FINAL PROJECT (SOLIDWORKS)

FULL NAME	**-**	**Chehal Lalindra Jayasuriya**
COURSE TITLE	**-**	**Solidworks**
BATCH CODE	**-**	**OLB11SW22**

Assignment cover page

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ASSIGNMENT

Course Title	SOLIDWORKS		
Project Title	Final Project		
Student Name	Chehal Lalindra Jayasuriya		
Assessor Name	**Ms:Kalani Dayawansha**		
Batch Code	OLB11SW22	**Student ID**	
Issue Date	31 / 07 / 2022	**Submit Date**	15 / 09 / 2022

☐	**Student's declaration prior to handing-in of assignment:** ❖ I certify that the work submitted for this assignment is my own and not a Plagiarism.
☑	❖ I certify that adequate support was given to me during the assignment through the Institute and/or the Inclusive Education Unit.
☑	❖ I declare that I refused the special support offered by the Institute.

Student Signature:		**Date:**	15 / 09 / 2022

Assessment Criteria	Maximum Mark	Mark Achieved
Criteria 1: Planning of Project Project Title, Ability to design an appropriate design or project, evidence of research or data	20	
Criteria 2: Skills Used Skills preparation & finalizing of materials, use of tools & materials, accuracy of data, design & technical contribution, Management of resources, Experiments used	50	
Criteria 3: Presentation of Project Preparation of presentation Communication and presenting skills, Satisfactory knowledge of construction industry/ field	30	
Total Mark	100	

Assessor's feedback to student

Final Grade	Assessor Signature	Date
Learner's signature upon collection of corrected assignment.		

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2. Part 01 – Base
3. Part 02 – Sliding Jaw
4. Part 03 – Vice Screw
5. Part 04 – Handle Rod
6. Part 05 – Pin
7. Part 06 – Knob
8. Part 07 – Jaw Plate
9. Part 08 – Slide Key
10. Part 09 – Key
11. Part 10 – Collar
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13. Assembly exploded view
14. Final Drawing
15. Simulation drawing
16. Simulation report
17. Curriculum Vitae
18. Course completion and Feedback form

Project Proposal

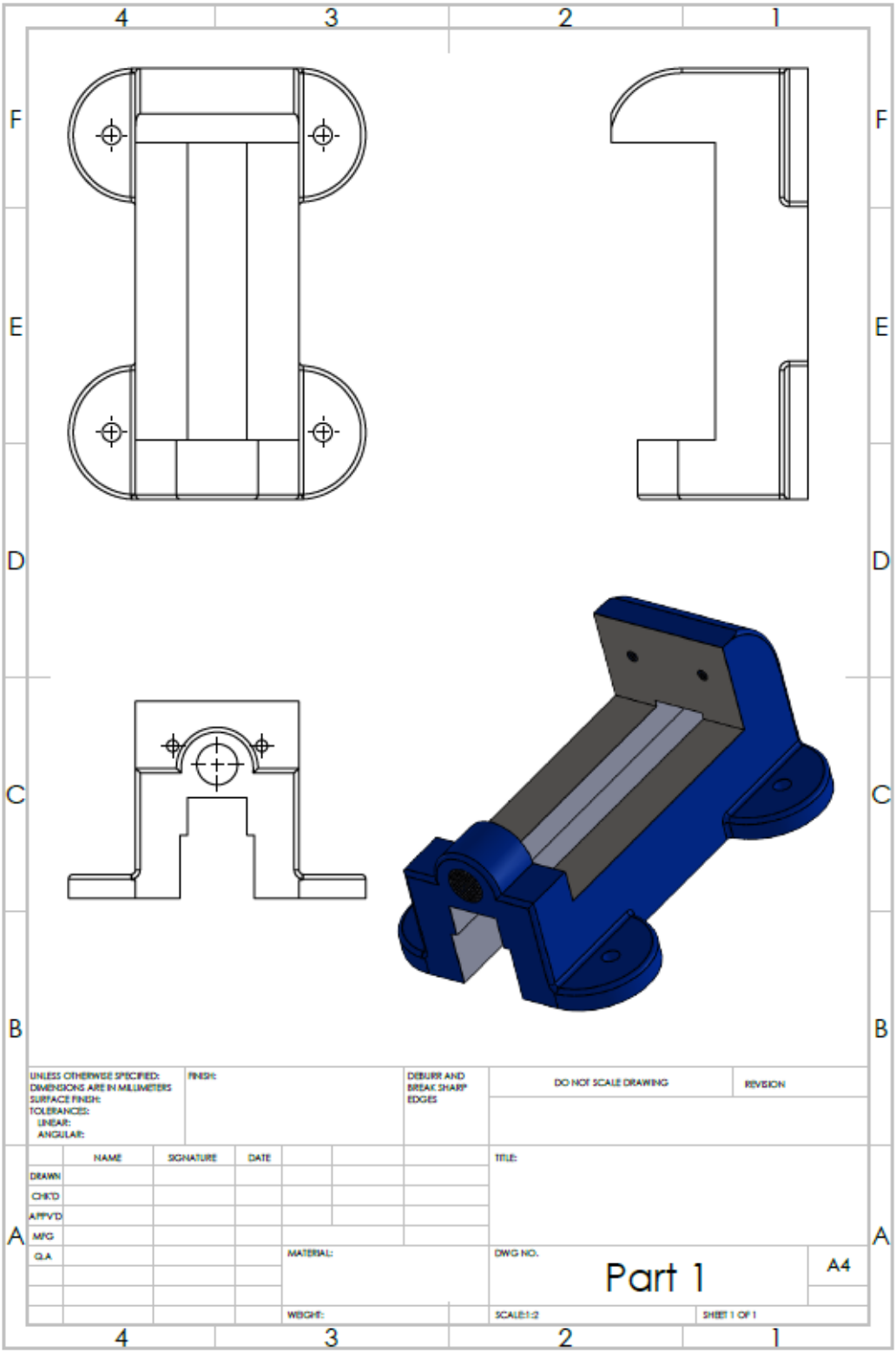
- This project is focused on the design of a bench vise model.

- It consists of eleven components of which the first two are major components and the remaining nine are minor components.

- The screws fixing the Jaw plate to the base and the sliding jaw were derived from the inbuilt toolbox.

- Finally, all the part drawings were assembled to form the bench vise model.

Part 01 – Base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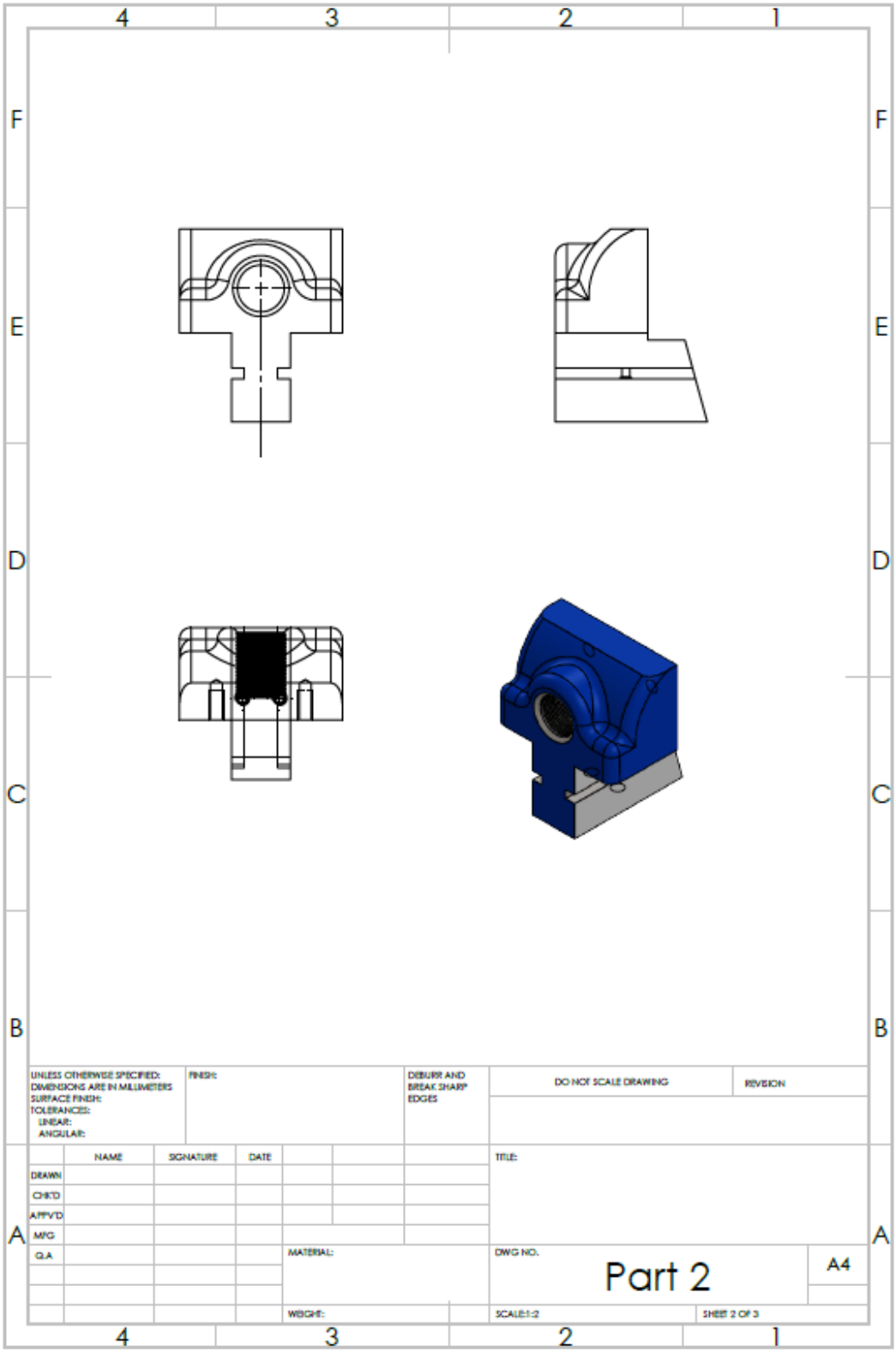
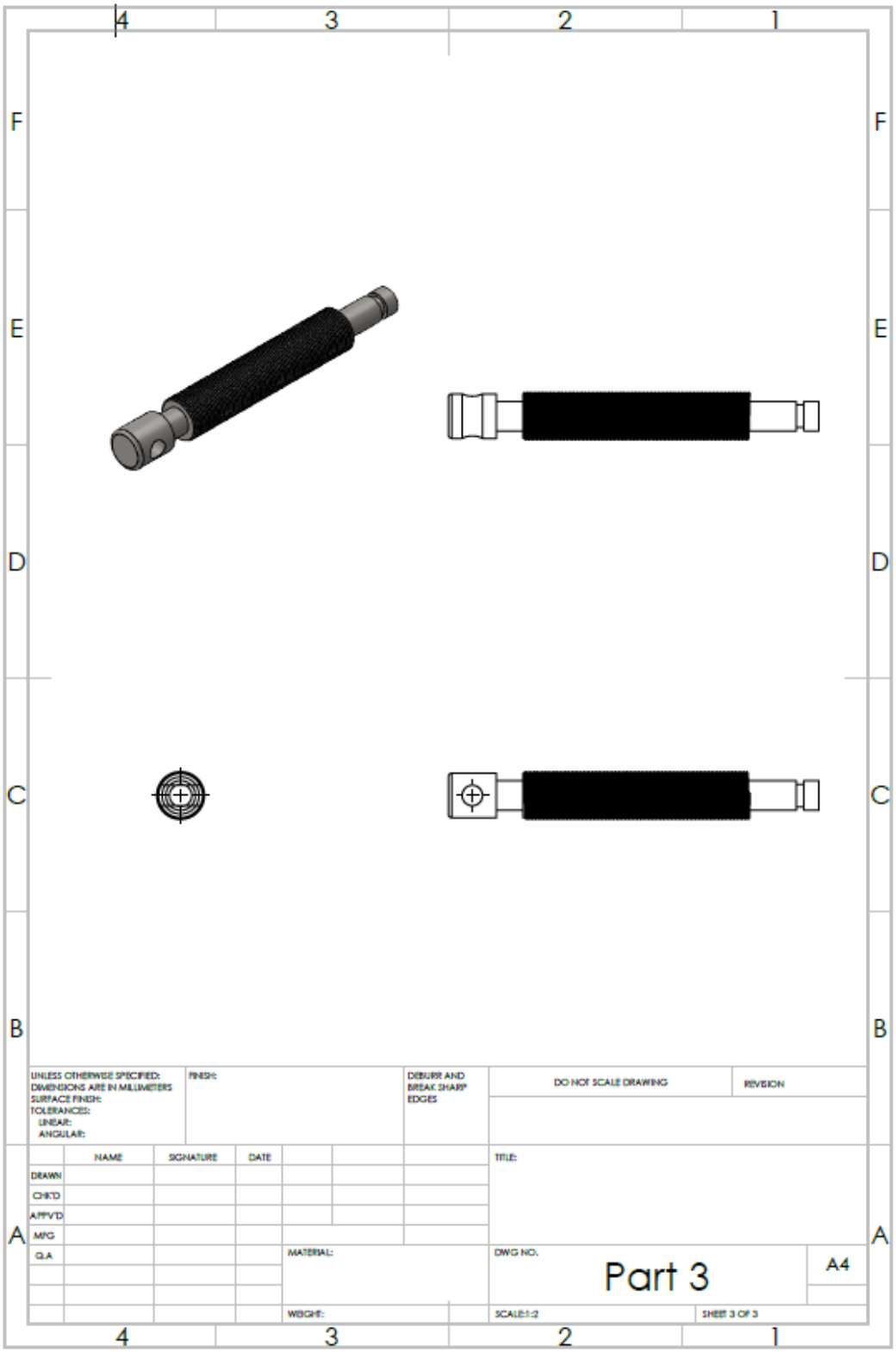
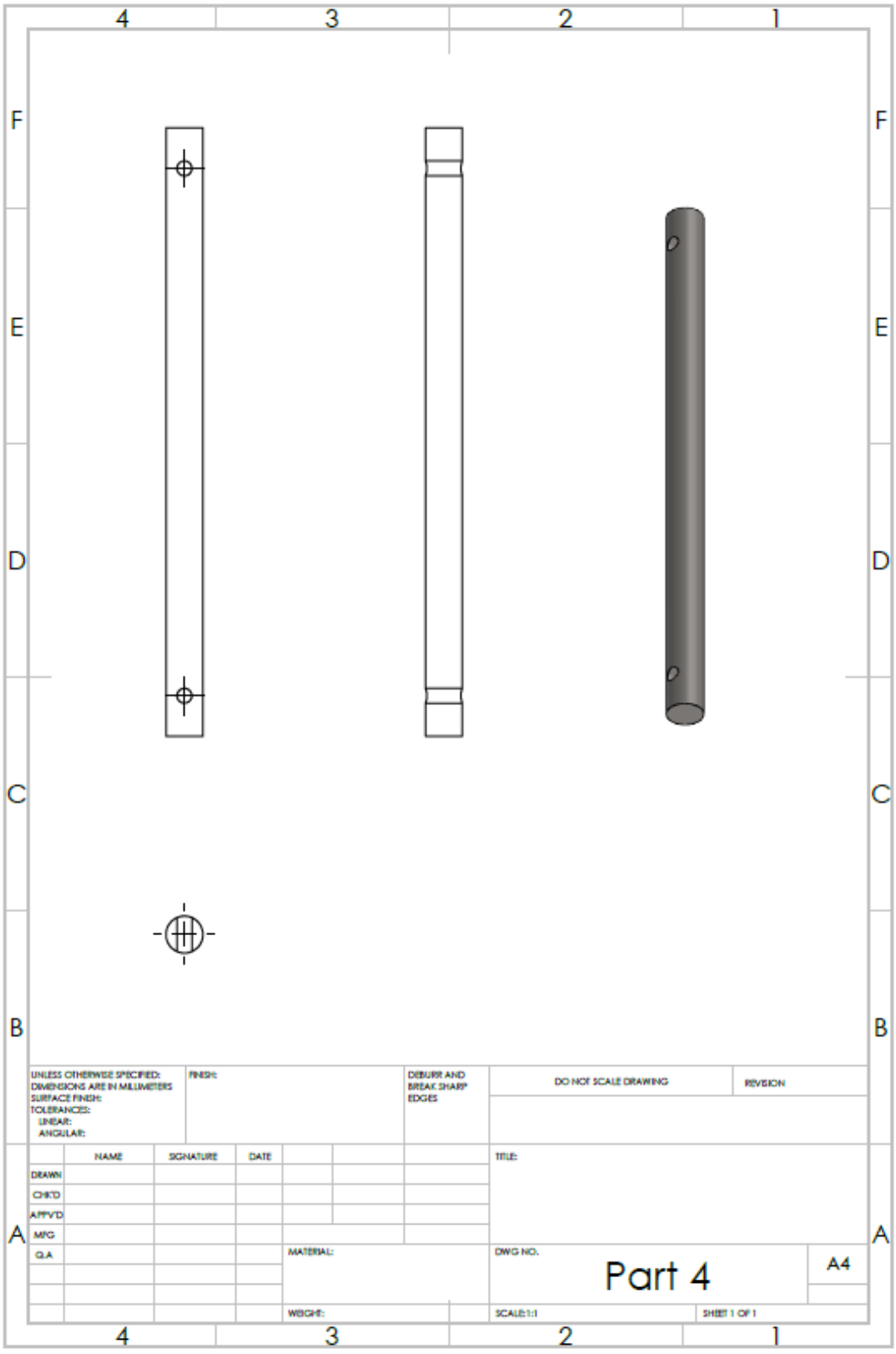
Part 02 – Sliding Jaw



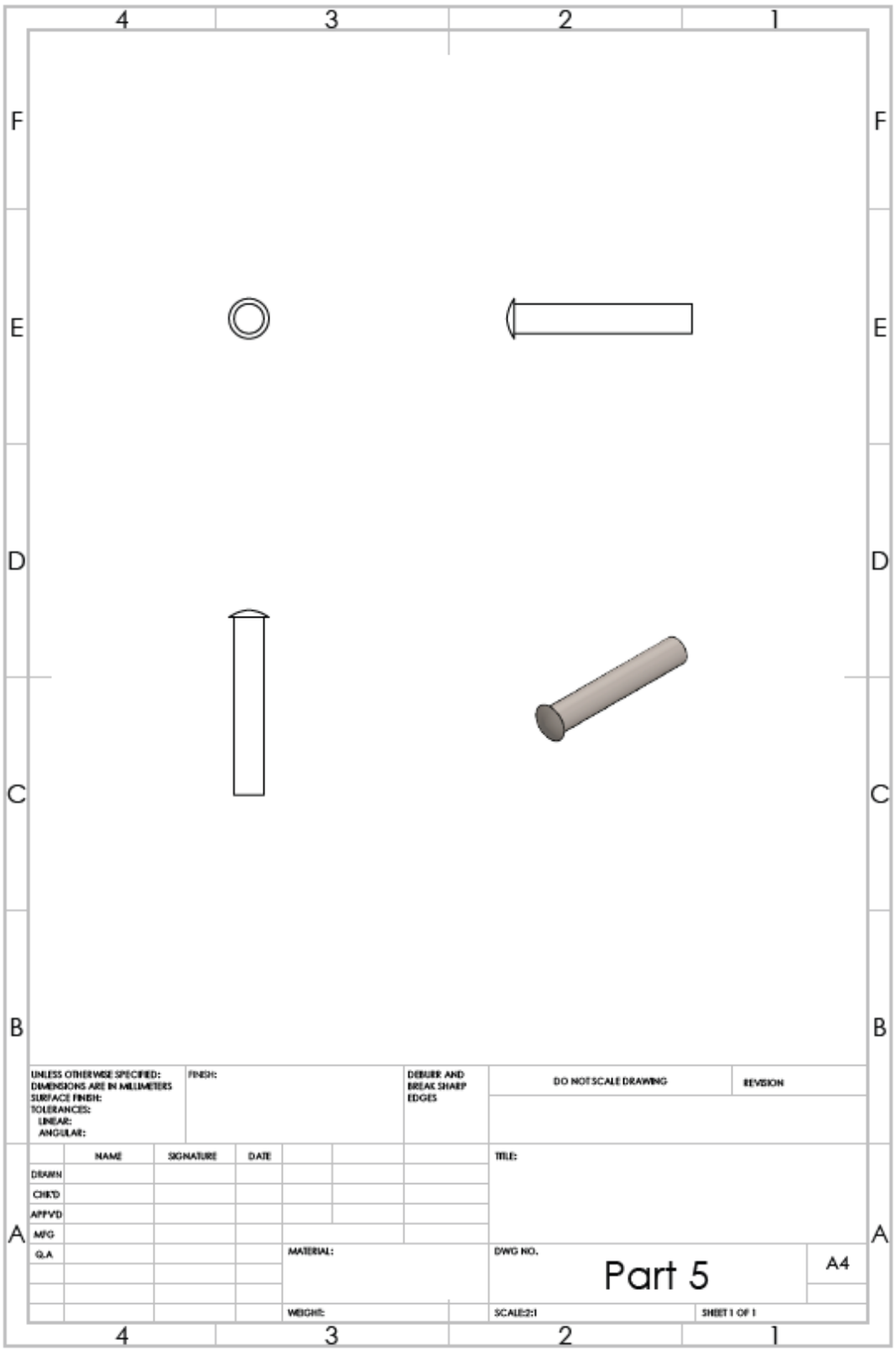
Part 03 – Vice Screw



Part 04 – Handle Rod



Part 05 – Pin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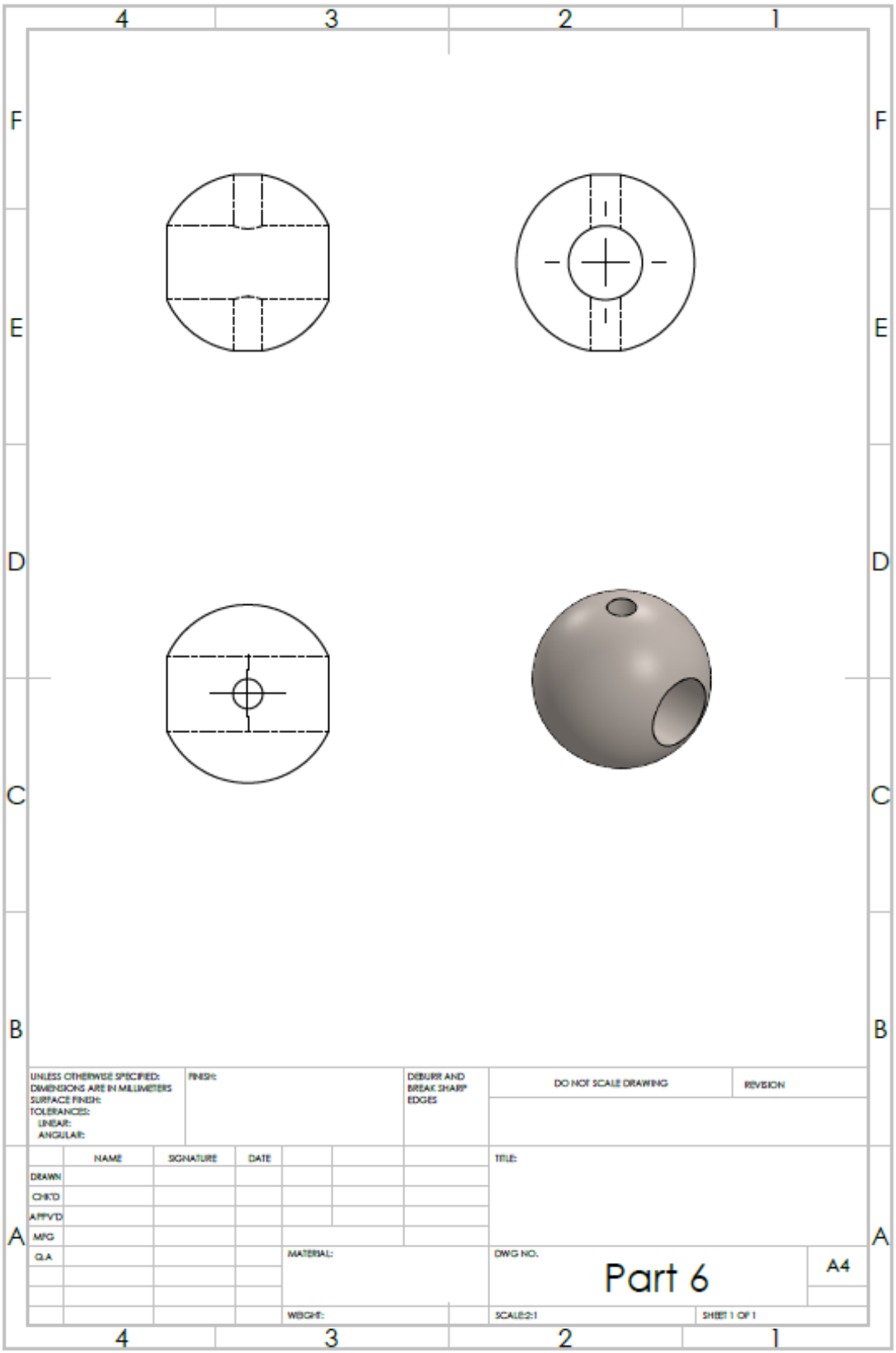
Part 06 – Knob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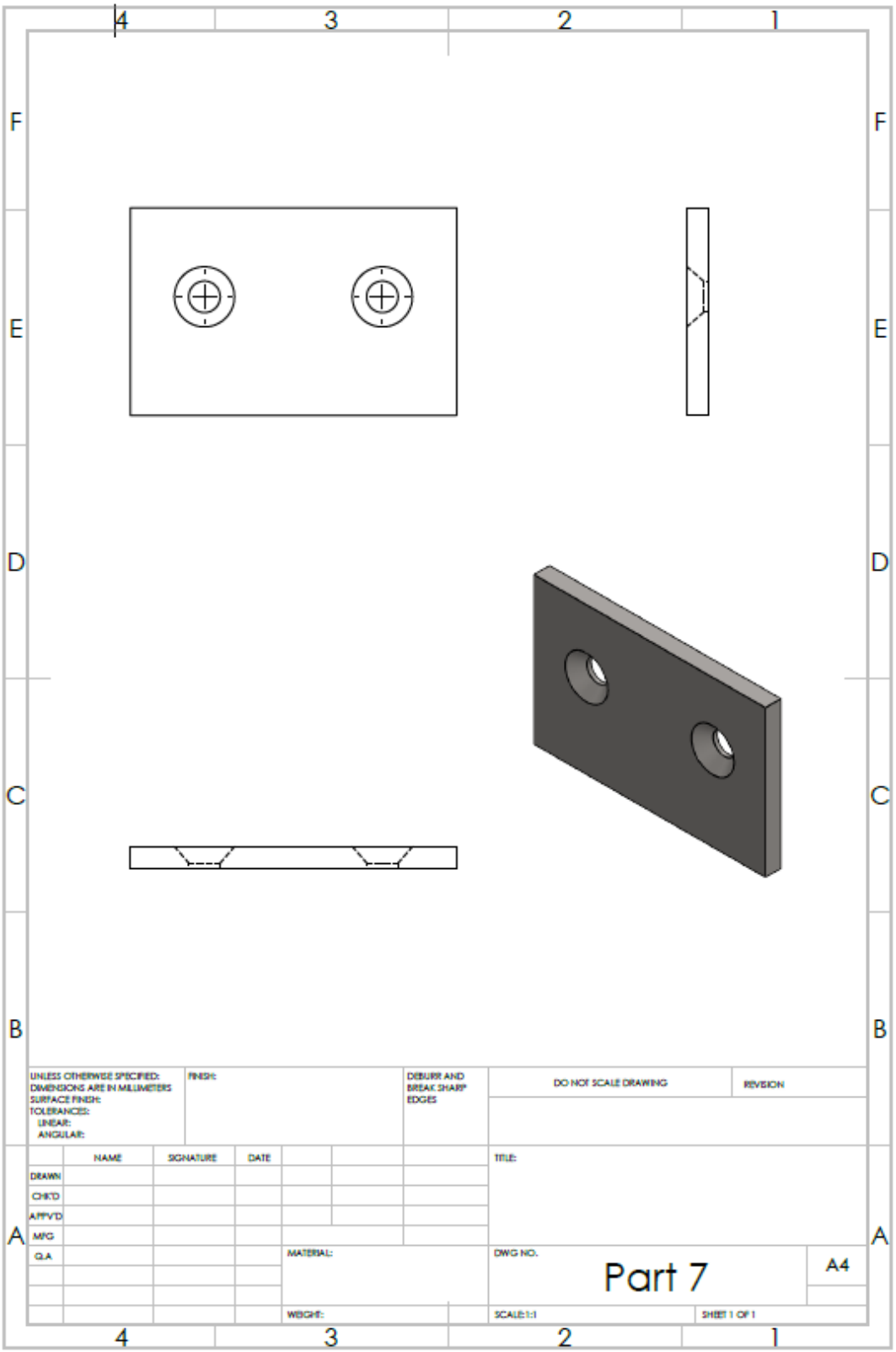
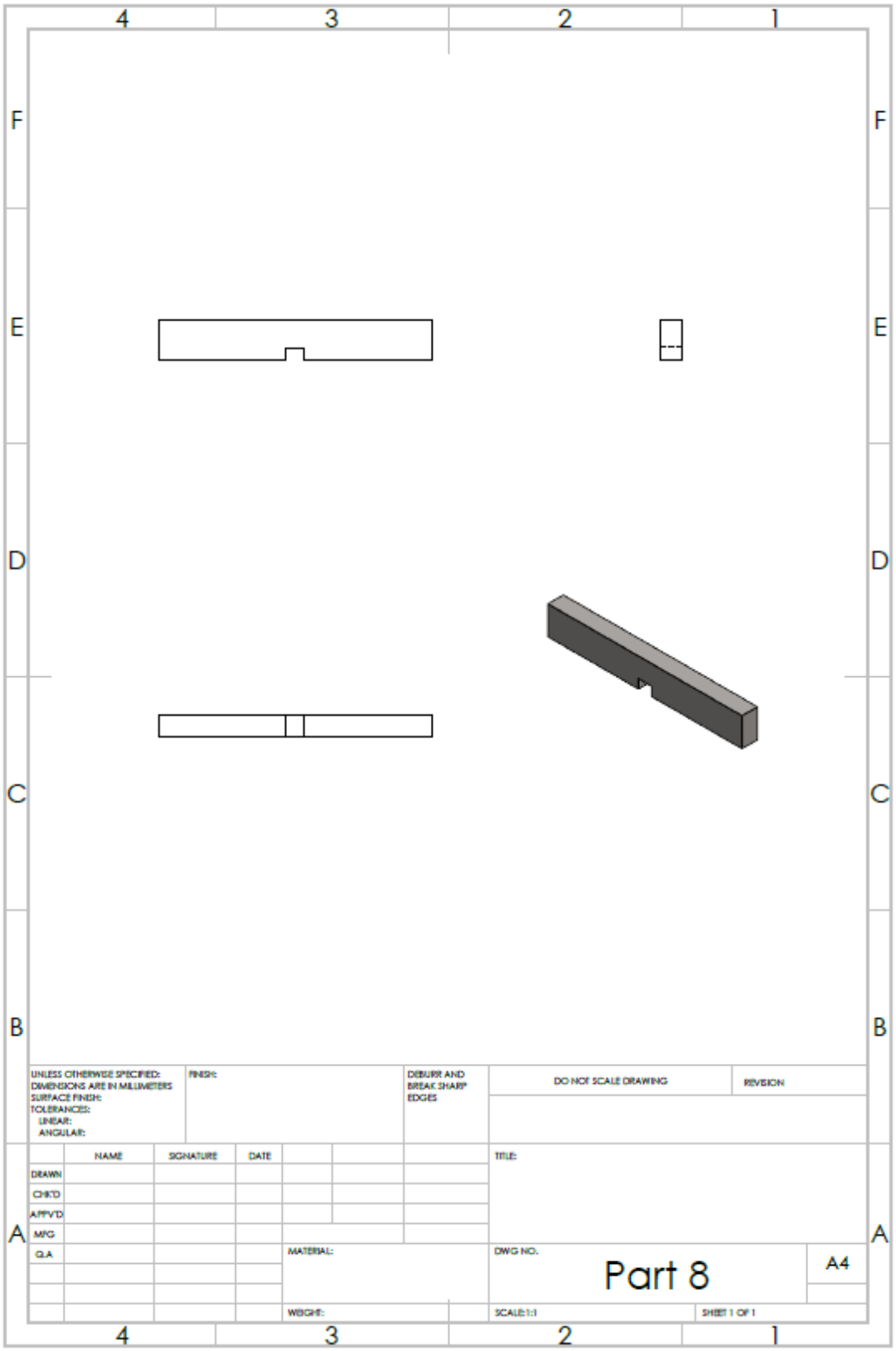
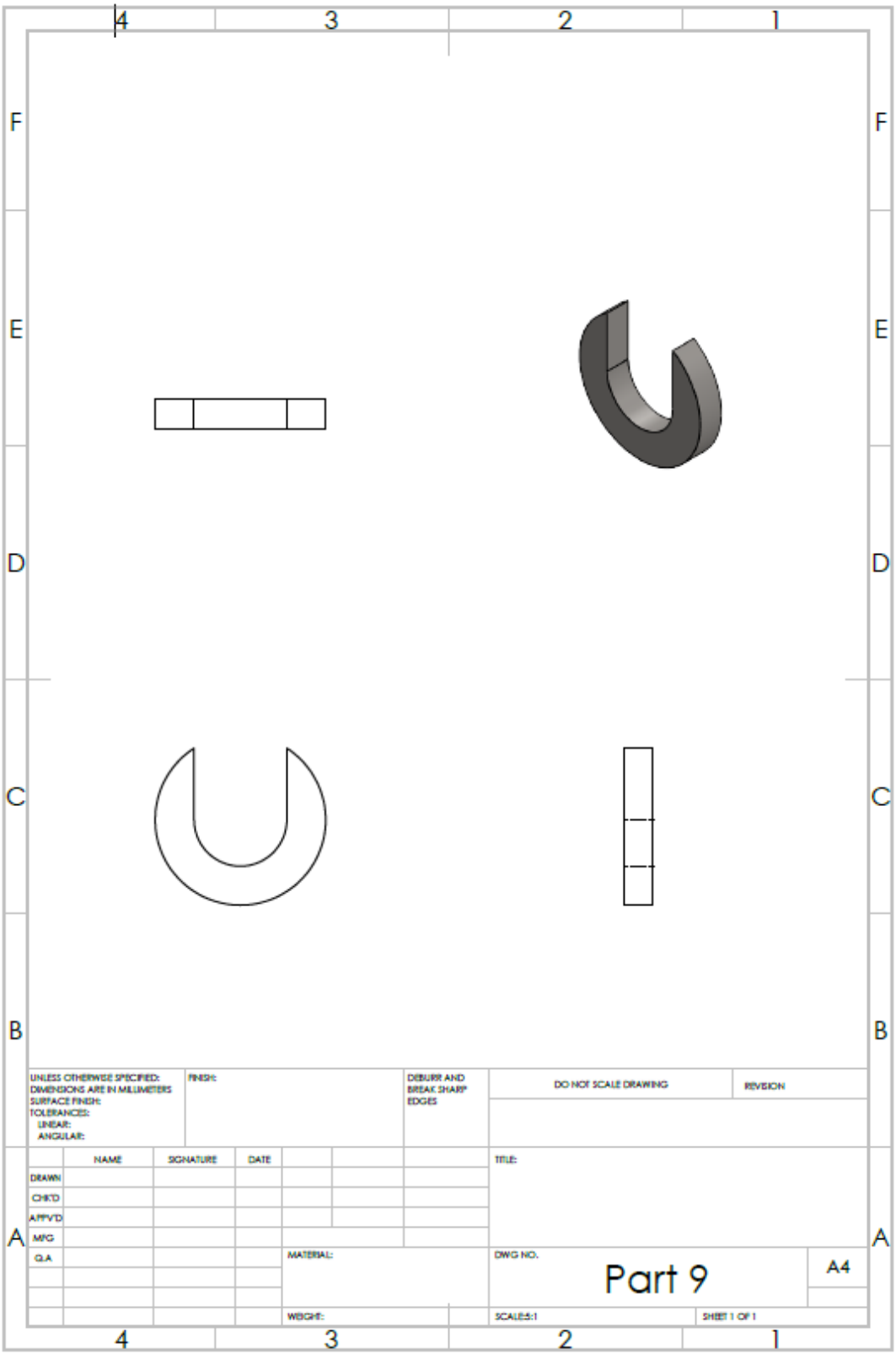
Part 07 – Jaw Plate



Part 08 – Slide Key



Part 09 – Key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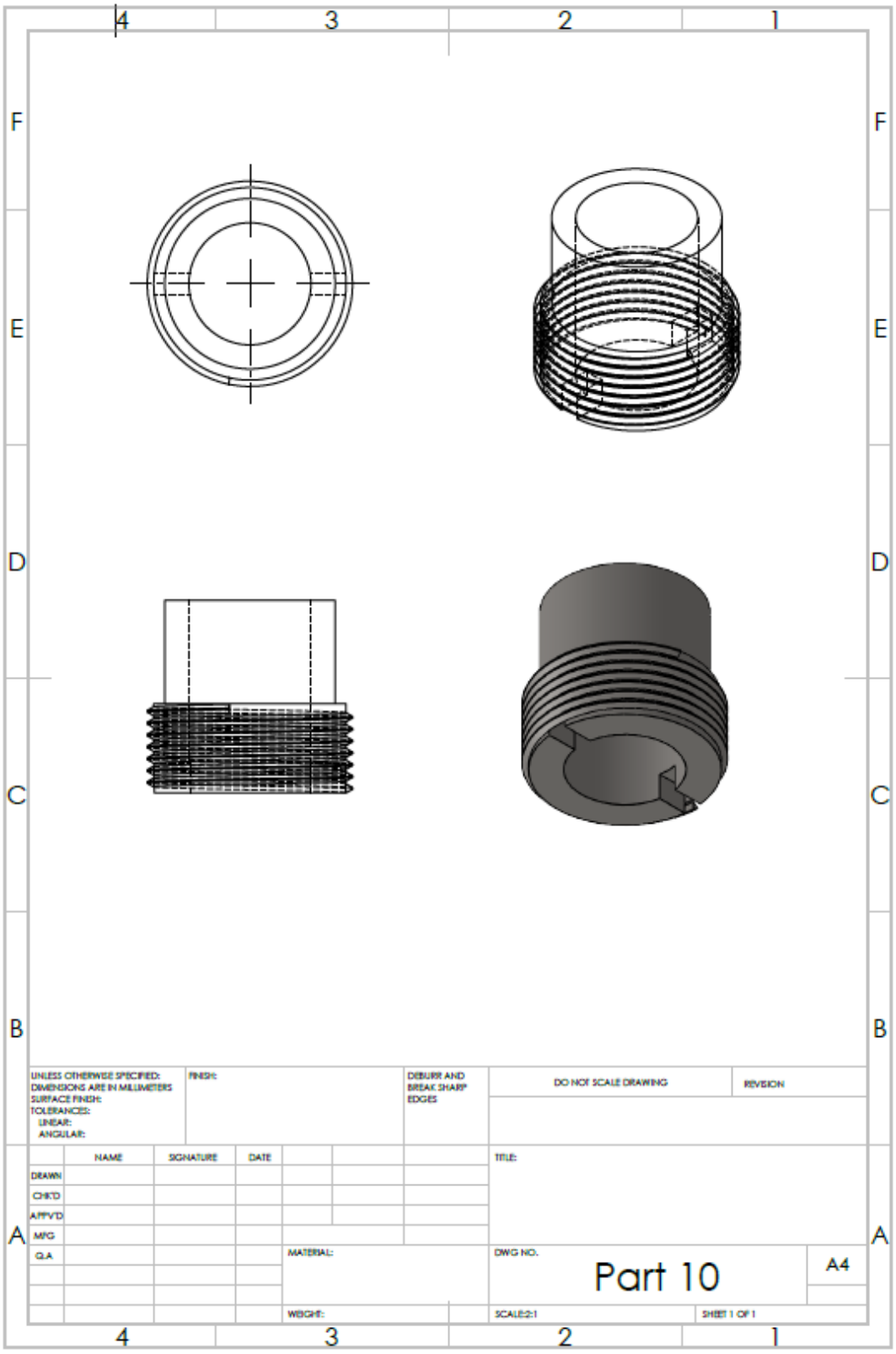
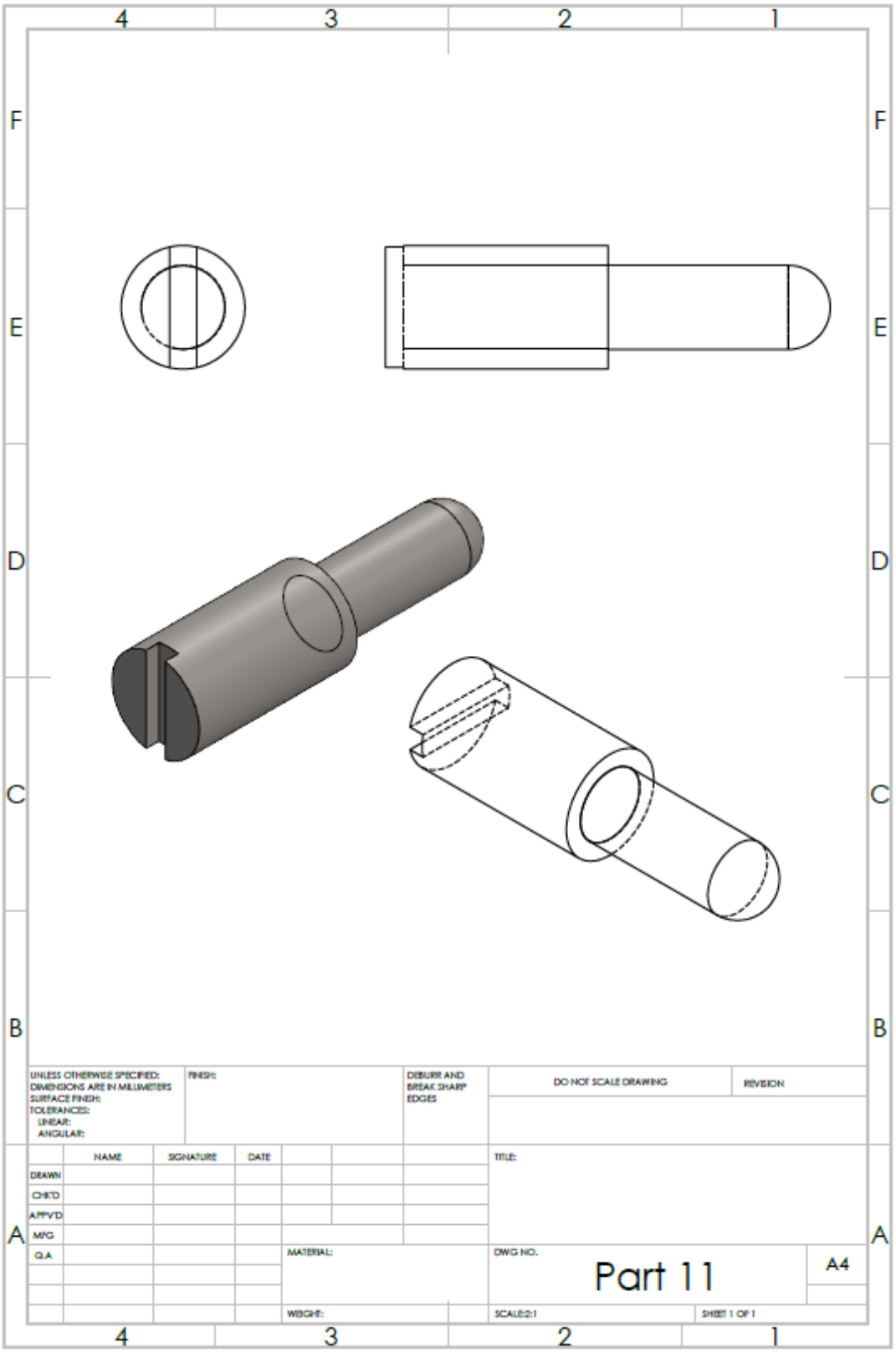
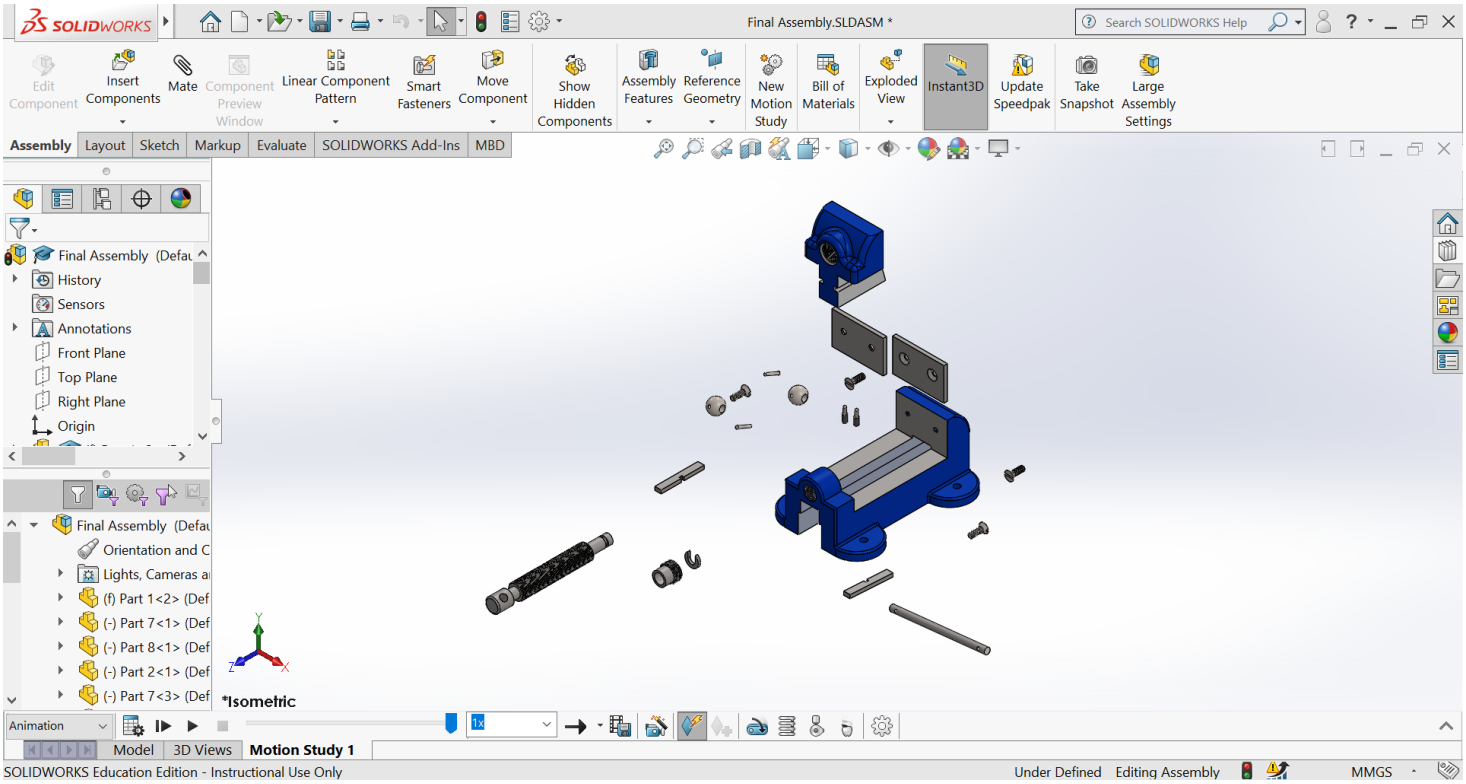
Part 10 – Collar

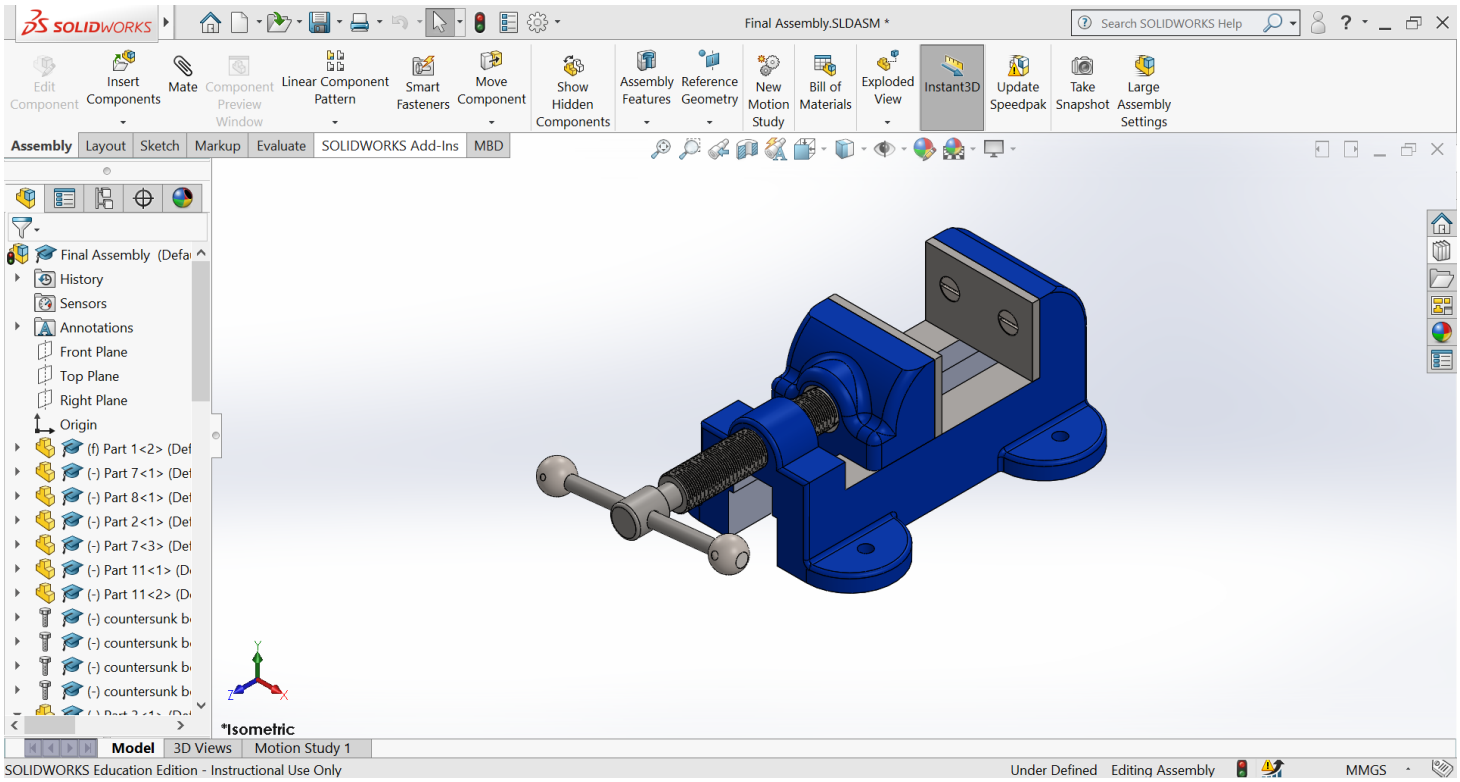


Part 11 – Set Screw

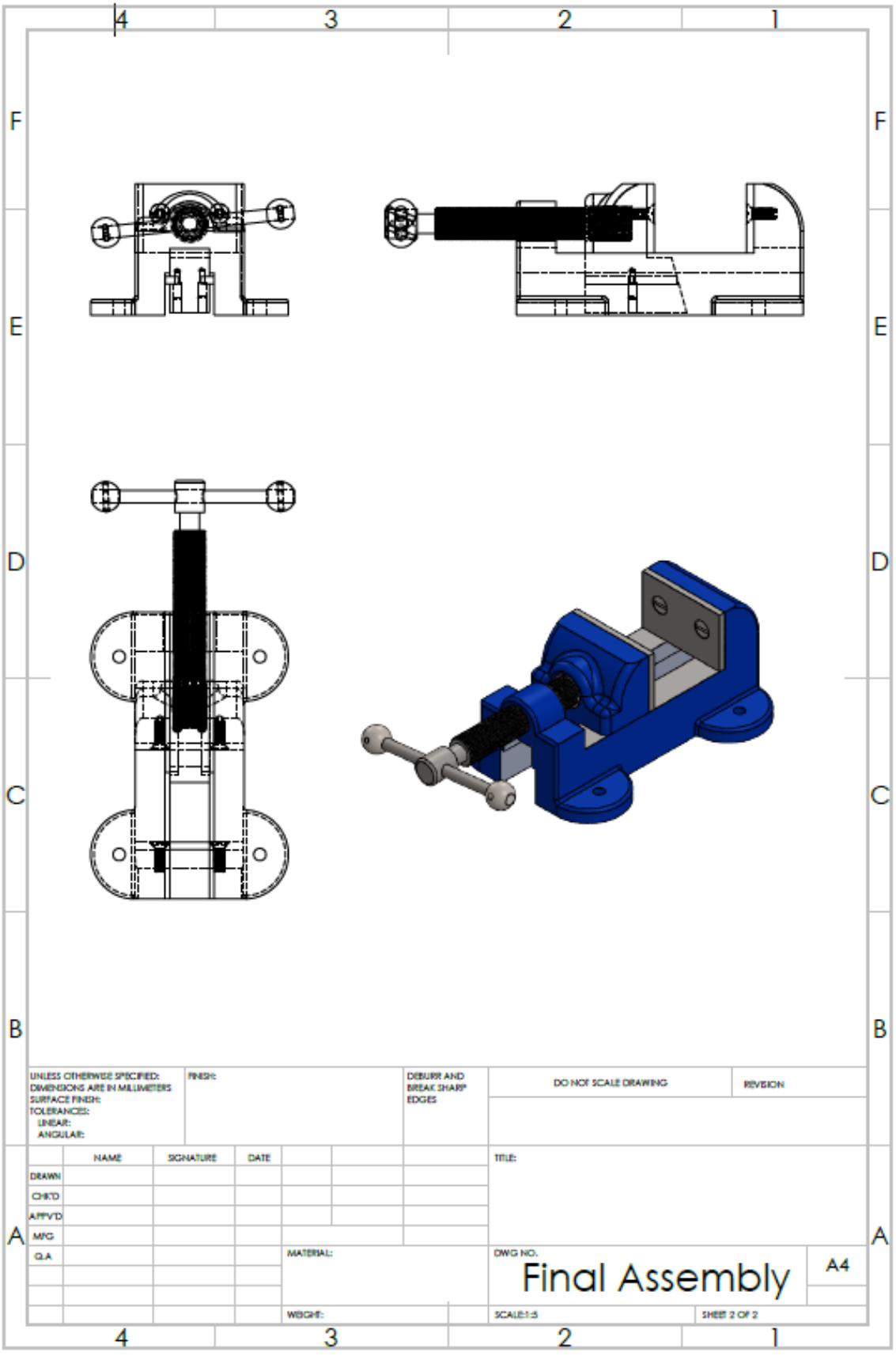


Assembly view



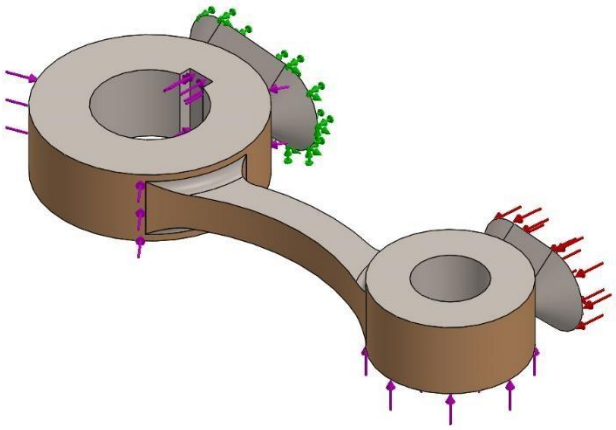


Final Drawing

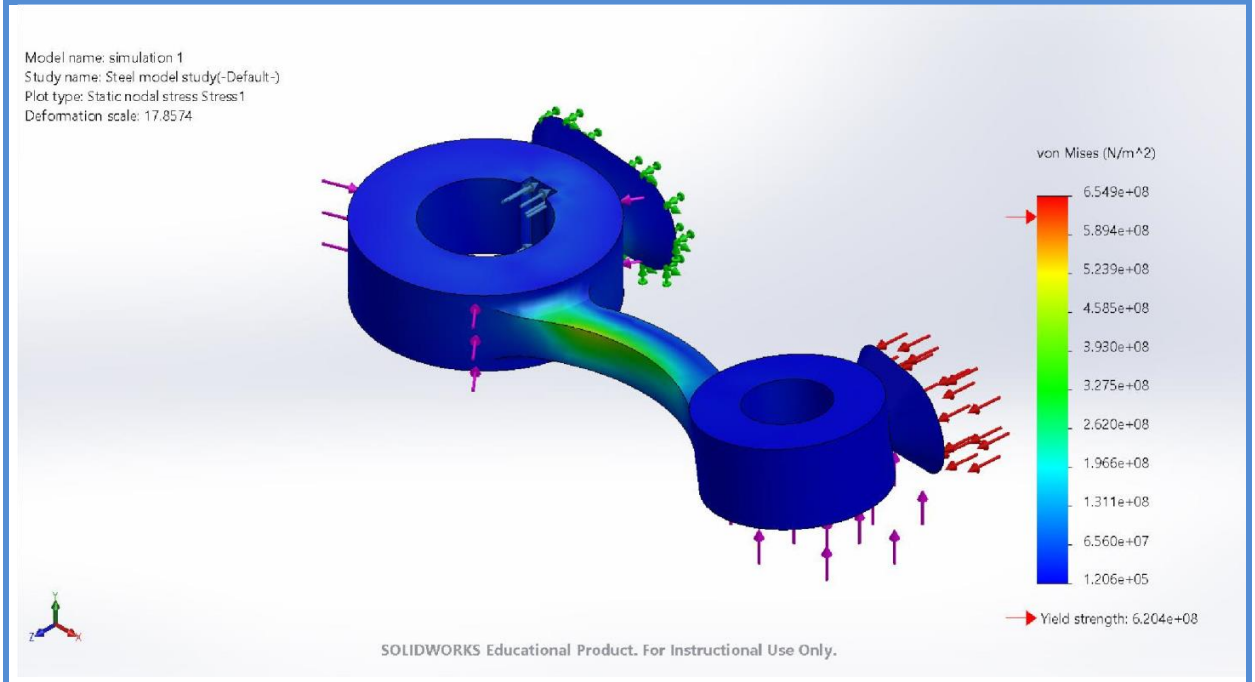


Simulation drawing

The following simulation was done to the model shown below and the material assigned to it was Steel.



Name	Type	Min	Max
Stress1	VON: von Mises Stress	1.206e+05 N/m^2 Node: 11571	6.549e+08 N/m^2 Node: 976



simulation -Steel model study-Stress1

Simulation Report

11/2A, Suramya Place, Panadura.
Phone: 0769038557

Description

This is a study of the action of force and pressure on a steel body.

Simulation of metal model

Date: Monday, 18 July 2022
Designer: JAYASURIYA C. L.
Study name: Steel model study
Analysis type: Static

Table of Contents

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Model Information 2
Study Properties 3
Units 3
Material Properties 4
Loads and Fixtures 5
Mesh information 7
Resultant Forces 8
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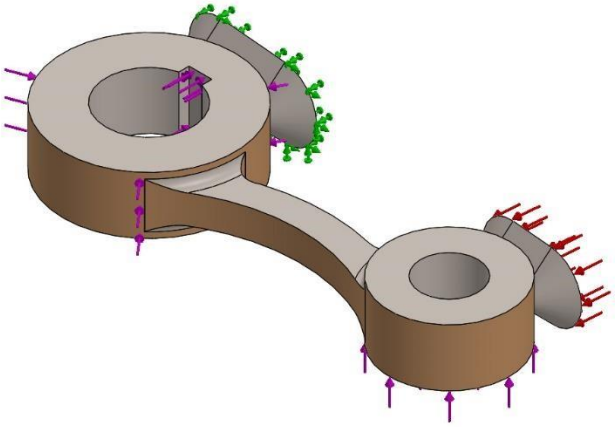
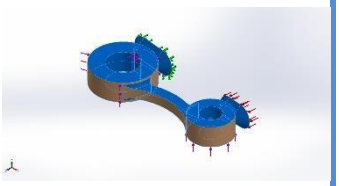
Model Information



Model name: simulation 1
Current Configuration: Default

lid Bodies

Document Name and Reference	Treated As	Volumetric Properties	Document Path/Date Modified
 Boss-Extrude9	Solid Body	**Mass:0.595185 kg** **Volume:7.72969e-05 m^3** **Density:7,699.98 kg/m^3** **Weight:5.83281 N**	**F:\Workshops and Courses\Solidworkds SFS course\Day 14\simulation 1.SLDPRT** Jul 18 07:37:22 2022

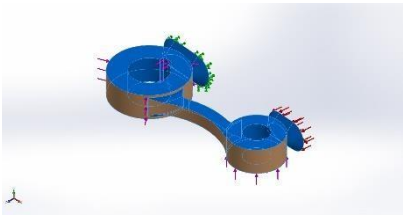
Study Properties

Study name	Steel model study
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 SOLIDWORKS Flow Simulation	Off
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 (F:\Workshops and Courses\Solidworkds SFS course\Day 14)

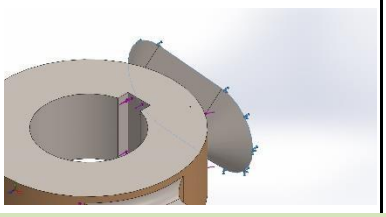
Units

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

Material Properties

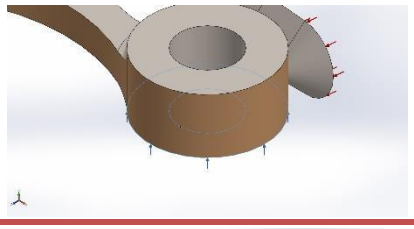
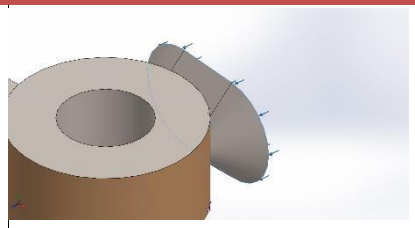
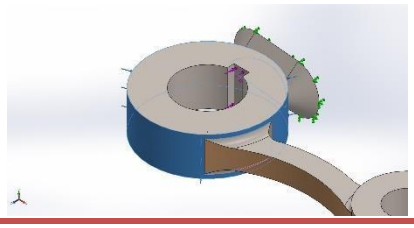
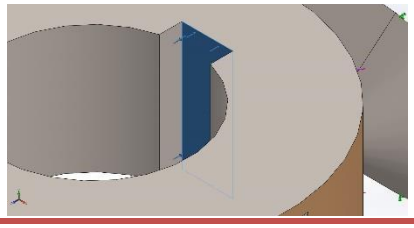
Model Reference	Properties		Components
	**Name:** **Model type:** **Default failure criterion:** **Yield strength:** **Tensile strength:** **Elastic modulus:** **Poisson's ratio:** **Mass density:** **Shear modulus:** **Thermal expansion coefficient:**	Alloy Steel Linear Elastic Isotropic Unknown 6.20422e+08 N/m^2 7.23826e+08 N/m^2 2.1e+11 N/m^2 0.28 7,700 kg/m^3 7.9e+10 N/m^2 1.3e-05 /Kelvin	SolidBody 1(Boss-Extrude9)(simulation 1)
Curve Data:N/A			

Loads and Fixtures

Fixture name	Fixture Image	Fixture Details
Fixed-1		**Entities:** 1 face(s) **Type:** Fixed Geometry

Resultant Forces

Components	X	Y	Z	Resultant
Reaction force(N)	27.8368	-499.947	-238.311	554.54
Reaction Moment(N.m)	0	0	0	0

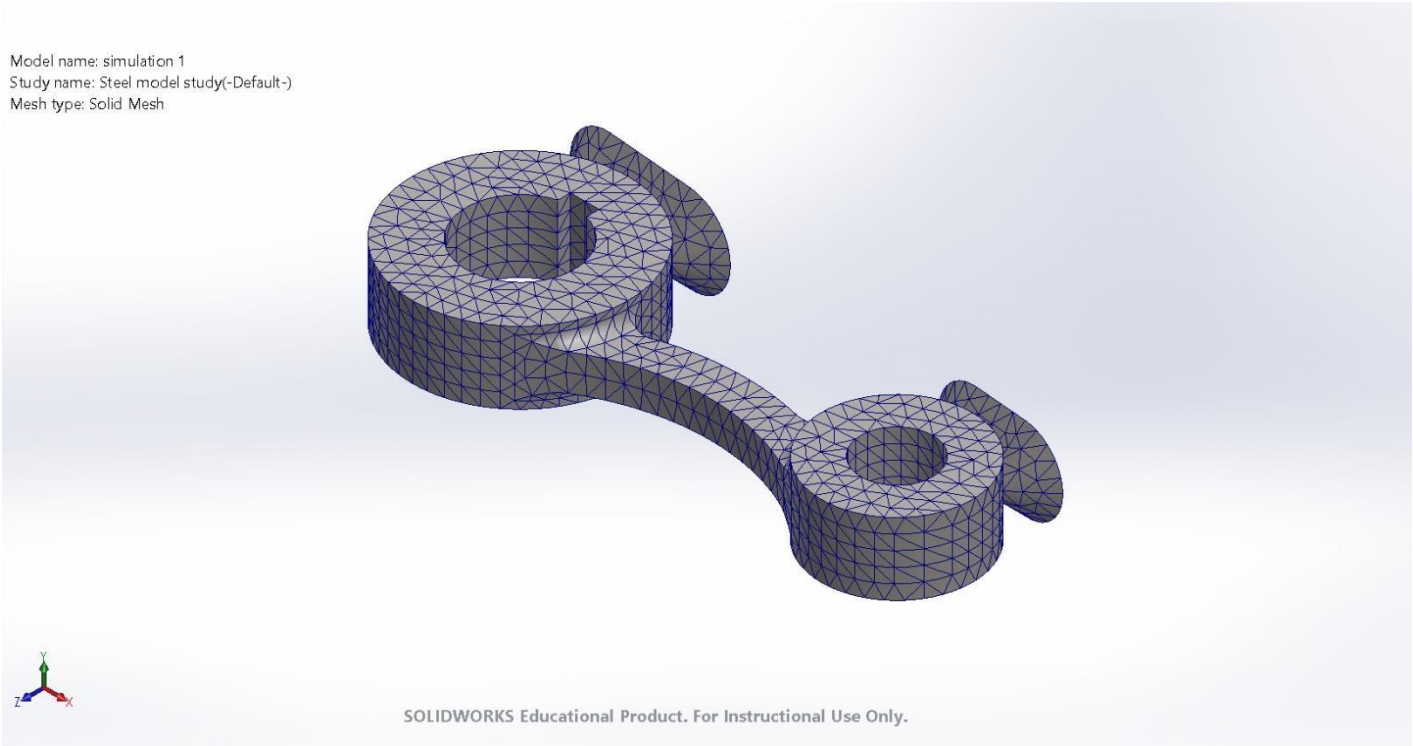
Load name	Load Image	Load Details
Force-1		**tities: Type: Value:** 1 face(s) Apply normal force 500 N
Pressure-1		1 face(s) Normal to selected face **tities: Type:** 1 **Value: Units:** N/mm^2 (MPa) **Phase Angle:** 0 **Units:** deg
Force-2		**tities: Type: Value:** 1 face(s) Apply normal force 250 N
Force-3		**Entities:** 1 face(s) **Type:** Apply normal force **Value:** 500 N

Mesh information

Mesh type	Solid Mesh
Mesher Used:	Standard mesh
Automatic Transition:	Off
Include Mesh Auto Loops:	Off
Jacobian points for High quality mesh	16 Points
Element Size	4.10133 mm
Tolerance	0.205067 mm
Mesh Quality	High

Mesh information - Details

Total Nodes	15114
Total Elements	9201
Maximum Aspect Ratio	12.183
% of elements with Aspect Ratio < 3	99.1
Percentage of elements with Aspect Ratio > 10	0.174
Percentage of distorted elements	0
Time to complete mesh(hh;mm;ss):	00:00:02
Computer name:	



Resultant Forces

Reaction forces

Selection set	Units	Sum X	Sum Y	Sum Z	Resultant
Entire Model	N	27.8368	-499.947	-238.311	554.54

ıction Moments

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

e body forces

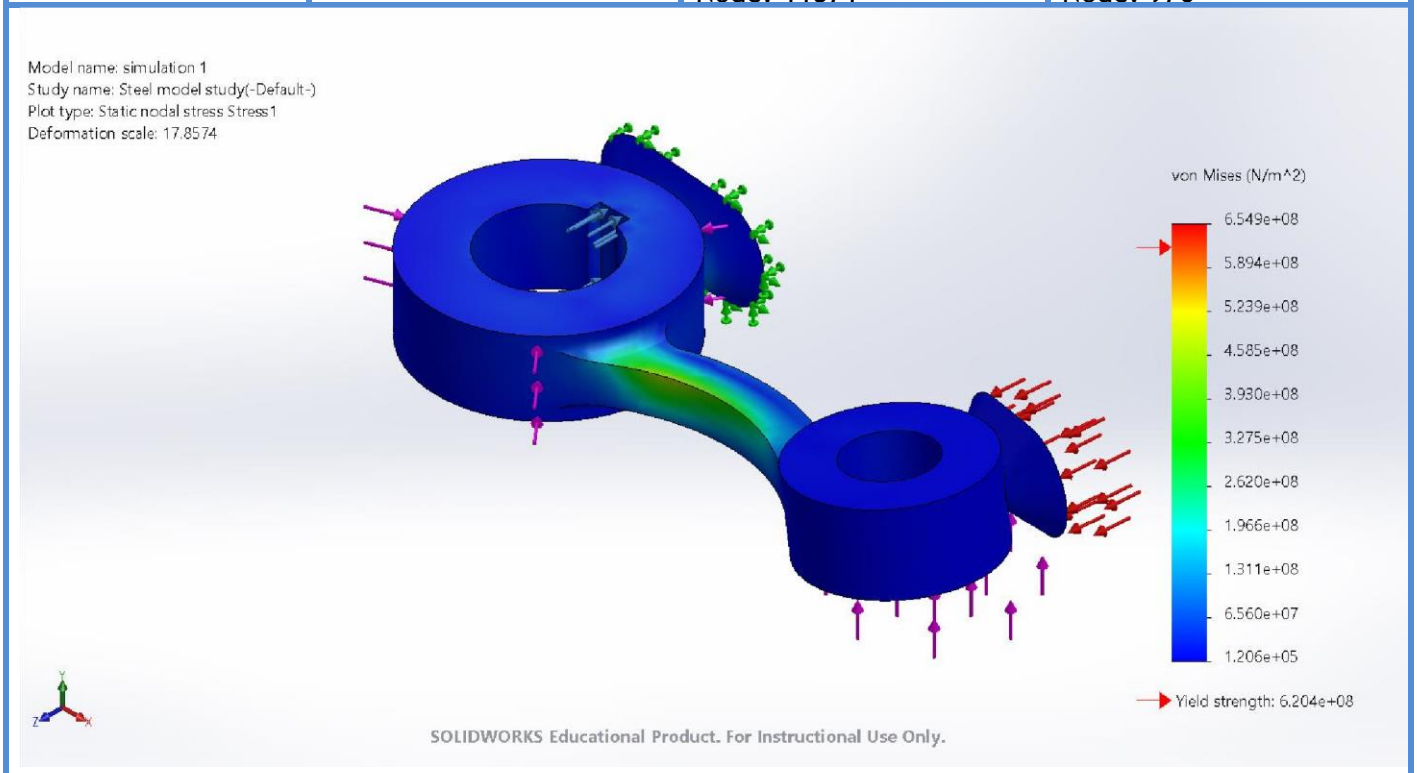
Selection set	Units	Sum X	Sum Y	Sum Z	Resultant
Entire Model	N	-0.0236015	-0.93762	-0.538866	1.0817

e body moments

Selection set	Units	Sum X	Sum Y	Sum Z	Resultant
Entire Model	N.m	0	0	0	1e-33

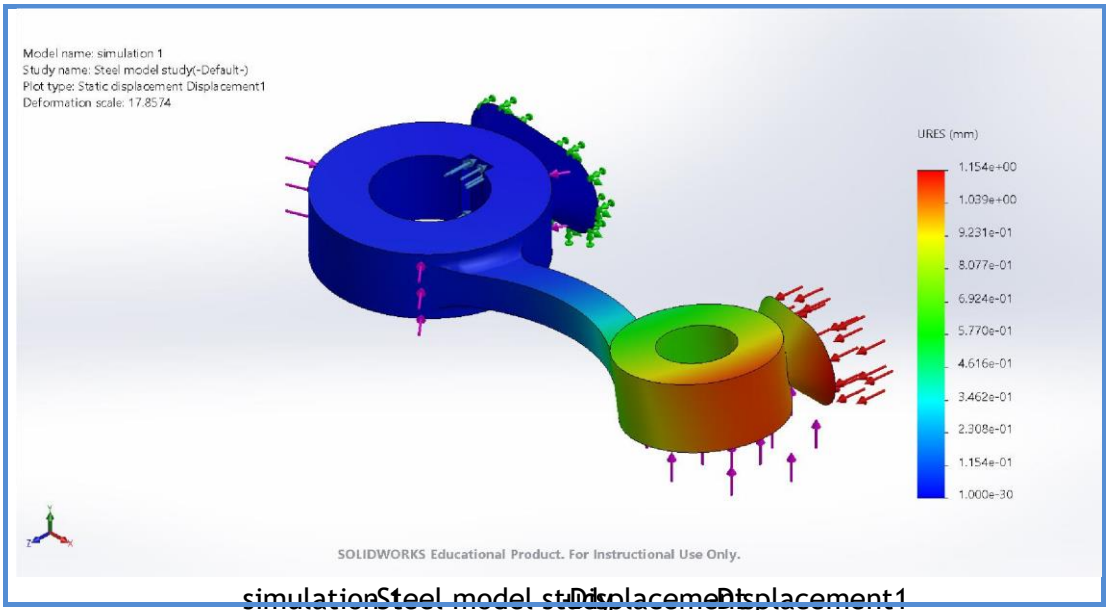
Study Results

Name	Type	Min	Max
Stress1	VON: von Mises Stress	1.206e+05N/m^2 Node: 11571	6.549e+08N/m^2 Node: 976



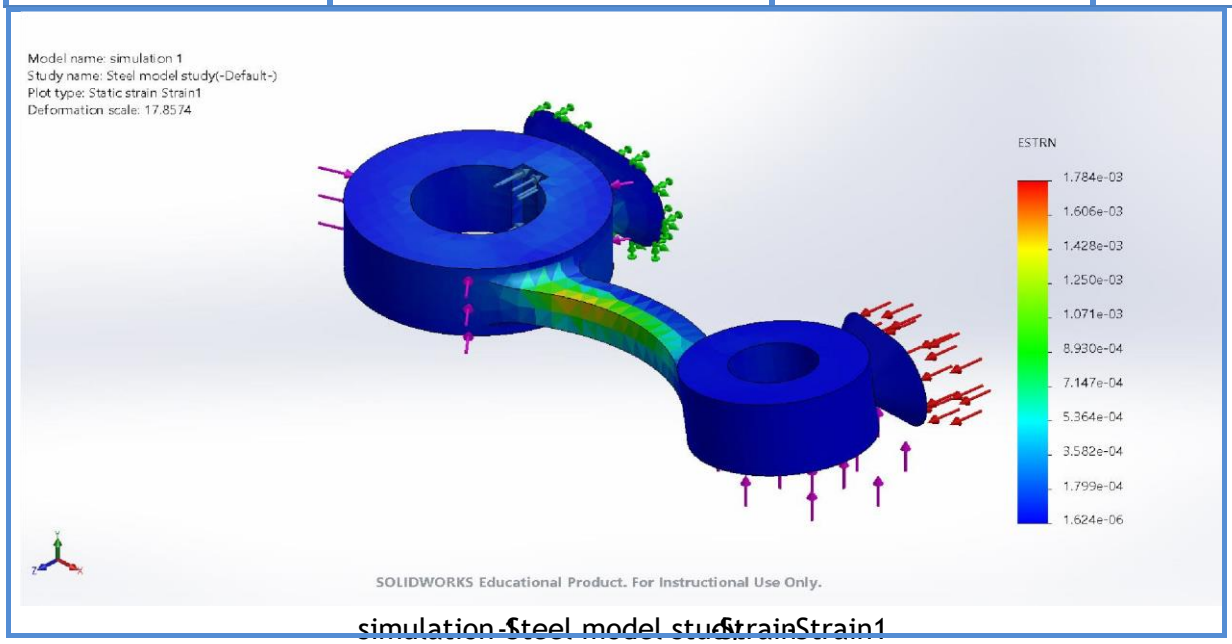
simulation 1-Steel model study-Stress-Stress1

Name	Type	Min	Max
Displacement1	URES: Resultant Displacement	0.000e+00mm Node: 39	1.154e+00mm Node: 15059



simulation Steel model study Displacement Displacement1

Name	Type	Min	Max
Strain1	ESTRN: Equivalent Strain	1.624e-06 Element: 5852	1.784e-03 Element: 4571



simulation Steel model study Strain Strain1

Conclusion

The study shows that the body can withstand the applied external loads.

Curriculum Vitae

CHEHAL LALINDRA JAYASURIYA

+94 769038557 | chehal2001lj@gmail.com | linkedin.com/jayasuriya.c.l

Statement

I am energetic, hardworking yet a humble character; a great team worker with amazing leadership skills, yearning to achieve his dreams.

Education

University of Moratuwa 2021 - Present

- Semester 01 GPA 3.74 (out of 4.00)

Lyceum International School Panadura. 2007 - 2018

- GCE A/L National 2019 - 3As Physical Science stream (z-score of 2.4058)
- Cambridge O/L 2017 - 6A*s Physical Science stream
- GCE O/L National 2016 - 7As

Achievements

- Best Advanced Level student of the Year (National), Lyceum International School Panadura. - 2020
- President's Scout Award - 2020

Skills

Technical skills

- CAD - Diploma in AutoCAD 2018 (Certified by Autodesk®)
- Python - Elementary proficiency

Language skills

- English - Bilingual proficiency
- Sinhala - Native proficiency

Leadership and Team skills

- Experience in leading junior scouts as a scout leader.
- Senior prefect (2017/2018)
- Member of school choir (won a silver medal at Asia Pacific Choir games 2017)
- Member of school chess club

References

1. Mrs. M. S. Meegahapola

   B.Sc. (USJP)
   Senior teacher - National Advanced Level Lyceum International School, Panadura.

   Telephone : 0772058668

   E-mail : sonali.cbm.upp_lp@lyceum.lk.

2. Dr. Ranga Rodrigo

   B.Sc. Eng. Hons. (Moratuwa), M.E.Sc. (Western), Ph.D. (Western), MIET, MIEEE
   Senior Lecturer, Department of Electronics and Telecommunication Engineering,
   University of Moratuwa, 10400, Moratuwa, Sri Lanka.

   Telephone : +94 71 804 5768

   E-mail : ranga@uom.lk

Course completion and Feedback form

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COURSE COMPLETION FORM

Student Name in Block Letters	:	CHEHAL LALINDRA JAYASURIYA
Student NIC Number	:	200130605360
Phone Number	:	0382299098
Mobile Number	:	0769038557
E-Mail ID	:	chehal2001lj@gmail.com
Home Address	:	11/2A, Suramya Place, Gorakapola, Panadura.
Course Title	:	SOLIDWORKS
Date of Course Commencement	:	20/03/2022
Date of Course Completion	:	31/07/2022
If Registered		
Center Location	:	
Batch Code	:	
Student ID	:	

Student Signature

FEEDBACK FORM

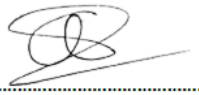
√ Please	Agree	Need improvement
The Instructor was well prepared for the class.	✓	
The Instructor explained the matter in an effective manner.	✓	
Instructor has thorough knowledge and is specialized in the field.	✓	
The instructor has clarified all your robust.	✓	

The overall rating of your course with us,

- Excellent : ✓
- Good :
- Needs Improvement :

Any comments / suggestions / Feedbacks,

The course was very informative and well paced. It was not very difficult to learn the content.



Student Signature