Drilling Machine

Drilling Machine is the simplest, moderate, and most accurate machine tool used in almost all the production shops and tool rooms. Drilling is basically a single-purpose machine tool as its main purpose is to make holes in the workpiece.

Drilling Machine Definition:

A drilling machine is a type of machine in which the holes are being made on the workpiece by making use of a rotating tool called drill bit or the twist drill.

Drilling is basically a technology of creating holes. Drilling operations can also be performed on Lathe machines.In the lathe machine, the workpiece rotates and the drilling tool is held stationary in the tailstock.

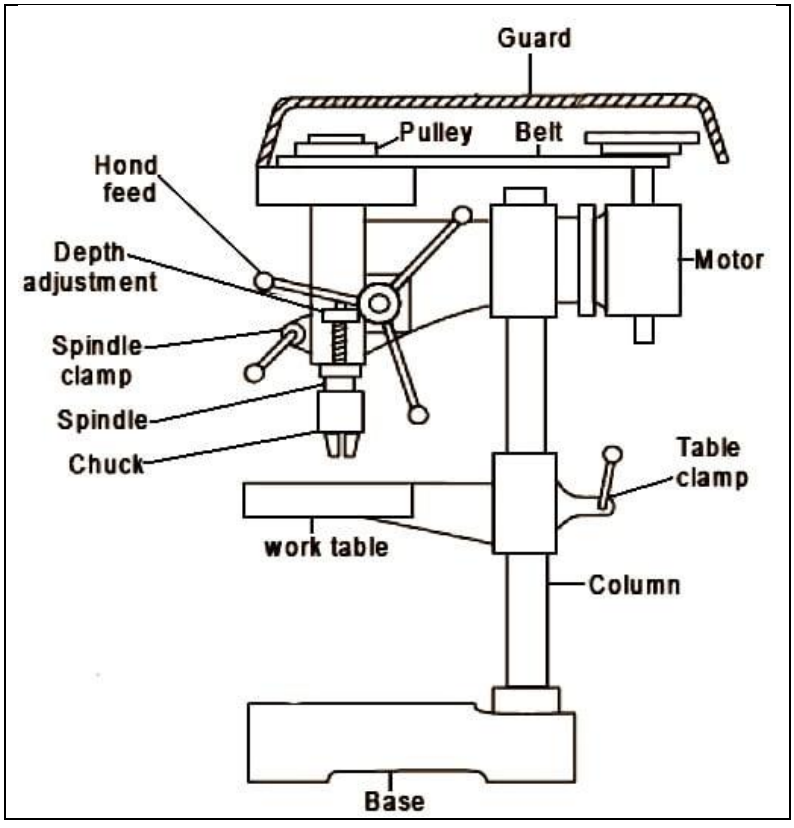
Boring: When we talk about drilling, boring is mostly discussed. Basically, Boring is a process in which the holes are enlarged that are already being drilled or cored. To perform boring action by a machine a special holder for the boring tool is required.

Drilling Machine working principle:

Drilling Machine has based upon the principle that the rotating edge of the tool exerts a large force on the workpiece and holes are being created in the workpiece. The material is removed from the workpiece by the shearing and extrusion process.

Drilling Machine Parts:

- Bed
- Pillar
- Swivel table
- Motor
- Steeped pulley
- Spindle
- Chuck
- Drill Bit and
- Hand-wheel.



1. Bed:

The bed is the main part of the machine on which the whole machine is being mounted. The bed is made up of cast iron, so it has high compressive strength and good wear resistance.

2. Pillar:

The pillar is a type of vertical column that rests on the bed. A pillar is present at the center of the bed. The pillar helps the motor and the spindle head.

4. Motor:

The motor is present at the top of the column. The inside motor shaft is there which is connected to a stepped pulley so that we can increase or decrease the speed of the rotation of the motor.

5. Stepped pulley:

Two steeped pulleys are present on either side of the column at the top. Out of these two, one pulley will be in an upward direction while the other pulley is inverted.Always both the pulleys will be there in the opposite direction. The basic function of the stepped pulley is to control the speed of the rotation of the motor.

6. Spindle:

Spindle arrangement is present at top of the column opposite to the arrangement of the motor. The top of the spindle is attached to one of the stepped pulleys. The bottom of the spindle is connected to the chuck.

7. Chuck:

Chuck is present at the bottom of the spindle. The basic function of the chuck is to hold the cutting tool firmly.

8. Drill bit:

A drill bit is an actual cutting tool that is used to create a hole in the workpiece.

9. Hand Wheel:

The basic function of the handwheel is to adjust the spindle position as per the requirement.

Drilling Machine Operation:

1. Drilling:

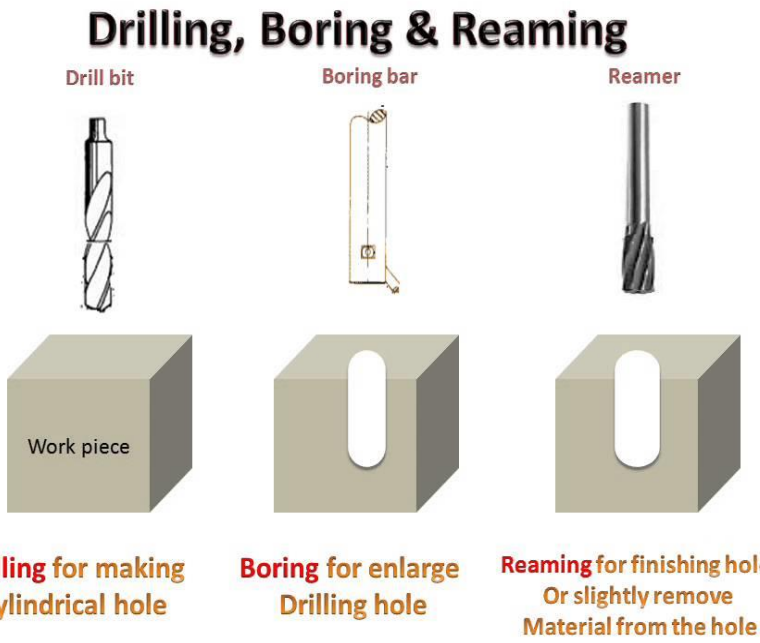
Drilling is the process of creating circular holes on the job(workpiece) using a drill.

2. Boring Operation:

Boring is the process of enlarging a hole by means of an adjustable cutting tool with only one cutting edge.

3.Reaming Operation:

It is basically a type of finishing operation. It is a process of sizing and finishing a hole by means of a reamer having several cutting edges.



Drilling	Boring	Reaming
Drilling is performed to originate a hole.	Boring is performed to enlarge the diameter of an existing hole.	Reaming is performed to finish hole surfaces and to improve tolerance.
Cutting tool used for drilling is known as drill.	Cutting tool used for boring is known as boring bar.	Cutting tool used for reaming is called reamer.
Drill is a double point cutting tool.	Boring bar is a single point cutting tool.	Reamer is a multi-point cutting tool.
Drilling is first phase of hole fabrication. It does not require any special feature prior to operation.	A pre-drilled hole (or a hollow portion made by casting) is mandatory for performing boring.	Similar to boring, reaming can be performed only if a hollow part or hole exists.
Drilling can increase length of the hole but not diameter (limited to drill diameter).	Boring can increase diameter of an existing hole but not length.	Neither diameter nor length can be increased substantially by reaming.
Surface quality of drilled hole is not very good.	Here surface quality is better than drilling.	Reaming produces highly finished surface.
Material Removal Rate (MRR) in drilling operation is higher.	MRR is lower than drilling but higher than reaming.	MRR is poor; in fact, MRR is not an issue in reaming.