Methods of taper turning

There are four methods of taper turning

- Method 1.

By the help of forming tool

- Method 2.

By setting over the tailstock centre

- Method 3.

By swiveling the compound rest

- Method 4.

By a taper turning attachment.

Taper Turning..

Conicity $K = \frac{D_1 - D_2}{L}$

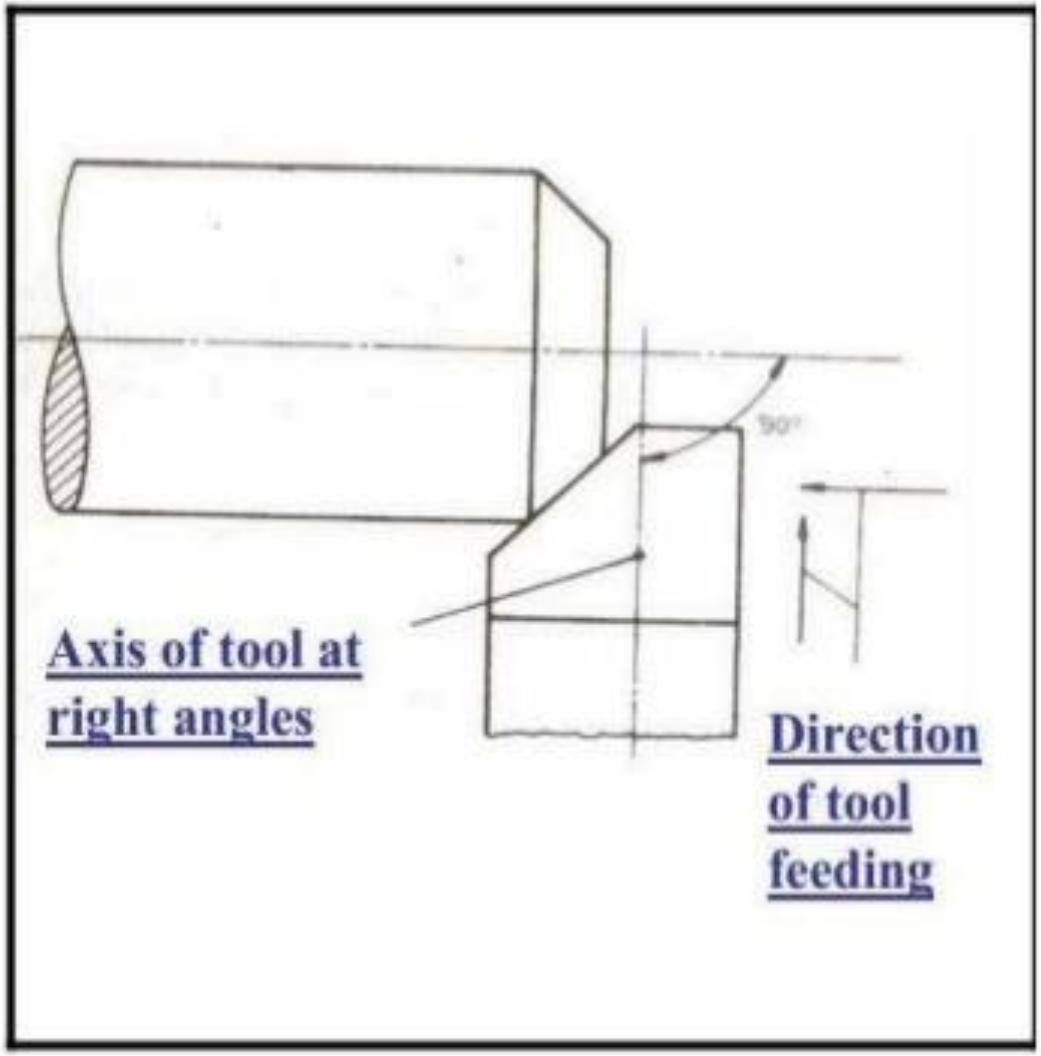
Methods

- Form Tool
- Swiveling Compound Rest
- Simultaneous Longitudinal and Cross Feeds
- Taper Turning Attachment
- Tailstock set over

- Method 1.

By the help of forming tool

- This Method Is Used In Mass Production For Producing A Small Length Of Taper.
- The Form Tool Should Be Set At Right To The Axis Of The Work. The Carriage Should Be Locked While Turning Taper By This Method.



- Method 2. By setting over the tailstock centre

TAIL STOCK OFFSET METHOD

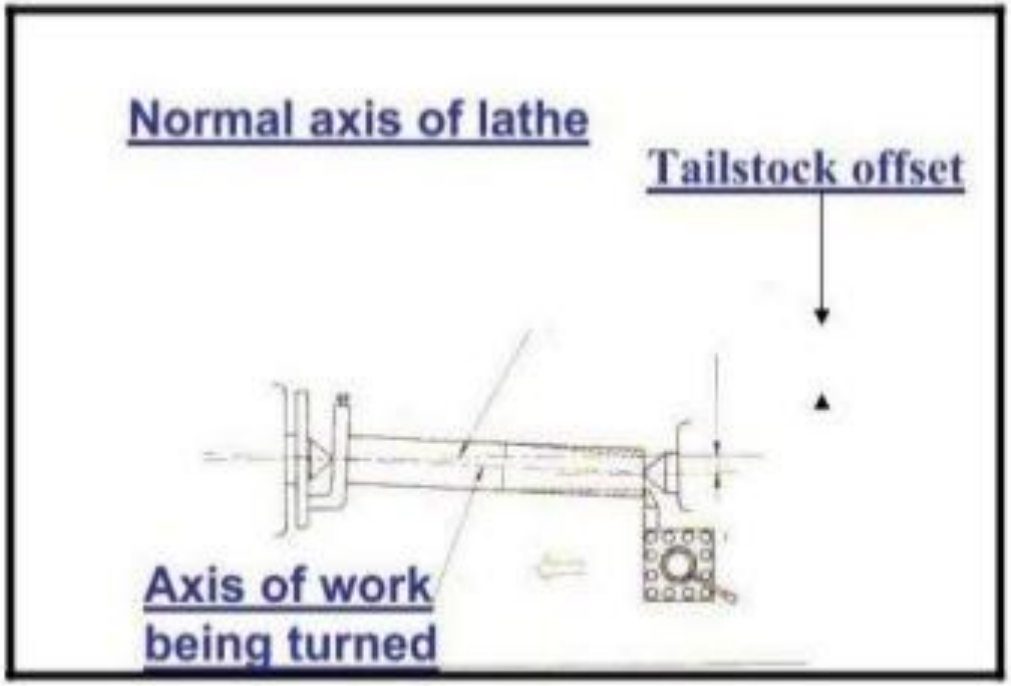
OFFSET:(D-d)×L/2l.

D=BIG DIAMETER.

d=SMALL DIAMETER.

L=LENGTH OF TAPER.

L=TOTAL LENGTH OF THE JOB.



- Method 3. By swiveling the compound rest

TAPER TURNING.
COMPOUND REST

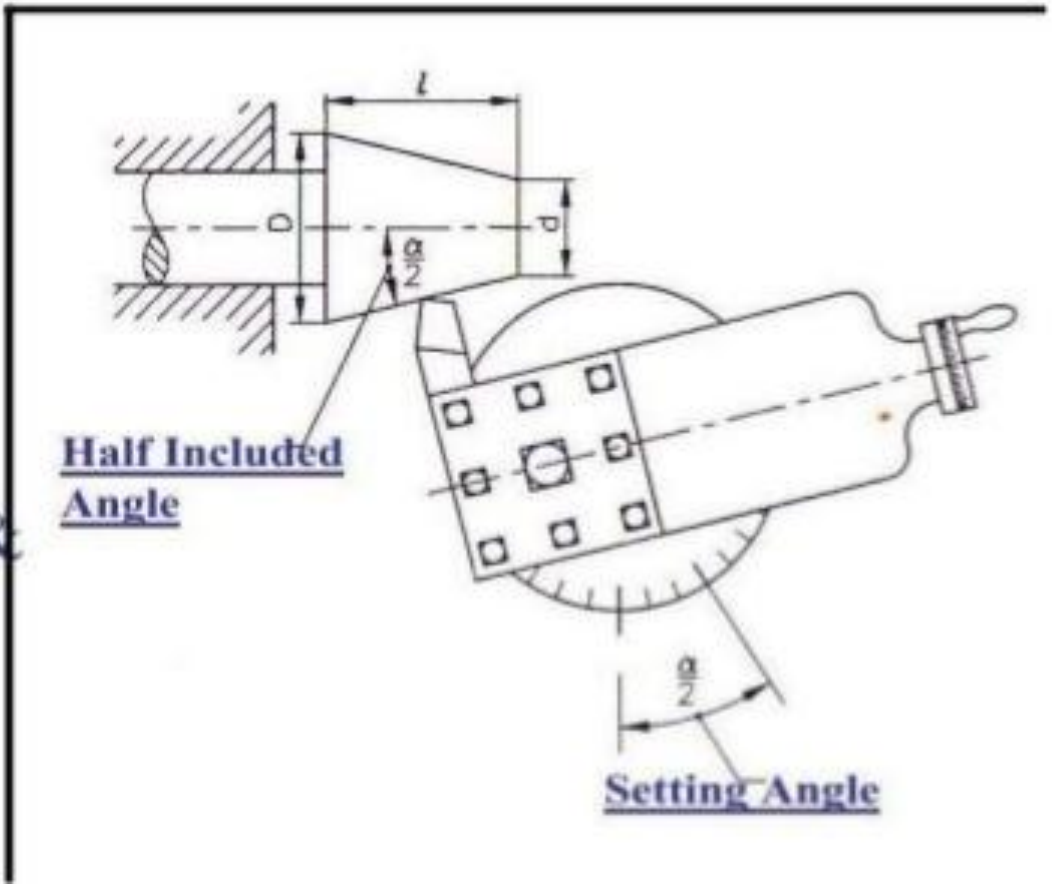
- Tan ø = D-d/2l.

➢ Major Diameter D,
Minor Diameter d,
Taper Length l,
Taper Angle Ø,

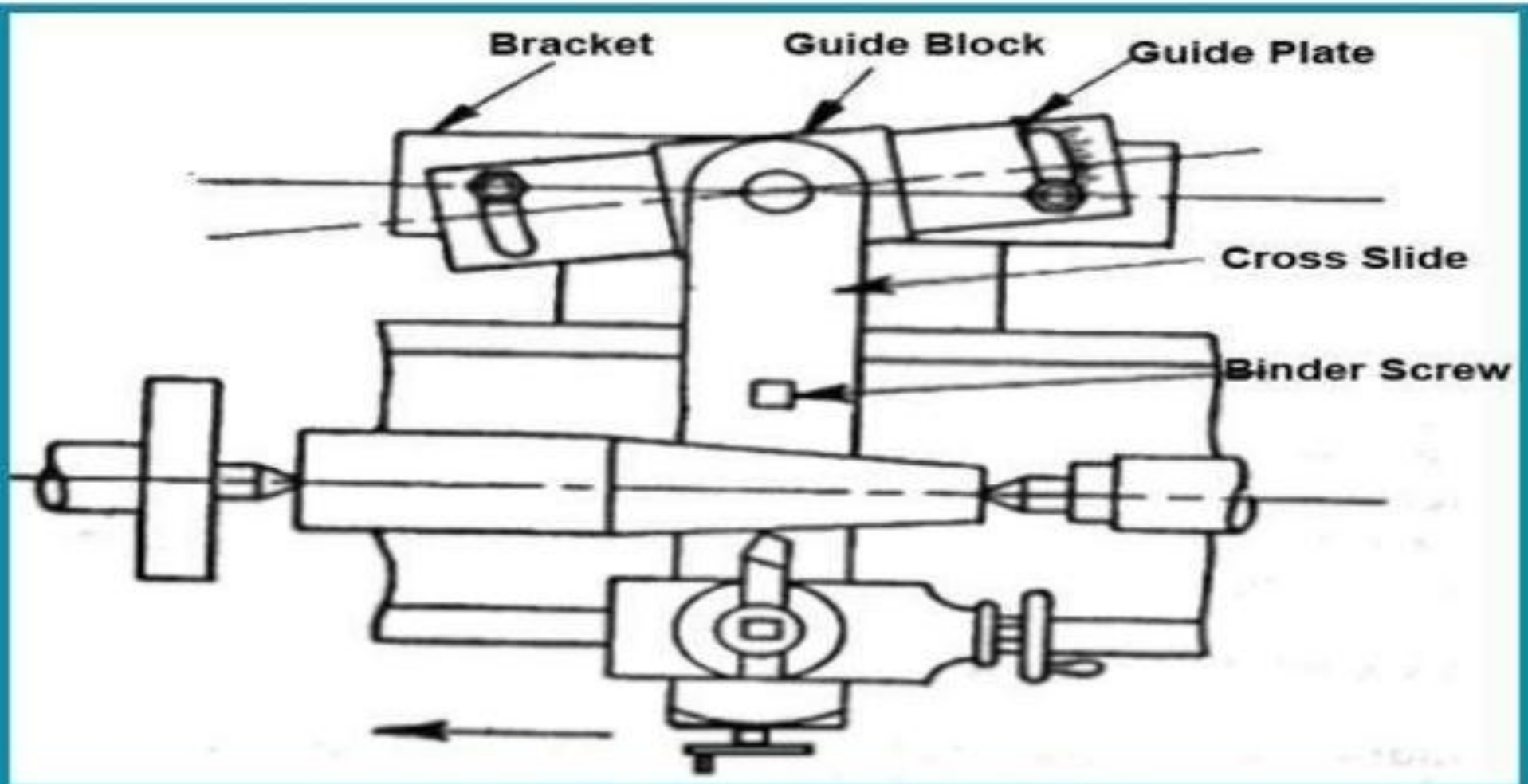
❖ **ADVANTAGE:**

➢ Can be made external & internal taper.

➢ Setting easily.

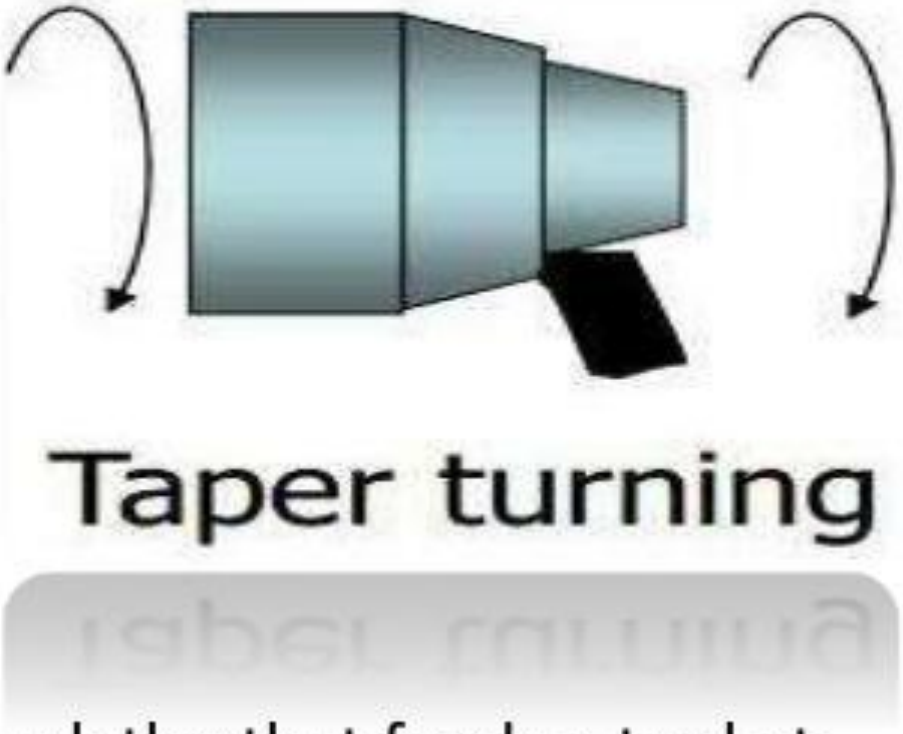


- Method 4: By a taper turning attachment.



Taper Turning by a Taper Attachment

TAPER TURNING



An operation performed on a lathe that feeds a tool at an angle to the length of the work piece in order to create a conical shape. This tapering operation has wide range of use in construction of machines. Almost all machine spindles have taper holes which receive taper shank of various tools and work holding devices.

Machine tool classification

- According to direction of major axis :
  - horizontal center lathe, horizontal boring machine etc.
  - vertical – vertical lathe, vertical axis milling machine etc.
  - inclined – special (e.g. for transfer machines).

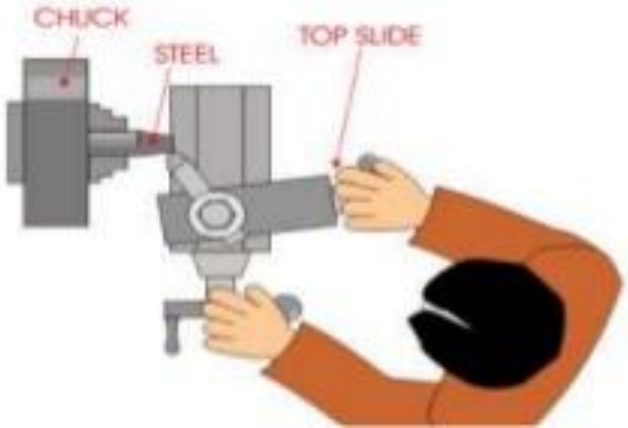
- According to purpose of use :
  - general purpose – e.g. center lathes, milling machines, drilling machines etc.
  - single purpose – e.g. facing lathe, roll turning lathe etc.
  - special purpose – for mass production.

- According to degree of automation
  - non-automatic – e.g. center lathes, drilling machines etc.
  - semi-automatic – capstan lathe, turret lathe, hobbinh machine etc.
  - automatic – e.g., single spindle automatic lathe, swiss type automatic lathe, CNC milling machine etc.

- According to size :
  - heavy duty – e.g., heavy duty lathes (e.g. $\geq$ 55 kW), boring mills, planning machine, horizontal boring machine etc.
  - medium duty – e.g., lathes – 3.7 ~ 11 kW, column drilling machines, milling machines etc.
  - small duty – e.g., table top lathes, drilling machines, milling machines.
  - micro duty – e.g., micro-drilling machine etc.

Taper turning by combining feeds

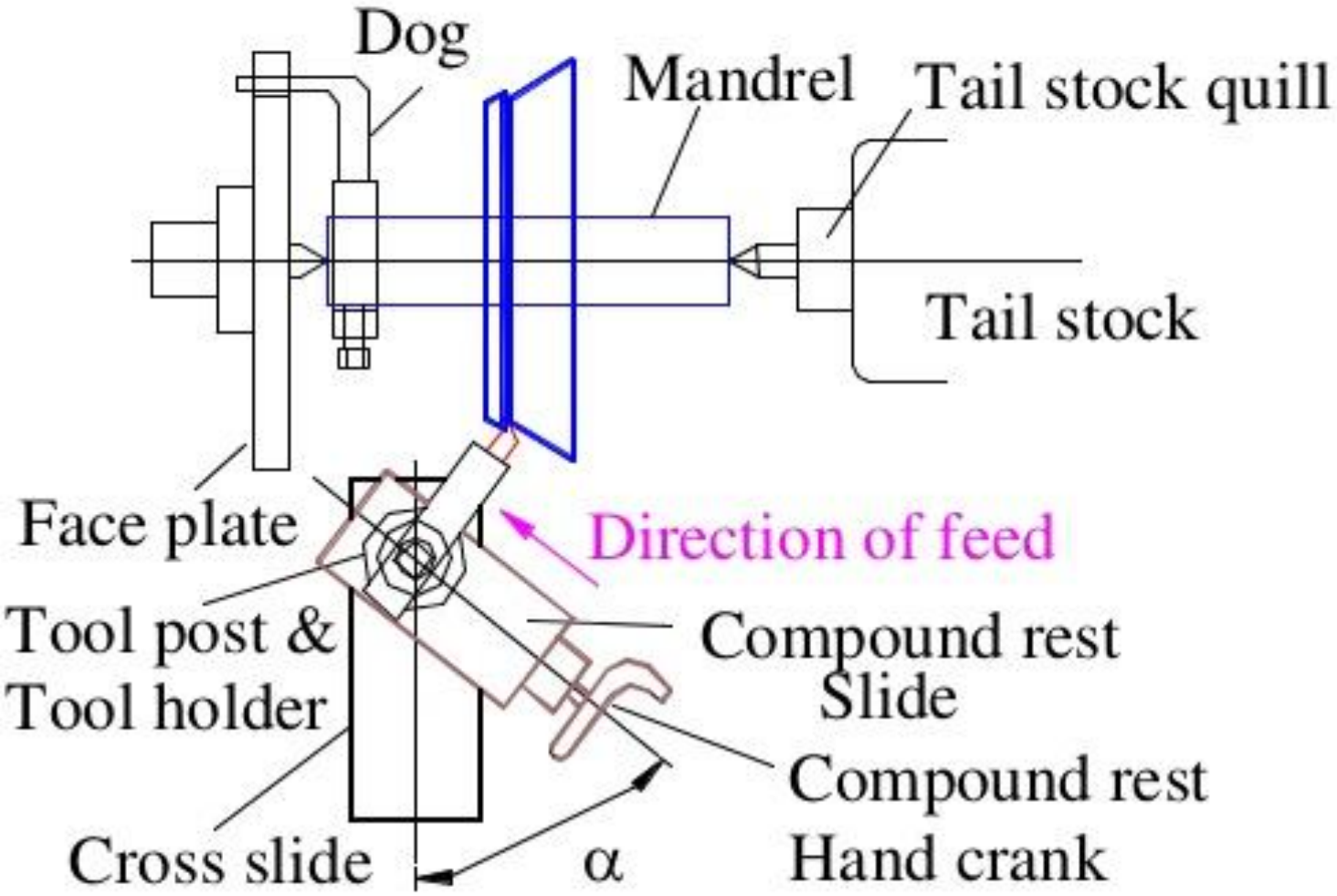
- Taper turning by combining feeds is a more specialized method of turning taper.
- In certain lathes both longitudinal and cross feeds may be engaged simultaneously causing the tool to follow a diagonal path which is the resultant of the magnitude of the two feeds.
- The direction of the resultant may be changed by varying the rate of feeds by change gears provided inside the apron



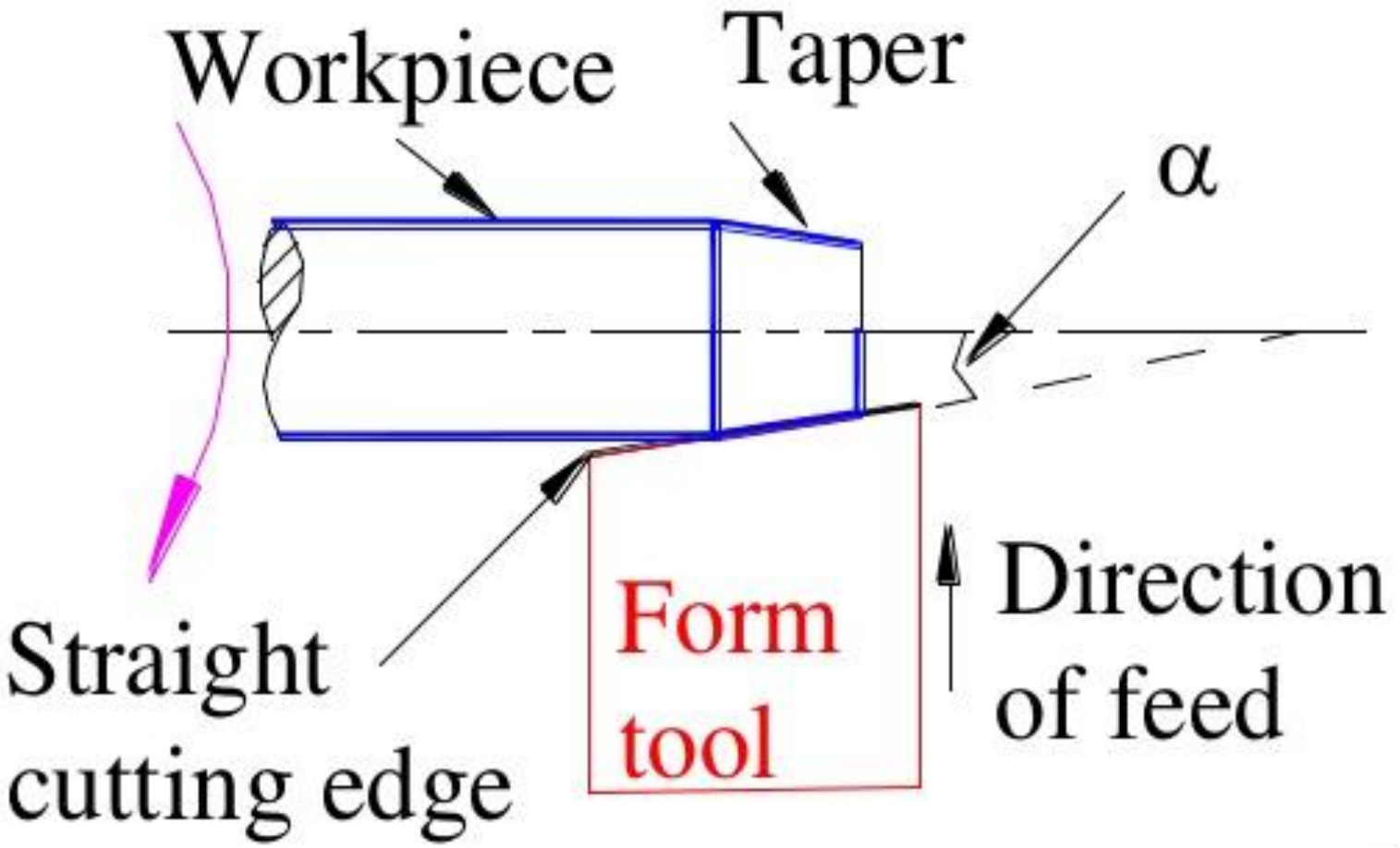
Operations on Lathe ..

Taper Turning „

by compound rest

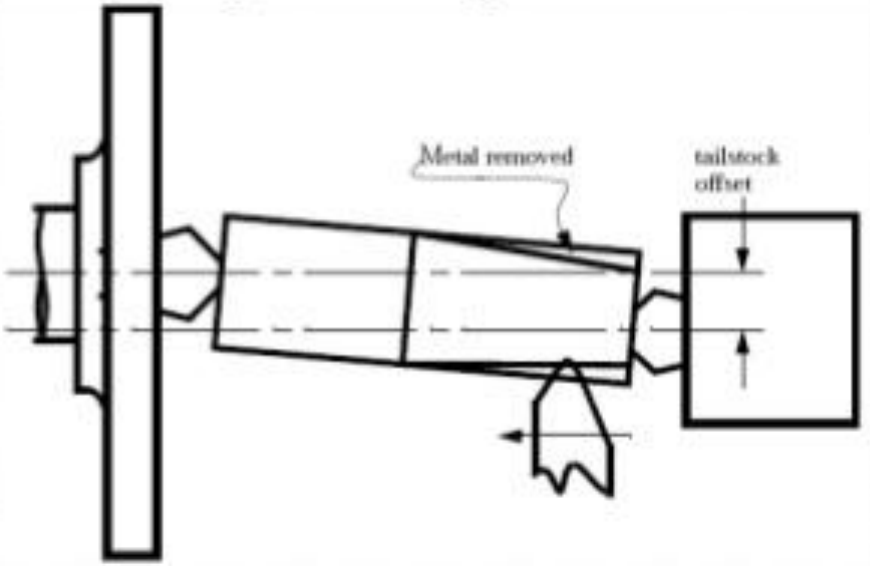


Taper Turning ..
by form tool

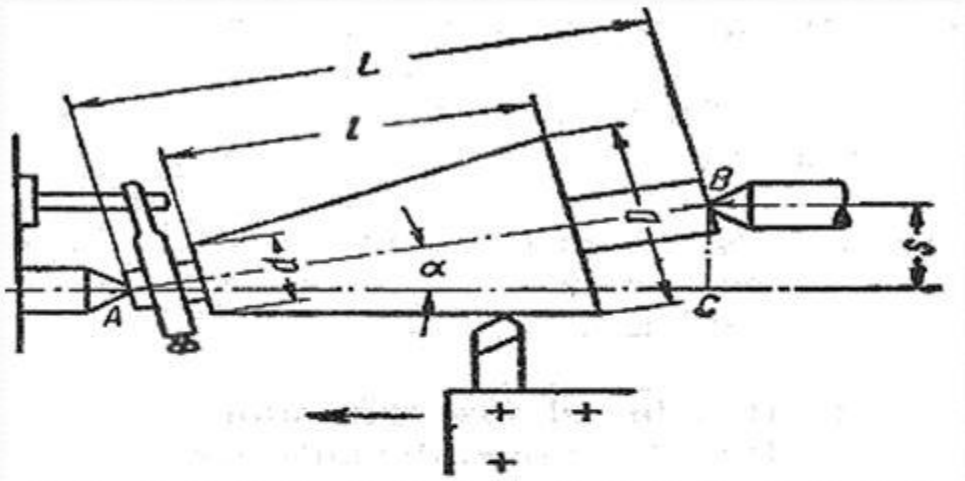


Offsetting the tailstock

- It is necessary to measure the tailstock offset when using this method.
- This method is limited to small tapers (Not exceeding 8°) over long lengths.
- By offsetting the tailstock, the axis of rotation of the job is inclined by the half angle of taper.



Taper turning by setting over tailstock:-



- The principle of turning taper by this method is to shift the axis of rotation of work piece from original axis.
- The amount of offset for a particular taper can be calculated by using the formula,

set over(offset)=L*[D-d/2L]

where L=total length of work piece
l= the length of taper
D= larger diameter of the work piece
d= smaller diameter of the work piece