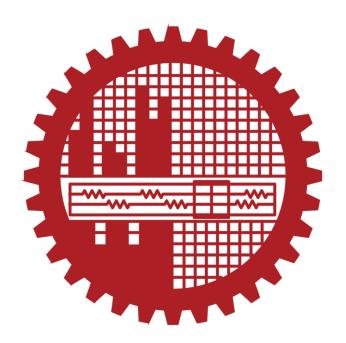
IPE-432 MACHINE TOOLS SESSONAL

Md. Hasibul Islam July 19, 2023



Contents

1 Experiment 03: Study of Engine Lathe (New Sir)

1

1 Experiment 03: Study of Engine Lathe (New Sir)

Date: 15/07/2023

Power

- Spindle speed \rightarrow Primary motion speed
- 3 phase induction motor \rightarrow V-belt pullet \rightarrow Headstock (S.G.B.)
- Feed rod/ Lead screw \rightarrow Feed movement
- Rest all \rightarrow auxiliary move.
- S.G.B. \rightarrow spindle \rightarrow Jaw \rightarrow Job
- F.G.B. (below S.G.B.) \rightarrow Lead screw / Feed rod \rightarrow Motion in carriage.

Headstock:

Housing of SGB, and rotation transfer to the spindle.

Change Gear Box

Precision threading (non-standard thread) F.G.B. \rightarrow speed transfer

Why change gear? \rightarrow We can easily change the gears of CGB

Normally, 4 gears with different combination and their transmission ratio is high.

Stepped drive system:

We can not get continuous speed but discrete speed is possible only.

Important Points:

- Lead screw/feed rod \rightarrow automatic feed is given
- In lathe machine, almost all operations can be done except gear cutting.
- Difference between turning and threading:
 Threading → high feed rate,
 Turning → low feed rate (also known as micro threading)
- 2 output shaft: High feed (threading) \rightarrow Lead screw Low feed (turning) \rightarrow Feed rod
- Torsional Deformation happens if high & low feed are given one after another. Thats why different feed for different rod/shaft.

- Apron (cover) → can convert roational motion to feed motion. Contains carriage.
- Saddle: H-shaped
- Cross slide [cross movement] : half nut mechanism
- Swivle Plate [angular movement]
- Top slide
- Tail stock: Support long workpiece and attach cutting tool. Can not move cross, only horizontal. But offsetting very small angle around 4° is possible.
- Guideway : Guide the movement of tailstock & carriage. [V-shaped guideway]
- topslide \rightarrow manual movement in cutting tool.
- half nut mechanism \rightarrow 2 position. cross slide and lead screw motion.

Taper Turning

- 1. Setting over tail stock [offsetting tail]
- 2. 2 feed method: simultaneous longitudial (carriage) and cross slide (cross) motion.
- 3. With swivle plate angle.
- 4. With taper turning attachment.

How rotary motion converted to linear motion (lead screw/ feed rod)

Key slot and spur gear in apron. The key sets on key slot and feed rod will move with spur gear. Rack and pinion are present (Bevel gear).

Accesories:

- Live center \rightarrow headstock
- Dead center \rightarrow tailstock
- \bullet Mandle \to Holds the internal hollow work piece
- 3 jaw self centered chuck [auto center]
- 4 jaw independent chuck [manually centering]

Follow Lab sheet also.

- Faceplate \rightarrow holds the irregular shape workpiece.
- • Rest \rightarrow Support the small diameter workpiece, in order to prevent buckling.

Two types:

a)Steady rest: fixed, doesn't move. (in bed)
Follower rest: mounted on saddle. Follow the cutting tool.