

LATHE MACHINE

Introduction

Lathe is one of the most versatile and widely used machine tools all over the world. It is commonly known as the mother of all other machine tool. The main function of a lathe is to remove metal from a job to give it the required shape and size. Figure 1 shows the working principle of lathe. An engine lathe is the most basic and simplest form of the lathe. It derives its name from the early lathes, which obtained their power from engines. Besides the simple turning operation as described a down.

1. Working principal of lathe machine

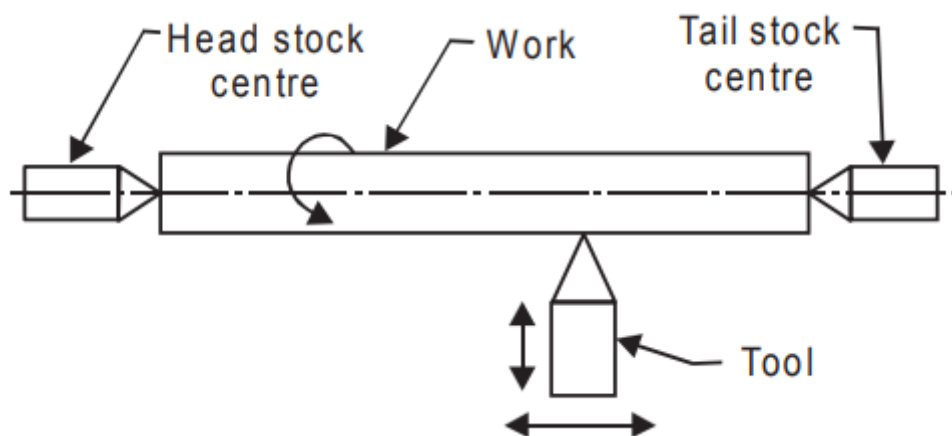


Fig. 1: Working principal of lathe machine

The working principle involves rotating a workpiece against a fixed cutting tool. As seen in the figure above, the chuck (live centre) and the tailstock (dead centre) hold the workpiece to be machined. The tool is moved horizontally or vertically along the surface of the workpiece to create circumferential (cylindrical) or deep cuts respectively.

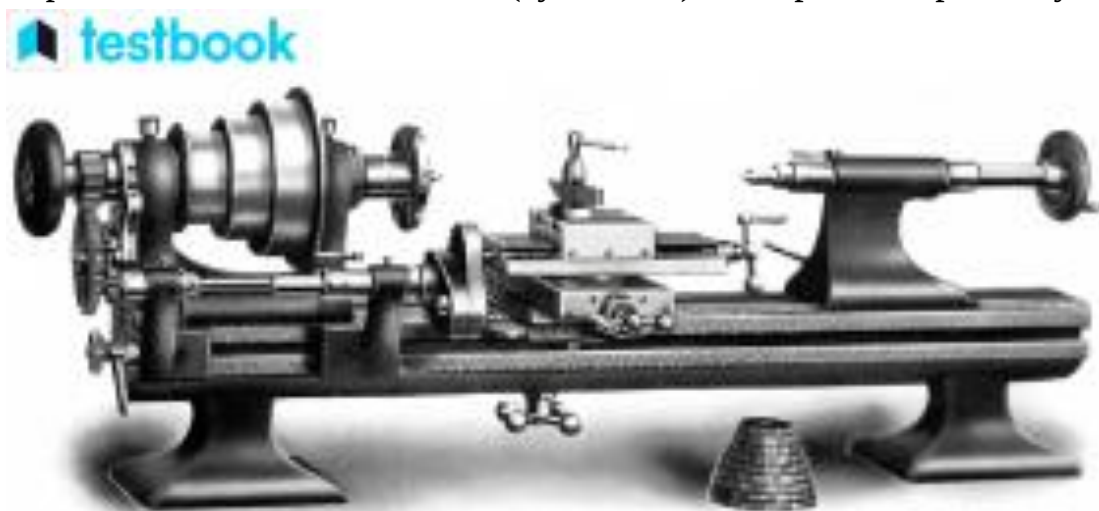


Fig. 2: Oldest Lathe Machine

2.The Parts of a Lathe Machine

This section helps you learn all the parts that are responsible for the work done on the machine

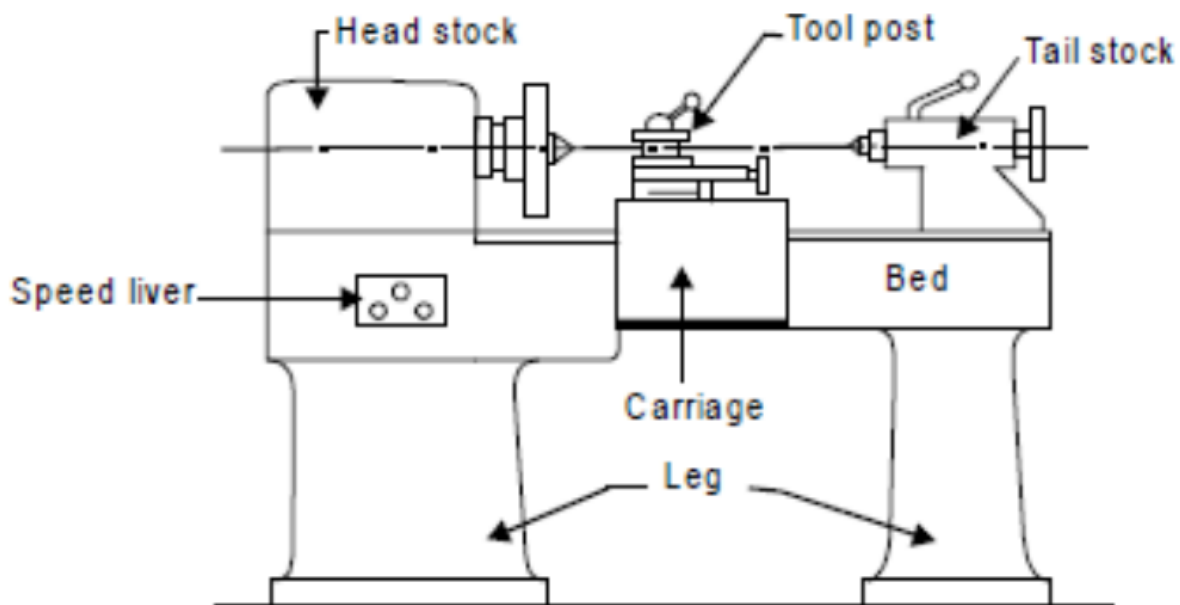


Fig. 3 Principal components of a central lathe

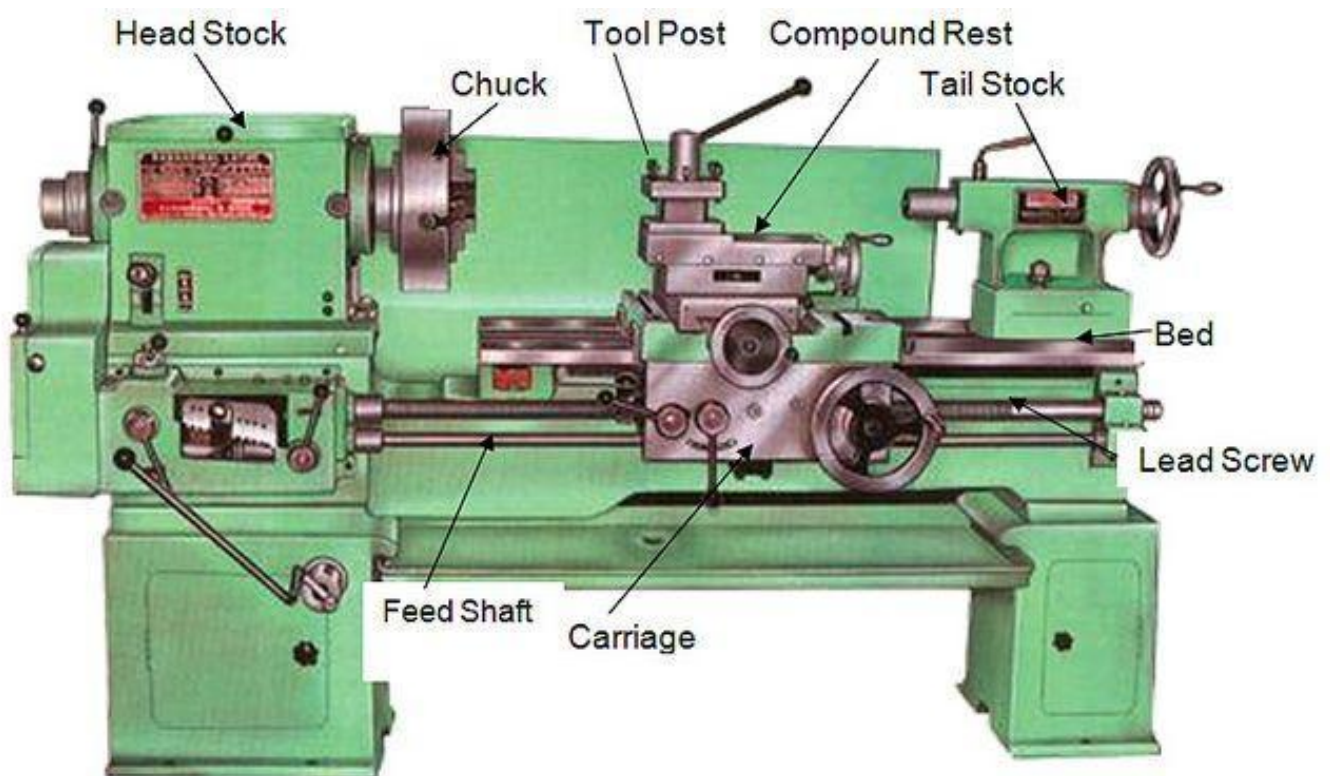


Fig. 4 Parts of Lathe Machine

1.1. Bed :

- 1) A bed is the main body of the machine.
- 2) All the main components are bolted on it.
- 3) It is usually made of cast iron due to its high compressive strength.
- 4) It is made by the casting process and is bolted to the floor space.

1.2. Legs:

- 1) Legs are used to carry all the loads of the machine.
- 2) They are bolted on the floor which prevents vibration.

1.3. Head Stock:

- 1) Headstocks are the main body parts that are placed on the left side of the bed.
- 2) It serves as a holding device for gear chains, spindles, driving pulleys, etc.
- 3) The mechanism of the headstock is driven by an electric motor that rotates the spindle.
- 4) It is also made of cast iron

1.4. Carriage:

- 1) It is located between headstock and tailstock.
- 2) It is used to hold and move the tool post along the bed either towards or away from the headstock.
- 3) It slides on the guideways.
- 4) It is also made of cast iron.

1.5. Tailstock:

Tailstock is a casting located on the right side of the bed.

- 1) Its function is to support the loose end of the workpiece or a job while machining.
- 2) It can slide on the bed guideways and can be clamped in any position.
- 3) The tailstock has the following purposes:
 - 3.1.) To support the loose ends of long jobs for carrying out lathe operations.
 - 3.2) To hold the cutting tools such as drill chucks, drills, reamers, etc.
 - 3.3) Turning of outer taper by an offsetting method

1.6. Chuck:

- 1) It is an important tool, which is used to hold and rotate the workpiece.
- 2) The smallest piece of workpiece can be hold in a chuck.

1.7. Tool Post:

- 1) It is bolted to the carriage on top of the compound slide.

1.8. Feed Shaft:

- 1) It is made from good quality alloy steel.
- 2) It spans the entire length of the bed and is fitted under the lead screw.
- 3) It has a “keyway” from which motions can be given to the carriage for the feed mechanism.
- 4) When the power feed is attached, it provides cross movement to the tool.

1.9. Lead Screw:

- 1) It is used for thread cutting.
- 2) Lead screw is situated at the bottom side of the bed which is used to move the carriage automatically during thread cutting.
- 3) It is made from good quality alloy and is made of acme threads.

1.10. Compound Rest:

- 1) A compound rest is a part that connects the cross slide and the compound slide.
- 2) The compound rest is mounted on top of the cross

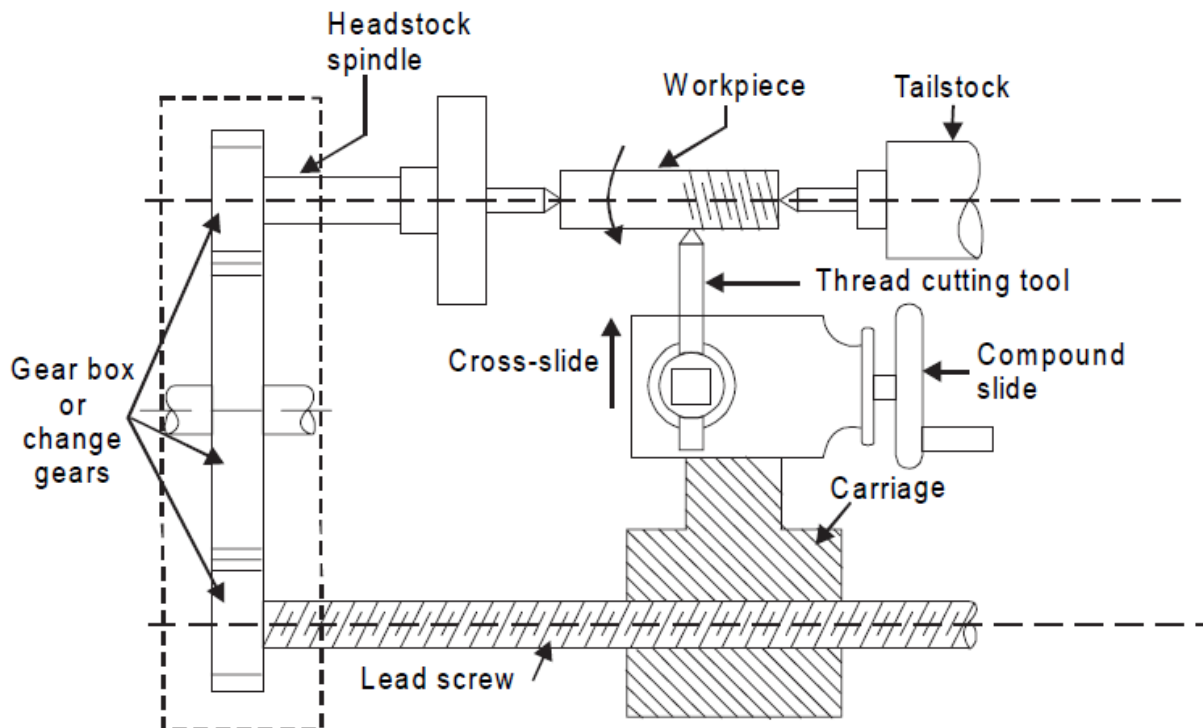


Fig. 5 Thread cutting

Glossary

An engine lathe: Un tour à moteur

Workpiece: pièce à usiner

Hold the workpiece to be machined: maintiennent la pièce à usiner

Gear chains: chaînes d'engrenages

Remove metal : enlever le métal

The Chuck (live centre): le mandrin (pointe tournante)

The Tailstock (dead centre) : la contre-pointe (pointe morte)

Headstocks: La tête de stock

Device : appareil

Spindles : les broches

Driving Pulleys : les poulies motrice

Carriage: Chariot

It slides on the guideways: Il coulisse sur les glissières.

Towards : vers

Drills : des perceuses

Reamers : des alésoirs

Outer Taper : cône extérieur

An Offsetting Method : une méthode de décalage

Tool Post : Porte-outil

Slide : glissière

Feed Shaft : Arbre d'alimentation

It spans the entire length of the bed and is fitted under the lead screw: Il est fabriqué en acier allié de bonne qualité. 2) Il s'étend sur toute la longueur du banc et est monté sous la vis mère

Lead Screw : Vis mère

Thread Cutting: Le filetage.

Compound Rest: Repos composé