

Design, Development & Analysis of 2 Wheeler Tire To Improve Fuel Efficiency for Tire Size 2.75-18 48p Dunlop Magic

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Abstract: - Tire is a toroidal shaped inflatable envelop made up of an elastic material, natural or synthetic rubber as a blend, thereof, reinforced with textile or a ply fabric carcass enclosing bead rings.. Tire is the most important component of any vehicle and it establishes the only contact between the vehicle and the road.

Without tire development, motor vehicle transport would not have been possible. It may be noted that more than 40% of world's rubber production finds its way into tires.

The earliest tires were bands of iron (later steel), placed on wooden wheels, used on carts & wagons. The first practical pneumatic tire was made by the Scot John Boyd Dunlop for his son bicycle, in an effort to prevent the headaches his son had while riding on rough roads. The pneumatic tire also has the more important effect of vastly reducing rolling resistance when compared to solid tire. The goal of our project is to design and development of 2 Wheeler tire for an M/S HMCL new model vehicle. The Pulley wheel testing equipment's are designed to measure the frictional losses seen in a derailleur pulley at a given RPM. From this project, the mechanical properties of the class of tread compound (6006 code) and tests conducted for before and after tire manufacturing and determination of rolling resistance for existing and modified tire. Details of processing of these tire sizes and the tests conducted on them have been described in the chapter 5. The results of various tests are noted. They include evaluation of tensile strength, Specific gravity, hardness, %elongation and M/S HMCL new model vehicle has been studied and discussed.

Keywords: - Tire, history, types. Mechanical tests like tensile tests, properties.

Date of Submission: 11-07-2019

Date of acceptance: 26-07-2019

I. INTRODUCTION

Tire is a toroidal shaped inflatable envelop made up of an elastic material, natural or synthetic rubber as a blend, thereof, reinforced with textile or a ply fabric carcass enclosing bead rings. Tire is the most important component of any vehicle and it establishes the only contact between the vehicle and the road. Without tire development, motor vehicle transport would not have been possible. It may be noted that more than 40% of world's rubber production finds its way into tires. Tire helps to maintain balance of the bike in motion. They enhance the steering and handling ability. They absorb some of the shocks & vibration from the road surface. They transfer the energy between the bike & the road (breaking, turning forces, acceleration) as well as handling the dissipation of heat from that frictional transaction of energy transference. Cushion the vehicle. Carry the load & improve impact resistance. Helps in directional stability, and speed capability. Transmit acceleration, breaking and cornering forces to the road surface. To support the weight of vehicle. The goal of our project is to design and development of 2 Wheeler tire for an M/S HMCL new model vehicle. The Pulley wheel testing equipment's are designed to measure the frictional losses seen in a derailleur pulley at a given RPM. The tester measures torque in gm cm. knowing this torque and the RPM of the pulley, the energy consumption in watts is calculated. Investigation made on the reduction of Rolling Resistance, thereby increasing fuel efficiency of 2 wheeler tires. In recent years, Tire rolling loss and fuel consumption in all types of automobiles have become increasingly important because of adverse environmental effects (Air pollution and global warming) and economic costs (High petroleum price).

II. HEADINGS

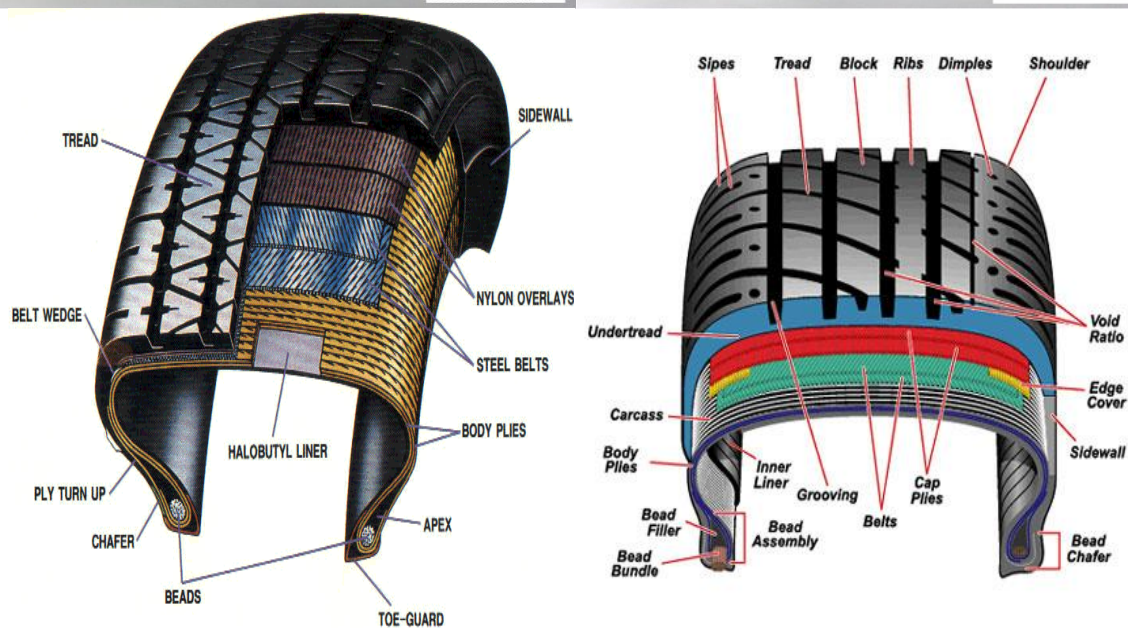
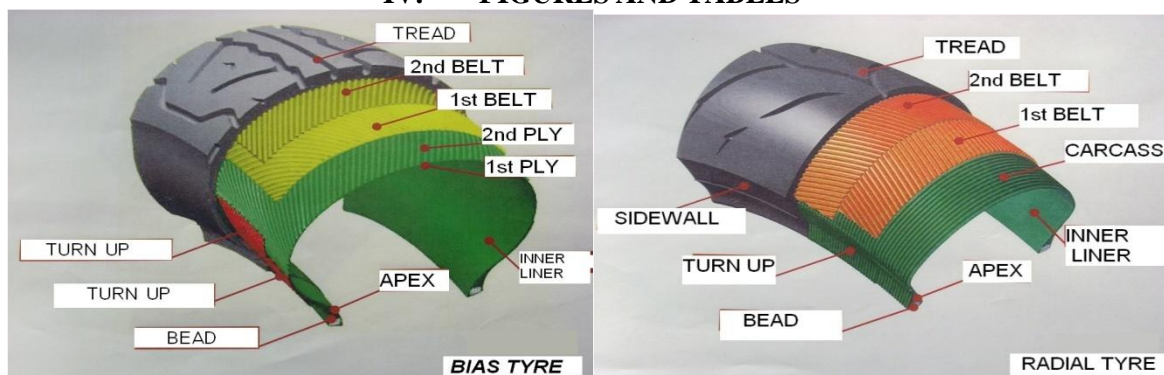
1. TIRE DEFINITION
2. Main Purpose/ Functions of Tire
3. Types of Tire
4. Different Parts of the Tire
5. LITERATURE SURVEY
6. Objectives
7. EXPERIMENTAL WORKS FOR DUNLOP MAGIC

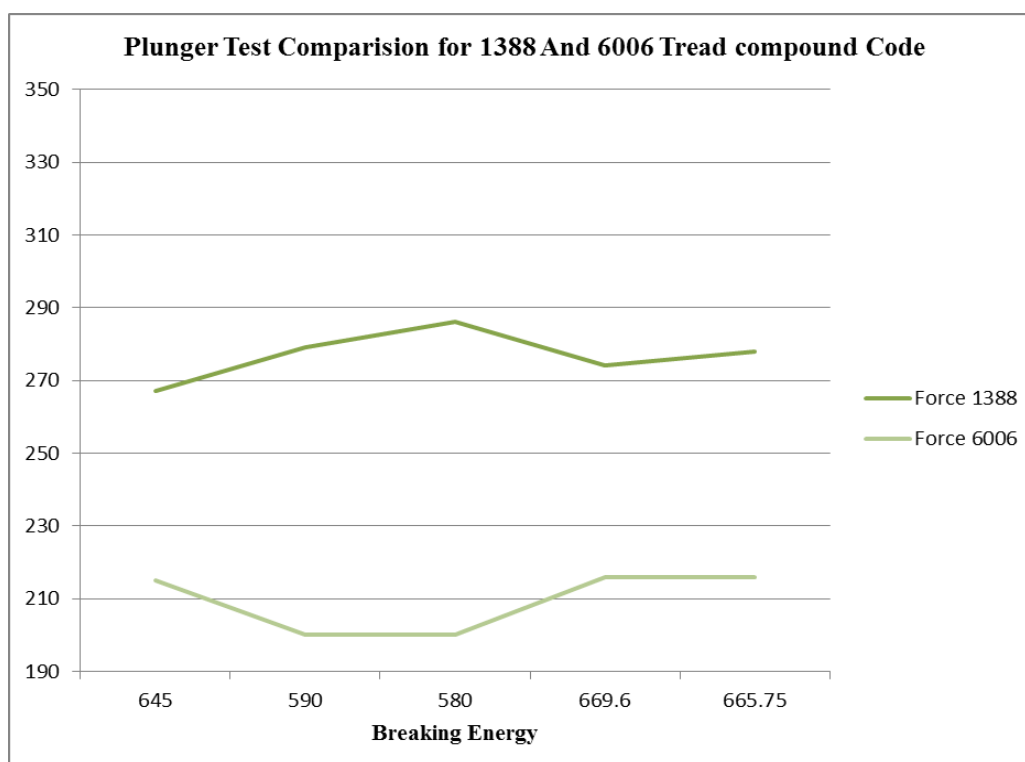
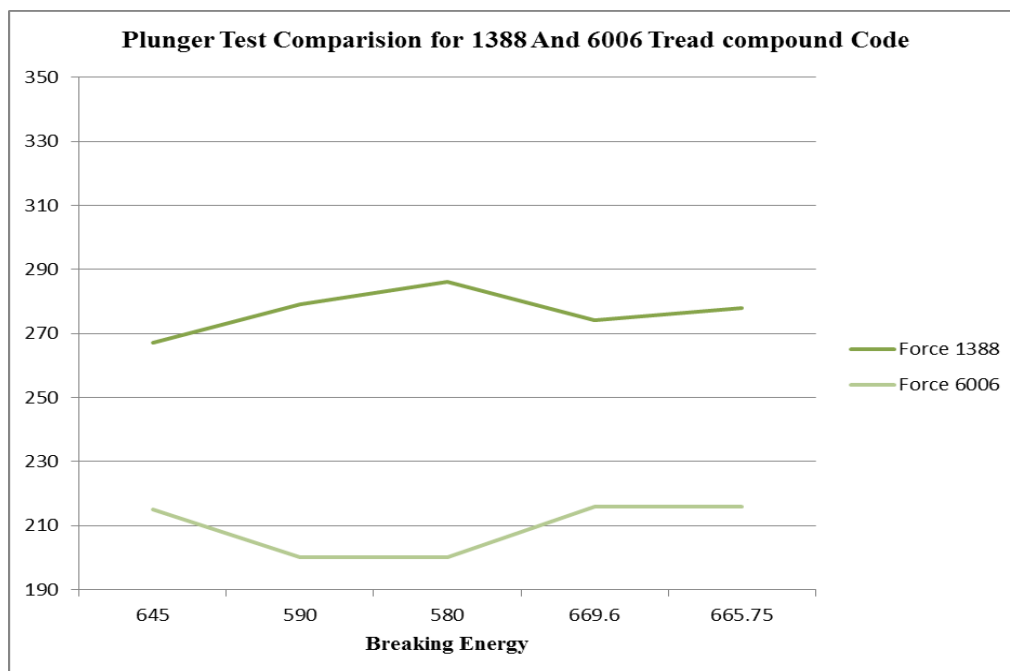
8. RESULTS AND DISCUSSION
9. CONCLUSIONS
10. SCOPE FOR FUTURE WORK
11. REFERENCE

III. INDENTATIONS AND EQUATIONS

Bias tire, Radial tire, Solid Tire, Semi-Pneumatic Tire.

IV. FIGURES AND TABLES





V. CONCLUSION

This chapter presents the mechanical properties of the class of tread compound (6006 code) and tests conducted for before and after tire manufacturing and determination of rolling resistance for existing and modified tire. Details of processing of these tire sizes and the tests conducted on them have been described in the chapter 5. The results of various tests are noted. They include evaluation of tensile strength, Specific gravity, hardness, %elongation and M/S HMCL new model vehicle has been studied and discussed. In this investigation an attempt is made to introduce the physical and rheological properties of tread compound for existing 1388 code size and modified tread compound 6006 and after tire manufacturing, tests were conducted for 2.75-18 6PR DUNLOP MAGIC for standard tread compound and is compared with new model for modified tread compound. By conducting the physical and rheological properties of tread compound 1388 and 6006, it is found that physical properties of 1388 tread compound is harder which wears out easily compared to 6006 tread

compound which is softer. In rheological properties it is clear from graph that 1388 tread compound requires more curing time to finish product, whereas 6006 tread compound don't require more curing time. After testing the product for low rolling resistance, for M/S HMCL new model vehicle, it is found that decrease in rolling resistance by 5.41% compared to existing tire for optimum speed of 40Kmph. By reducing this rolling resistance fuel efficiency of new model vehicle for 2.75-18 48P DUNLOP MAGIC increased. It is found that, an improvement in vehicle mileage of 4km/lt with 6006 tread compound compare to the tire with 1388 tread compound.

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BHAVYA V. "Design, Development & Analysis of 2 Wheeler Tire To Improve Fuel Efficiency for Tire Size 2.75-18 48p Dunlop Magic." IOSR Journal of Engineering (IOSRJEN), vol. 09, no. 07, 2019, pp. 39-42.