



Comparative Analysis Of Different Lubricating Oil

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Abstract: This paper focuses on the study and comparison of different types of lubricating oils used in engines and machinery. Lubricating oils play a vital role in reducing friction, wear, and overheating of moving parts. In this study, we selected several commonly used lubricating oils and analyzed their physical and chemical properties such as viscosity, density. Standard testing methods were used to evaluate the performance of each oil. The results were compared to understand which oil performs better under different operating conditions. This analysis helps in selecting the most suitable lubricating oil for specific applications, which can improve the efficiency and lifespan of machines. The project aims to provide useful insights for industries and individuals in choosing the right lubricant based on performance and environmental conditions

Index Terms Lubricating Oil, Viscosity, Efficiency, TBN, Performance improvement.

I. INTRODUCTION

Lubrication plays a vital role in the efficient operation of all types of machinery, especially engines. The primary function of lubricating oil is to reduce friction and wear between moving parts, thereby increasing the life and efficiency of the machine. In addition to reducing friction, lubricating oils also perform several secondary functions such as cooling, cleaning, sealing, and protecting metal surfaces from corrosion.

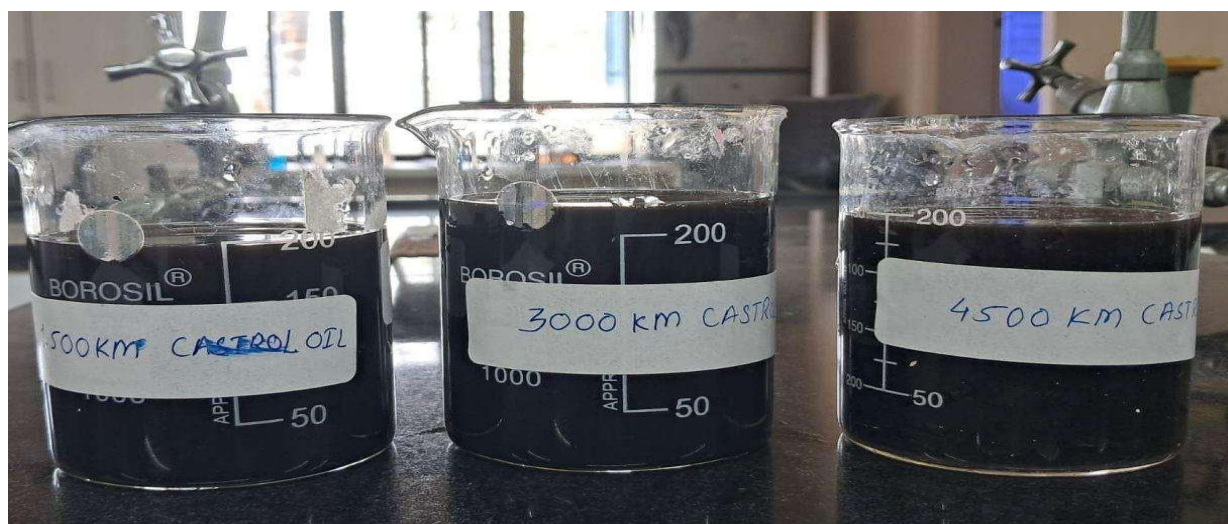
With the advancement of technology and the increasing demand for high-performance machinery, the choice of the right lubricating oil has become more important than ever. The market today offers a wide variety of lubricating oils, including mineral-based oils, synthetic oils, and semi-synthetic oils, each with different chemical compositions, performance characteristics, and costs. Selecting the most suitable oil for a specific application requires a clear understanding of its physical and chemical properties.

This paper aims to study and compare different types of lubricating oils based on important parameters such as viscosity, flash point, pour point, density, and thermal stability. These properties directly affect the performance of lubricating oils under various operating conditions, including high temperatures, pressures, and varying environmental conditions.

In this study, we have selected a range of commercially available lubricating oils and subjected them to laboratory testing using standardized procedures. The goal is to determine which oils offer better performance characteristics and to identify their suitability for different types of engines or machines. The comparative analysis will help in understanding the trade-offs between cost, performance, and durability. Moreover, this project emphasizes the importance of regular oil maintenance and monitoring. Poor lubrication can lead to increased energy consumption, frequent breakdowns, and costly repairs. By understanding the properties and behavior of different lubricating oils, users can make informed decisions that lead to improved machine performance, reduced downtime, and lower maintenance costs. and lower maintenance costs.

II. Experimental Methodology:

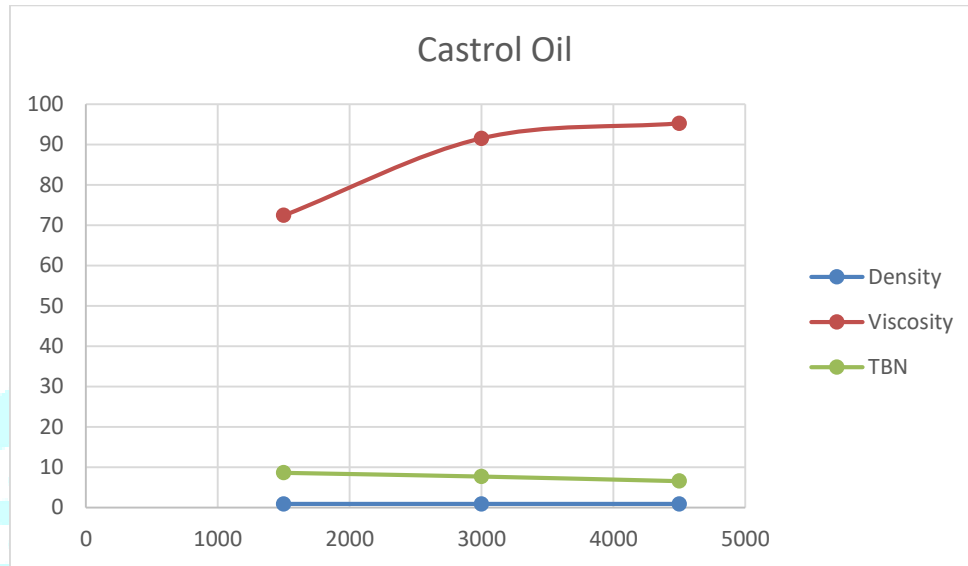
To carry out this analysis, followed a step-by-step method to study and compare different lubricating oils. First, selected a few commonly used oils from three main types: mineral oil, synthetic oil, and semi-synthetic oil. These oils were chosen based on their availability in the market and their use in vehicles and machines and checked oil by hydrometer



III. Observation-

| Distance(Km) | TBN(mg KOH/gm) | Viscosity(mpas) | Density(gm/cc) |
|--------------|----------------|-----------------|----------------|
| 1500 | 8.63 | 72.4 | 0.88 |
| 3000 | 7.70 | 91.5 | 0.880 |
| 4500 | 6.54 | 95.2 | 0.883 |

IV. Result and Discussion-



Conclusion-

Testing for different lubricating oil carried out and got correlation between different performance characteristics in-between density, viscosity and TBN. Density differs a lot as compared to TBN and viscosity. Efficiency of engine oil correlate with all the performance