INDUSTRIAL SOLUTIONS LABORATORY

Company Information

Company Name	*Bosch PowerTools*	**Date Submitted**	*5/1/2023*
Project Title	*Design and Prototype of a Precision Measuring Device* ***(BOSCH_MEASURE)***	**Planned Starting Semester**	*Fall 2023*

Senior Design Project Description

Personnel

Typical teams will have 4-6 students, with engineering disciplines assigned based on the anticipated Scope of the Project.

Please provide your estimate of staffing in the below table. The Senior Design Committee will adjust as appropriate based on scope and discipline skills.

Discipline	Number	Discipline	Number
Mechanical	3	Electrical	
Computer	2	Systems	

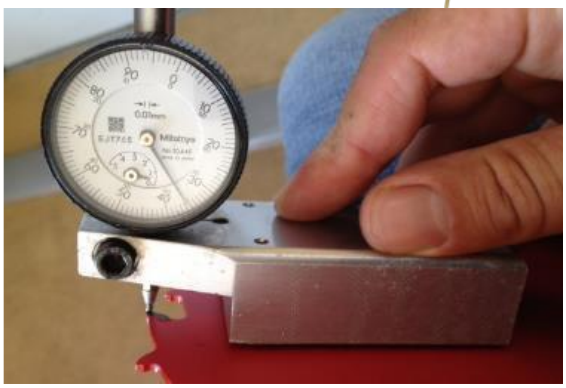
Company and Project Overview:

The Power Tools Division of the Bosch Group is the world market leader for power tools and power tool accessories. Bosch Tool Corporation's plant in Lincolnton, NC focusses primarily on the manufacturing of power tool blades such as circular saw blade, reciprocating saw blade, and other accessories such as sander belts, Dremel bits and other rotary tools. This project is related to the production of circular saw blades.

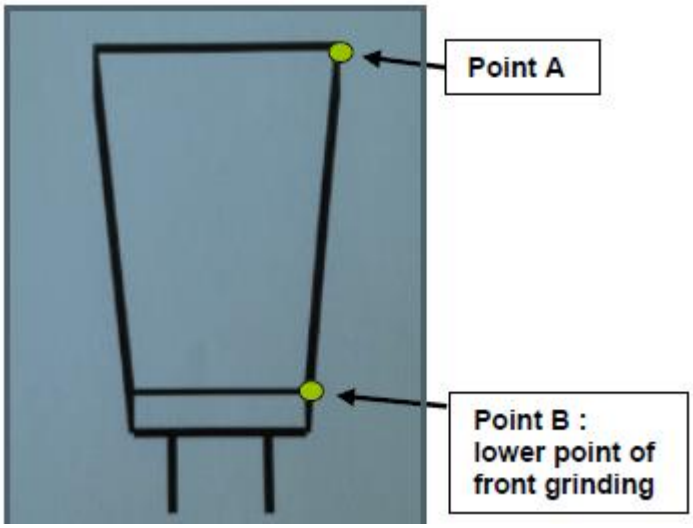
Project Requirements:

For circular saw blade production, one of the most crucial processes is grinding the carbide tips. For them to cut correctly, they need to be ground with two relief angles on the tip. Those angles are called Top to Bottom (TTB) and Front to Back (FTB). To measure these, we are currently using a manual dial indicator with a fixture which leads to too much human error.

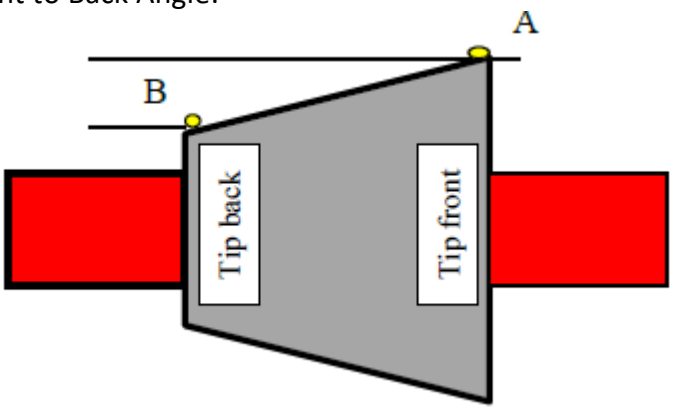
Example of the current measuring device:



Top to Bottom Angle:



Front to Back Angle:



If the angle is not ground correctly, it will lead to quality of cut issues. The distance between

A to B is approximately 3.5mm on the TTB angle and it is approximately 1.5mm on the FTB angle.

Expected Deliverables/Results:

- A device that is repeatable and eliminates the human error that is inflicted on the manual measuring. Perform a Gauge Repeatability and Reproducibility study.
- A device that holds the blade in the correct orientation for all measurements.
- Digital callout for the operators to read
- Training video for how to operate and maintain the machine
- All drawings, BOM's and software provided.

Disposition of Deliverables at the End of the Project:

Students are graded based on their display and presentation of their team's work product. It is mandatory that they exhibit at the Expo, so if the work product was tested at the supporter's location, it must be returned to campus for the Expo. After the expo, the team and supporter should arrange the handover of the work product to the industry supporter. This handover must be concluded within 7 days of the Expo.

List here any specific skills, requirements, specific courses, knowledge needed or suggested (If none please state none):

- Interest in controls and automation design
- Interest in Precision Metrology
- Team will be required to travel to the Bosch facility in Lincolnton, NC. Travel will be reimbursable by following the procedures in the Purchasing lecture.