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Lathe Centering Tool

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***Abstract* - As India trying to solve the problem of unemployment without looking to manufacturing sector it won"t happen and enhancing the productivity through innovation and also enhance the competitive edge and tapping onto export business for engineering. Lathe is the oldest machine tool with certain machining operation and increasing the productivity on the operation mechanism through small changes of the process. With the thorough observation the starting process of machining is centering and lean changes can also improves productivity.**

Keywords - Component; Lathe Machine, Tool Post, Chuck, Cutting Tool

INTRODUCTION

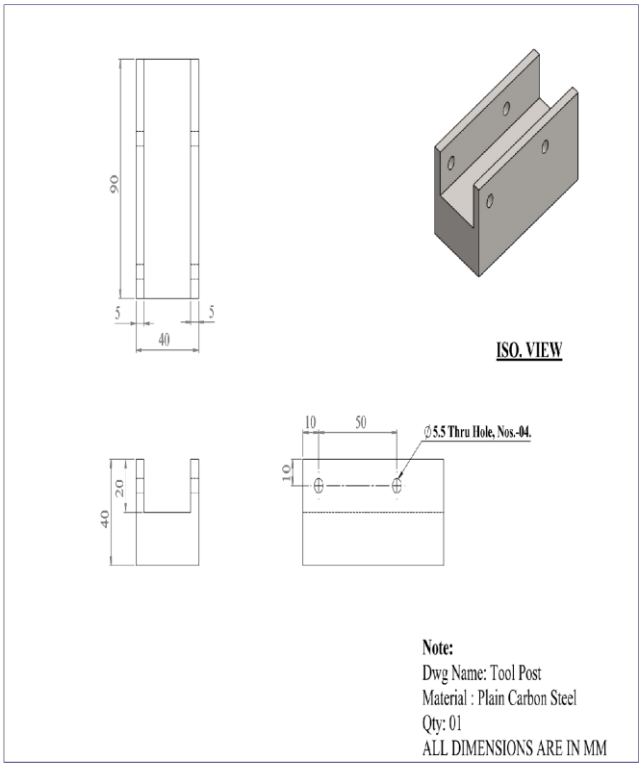
The lathe is one of the most essential machine tools. This multipurpose equipment is commonly used for executing a wide range of functions that includes shaping many solid substances such as wood, metal, etc. It is an important workshop tool which is extensively utilized in several industrial segments and especially in the metal shaping industries.

DEFINITION

As lathe is the most conventional machine which remove chips from the job and chips is removed and desired shape is obtain on it. Beginning the procedure to start operation on lathe requires the centering of tool through proper balancing and taking the single point cutting tool to centre of job piece. It requires certain time at the beginning of process. If we are making a customized product than it would increase the time to adjust the tool and also more number of time we have to adjust that tool , so we are designing this tool to decrease overall time to manufacture product.

PROJECT PURPOSE

This project leads to:
More productivity of crops
Reduction in time
Less labor work
Affordable equipment



The purpose is to reduce the time consumption and make pro- duct most effective.

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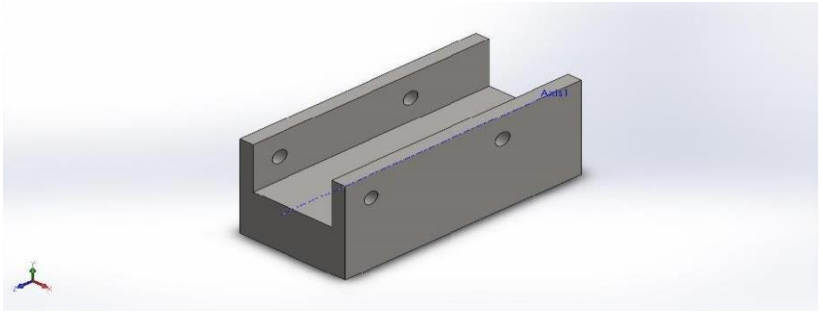
DESIGN AND CALCULATION

Simulation of Tool Post



Document Name and Reference	Treated As	Volumetric Properties	Document Path/Date Modofied
L Pattern 1	Solid Body	Mass:0.698294 kg Volume:8.95248e-005m^3 Weight:6.84328 N	D:\Laptop Backup_Oct 2017\DPP\BE Project_2018\git student\Tool Post.SLDPR Oct 12 09:45:42 2018

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Study Properties

Study name	Static 1	
Analysis type	Static	
Mesh type	Solid Mesh	
Thermal Effect:	On	
Thermal option	Include temperature loads	
Zero strain temperature	298 Kelvin	
Include fluid pressure effects from	Off	
SOLIDWORKS Flow Simulation		
Solver type	FFEPlus	
Inplane Effect:	Off	
Soft Spring:	Off	
Inertial Relief:	Off	
Incompatible bonding options	Automatic	
Large displacement	Off	
Compute free body forces	On	
Friction	Off	
Use Adaptive Method:	Off	
Result folder	SOLIDWORKS document (D:\Laptop	
	Backup_Oct 2017\DPP\BE Project_2018\git	
	student)	

Units

Unit system:	SI (MKS)
Length/Displacement	Mm
Temperature	Kelvin
Angular velocity	Rad/sec
Pressure/Stress	N/m^2

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I. RESULTANT FORCES

Reaction forces

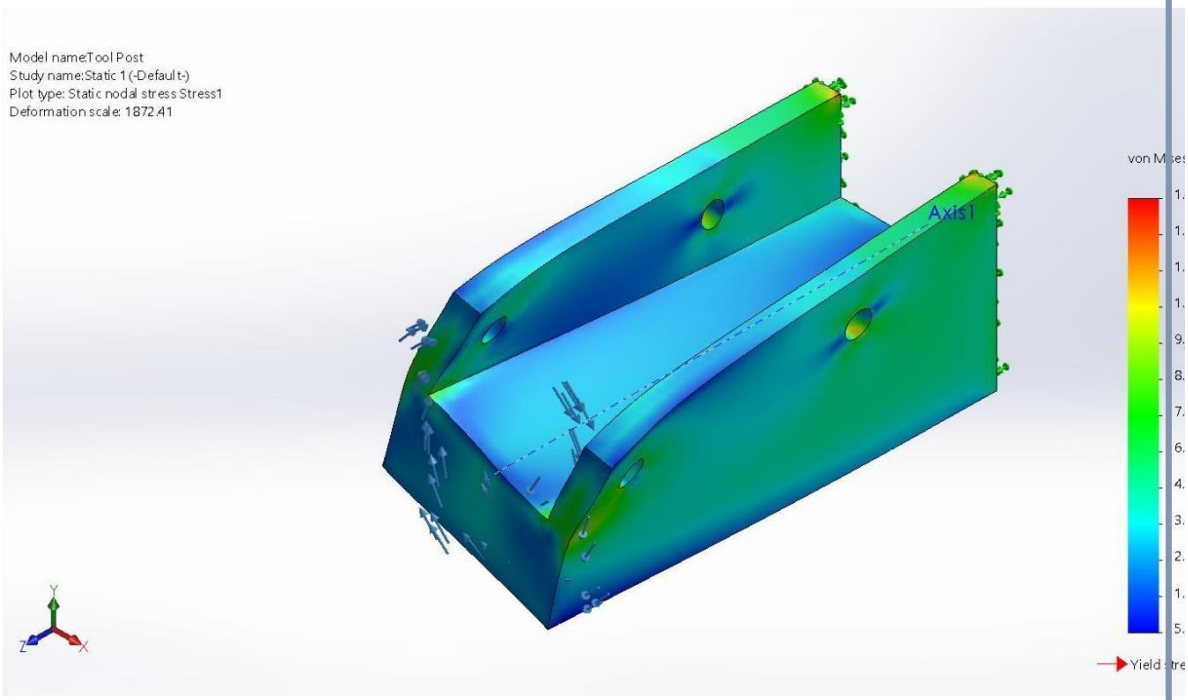
Selection set	Units	Sum X	Sum Y	Sum Z	Resultant
Entire Model	N	470.425	-0.242937	-0.0734186	470.425

Reaction Moments

Selection set	Units	Sum X	Sum Y	Sum Z	Resultant
Entire Model	N.m	0	0	0	0

STUDY RESULTS

Name	Type	Min	Max
Stress1	VON: von Mises Stress	57104.3 N/m^2 Node: 603	1.47901e+007 N/m^2 Node: 151



Tool Post-Static 1-Stress-

Name	Type	Min	Max
Displacement1	URES: Resultant Displacement	0 mm Node: 151	0.00557972 mm Node: 1322

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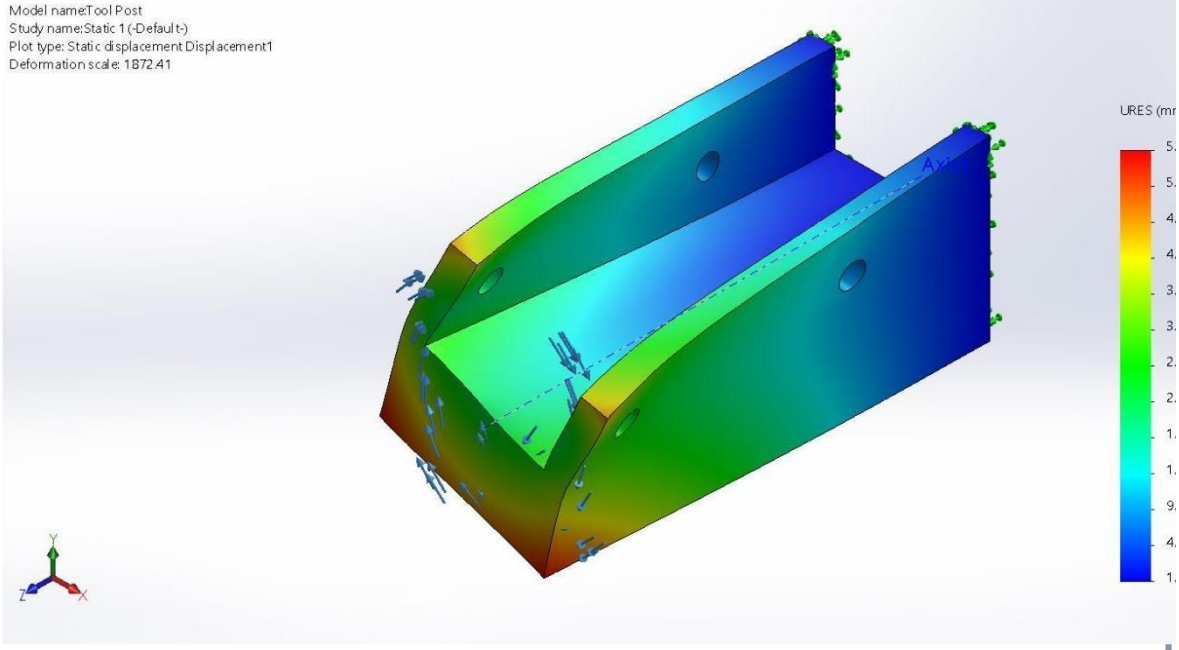
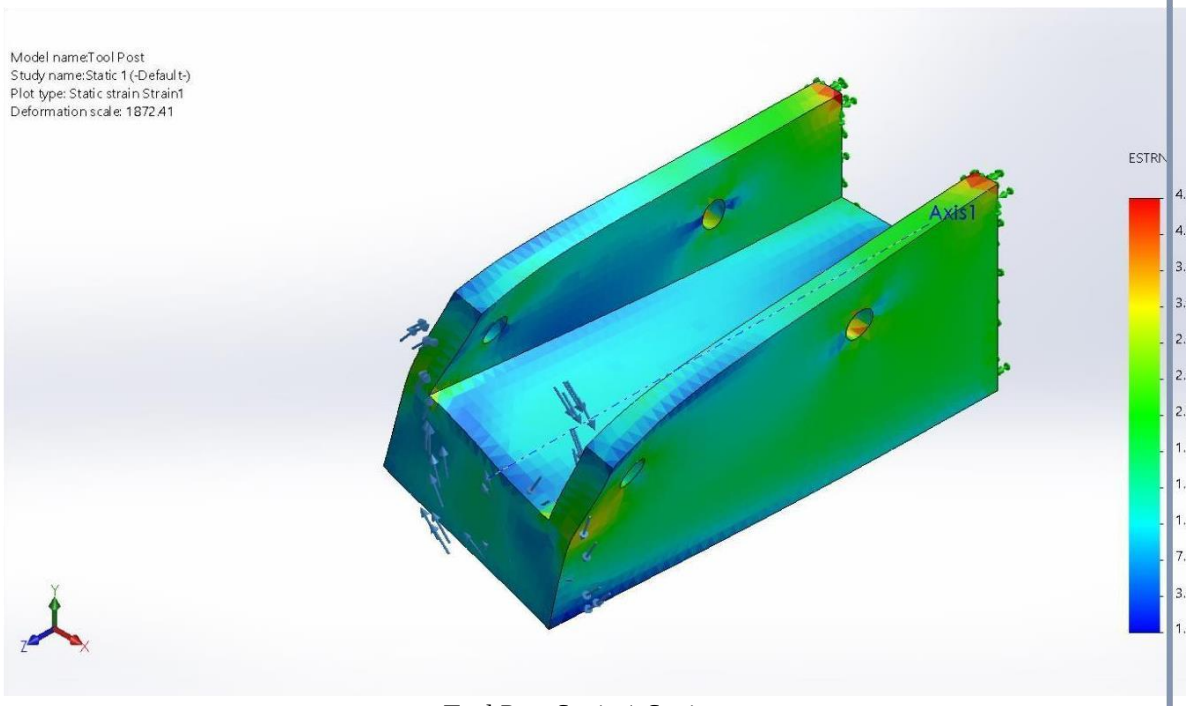


Tool Post-Static 1-Displacement-Displacement1

Name	Type	Min	Max
Strain1	ESTRN: Equivalent Strain	1.98638e-007 Element: 15353	4.3937e-005 Element: 6257



Tool Post-Static 1-Strain-

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CONCLUSION

After the observation of lathe machines in industries we found some problem regarding the tool cantering in lathe. One of the major issue was the time consuming process of fixing the tool in tool post at required level with the help of the strips. In order to get required height of the tool, worker has to set the number of strips below the tool which quantity is unknown so worker has to perform that particular task number of times just to set the tool. so we decided to fix this problem by eliminating the process of resting the strips below the tool. We design the tool post in which strips are not required and tool can be set in less time. The design required some essential analysis in solid work software for safety and performance of actual working model of our design. In process of analysis we have to change our design certain time for removing flaws from our design model.

REFERENCES

[1] HOLE SPACNG AND CENTERNG DEVICE by Henry Timpner, Milwaukee, Wis., assignor of one half to Robert F. Xainz, Milwaukee, Wis. Oct. 7, 1952.
[2] ANTIFRCTION SCREWAN NUT ASSEASY by Daniel F. Greby, Chicago, ii., assigicor, by mesae assign neigis, to Textron Eric Providence, R.E., a corporation of Rhode island, July 6, 1965.
[3] SELF-CENTERING CHUCK Kurt Reich, Dusseldorf, Germany, assignor to Paul Forkardt Kommanditgesellschaft, Dusseldorf, Germany, Dec. 2, 1969.
[4] LATHE CENTER DEVICE AND METHOD Claus Staplemann, Dover, N.J., assignor to Climax Engineering Co., Goleta, Calif. Oct. 5, 197.
[5] SCREW AND NUT MECHANISM , Inventor: Sven W. Nilsson, Partille, Sweden, Assignee: SKF Nova AB, Goteberg, Sweden , Dec. 21, 1982.
[6] DEVICE FOR POSITIONING AND LOCKING TURNING, MILLING OR OTHER TOOL HOLDERS ON TO MOBILE LATHE-MACHINING CENTER SLIDES WITH AN INTERNAL SPINDLE, Inventor: Alberto Cattani, Modena, Italy Assignee: Comau S.p.A., Grugliasco, Italy, Jun. 24, 1986.
[7] TOOL HOLDER ON WHICH NONROTATIONAL TOOL OF MACHINING CENTER IS MOUNTED Applicant: FANUC Corporation, Yamanashi (JP), Jun. 14, 2016.