secondary data. Qualitative research method which is interview has been selected as a primary method to obtain the data and information. The researcher will conduct an interview session as the primary data with the respondents. Data from journal, book and internet also will be collected as secondary data.

Data Analysis

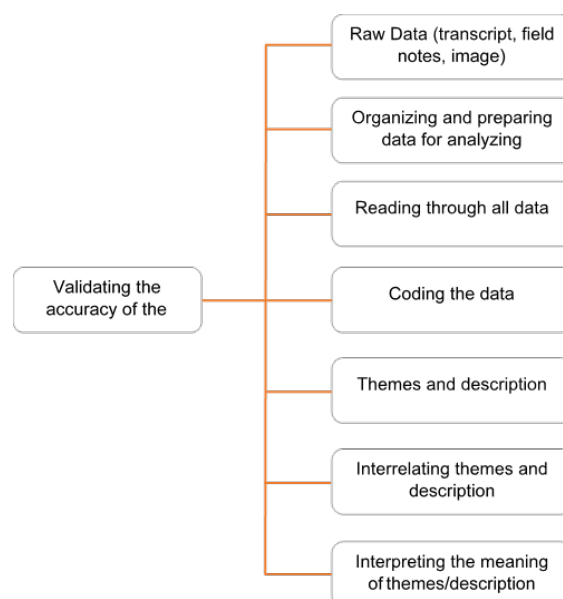


Figure 3.1 Data analysis

Theoretical Framework

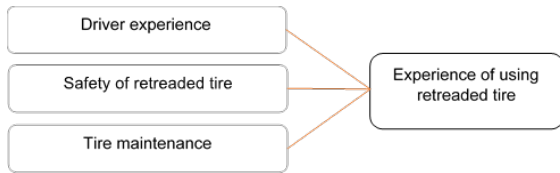


Figure 3.2 Theoretical framework

Conceptual Framework

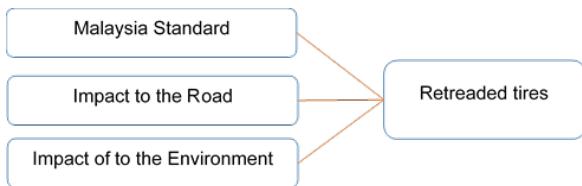


Figure 3.3 Conceptual framework

4.0 RESULTS AND DISCUSSION

From an interview session with the respondents, the researcher found out the experience of the driver to handle the situation with the use of retreaded tire on heavy vehicle. There are 3 themes in the findings in this research. The table below shows the summary of the interview session.

Table 4.1 Summary of the respondents

Themes	Summary from respondents
Driver Experience	Have ever use retreaded tire. As a result, the respondents stated that the use of retreaded tires on the vehicle can save the cost of tire maintenance, and this can reduce the expenditure to the company in the maintenance of their vehicles. The use of this retreaded tire is also more durable and the same with regular tires. Therefore, the purchase of this retreaded tire should be from a company that has been recognized and has a certificate issued by the government.
	Procedure usually do before start operation/trip. Basically, the procedure that the respondents always do is to check the condition of the engine whether it is in perfect condition or not for example the engine oil and radiator coolant should be in adequate condition. It is also

	important to check the condition of the tires such as tire tread and air pressure must be in good and sufficient condition, and the condition of the trailer must be checked such as the connection of prime mover with trailer, cable, and lights must be in good condition before transporting the goods.
	Tire maintenance in a week. Most of the respondents checked first the condition of the tires applied to their vehicle before starting their journey by tapping and seeing the tire whether the air pressure in the tire was sufficient or not. The respondents also check the condition of the tire tread, if the tire tread is worn or thin, they should immediately change the tire to a new one, and the respondents do maintenance on the tire 3 to 4 times a week, and the tire can last long to 2 to 3 years without being exchanged.
	Have ever had an accident related to the use of vehicle tire. Most of the respondents have never had an accident with the use of tires used on their heavy vehicle, but some of the respondents only ever experienced that the tires used were in a state of airless tires or had punctured while on their way to deliver the goods. However, some respondents also had accidents that were not related to the tires used on their vehicles.
	Driver action when/if the accident occurs. The respondents acted to stop their vehicles driven to the side of the road in the event of any damage to the tires of their vehicles to conduct a condition inspection on the tires. Then, the respondents chose to call the company they worked for to inform them of the current situation and acted to call any nearby tire shop so that the tire mechanic could check the situation thoroughly whether the damaged tire could be repaired or needed to be replaced to new tires. Besides, some of the respondents acted to continue their journey in delivering the goods brought in if the condition of the damaged tires was not bad to avoid delays in transporting the goods.

<p>Causes of tire damage</p>	<p>Based on the knowledge of the respondents, the cause of damage to tires used on heavy vehicles is due to lack or excess air pressure on the tires which can cause the tires to have less lifespan or cause the tires to explode if carrying the load. In addition, hitting an object that is on the road also one of the causes of tire to be damage for example, hitting a sharp object such as a big rock or iron. Furthermore, carrying an excessive load, expired tires, using illegal tires that are not certified by the government, and misalignment are also the causes that cause the tires to quickly break or explode while driving which can endanger other road users.</p>
<p>Impact to the road and environment</p>	<p>Scattered tire fragments on the road can endanger road users, especially motorcyclists compared to car drivers where they can have an accident in a much worse situation if they dodge or collide with tire fragments that can cause loss of control while riding because the fragments of this truck tire are large and the content in the manufacture of truck tire contains wire that can cause the tires of other vehicles to puncture. Furthermore, tires that have been recycled to make synthetic tires are a type of tire that is less quality compared to new tires and it is also less elastic. Besides, tire debris that is scattered and left alone without being cleaned by the road foreman and tires that are thrown and burned just like that can cause pollution to the environment.</p>

5.0 CONCLUSION

Based on the findings, several research methodologies, including literature review, observations, interview sessions, document review and physical evidence have successfully achieved all the objectives of this study. In addition, within a specified time frame, the researchers successfully completed the study without accepting critical problems.

The first objective is to investigate driver experience while using retreaded tire where the respondents have stated that their experience as a driver of heavy vehicles using this retread tire has been perfectly explained as the results collected by the researcher. The second objective which is to

identify the impact of tire fragment on the road and to the environment have also been able to collect the results after undergoing an interview session with respondents where to find out the effects of tire debris that can endanger road users and pollute the environment. Both objectives are achieved.

First recommendation is to ensure the respondents have longer experience as heavy vehicle drivers. It is very important to find respondents who have worked at least with more than 10 years of experience as a heavy vehicle driver because someone who has a lot of experience in the field of heavy vehicle driving has a lot of knowledge that the researcher can learn and to collect more detailed data than respondents the less experienced.

Then, the second recommendation for future research is that other researchers may carry out a case study on 6 or more respondents to gain more data on the respondents' experience as a driver of this heavy vehicle such as about the driver action when any unexpected event occurs, etc. This suggestion is kindly difficult to make because it is hard to assume the knowledge from the respondents if a researcher does not have a great connection with the specific respondents.

Finally, researchers recommend and suggest improving research to be better, thus bringing research to a new level. Therefore, this study is important because it determines the main reasons why this study was done and why this study needs to be explored because such information will be able to help researchers to continue to progress in the future.

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