

SAFETY AND HYGIENE REGULATIONS



Servei de Prevenció de Riscos Laborals
UNIVERSITAT POLITÈCNICA DE CATALUNYA

LATHES

CODE

SHR 204

Date:

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DESCRIPTION OF A LATHE

Turning consists of using a cutting tool to remove material from a workpiece that turns on its axis, to form surfaces of revolution around the axis.

Turning consists of two main movements: the spinning of the workpiece around its axis, which determines the cutting speed, and the forward movement of the tool.

Lathes can be classified as lathes between centres, face or plate lathes, turret lathes and automatic lathes.

Some parts of a lathe:

- Bed: part of the machine where its mechanisms are housed. It supports the entire process. The bed contains:
 - A longitudinal carriage, by which the tailstock moves along the bedways.
 - A cross slide, by which the tool carrier moves. The tool carrier contains the turret or chariot, to which the tool is attached using clamps, and has a circular movement to give the tool its angle of orientation.
- Headstock: this holds the workpiece. A lathe centre can be fitted to produce concentric work. In this case, the workpiece is supported between centres (that of the headstock and that of the tailstock). A jaw chuck can also be fitted. In this case, if the piece is not prone to buckling, additional supports are not required.

Lathe movements:

- Cutting movement: this is the movement of rotation of the workpiece. The speed is programmed depending on the material to be machined. The direction is variable.
- Forward movement: this takes place in a straight line and carries the tool along the longitudinal carriage. It may be automatic or manual, and the direction of movement is regulated.
- Other movements of the lathe are a perpendicular movement that determines the depth of the pass, and the angular movement of the chariot.



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GENERAL RECOMMENDATIONS

1. It must be ensured that switches and clutch engaging levers of lathes cannot be operated accidentally.
2. Gears, drive belts, couplings and even smooth shafts must be protected by covers.
3. The electric circuit of a lathe must be earthed. The distribution board that the lathe is connected to must have a circuit breaker that is sufficiently sensitive. The protective covers of gears and drive belts should have switches installed in series, to prevent the lathe from starting up when the covers are not properly closed.
4. All inspections, measurements, adjustments, replacements of parts or tools, etc. must only be carried out if the lathe is completely shut down.
5. Chips that are produced during machining should never be removed by hand.
6. To remove long chips, a hook with a handguard should be used. Blades that break up the chips prevent the formation of long, dangerous chips and make it easier to remove them. Small chips should be removed with a suitable brush.
7. It is extremely dangerous for operators to work on a lathe when they are wearing rings, watches, bracelets, necklaces, ties, scarfs or any other item that hangs down. It is also dangerous to wear long hair loose. Hair should be tied back under a cap or similar item.

PERSONAL PROTECTION EQUIPMENT (PPE) TO USE

SAFETY GOGGLES

- When you use a lathe, you must wear safety goggles to protect your eyes against impacts, particularly when hard, fragile or easily broken metals are used.
- Eye protection must also be worn during blade sharpening operations.
- If, despite all precautions, a foreign body enters your eye, **DO NOT** rub it: this could cause an injury. Clean your eye with abundant water, cover with gauze attached with surgical tape, and go to the nearest health centre.



SAFETY FOOTWEAR

- Operators should wear well-fitting clothing, without any breast pockets or belts. Sleeves should be tightly fitting at the wrists, with elastic instead of buttons, or worn rolled up inwards.
- Safety footwear should be used to protect feet from heavy work pieces falling on them or cuts caused by chips, with reinforced toe caps and rubber soles with good treads to prevent slipping and no conductive metal parts.



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BEFORE USING THE LATHE

Before the machine is switched on to start lathing a workpiece, the following checks should be made:

1. The chuck and the catch that prevents it from coming loose are positioned correctly.
2. The workpiece is secured correctly and firmly and there are no obstacles that prevent its movement.
3. The key has been taken out of the chuck.
4. The screws on the tool carrier have been tightened firmly.
5. The locking lever on the tool carrier is properly tightened.
6. The fastening screws are tightened on the upper carriage.
7. If a tailstock is used, check that it is firmly attached to the lathe bed, and that the locking lever for the shaft of the tailstock is well tightened.
8. The protective casing or guards on the gears and drive belts are positioned and fixed correctly.
9. No parts or tools have been left on the lathe that could fall or fly off the machine.
10. If you are working on long bars that overhang behind the headstock, check that the bar is covered by a protection-guide along its entire length.
11. The protective cover for the chuck must be positioned correctly.
12. The transparent screen to protect against projected chips and drill lubricant must be positioned correctly.

WHILE USING THE LATHE

1. While using the lathe, position yourself safely as far as possible from moving parts. Your hands should be kept on the hand wheel; not on the lathe bed, carriage, tailstock or headstock.
2. All inspection, adjustment and other operations must be carried out when the lathe is completely shut down. This applies in particular to the following operations:
 - Securing the workpiece
 - Changing the tool, taking measurements or checking the finish
 - Cleaning
 - Adjusting guards or making repairs
 - Adding or directing lubricant
 - Moving away from or leaving the workplace
3. Never try to slow down the chuck using your hand.
4. To lathe between centres, safety driving devices must be used. If this is not possible, use normal driving devices with a safety latch.
5. To file in the lathe, hold the file by its handle in your left hand. Hold the file by its point in your right hand.
6. To work with abrasive cloth in the lathe, some precautions should be taken:
 - If possible, do not apply the abrasive cloth onto the piece by holding it directly in your hands.
 - Buffing can be carried out safely using a file or strip of wood to support the abrasive cloth.
 - It is very dangerous to insert abrasive cloth into the machine using your finger to polish the inside of a piece. To carry out this operation safely, use sandpaper wrapped around a cylindrical pole.
7. When you measure, file or buff, the blade of the lathe must be protected with a cloth or a leather sleeve.

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MAINTENANCE, ORDER AND CLEANING

1. The lathe must be kept in good condition, clean and well-lubricated.
2. Likewise, care must be taken to keep tools, implements and accessories clean, well-maintained and in good order. Each item must have a place and be kept in it.
3. The work area and the area around the lathe must be kept clean and free from obstacles. Any oil spills must be cleaned up with sawdust or absorbent mats, which will then be deposited in a metal recipient with a lid.
Objects that have fallen or are scattered on the floor could cause people to trip or slip and put them at risk. Therefore, all objects that fall on the floor must be picked up before this can happen.
4. Chips must be removed regularly, rather than waiting for the end of the day, using a hook with a handguard for long chips and a brush for small chips.
5. Tools must be kept in a suitable cupboard or place. No tool or object should be left loose on the lathe.
6. Both raw and machined pieces must be stacked safely and in an orderly way, and suitable containers should be used if the pieces are small. An entry and exit corridor to the lathe must be left free. No materials should be stacked up behind the operator.
7. All waste, cloths or cotton that are impregnated with oil or grease, which could easily catch fire, must be deposited in suitable containers (metal and with a lid).
8. Electrical faults in the lathe can only be inspected and repaired by specialist staff. Whenever a fault of this type is detected, however small, the machine must be disconnected and an “**OUT OF ORDER**” sign hung on it. Specialized staff must be notified.
9. Electric wires must be protected against cutting or damage caused by chips and/or tools.
10. During repairs, a sign stating “**DO NOT TOUCH – DANGER – MEN AT WORK**” must be hung on the main switch. If possible, the main switch should be padlocked or its fuses removed.