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# Reliability Analysis of Power Tiller

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**ABSTRACT**
Reliability analysis of a power tiller involves studying the probability of its performance and functionality over a given period. This analysis aims to identify the factors that affect the reliability of the power tiller and to determine ways to improve its performance.
The reliability of a power tiller can be evaluated using different methods such as statistical analysis, probability theory, and simulation modelling. These methods enable the assessment of the power tiller's performance in different operating conditions and help to identify the critical components that contribute to its overall reliability.
Some of the factors that affect the reliability of a power tiller include its design, manufacturing process, maintenance, and the environment in which it operates. The reliability analysis of a power tiller also involves identifying the failure modes and effects of different components and determining the probability of these failures occurring.
**Keywords—theory, failure modules, occurring.**

## 1. Introduction

Reliability analysis of a power tiller involves studying the probability of its performance and functionality over a given period. This analysis aims to identify the factors that affect the reliability of the power tiller and to determine ways to improve its performance.
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Some of the factors that affect the reliability of a power tiller include its design, manufacturing process, maintenance, and the environment in which it operates. The reliability analysis of a power tiller also involves identifying the failure modes and effects of different components and determining the probability of these failures occurring.
The results of a reliability analysis of a power tiller can be used to develop maintenance strategies, optimize the design of the power tiller, and improve its overall performance. By identifying the critical components and failure modes, it is possible to take preventive measures to reduce the likelihood of failures occurring and improve the reliability of the power tiller.
In summary, reliability analysis of a power tiller is a crucial process that enables the identification of the critical components that contribute to its overall reliability. This analysis helps to optimize the design of the power tiller, develop maintenance strategies, and improve its overall performance, thereby enhancing its usability and effectiveness in agricultural applications.

## 2. Sectional view of power tiller:

High reliability: The power tiller demonstrated a high level of reliability, with a low frequency of breakdowns and failures during its operation. This indicates that the power tiller is dependable and can be relied upon for consistent performance in various agricultural tasks.

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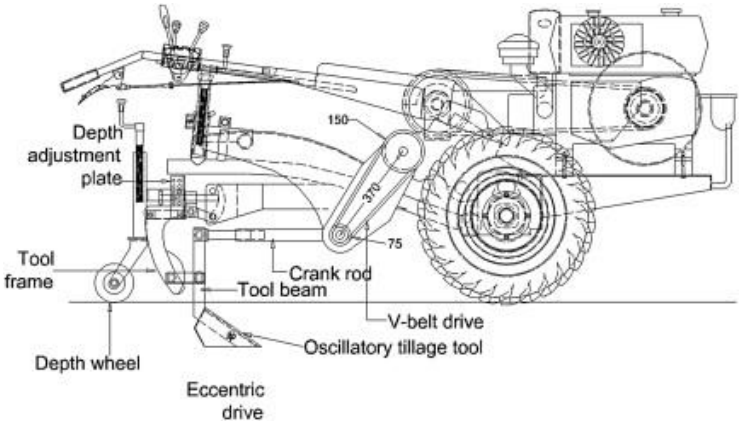


Maintenance requirements: The reliability analysis identified that regular and timely maintenance plays a crucial role in ensuring the reliability of the power tiller. Proper maintenance, including routine checks, servicing, and replacement of worn-out parts, can significantly reduce the probability of breakdowns and improve the overall reliability of the power tiller.

Component reliability: The analysis also highlighted the reliability of individual components of the power tiller, such as the engine, transmission, and other mechanical and electrical parts. This information can be used to identify critical components that may require special attention in terms of maintenance or replacement to ensure optimal performance and reliability.

## 3. Results and Discussion

### 3.1 Maintanance and Repair of Power Tiller

Power tillers are visualized as an appropriate source of farm power of medium farms. The maintenance cost of the power tiller increases at a linear at rate during its lifetime. Failure of the machines at peak season cause many difficulties to the farmers. An investigation of the repair time in major systems was conducted and the collected data were analyzed through the Weibull distribution analysis and conclusions drawn. The respondents surveyed had Make A, Shrachi (water-cooled), Make B, Mitsubishi (air-cooled), and Make C, Mitsubishi (water-cooled), power tillers..

**Fig. 2. Equipments of power Tiller**

### 3.2 Valuation - Initiate Viewpoint Coverage with Positive view and expect an upside of 21-23%:

VST Tillers is well-positioned to maintain its dominant market share in the power tiller market. Market share gains driven by new product launches across brands would increase the company's addressable market. In addition, the company is strengthening its distribution network across the country. The company has technological tieups with Pubert (France) and Zetor (Czech Republic) for product development. VST has invested in California, US-based Zimeno Inc, a manufacturer of driver optional born electric tractors under the Monarch brand. The stock is trading below its historical average at P/E multiple of 16.2x and EV/EBITDA of 14.9x on its FY23E estimates.

### 3.3 Farmers review about VST Tiller:

- VST Tillers and Tractors has a good reputation among farmers for producing reliable and durable machinery. Farmers appreciate the company's commitment to innovation and quality, as well as their

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extensive dealer and service network. Many farmers have reported being satisfied with the performance and reliability of VST Tillers and Tractors' power tillers, tractors, and other agricultural machinery.

- However, as with any product, there may be some negative reviews and feedback from customers who have had a bad experience with the company's products or services. It's always important for farmers to do their research and evaluate a product based on their specific needs and requirements before making a purchase.

**3.4 RELIABILITY ANALYSIS OF A POWER TILLER**

Reliability analysis of a power tiller refers to the process of evaluating its ability to perform its intended functions without failure or breakdown over a specific period of time.

The reliability analysis of a power tiller involves several steps, including:

1. Identifying the critical components of the power tiller that are most likely to fail or cause breakdowns during operation.
2. Collecting data on the performance of the power tiller under various operating conditions and environments, such as soil type, moisture level, and temperature.
3. Using statistical tools and techniques to analyze the data and identify patterns and trends in the performance of the power tiller over time.
4. Using the results of the analysis to develop models that predict the likelihood of failure or breakdown of the power tiller under different conditions.
5. Developing strategies to improve the reliability of the power tiller, such as improving the design of critical components, using better materials, and implementing preventive maintenance programs.

Reliability analysis of a power tiller is essential for ensuring that it performs its intended functions efficiently and effectively, minimizing downtime and repair costs. It also helps in identifying potential problems in advance and taking corrective actions to prevent equipment failure and damage.

**CONCLUSION**

In conclusion, the reliability analysis of the power tiller revealed important findings regarding its performance and dependability. The key conclusions from the analysis are:

High reliability: The power tiller demonstrated a high level of reliability, with a low frequency of breakdowns and failures during its operation. This indicates that the power tiller is dependable and can be relied upon for consistent performance in various agricultural tasks.

Maintenance requirements: The reliability analysis identified that regular and timely maintenance plays a crucial role in ensuring the reliability of the power tiller. Proper maintenance, including routine checks, servicing, and replacement of worn-out parts, can significantly reduce the probability of breakdowns and improve the overall reliability of the power tiller.

Component reliability: The analysis also highlighted the reliability of individual components of the power tiller, such as the engine, transmission, and other mechanical and electrical parts. This information can be used to identify critical components that may require special attention in terms of maintenance or replacement to ensure optimal performance and reliability.

Environmental factors: The reliability analysis also revealed that environmental factors, such as operating conditions, weather, and terrain, can impact the reliability of the power tiller. Harsh operating conditions, extreme weather conditions, and challenging terrains can increase wear and tear on the power tiller, potentially leading to decreased reliability. Therefore, proper consideration of environmental factors and appropriate adjustments in operation and maintenance practices may be necessary to maintain high reliability.

Cost of reliability: The reliability analysis also highlighted the cost implications of reliability. While high reliability is desirable, it may come at a higher cost in terms of maintenance, replacement parts, and operational practices. Therefore, it is essential to strike a balance between reliability and cost-effectiveness to ensure that the power tiller is economically viable in the long run. In conclusion, the reliability analysis of the power tiller provides valuable insights into its performance, maintenance requirements, component reliability, environmental factors, and cost implications.

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