

“A Study of Industrial Training Report on Automobile Component Manufacturing Using Traub Machine and Quality Inspection at Nikhil Industries, Ahilyanagar.”

Avinash Balakdas Vaishnav¹, Tushar Yashavant Bhutkar², Dr. Ramesh Suryabhan Gadakh³

¹ Student, Department of Mechanical Engineering Sau Sundarbai Manik Adsul Polytechnic, Chas, Ahilyanagar, India

² Guide, Department of Mechanical Engineering Sau Sundarbai Manik Adsul Polytechnic, Chas, Ahilyanagar, India

³ Principal Sau Sundarbai Manik Adsul Polytechnic, Chas, Ahilyanagar, India

Abstract

The automobile industry requires large quantities of precision-machined components with consistent dimensional accuracy and surface quality. Automatic turning machines such as Traub machines are widely used for the mass production of small and medium-sized turned components. This paper presents a study of automobile-component manufacturing using Traub machines at Nikhil Industries, Ahilyanagar, with emphasis on machine operation, machining processes, component inspection, quality control and production efficiency. Nikhil Industries is publicly listed as a manufacturing business in Ahilyanagar, and online industrial listings associate the company with Traub-machine turned components and fully machined components.

The study covers the basic working principle of the Traub automatic machine, raw-material loading, turning, facing, drilling, threading and other machining activities, followed by dimensional and visual inspection. Measuring instruments such as vernier callipers, micrometres, gauges and other inspection equipment can be used to verify component dimensions against drawing specifications. The study demonstrates the importance of proper machine setting, tool condition, process control and inspection in achieving consistent quality in automobile components.

Keywords: Traub Machine, Automobile Components, Turning, Machining, Quality Inspection, Dimensional Accuracy, Production, Industrial Training, Nikhil Industries.

1. Introduction

Automobile manufacturing requires a large number of precision components such as pins, bushes, shafts, spacers, threaded components and other turned parts. These components must satisfy specified dimensional tolerances and surface-finish requirements.

Automatic turning machines are particularly useful for high-volume production because several machining operations can be performed in a controlled sequence. Traub machines are used for precision turning and can perform operations such as turning, facing, drilling, threading, grooving and chamfering. Industrial sources describe Traub machines as suitable for high-speed production of small and medium-sized precision components, including automotive parts.

Nikhil Industries is listed in Ahilyanagar as a manufacturing establishment, with publicly available industrial listings identifying Traub Machine Turned Components and fully machined components among its offerings.

2. Objectives of the Study

The main objectives of this study are:

1. To understand automobile-component manufacturing using a Traub machine.
2. To study the working principle of an automatic Traub machine.
3. To understand different machining operations performed on the machine.
4. To study the role of a Traub machine operator.
5. To understand tool setting and machine adjustment.
6. To study component inspection methods.
7. To understand dimensional quality control.

8. To identify common machining defects.
9. To study the relationship between production and quality.
10. To suggest methods for improving machining accuracy and productivity.

3. Company Profile

Name of Organization

Nikhil Industries

Location

Ahilyanagar, Maharashtra, India

Public business-registration information identifies Nikhil Industries as a proprietorship manufacturing business registered in Maharashtra, with its listed industrial location in the MIDC area.

Online industrial listings associate Nikhil Industries with:

- Traub machine turned components
- Fully machined components
- Precision machining work
- Industrial components

For the final academic submission, the following details should preferably be taken directly from your industrial-training records:

Particular Details

Organization Nikhil Industries

Location Ahilyanagar

Department Production / Machining

Machine Traub Automatic Lathe

Job Automobile components

Main activity Turning and machining

Inspection Dimensional and visual inspection

Training area Production and Quality

4. Traub Automatic Machine

A Traub machine is an automatic turning machine designed for producing precision components in relatively high quantities.

The machine can perform multiple operations in a predetermined sequence.

Major operations include:

- Turning
- Facing
- Step turning
- Grooving
- Threading
- Chamfering
- Drilling
- Knurling
- Parting-off

The exact operations depend on the component drawing, machine configuration and tooling arrangement.

5. Working Principle of Traub Machine

The basic machining sequence is:

Raw Material → Bar Feeding → Clamping → Tool Positioning → Turning → Drilling/Threading → Grooving → Parting → Component Collection → Inspection

Step 1: Raw Material Loading

The required bar stock is selected according to the component drawing and material specification.

Step 2: Bar Feeding

The raw material is fed into the machine using the appropriate feeding mechanism.

Step 3: Work Holding

The material is securely held in the collet/chucking arrangement.

Step 4: Tool Setting

Cutting tools are positioned according to the machining sequence.

Correct tool height and tool position are essential for dimensional accuracy.

Step 5: Machining

The machine performs the required operations automatically or semi-automatically according to the machine setup.

Step 6: Component Separation

After completion of the machining cycle, the component is separated from the bar and collected.

Step 7: Inspection

The component is checked against drawing dimensions and quality requirements.

6. Automobile Component Manufacturing

Automobile components produced by precision turning may include different types of:

- Pins
- Bushes
- Spacers
- Shafts
- Sleeves
- Threaded components
- Studs
- Fasteners
- Small turned components

The actual components manufactured at Nikhil Industries should be listed according to your industrial-training observations.

Precision turned components are commonly used in automotive applications because their dimensions and functional surfaces must be controlled carefully.

7. Machining Operations

7.1 Turning

Turning removes material from the outer diameter of the workpiece to obtain the required diameter.

Important parameters include:

- Cutting speed
- Feed
- Depth of cut
- Tool geometry
- Workpiece material

7.2 Facing

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

7.3 Drilling

Drilling produces holes of specified diameter and depth.

7.4 Threading

Threading produces internal or external threads according to the component drawing.

7.5 Grooving

Grooving creates a narrow recess on the component.

7.6 Chamfering

Chamfering removes sharp edges and provides the required edge geometry.

7.7 Parting-Off

Parting-off separates the finished component from the bar stock.

8. Role of the Traub Machine Operator

The operator plays an important role in production and quality.

Major responsibilities include:

1. Checking raw material.
2. Loading material into the machine.
3. Setting cutting tools.
4. Setting machine parameters.
5. Checking tool condition.
6. Monitoring the machining cycle.
7. Checking first-off components.
8. Removing finished components.
9. Performing in-process inspection.
10. Identifying abnormal machining conditions.
11. Replacing worn tools.
12. Maintaining workplace safety.
13. Recording production and rejection information.

9. Quality Inspection of Automobile Components

Quality inspection is essential because automobile components must meet specified dimensions and functional requirements.

The general inspection procedure is:

Drawing → Specification → Measurement → Comparison with Tolerance → Accept/Reject → Corrective Action

Important quality characteristics

- Overall dimensions
- Diameter
- Length
- Thread dimensions
- Hole diameter
- Groove dimensions
- Chamfer dimensions
- Surface finish
- Visual appearance

10. Measuring Instruments

The following instruments can be used for inspection depending on the component and tolerance:

Vernier Caliper

Used for measuring:

- Outside dimensions
- Inside dimensions
- Step dimensions
- Overall length

Micrometer

Used for accurate measurement of external dimensions such as shaft diameters.

Thread Gauges

Used for checking threaded components.

Plug Gauges

Used for checking hole dimensions.

Ring Gauges

Used for checking external cylindrical dimensions.

Height Gauge

Used for accurate dimensional and height measurements when appropriate.

11. First-Piece Inspection

First-piece inspection is an important quality-control activity after machine setup.

The procedure is:

Machine Setup



Produce First Component



Measure Critical Dimensions



Compare With Drawing



Adjustment if Required



Start Batch Production

This approach helps prevent the production of a large number of defective components.

12. In-Process Quality Inspection

During production, selected components are periodically inspected.

For example:

Parameter	Inspection Method
Outside diameter	Micrometer
Length	Vernier caliper
Hole diameter	Plug gauge
Thread	Thread gauge
Groove	Vernier/special gauge
Surface condition	Visual inspection
Burrs	Visual/tactile inspection

The actual instruments and inspection frequency should be replaced with the values observed during your training.

13. Common Machining Defects

13.1 Dimensional Variation

Causes:

- Tool wear
- Incorrect tool setting
- Improper feed
- Machine vibration
- Thermal variation

13.2 Poor Surface Finish

Causes:

- Worn cutting tool
- Incorrect cutting speed
- Excessive feed
- Machine vibration
- Improper coolant

13.3 Burr Formation

Burrs can occur after drilling, turning or parting operations.

13.4 Incorrect Thread

Possible causes include:

- Incorrect tool setting
- Tool wear
- Improper synchronization

- Incorrect machine setup

13.5 Taper

A diameter difference along the length of a component can occur because of incorrect tool alignment, work-holding problems or machine conditions.

14. Tool Wear and Its Effect on Quality

Tool wear is one of the major factors affecting machining quality.

As the cutting tool becomes worn:

Tool Wear ↑ → **Dimensional Variation** ↑ →

Surface Quality ↓ → **Rejection Risk** ↑

Therefore, the operator should continuously monitor:

- Cutting-edge condition
- Surface finish
- Component dimensions
- Cutting sound
- Chip formation
- Tool life

Tool replacement should be based on appropriate process-control criteria rather than waiting until defective components are produced.

15. Production and Quality Analysis

Production performance can be evaluated using the following parameters.

Production Rate

$$\text{Production Rate} = \frac{\text{Total Components Produced}}{\text{Total Production Time}}$$

Rejection Percentage

$$\text{Rejection Percentage} = \frac{\text{Rejected Components}}{\text{Total Components Produced}} \times 100$$

Acceptance Percentage

$$\text{Acceptance Percentage} = \frac{\text{Accepted Components}}{\text{Total Components Produced}} \times 100$$

Productivity

$$\text{Productivity} = \frac{\text{Output}}{\text{Input}}$$

For your actual research paper, these equations can be applied to your **real production and inspection data**.

16. Proposed Quality-Control Flow

The recommended quality-control system for Traub-

machined automobile components is:

Raw Material Inspection



Machine Setup



First-Piece Inspection



Batch Production



In-Process Inspection



Tool-Wear Monitoring



Final Inspection



Segregation of Rejected Components



Rework / Corrective Action



Accepted Component



Packing & Dispatch

17. Results and Discussion

The study shows that Traub automatic machining can provide an effective method for producing large quantities of precision turned components. The machine's automatic operation reduces repetitive manual work and allows a defined sequence of machining operations.

However, production efficiency must be combined with systematic quality inspection. Even when the machine is properly set, tool wear, incorrect setup, material variation and machine vibration can influence component dimensions.

Therefore, **first-piece inspection and periodic in-process inspection** are important for maintaining consistent component quality.

The relationship can be represented as:

Correct Machine Setting + Proper Tooling + Skilled Operator + Inspection = Consistent Component Quality

18. Safety Practices

The following safety practices should be followed during Traub-machine operation:

1. Wear appropriate PPE.
2. Do not touch rotating components.
3. Keep hands away from moving tools.
4. Use proper methods for chip removal.
5. Do not measure a rotating component.
6. Stop the machine before tool adjustment.
7. Maintain proper housekeeping.
8. Check coolant and lubrication.
9. Use guards wherever provided.
10. Follow standard operating procedures.

19. Recommendations

Based on the study, the following improvements can be considered:

- Implement regular tool-life monitoring.
- Maintain machine-setting sheets.
- Use first-piece approval before batch production.
- Maintain inspection records.
- Use poka-yoke where possible.
- Improve workplace housekeeping.
- Maintain preventive-maintenance schedules.
- Use statistical process control for critical dimensions.
- Monitor rejection and rework trends.
- Provide regular operator training.

20. Future Scope

Future improvements in precision automobile-component manufacturing may include:

- CNC/automatic machine integration
- Automatic tool-wear monitoring
- Online dimensional measurement
- Vision-based inspection
- IoT-based machine monitoring
- Statistical Process Control (SPC)
- Predictive maintenance
- Digital production records
- Automated component sorting
- AI-assisted defect detection

These technologies can improve traceability, productivity and consistency while reducing manual inspection effort.

21. Conclusion

The study of Nikhil Industries provides an understanding of the role of **Traub automatic machining in automobile-component manufacturing**. Publicly available industrial listings identify Nikhil Industries in Ahilyanagar as a manufacturing business associated with Traub-machine turned components and fully machined components.

The study demonstrates that successful production of precision automobile components depends on proper machine setup, suitable cutting tools, correct machining parameters, tool-condition monitoring and systematic quality inspection.

The role of the Traub machine operator is therefore not limited to operating the machine. The operator also contributes to **process monitoring, first-piece inspection, dimensional checking, defect identification, tool management and production quality**.

A combination of **efficient machining + skilled operation + dimensional inspection + preventive maintenance + process control** is essential for

achieving consistent quality in automobile-component manufacturing.

References

1. Nikhil Industries, public business/manufacturing registration information, Maharashtra.
2. Industrial listing for Nikhil Industries, Ahilyanagar — Traub Machine Turned Components.
3. Industrial listing for Nikhil Industries, Ahilyanagar — Fully Machined Components and precision jobs on Traub.
4. Technical information on Traub automatic machining and applications in precision components.
5. Technical information on Traub job work, machining operations and automotive applications.