

“Industrial Training Report on Traub Machine Operation and Maintenance for Automobile Parts Manufacturing at Nikhil Industries Ahilyanagar.”

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Abstract

The automobile industry requires large quantities of precision-machined components with consistent dimensions, surface finish and dimensional accuracy. Automatic turning machines such as Traub machines are widely used for the mass production of turned components. This paper presents a case study of **Nikhil Industries**, focusing on the work of a Traub machine operator involved in automobile-parts manufacturing and machine maintenance activities.

The study covers raw-material loading, machine setting, tool selection, turning operations, drilling, grooving, threading, chamfering, component inspection and production monitoring. It also discusses preventive and breakdown maintenance activities performed on the machine. Proper machine maintenance is important because machine condition directly affects productivity, dimensional accuracy, tool life and component quality. Publicly available business listings associate Nikhil Industries in Ahilyanagar with Traub-machine turned components and fully machined components.

The case study demonstrates that effective coordination between machine operation, inspection and maintenance can reduce machine downtime, improve productivity and maintain consistent quality in automobile-component manufacturing.

Keywords: Traub Machine, Automatic Lathe, Automobile Components, Machine Operator, Preventive Maintenance, Turning, Production, Precision Machining.

1. Introduction

Automobile manufacturing requires a large number of precision components such as shafts, bushes, pins, spacers, sleeves, studs and other turned parts. These components are generally manufactured in large quantities, making

productivity, repeatability and dimensional accuracy important manufacturing requirements.

Automatic turning machines are suitable for repetitive production because several machining operations can be performed in a controlled sequence. Traub machines are used for turning and other machining operations in production environments. Publicly available industrial information also documents the use of Traub machines for precision component manufacturing.

A machine operator plays an important role in maintaining production output. The operator is responsible not only for operating the machine but also for machine setup, tool monitoring, dimensional inspection, chip removal, lubrication checks and identifying abnormal machine conditions.

This study focuses on the practical experience of a **Traub machine operator at Nikhil Industries**, particularly in automobile-component production and machine maintenance.

2. Objectives of the Study

The main objectives are:

1. To study the working principle of a Traub machine.
2. To understand automobile-component manufacturing using a Traub machine.
3. To study the responsibilities of a Traub machine operator.
4. To understand machine setup and tool-setting procedures.
5. To study various machining operations performed on automobile components.
6. To understand dimensional inspection methods.
7. To study preventive maintenance activities.
8. To identify common machine problems and their causes.
9. To study the effect of maintenance on productivity and quality.
10. To suggest methods for improving machine performance.

3. Company Overview

Nikhil Industries is associated in public business listings with manufacturing of **Traub-machine turned components** and **fully machined components** in the Ahilyanagar region.

The manufacturing activity considered in this case study involves precision machining of components used in automobile-related applications.

Major Activities

- Automatic turning
- Component machining
- Drilling
- Threading
- Grooving
- Chamfering
- Facing
- Dimensional inspection
- Tool replacement
- Machine maintenance

4. Traub Machine

A Traub machine is an automatic turning machine used for repetitive production of cylindrical and turned components.

The machine can perform multiple operations in a predefined sequence.

Basic Components

The major parts include:

1. Headstock
2. Spindle
3. Collet/chuck
4. Tool holders
5. Cutting tools
6. Cross slides
7. Longitudinal slides
8. Cam/drive mechanism depending on machine type
9. Coolant system
10. Lubrication system
11. Bar-feeding arrangement
12. Chip collection arrangement

Modern Traub turning machines can also be configured for highly productive multi-tool machining.

5. Raw Material Used

For automobile components, the raw material may include:

- Mild steel
- Carbon steel
- Alloy steel

- Stainless steel
- Brass
- Aluminium

The actual material depends on the component drawing and customer specification.

Raw Material Inspection

Before loading material into the machine, the operator should check:

- Material diameter
- Material length
- Material grade
- Surface condition
- Straightness
- Identification/traceability

6. Production Process

The general manufacturing process can be represented as:

Raw Material

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Material Inspection

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Bar Loading

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Traub Machine Setup

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Tool Setting

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Trial Component

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Dimensional Inspection

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Mass Production

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In-Process Inspection

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Deburring/Cleaning

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Final Inspection

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Packing

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Dispatch

7. Working as a Traub Machine Operator

The operator performs several important activities during production.

7.1 Machine Setup

Before starting production, the operator checks:

- Machine cleanliness
- Tool condition
- Tool position
- Material loading

- Collet/chuck condition
- Coolant level
- Lubrication
- Machine guards
- Electrical condition

7.2 Tool Setting

Cutting tools are positioned according to the machining sequence.

Typical tools may include:

- Turning tool
- Facing tool
- Grooving tool
- Parting tool
- Threading tool
- Form tool
- Drilling tool
- Chamfering tool

Correct tool setting is essential for maintaining component dimensions.

8. Machining Operations

The following operations may be performed depending on the automobile component.

8.1 Facing

Facing produces a flat surface at the end of the component.

8.2 Turning

Turning reduces the diameter of the raw material to the required dimension.

8.3 Grooving

Grooving produces a narrow recess at a specified location.

8.4 Threading

External or internal threads can be produced according to component requirements.

8.5 Drilling

Drilling produces a required hole in the component.

8.6 Chamfering

Chamfering removes sharp edges and produces the specified chamfer.

8.7 Parting-Off

The finished component is separated from the bar using a parting tool.

9. Quality Inspection

Quality control is an important responsibility during Traub-machine production.

The operator may perform regular inspection using:

- Vernier caliper
- Outside micrometer
- Bore gauge
- Plug gauge
- Ring gauge
- Thread gauge

- Height gauge
- Dial indicator

Typical Inspection Parameters

Parameter	Instrument
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Outside diameter	Micrometer
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Overall length	Vernier caliper
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Hole diameter	Bore gauge
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Thread	Thread plug/ring gauge
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Groove width	Vernier/micrometer
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Runout	Dial indicator
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Surface condition	Visual inspection
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The actual tolerance values should always be taken from the relevant component drawing.

10. Importance of In-Process Inspection

In-process inspection helps identify dimensional variation before a large batch is produced.

A typical inspection cycle is:

First Piece → Inspection → Approval → Production → Periodic Inspection → Final Inspection

If a dimension gradually changes during production, the operator can investigate:

- Tool wear
- Incorrect tool setting
- Machine vibration
- Material variation
- Improper cutting conditions
- Machine alignment

11. Maintenance Activities

Maintenance is an important part of the operator's responsibilities.

The maintenance activities can be divided into:

11.1 Daily Maintenance

- Cleaning the machine
- Removing chips
- Checking lubrication
- Checking coolant
- Checking tool condition
- Checking unusual noise
- Checking vibration
- Checking leakage
- Cleaning work area

11.2 Weekly Maintenance

- Detailed machine cleaning
- Checking belts and drive components
- Checking lubrication points
- Checking electrical connections
- Checking coolant condition
- Inspecting tool holders

11.3 Periodic Maintenance

- Lubricant replacement
- Coolant replacement
- Inspection of bearings
- Inspection of spindle condition
- Alignment inspection
- Electrical-system inspection
- Replacement of worn components

The exact maintenance interval should follow the machine manufacturer's manual and the company's maintenance schedule.

12. Common Machine Problems

During continuous production, the following problems may occur:

Problem	Possible Cause
Poor surface finish	Tool wear/vibration
Dimensional variation	Tool wear/improper setting
Excessive vibration	Loose tooling/bearing problem
Tool breakage	Incorrect cutting condition
Excessive noise	Bearing/drive problem
Coolant leakage	Pipe/seal damage
Lubrication problem	Low lubricant/clogged line
Machine stoppage	Electrical/mechanical fault
Excessive burr	Tool condition/improper cutting
Component rejection	Incorrect setting/tool wear

13. Preventive Maintenance

Preventive maintenance is carried out before machine failure occurs.

A preventive-maintenance schedule can include:

Daily → Cleaning and lubrication

Weekly → Mechanical inspection

Monthly → Detailed inspection

Periodic → Alignment and component inspection

Preventive maintenance can help reduce unexpected breakdowns and maintain production continuity.

14. Breakdown Maintenance

When a machine suddenly stops, the operator first reports the problem to the maintenance department.

The basic procedure is:

Machine Breakdown

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Stop Machine Safely

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Identify Problem

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Maintenance Inspection

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Repair/Replacement

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Trial Run

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First Component Inspection

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Production Restart

A breakdown record should contain:

- Date
- Machine number
- Failure time
- Problem description
- Cause
- Repair performed
- Spare parts used
- Restart time
- Total downtime

15. Operator's Role in Maintenance

The operator is often the first person to identify abnormal machine conditions.

Important observations include:

- Unusual noise
- Increased vibration
- Temperature rise
- Oil leakage
- Coolant leakage
- Tool wear
- Dimensional variation
- Spindle abnormality
- Electrical warning
- Abnormal machine cycle

Early identification can prevent minor problems from developing into major failures.

16. Production and Maintenance Relationship

The relationship can be represented as:

Good Maintenance

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High Machine Availability

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Stable Machining Process

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Consistent Dimensions

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Lower Rejection

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Higher Productivity

Thus, maintenance is not only a repair activity; it is an important part of production management.

17. Safety Practices

Safety is essential while operating automatic turning machinery.

The operator should:

- Wear safety shoes.
- Use appropriate eye protection.
- Avoid loose clothing.
- Never touch rotating components.
- Stop the machine before removing chips manually.
- Use suitable tools for chip removal.
- Keep the work area clean.
- Follow machine guarding requirements.
- Report oil/coolant leakage.
- Follow lockout/tagout procedures during maintenance where applicable.

18. Observations

Based on the case-study framework, the major observations are:

1. Traub machines are suitable for repetitive production of turned components.
2. Proper machine setup directly affects component accuracy.
3. Tool wear can result in dimensional variation.
4. Regular inspection helps reduce batch rejection.
5. Preventive maintenance can reduce unexpected machine stoppage.
6. Proper lubrication is important for machine performance.
7. Operator experience is important for identifying abnormal machine conditions.
8. Production and maintenance departments must coordinate closely.
9. Machine cleanliness contributes to reliable operation.
10. Maintenance records help identify recurring problems.

19. Results and Discussion

The study demonstrates the importance of combining **machine operation, quality inspection and maintenance** in automobile-component manufacturing.

The Traub machine operator has a significant role in maintaining production continuity. Correct tool setting, appropriate machining parameters and regular dimensional inspection help maintain component quality.

At the same time, preventive maintenance activities such as cleaning, lubrication, inspection and timely replacement of worn components can reduce the probability of unexpected breakdowns.

The relationship can therefore be summarized as:

Skilled Operator + Proper Tool Setting + Regular Inspection + Preventive Maintenance = Improved Manufacturing Performance

The actual improvement percentage should be calculated from Nikhil Industries' production and maintenance records rather than estimated.

20. Conclusion

This research paper presents a case study of **Nikhil Industries**, focusing on the work of a **Traub machine operator involved in automobile-parts manufacturing and machine maintenance**. The study covers production operations including turning, facing, grooving, threading, drilling, chamfering and parting-off.

The study also highlights the importance of dimensional inspection and preventive maintenance. Regular machine cleaning, lubrication, tool inspection and monitoring of abnormal machine conditions can help maintain machine reliability and product quality.

For automobile-component manufacturing, the integration of **production, quality and maintenance** is essential for achieving consistent component dimensions, reduced rejection, improved machine availability and continuous production.

21. Future Scope

Future work can focus on:

- Implementation of TPM on Traub machines.
- Reduction of machine setup time.
- Tool-life optimization.
- Cutting-parameter optimization.
- Predictive maintenance.
- Digital maintenance records.
- OEE monitoring.
- Automated dimensional inspection.
- Reduction of rejection and rework.
- Energy-efficient machining.

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