



SNS COLLEGE OF TECHNOLOGY

(An autonomous institution)



Department of Mechanical Engineering

Unit – III

**Topic
Lathe**

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Lathe

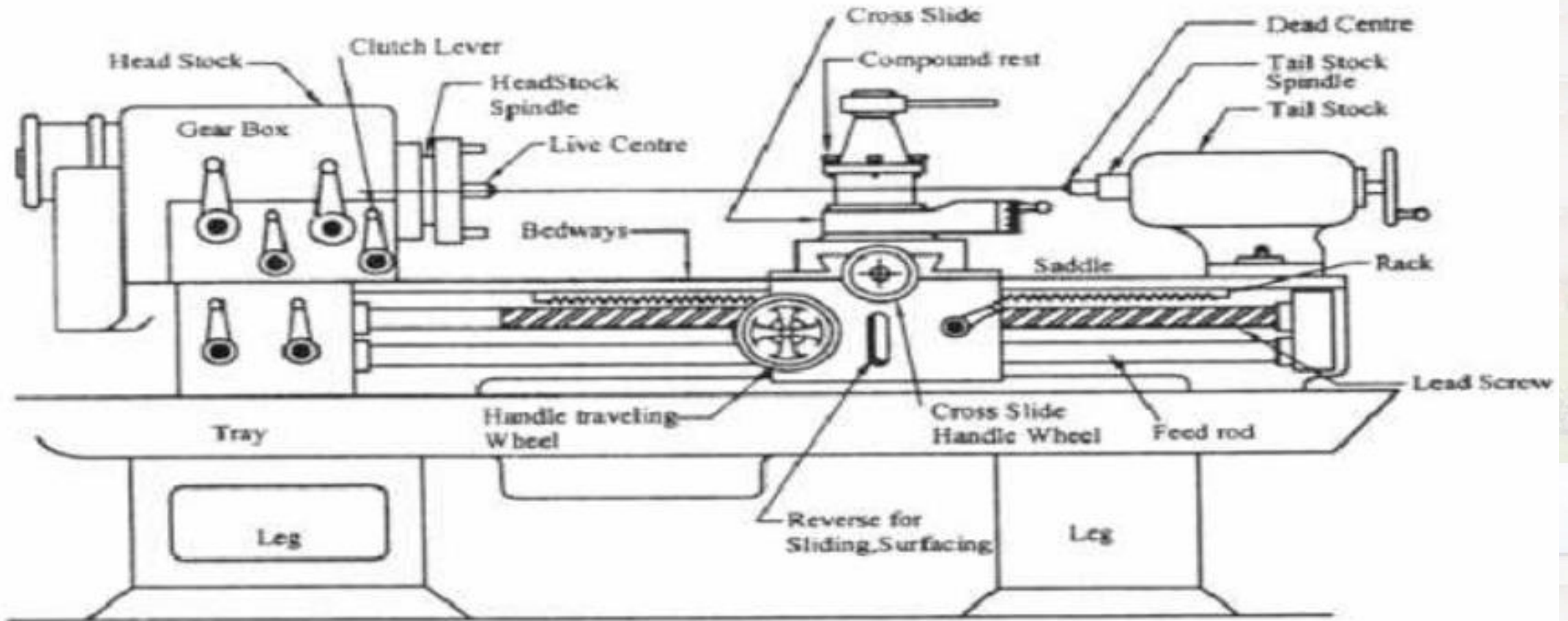


Lathe is a machine tool, which is used to remove metal from work piece for required shape and size.

This is done by holding the work piece firmly on the machine and turning it against the cutting tool, which will remove metal from the work in the form of chips



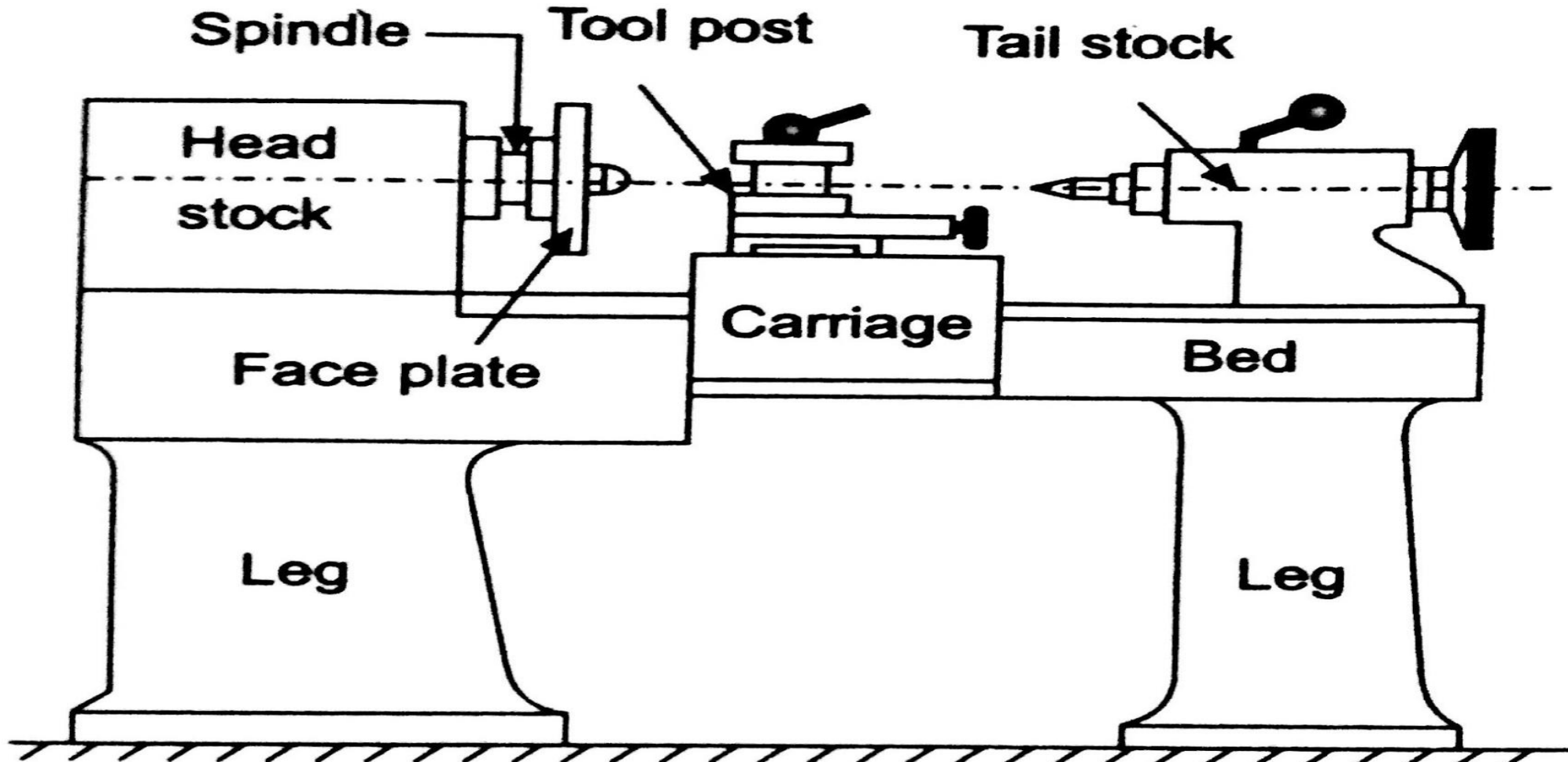
Lathe



Centre Lathe



Lathe





Lathe



Bed:

- ❖ It is the base of the lathe; the headstock and tailstock are located at either end of the bed and the carriage rests over the lathe bed and slides on it.

Headstock:

- ❖ It carries a hollow spindle .
- ❖ A live center can be fitted in to hollow spindle.
- ❖ The live center rotates with the work piece and hence called live center.

Tailstock:

- ❖ It is mounted on the bed at right angles end.
- ❖ It is used for supporting the right end of the work piece by means of a dead center.
- ❖ The dead center does not revolve with the work piece and hence called dead center.



Lathe



Carriage:

- ❖ It is supported on the lathe bed ways and can move in a direction parallel to the lathe axis .
- ❖ It carries **saddle, cross slide, compound rest, tool post and apron.**
- ❖ It is a H- shaped casting fitted over the bed. It moves along the guide way.

Cross slide:

- ❖ It carries the compound rest and tool post.
- ❖ It is mounted on the top of the saddle.
- ❖ It may be moved by hand or may be given feed through apron mechanism.



Lathe



Compound rest:

- ❖ It is mounted on the cross –slide .
- ❖ It carries a circular bar called swivel plate, which is graduated on degrees.
- ❖ The upper part is known as the compound slide, and it can be moved by means of the hand wheel.

Tool post:

- ❖ The tool post is fitted over the compound rest. the tool is clamped in the tool post.

Apron:

- ❖ Lower part of the carriage is termed as the apron.
- ❖ It is attached to the saddle and hangs in front of the bed .
- ❖ It contains **gear, clutch and lever** for moving the carriage by a hand wheeler power feed.



Lathe



Feed mechanism:

- ❖ The movement of tool relative to the work is termed as feed.
- ❖ A lathe may have three types of feed: longitudinal, cross, and angular feed.
- ❖ The feed mechanisms have different units through which motion is transmitted from the head stock spindle to the carriage.

Following are the units:

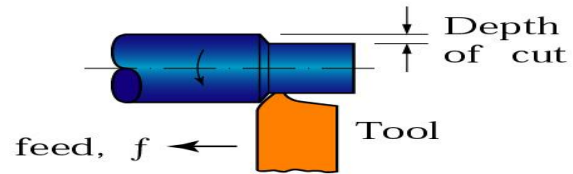
- **End of bed gearing,**
- **Feed gear box,**
- **Feed rod and lead screw,**
- **Apron mechanism.**



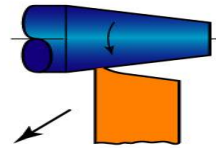
Lathe Operations



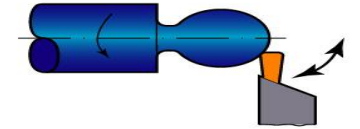
(a) Straight turning



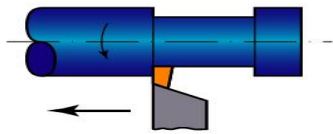
(b) Taper turning



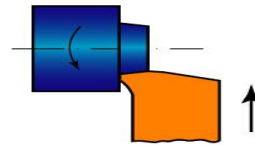
(c) Profiling



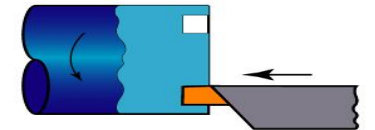
(d) Turning and external grooving



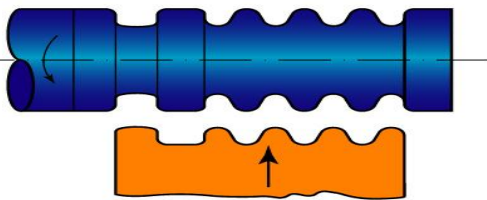
(e) Facing



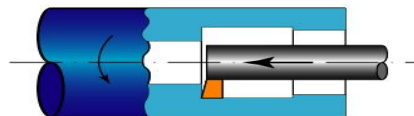
(f) Face grooving



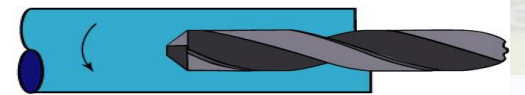
(g) Cutting with a form tool



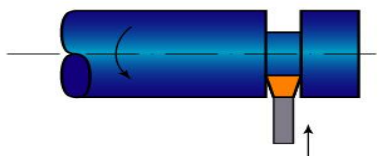
(h) Boring and internal grooving



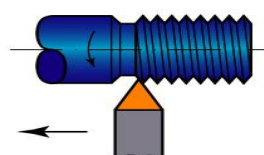
(i) Drilling



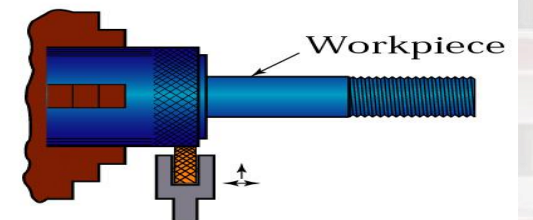
(j) Cutting off



(k) Threading



(l) Knurling





Lathe Operations



Turning:

Operation of **reducing diameter** of cylindrical jobs.

To produce straight, conical, curved, or grooved workpieces such as shafts, spindles, and pins.

Plain turning

Step turning

Form turning-Involves use of form tool for turning different contours.

Taper turning- operation of turning conical or tapered shapes.

Facing: to produce a flat surface at the end of the part and perpendicular to its axis useful for parts that are assembled with other components. Face grooving produces grooves for applications such as O-ring seats

Boring: to **enlarge a hole** or cylindrical cavity made by a previous process or to produce circular internal grooves.



Lathe Operations



Drilling: to **produce a hole** which may be followed by boring to improve its dimensional accuracy and surface finish.

Parting: also called cutting off, to **cut a piece** from the end of a part, as is done in the production of slugs or blanks for additional processing into discrete products.

Threading: to produce **external or internal threads**. It is the operations by which threads are cut on the surface of the work piece.

Knurling: to produce a **rough surface on smooth surfaces** of cylindrical jobs.

Ex. Micrometer screw gaug.

Reaming: The operations for **finishing a drilled or bored hole** for smooth finishing are called as reaming. The tool used is called as reamer. It has multiple cutting edges. The reamer is fitted in the tail stock spindle.

Tapping



Lathe Operations



Grooving

Grooves or necking are produced on work piece.

Forming

Convex, concave or any irregular shapes are formed on workpiece using form tool.

Chamfering

Turning a taper at end of work piece.



Thankyou