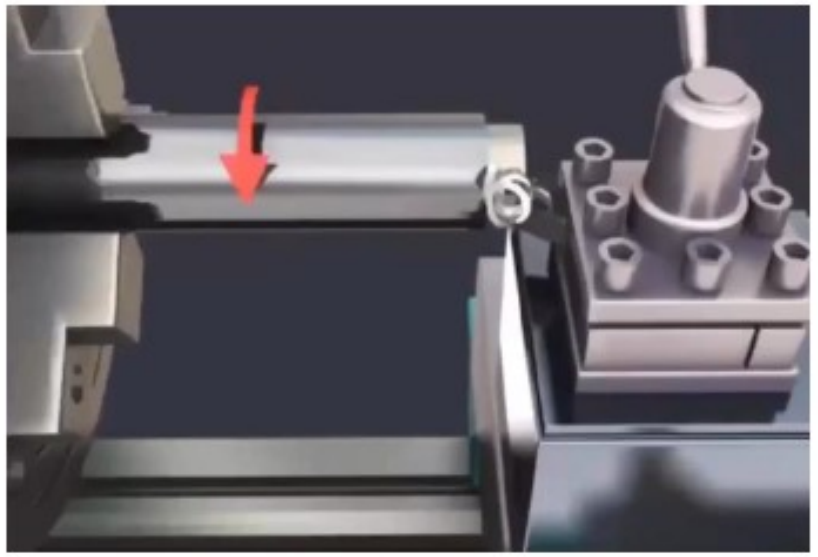
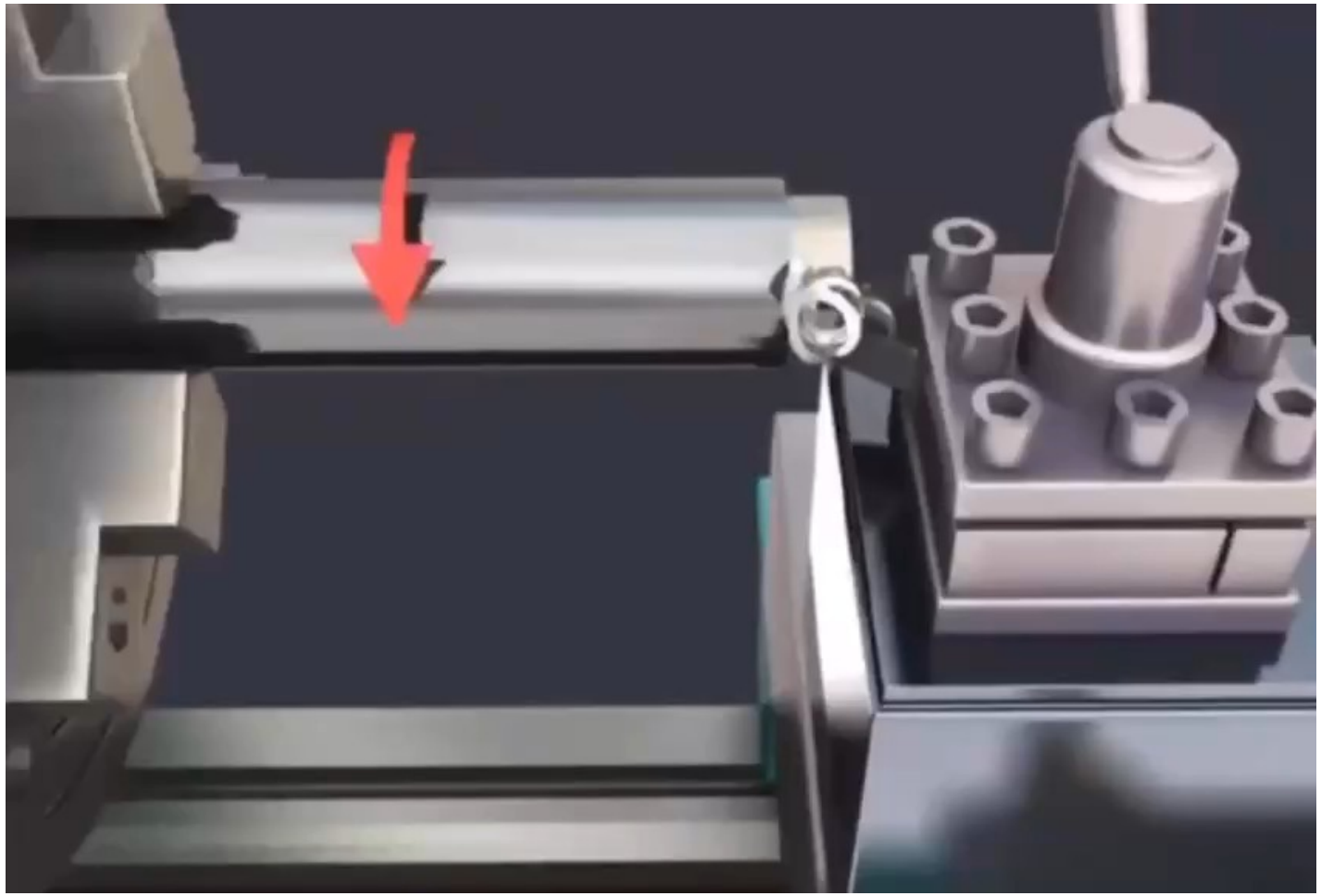
## INTRODUCTION TO LATHE

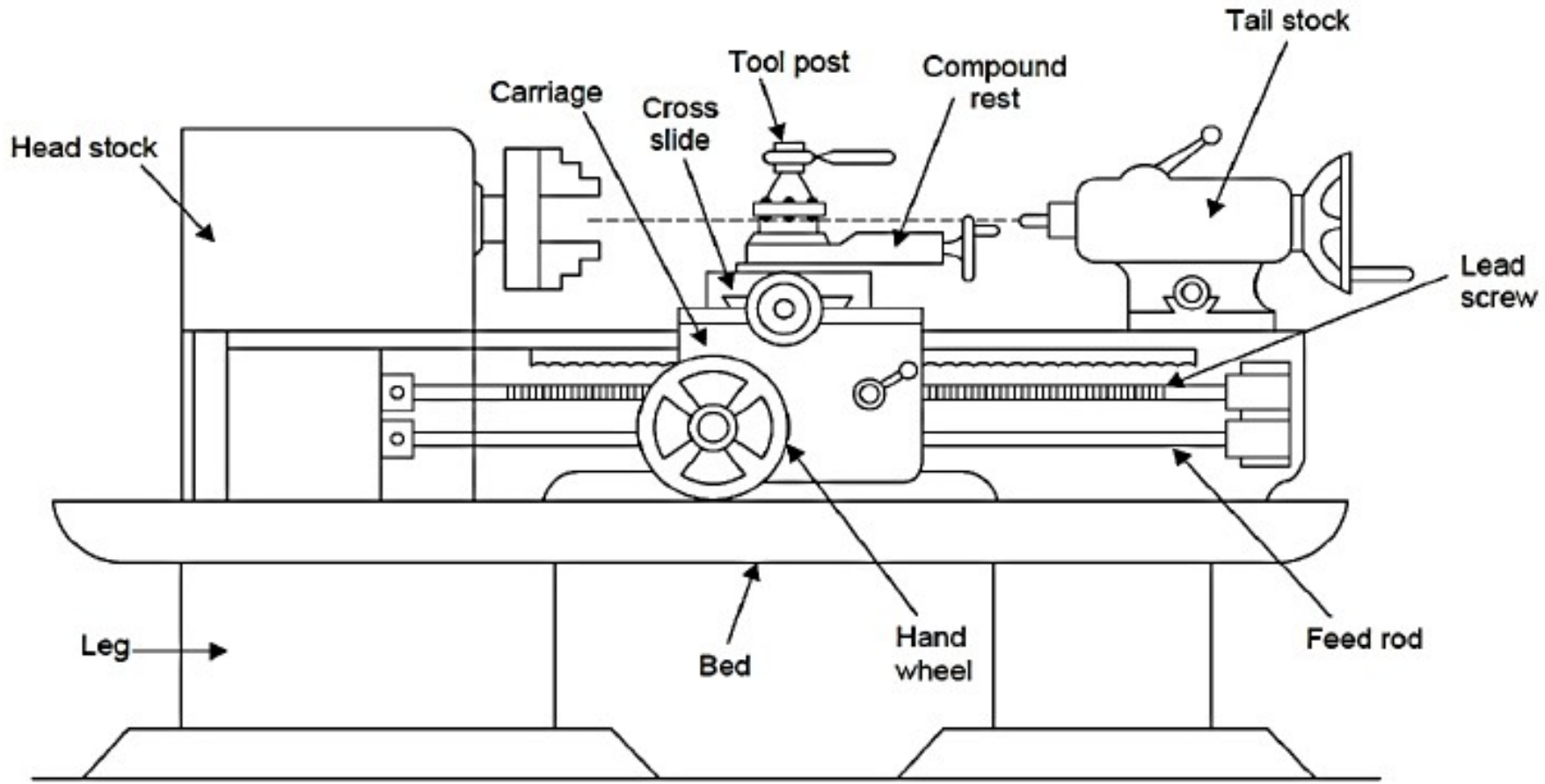
- Lathe is the oldest machine tool invented, starting with the Egyptian tree lathes.
- The principal form of surface produced in a lathe is the **cylindrical surface**. This is achieved by rotating the work piece while the single point cutting tool removes the material by traversing in a direction parallel to the axis of rotation and termed as **turning**.
- **Centre lathe** is the most common of the lathes, which derives its name from the way a work piece is clamped by centres (live and dead centres) in a lathe, though this is not the only way in which the job is mounted.
- This is sometimes also called engine lathe in view of the fact that early lathes were driven by steam engines.



# MECHANICAL ENGINEERING SCIENCE
## MACHINE TOOL OPERATIONS



## TYPICAL PARTS OF LATHE



## TYPICAL PARTS OF LATHE

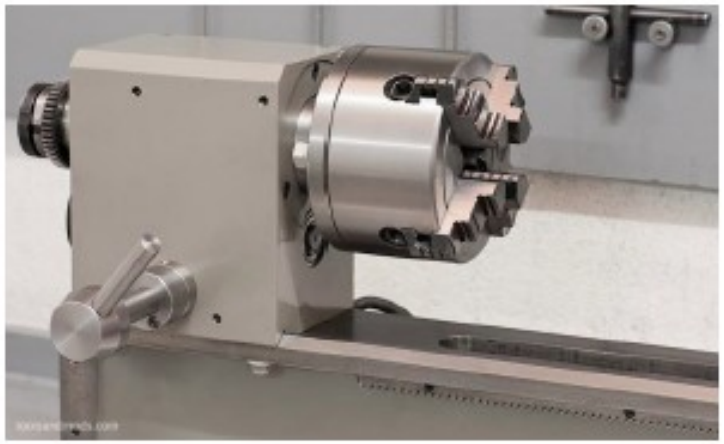
### BED

- It's the backbone of the lathe upon which all other components are mounted.
- The top of the bed is formed by guide ways. They act as a guide for accurate movement of carriage and tailstock.
- Made up of cast iron because of good damping and frictional resistance.

## TYPICAL PARTS OF LATHE

### HEADSTOCK (LIVE CENTRE)

- Is a box like casting mounted at the left end of the machine.
- It contains feed gear box or cone pulley which enables the spindle to rotate at different speeds.
- The gear box distributes the power to the lead screw for threading or to the feed rod for turning.



## TYPICAL PARTS OF LATHE

### TAILSTOCK (DEAD CENTRE)

- It is mounted on the right side of the machine.
- It is the movable part of the lathe that carries the dead centre in it.
- It can be slided on the bed to support different length of work piece. It can be clamped on the bed at desired location.
- Can be moved laterally for taper turning
- It can be used to carry tool like drill, reamer for making hole.

## TYPICAL PARTS OF LATHE

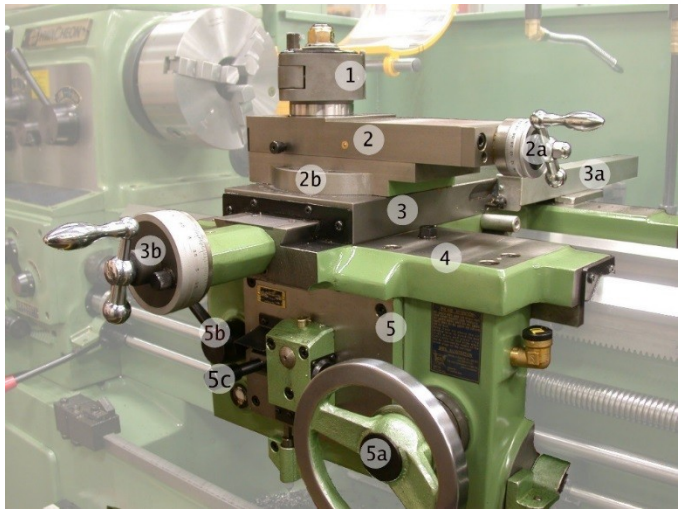
### CARRIAGE ASSEMBLY

- **CROSS SLIDE:** On the upper surface of the saddle is the cross slide. This moves the tool at right angle to spindle axis.

- It can either be operated by the means of the cross slide hand wheel or may be given power feed through the apron mechanism.

- **COMPOUND REST:** The compound rest is mounted on the upper surface of the cross slide. This can be swiveled so that the tool can move at an angle to the spindle axis.

- **TOOL POST:** This is mounted on the compound rest and carries the cutting tool.



## TYPICAL PARTS OF LATHE

### FEED ROD

- Feed rod is long shaft used to drive the **apron mechanism** for cross and longitudinal power feed during turning. It is powered by the set of gears from the headstock.

### LEAD SCREW

- It is a long threaded shaft geared to the headstock. Closing a split nut around the lead screw engages it with the carriage. The lead screw is used for cutting thread accurately and should be disengaged for other operations.