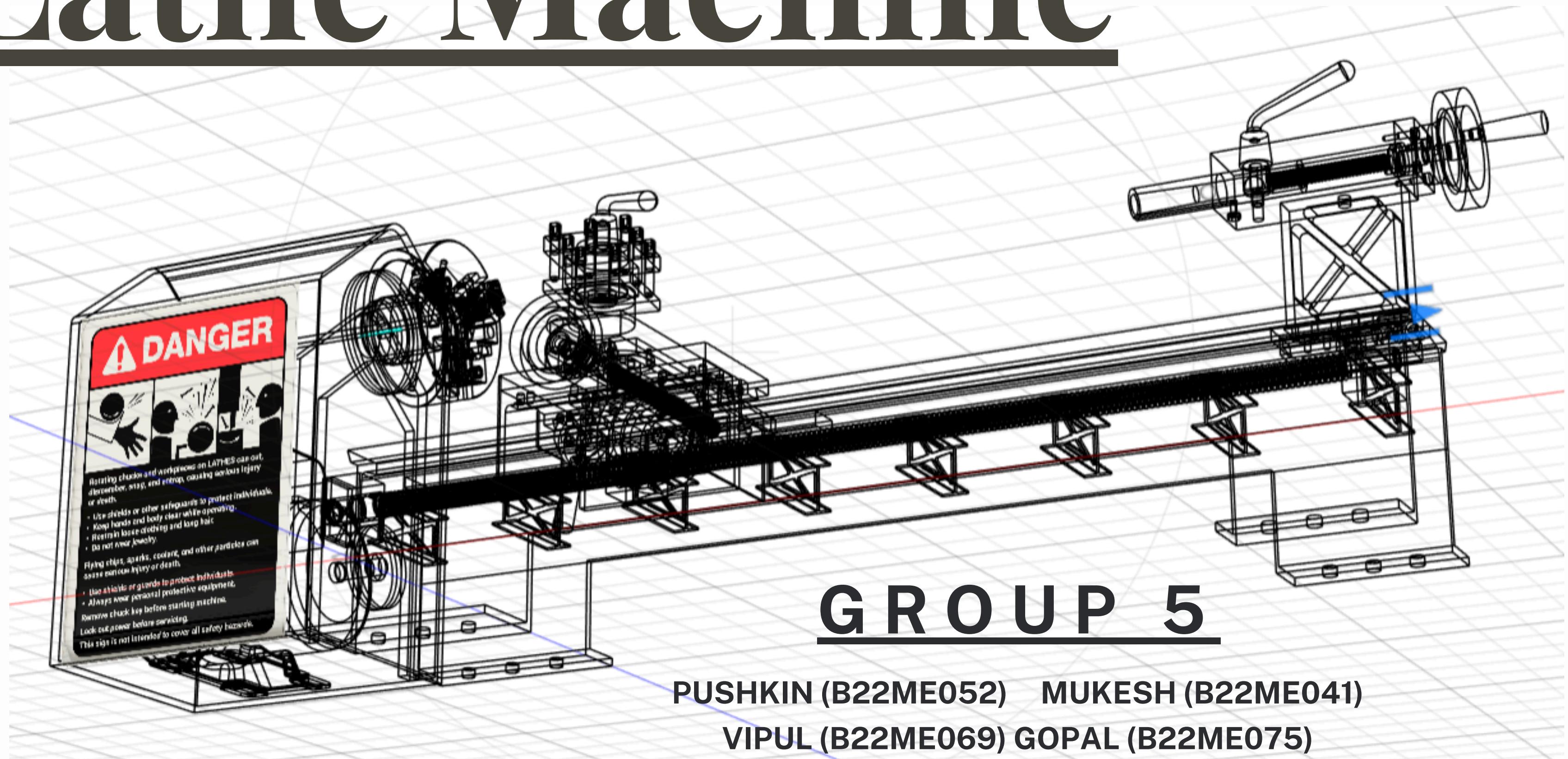


Lathe Machine

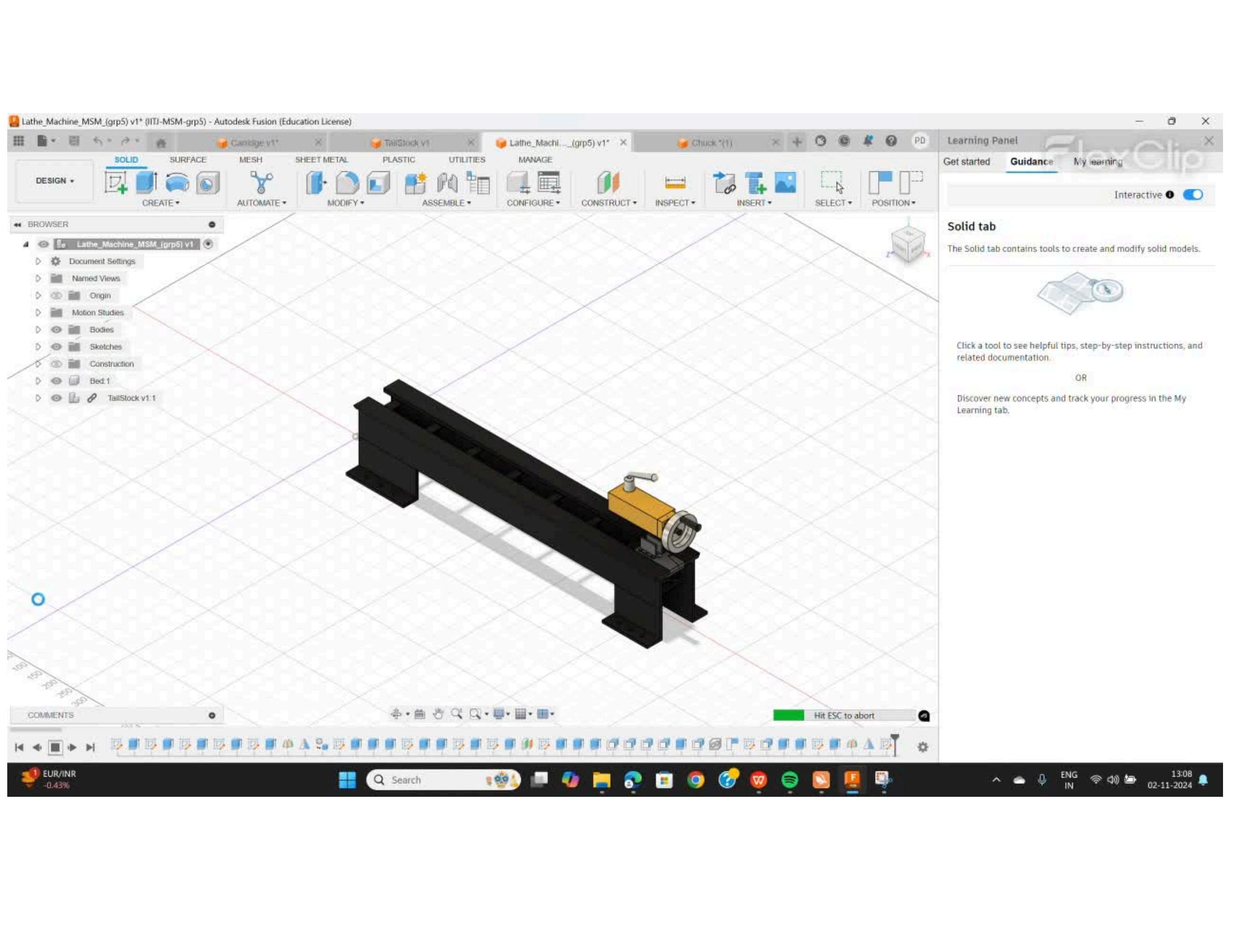


GROUP 5

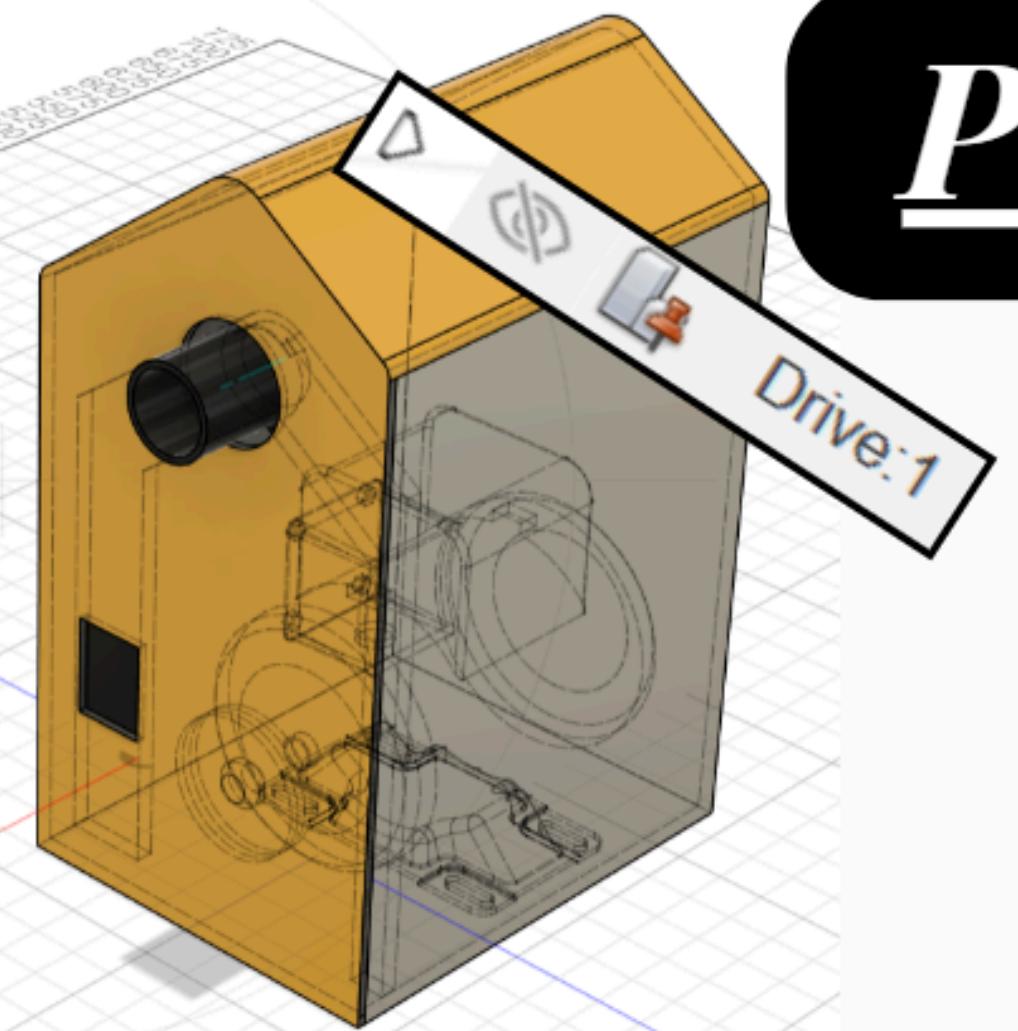
PUSHKIN (B22ME052) MUKESH (B22ME041)
VIPUL (B22ME069) GOPAL (B22ME075)
LAVISH (B22ME035) GAURAV (B22ME020)

PURPOSE AND OBJECTIVE OF THE MODEL

- **Reverse Engineering:**
Modeled the lathe machine by analyzing each part's functionality.
- **Tool Design & Assembly Simulation:** Gained insights into the lathe tool design and assembly process through detailed simulations.
- **Enhanced Understanding:**
Improved comprehension of component interactions and assembly procedures.



Parts and Components



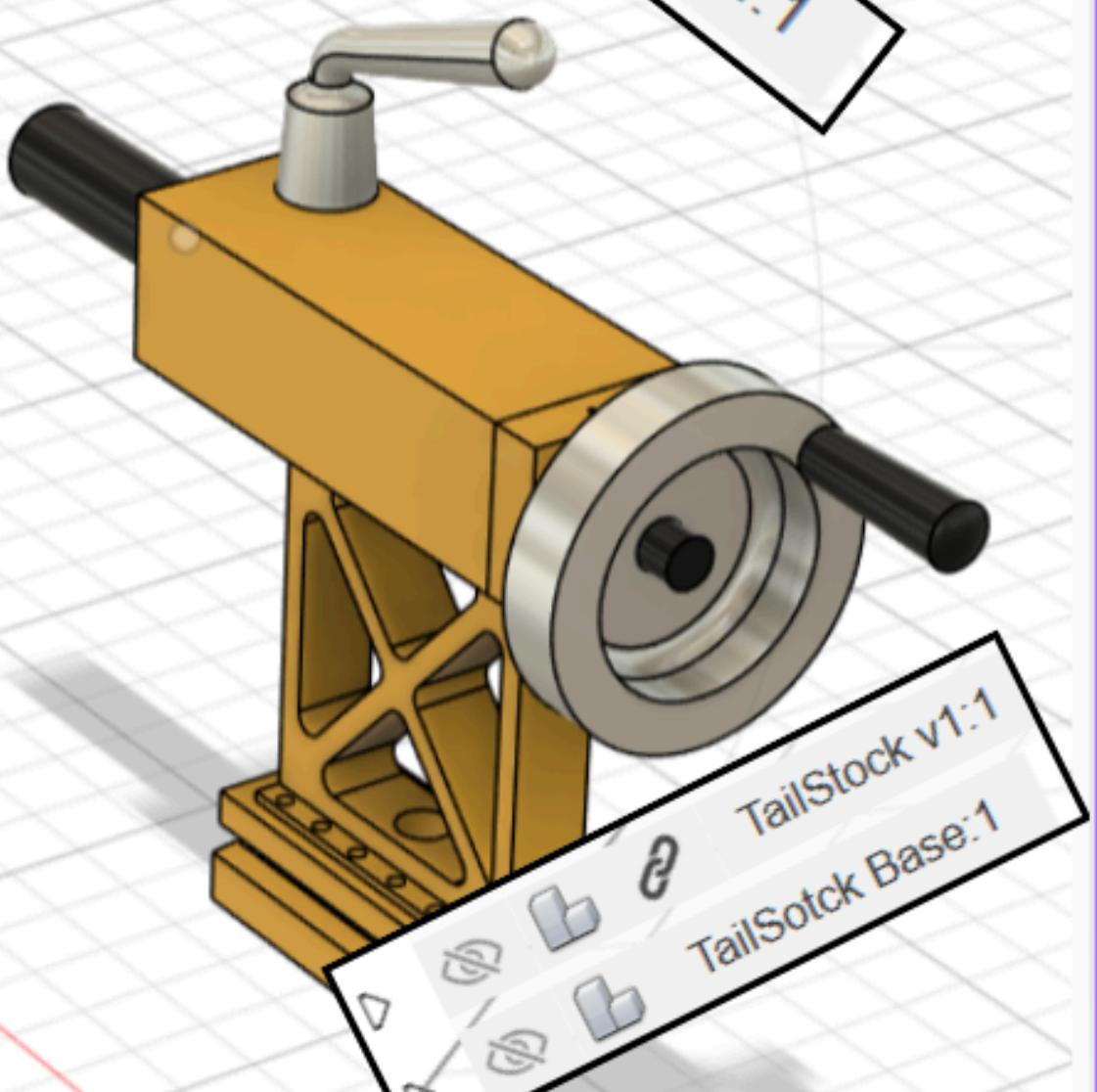
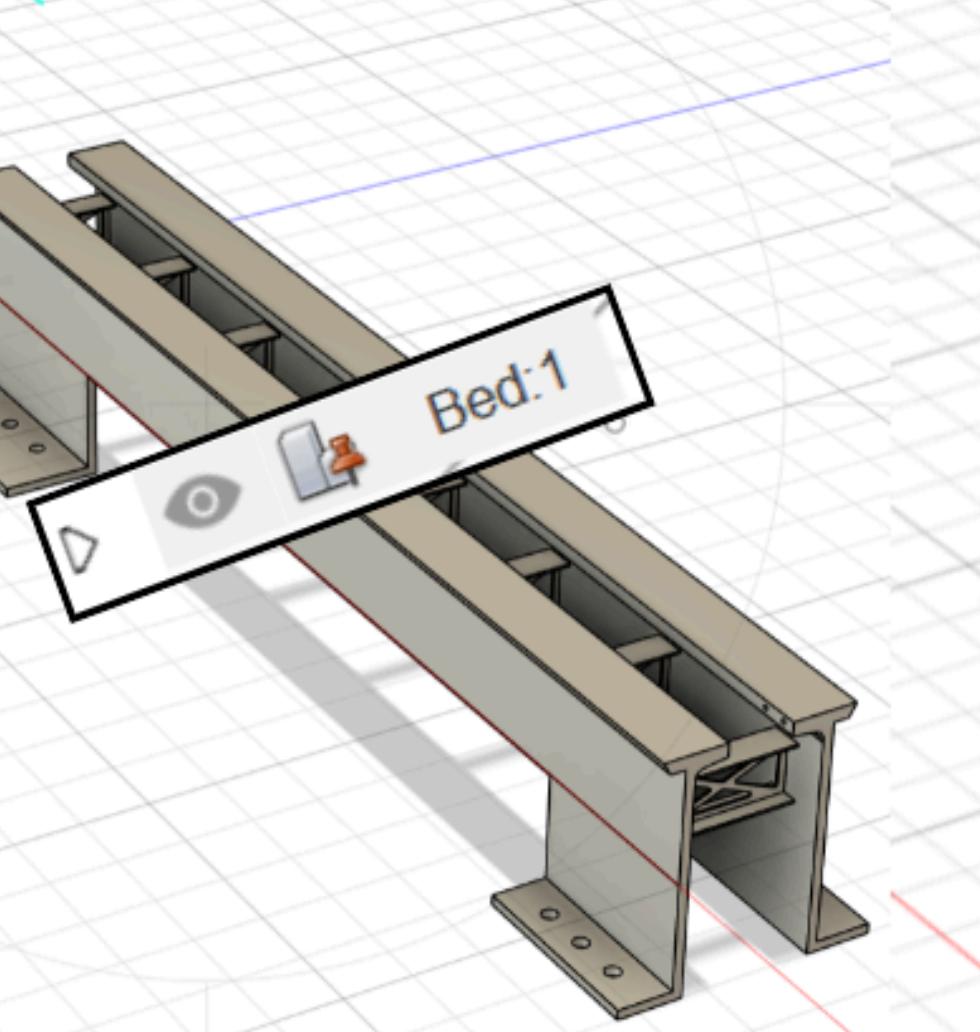
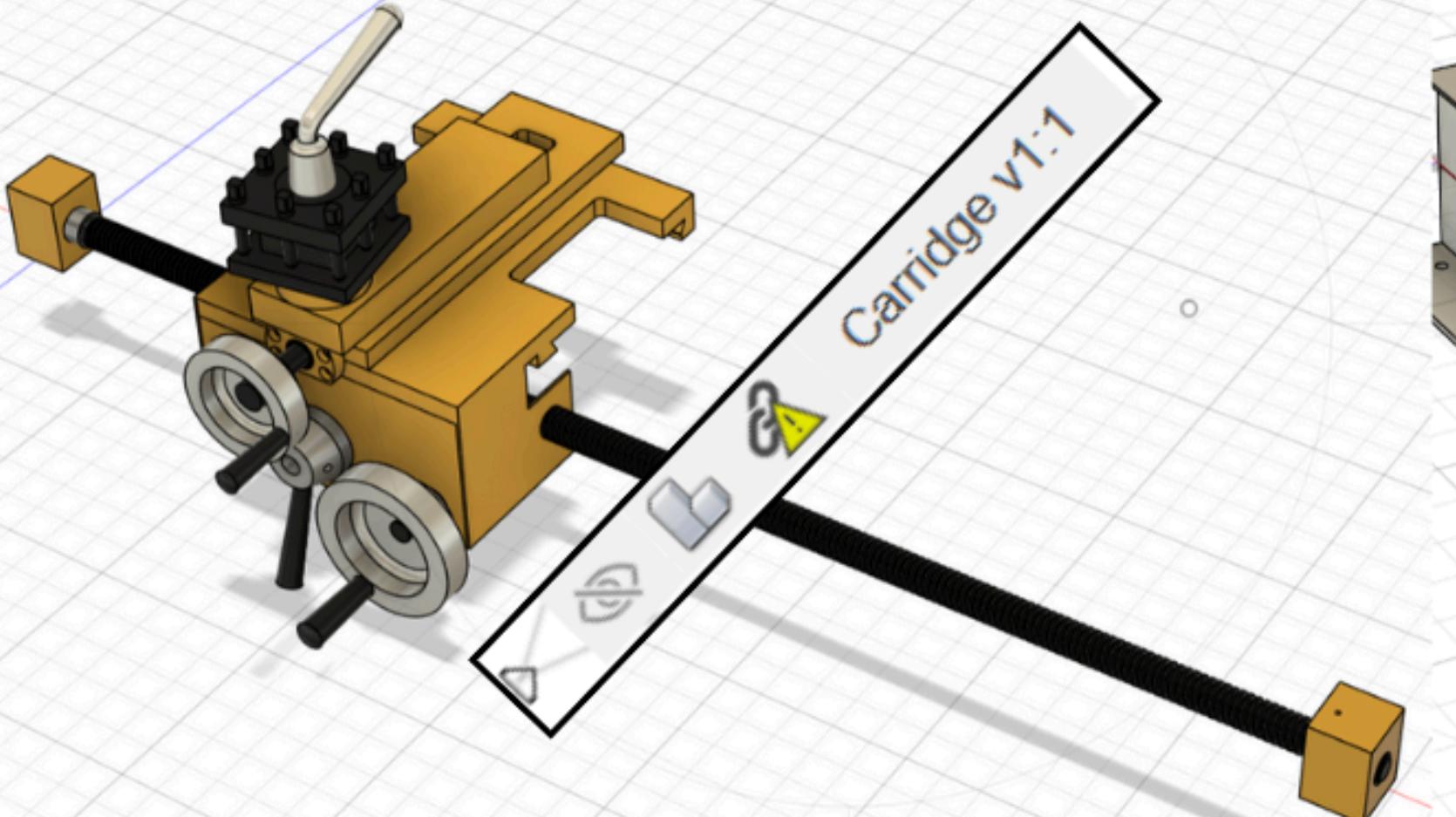
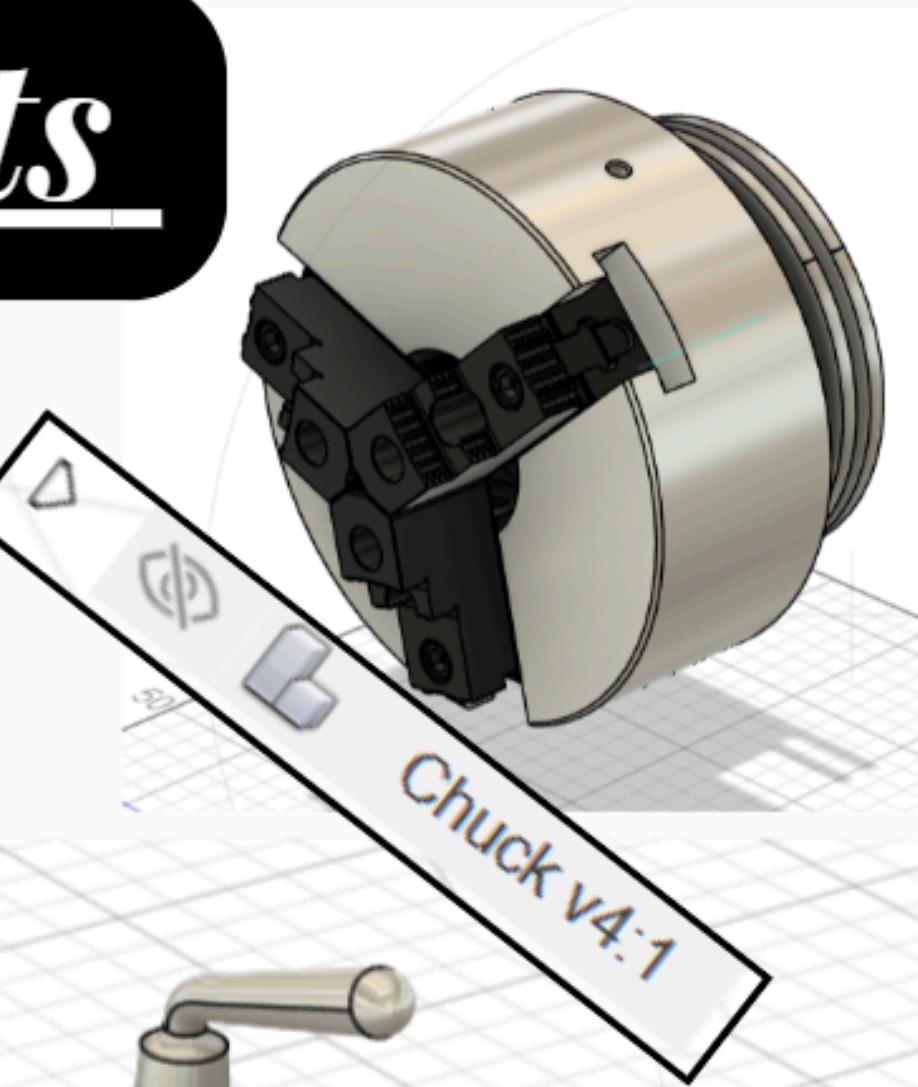
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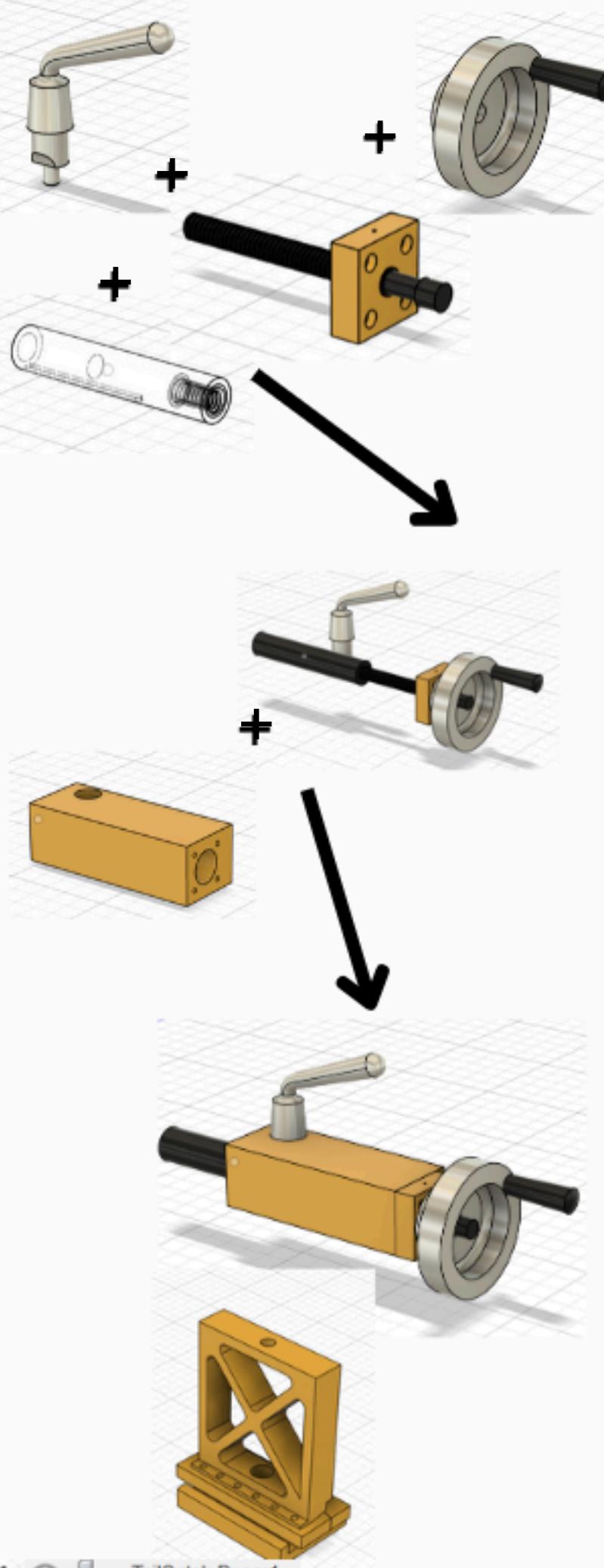
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3

1



TAILSTOCK



Handle

- Function:** The handle is used to manually move the quill or the entire tailstock along the lathe bed. It controls the forward and backward motion of the tailstock for positioning.
- Movement:** Rotates to extend or retract the spindle.

Quill (Screw Assembly)

- Function:** The quill holds tools like drills or centers and provides precise movement for machining operations.
- Movement:** Moves axially (in and out) to push tools into or away from the workpiece.

Block (Tailstock Housing)

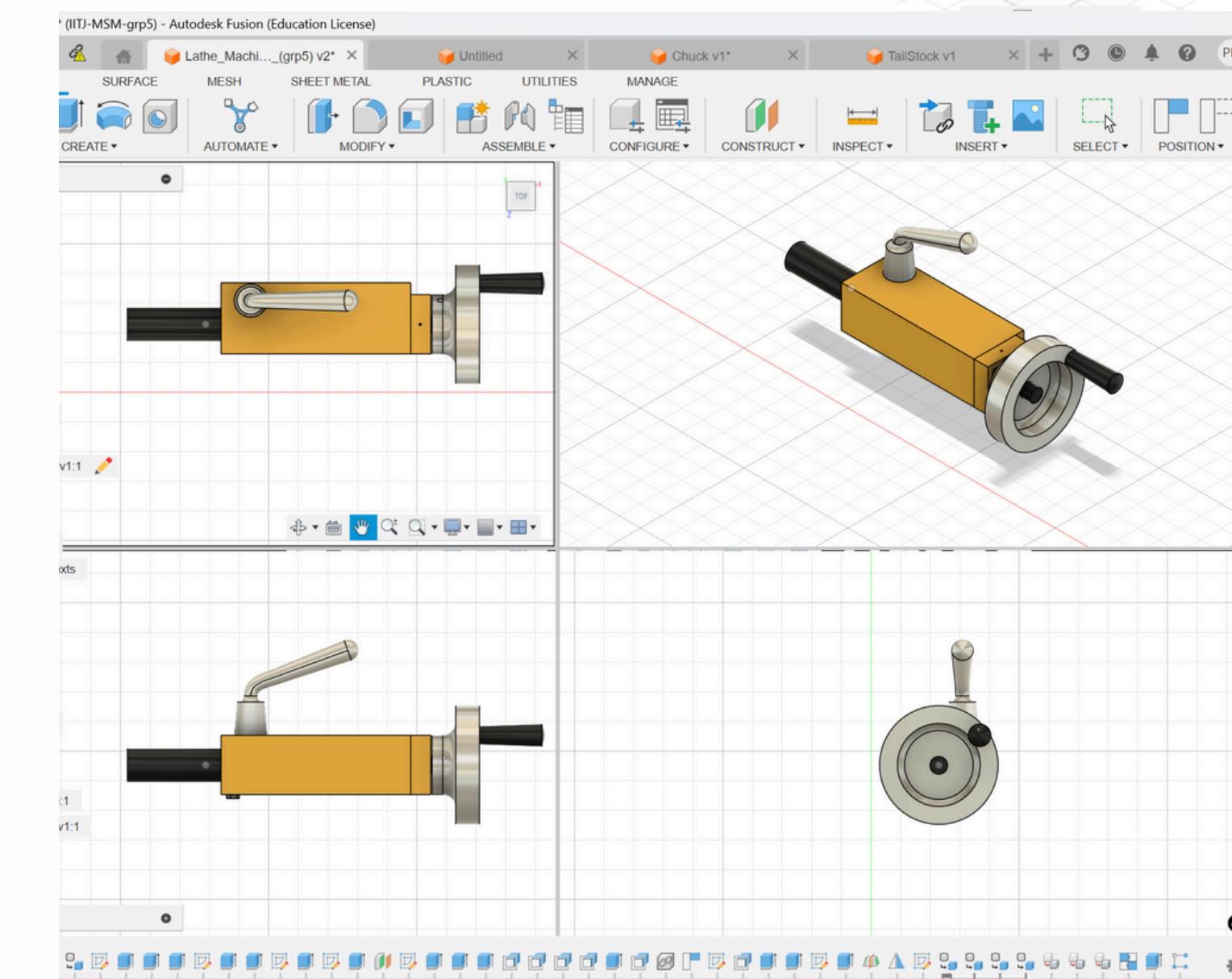
- Function:** The block provides structural support, holding the entire tailstock assembly together. It keeps the parts aligned and facilitates easy mounting on the lathe bed.
- Movement:** Moves along the lathe bed for positioning relative to the workpiece.

Clamp/Base

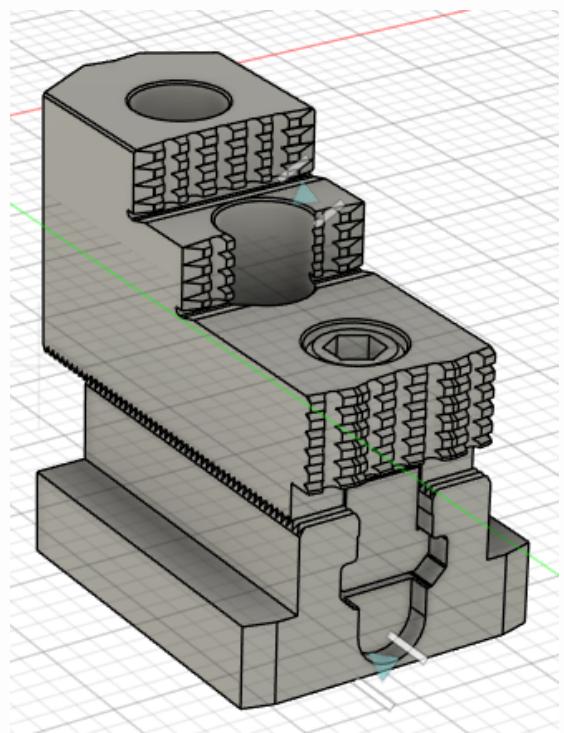
- Function:** The clamp secures the tailstock in place on the lathe bed to prevent unwanted movement during operation.
- Movement:** Locks and unlocks to slide along or stay fixed on the lathe bed.

Disk (Spindle Mount)

- Function:** The disk interfaces with the quill and provides support for accurate rotation and positioning of tools.
- Movement:** Rotates with the spindle when needed or remains stationary.



CHUCK

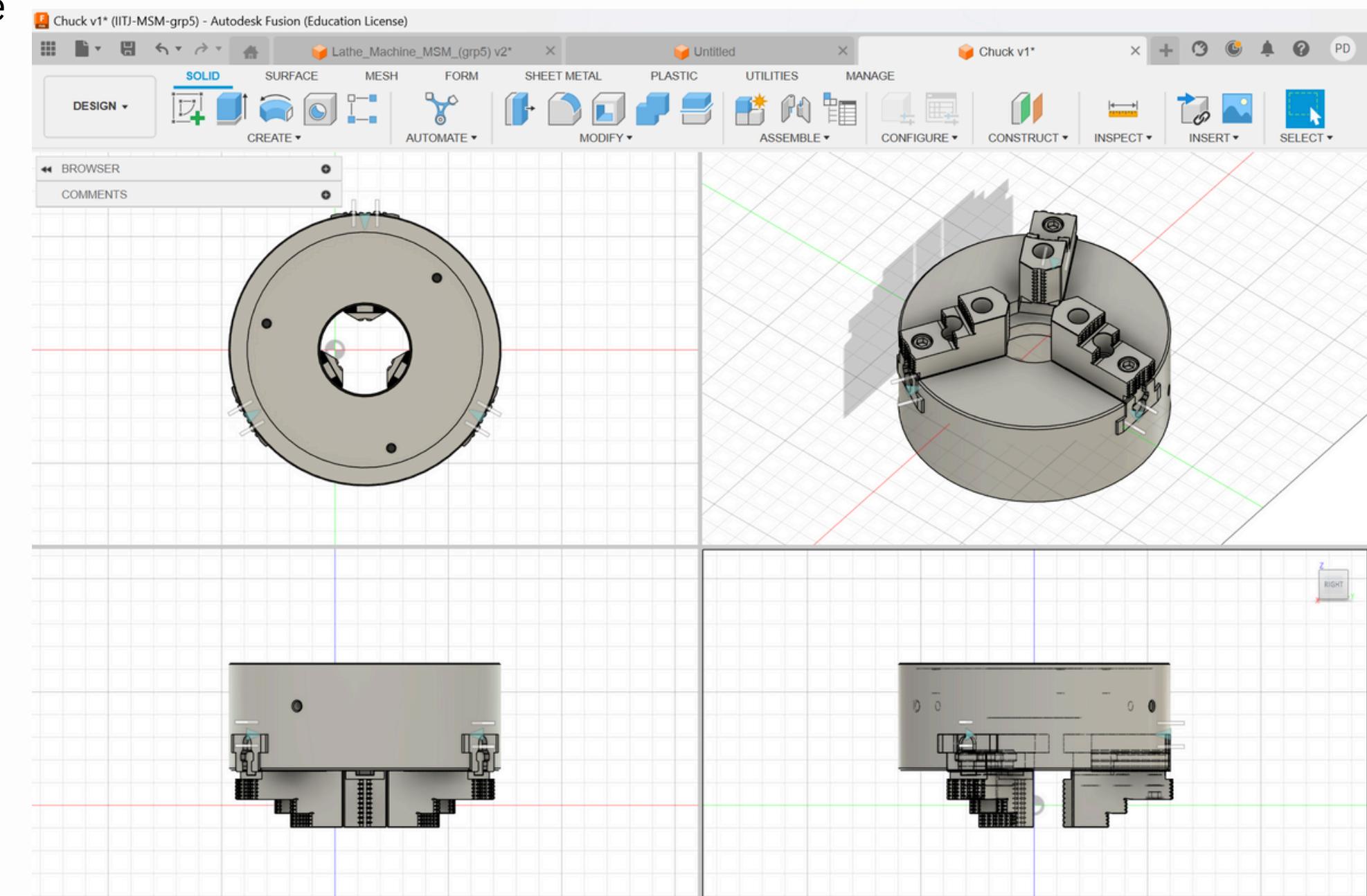
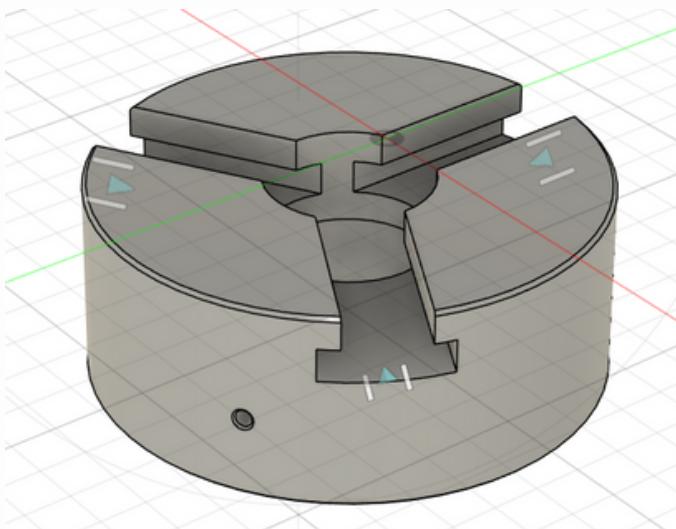


JOINT SLIDERS (JAWS) - FUNCTION:

The jaws adjust radially to accommodate different workpiece sizes, tightened or loosened using a key mechanism.

CHUCK FUNCTION

A lathe chuck secures the workpiece on the spindle using jaws, ensuring stable rotation during machining. Commonly, self-centering chucks with three jaws are used to hold round or hexagonal workpieces, providing precise alignment.



- Versatile Holding
- Self-Centering
- Quick Setup
- Secure Grip

BED

FUNCTION

- **Structural Support:** Provides a rigid foundation, aligning the headstock, tailstock, and carriage along the lathe's longitudinal axis.
- **Guideways:** Ensures precise, smooth sliding of the carriage and tailstock, maintaining accurate tool positioning.
- **Vibration Damping:** Minimizes operational vibrations, enhancing machining precision and surface finish.

Impact on Efficiency

Precision: Maintains high dimensional accuracy and reduces machining errors.

Load Capacity: Supports heavy workpieces without distortion, increasing versatility.

Reduced Downtime: Enhances reliability, minimizing maintenance and operational delays.

Advantages

Rigidity: Ensures stable, vibration-free machining.

Durability: Long-lasting, wear-resistant construction.

High Finish Quality: Facilitates superior surface finishes.

Versatility: Supports various machining operations efficiently.

Did these help you get started?

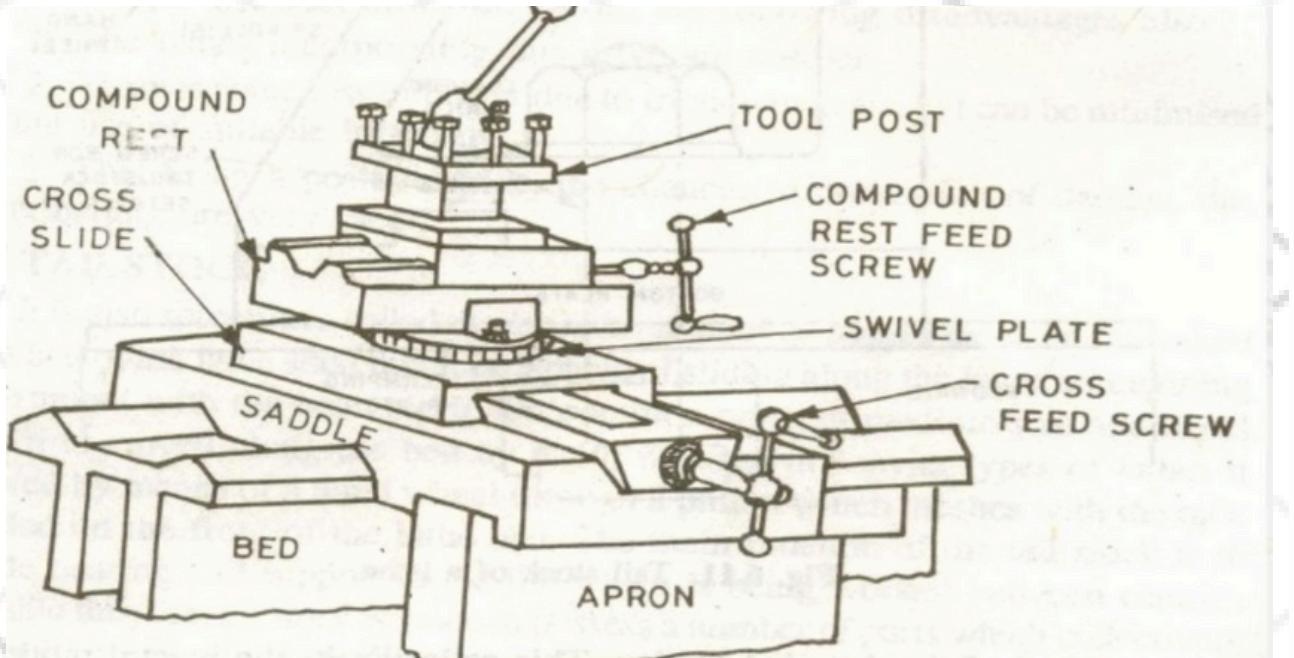
[Let us know](#)

Suggestions for you

CARRIAGE

PURPOSE

The carriage holds and moves the cutting tool across the lathe, allowing precise control over cutting operations on the workpiece.

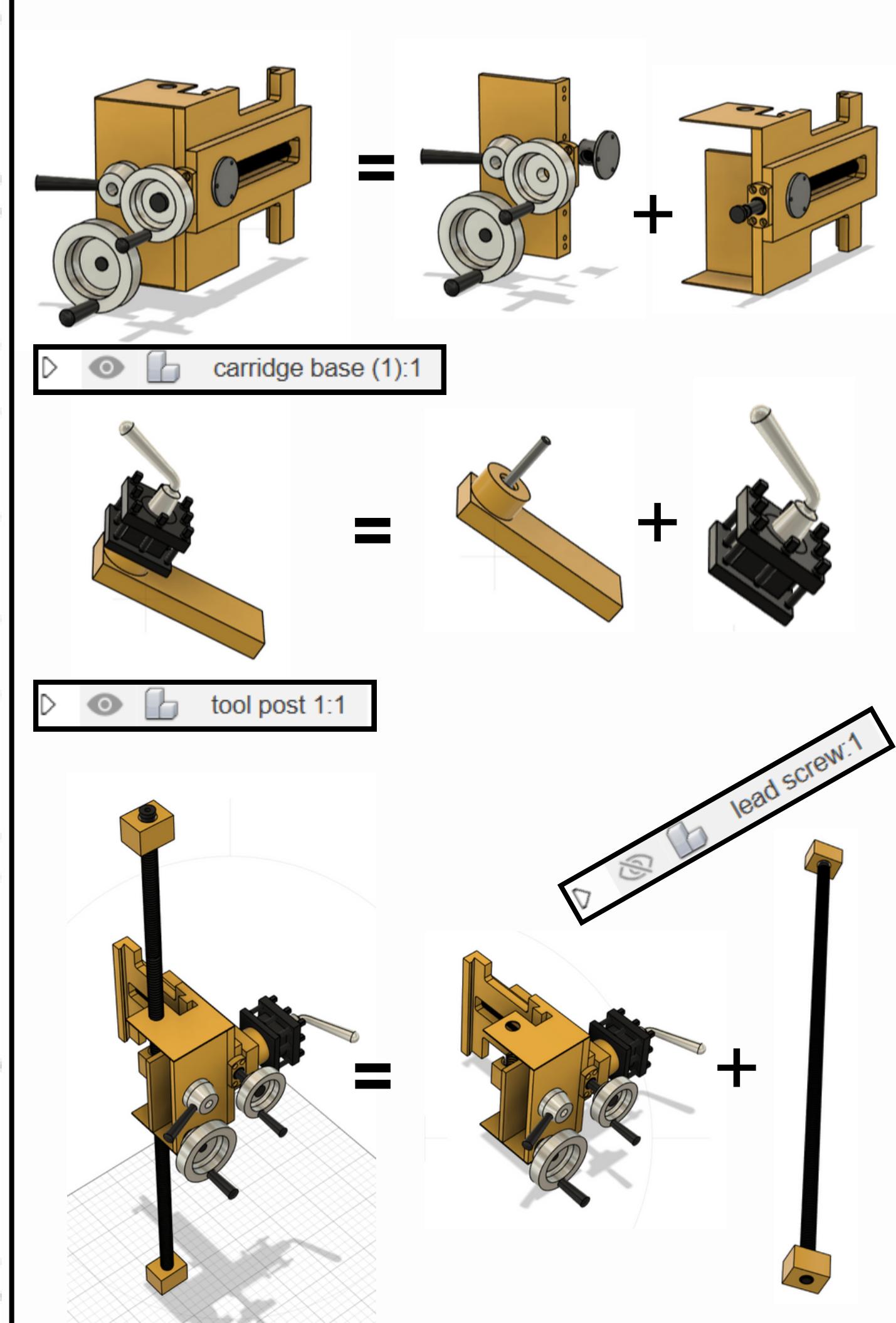


MAIN COMPONENT

- Saddle: Slides along the lathe bed, providing stable support for the tool.
- Cross-Slide: Moves perpendicular to the lathe bed for depth adjustment.
- Compound Rest: Allows angled cuts and fine adjustments.
- Tool Post: Holds the cutting tool in place.
- Apron: Houses the controls for movement and holds mechanisms for automatic feed.

FUNCTIONS

- Enables longitudinal and transverse tool movement.
- Facilitates turning, facing, and threading operations.



DRIVE

Pully

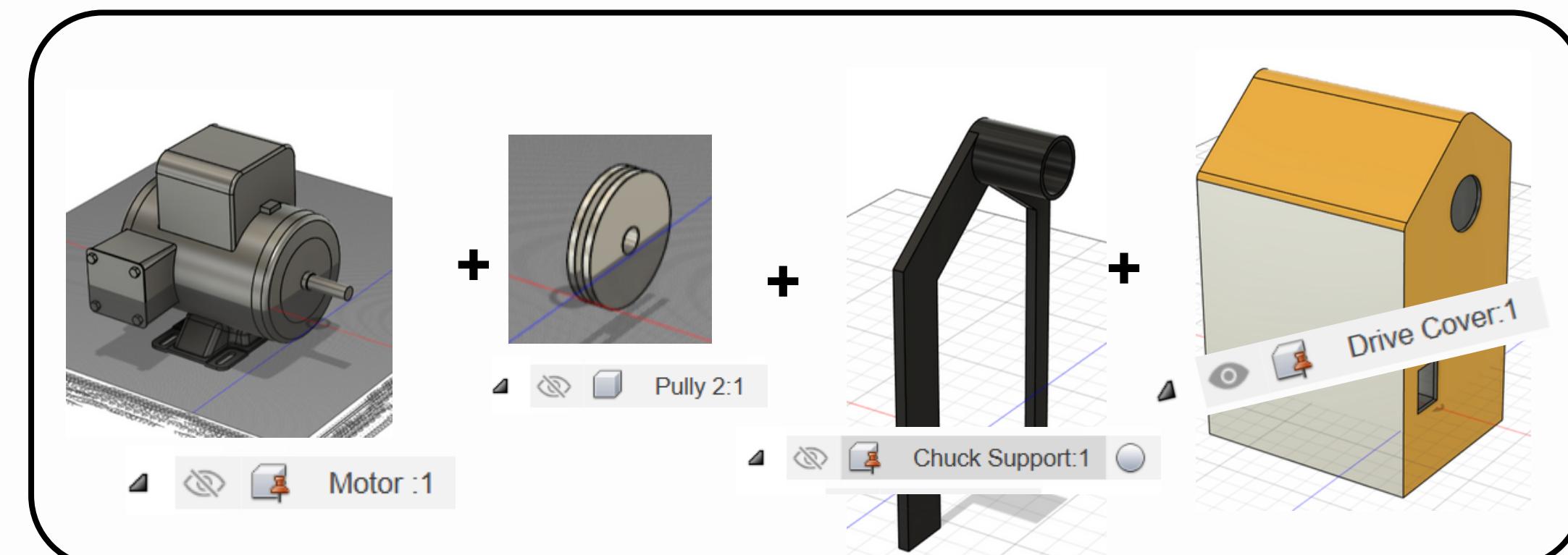
- **Function:** The pulley in a lathe machine helps transfer power from the motor to the spindle by using belts, allowing for speed adjustments. It enables different speeds by changing belt positions, which is essential for machining different materials effectively.
- **Function:** The pulley system offers a simple and efficient way to control spindle speed, allowing the lathe to handle a variety of tasks. It is also reliable, low-maintenance, and helps reduce motor load by efficiently transmitting power.

Chuck Support

- **Function:** The chuck support holds and secures the workpiece in place on the spindle, allowing it to rotate accurately for machining. It provides a firm grip, ensuring stability and alignment during various cutting operations.
- **Advantage:** Chuck support enhances precision and safety by firmly holding the workpiece, reducing vibration and preventing slippage. This stability allows for more accurate cuts, even on irregularly shaped workpieces, and improves overall machining efficiency.

Motor

- **Function:** The motor in a lathe provides the rotational power to turn the workpiece at adjustable speeds, enabling cutting, shaping, and finishing. It drives the spindle, ensuring smooth and efficient machining for precise results.
- **Advantage:** The motor in a lathe machine enables adjustable speeds for handling various materials and cutting needs, ensuring precise, efficient machining. It provides consistent power to the spindle, allowing smooth rotation of the workpiece and reducing operator effort. This enhances productivity and accuracy in manufacturing tasks.



FINAL ASSEMBLY

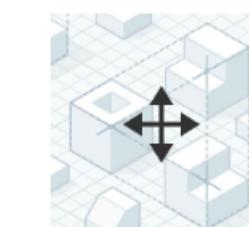
The image shows the Autodesk Fusion 360 interface with a large title "FINAL ASSEMBLY" at the top. The main workspace displays a 3D model of a lathe machine. A callout line points from the text "How would you like to start?" to the "DANGER" warning label on the machine's side panel. The left sidebar shows the component tree with items such as "Bed:1", "Base:1", "TailStock v1:1", "Carriage v1:1", and "Lead Screw:1". The bottom right view provides a detailed look at the internal mechanism of the carriage. The toolbar at the top includes icons for "INSERT", "SELECT", and "POSITION".

Learning Panel

Get started Guidance My learning

Hi Pushkin, you're in the Design wo

How would you like to start?



Set up view navigation

Control how you move around in Fusion.



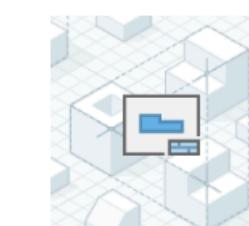
Create a component

Use components and bodies to build your designs.



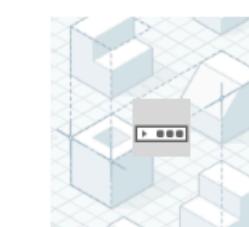
Create a sketch

Create sketch profiles that define the shape of solid, surface, and薄壁 bodies in your design.



Create a drawing from

Create and detail a drawing.



Capture design history

Record design changes and relationships in a timeline.

Did these help you get started?
[Let us know](#)

Suggestions for you

Thank You