GERMANS LILLERØDE

Table of Contents

Introduction:

This brochure is a supplement to the introductory course and can be used as a "Quick Guide" for general information or if you have any doubts about how to use the machines.

It is very important that we maintain good communication with each other. If you don't know how a machine works or if you have forgotten the routines, don't be afraid to ask us.

We use SLACK to communicate with the workshop instructor and with each other. Join at kroloftet.no/join-slack and choose the channel **#treverkstedet**

1. Health, Environment, and Safety (HMS)

1.1 Hearing Protection:

The use of hearing protection is not mandatory, but it is recommended.

1.2 Safety Glasses:

Safety glasses and/or face protection are mandatory. Wear them!

1.3 Air Warning:

The use of filter masks, half masks, etc., is not mandatory, but it is recommended. However, it is more effective to follow the cleaning routines ***(see 1.5).***

1.4 Additional Protection:

It is prohibited to wear gloves when operating the machines (it is very dangerous), as they can get caught in moving parts and disable the natural response to risk of cuts or amputations. For the same reasons, the use of rings, bracelets, loose long sleeves, and loose hair is also prohibited.

1.5 Cleaning and Tidiness Routines:

It is a collective responsibility. Be considerate of others and keep the workshop clean. Every time you use a machine, turn on the dust extraction system ***(see 2.1 / 2.2)*** and clean the machine after use. Sweep the floor and dispose of trash. In both the machine room and the workshop, work should minimize dust emission.

1.6 Vacuum Bag Replacement (2.2):

Vacuum bags should be changed frequently, and it is a simple operation.
If the bags run out, contact the workshop instructor through SLACK (see Introduction).

1.7 Emptying the Dust Extraction System (*see 2.1*):

The dust extraction system is located in the corner of the workshop next to the windows. Below the unit, there is a wheeled chip container that needs to be emptied regularly.

To perform this operation, you need to lift the lever and pull the container toward you. Outside the workshop, there are 2 containers of 660 liters for emptying the chips and sawdust. Empty the bags into the wood waste container. If the container(s) are full or nearly full, contact the workshop instructor via Slack.

The bags should be placed back on the trolley and reinstalled in the extraction unit by lowering the lever again. Any remaining waste must be cleaned properly.

1.8 Use of the Room:

There is only space for 6 people at a time, so it is important and mandatory to register in advance. www.kroloftet.no/min-side

1.9 Storage Space:

The part-time workshop has 2 storage areas: the red shelf and the orange shelf. Both can be used for free for a period of 7 days, while respecting other people's materials and work.

For additional storage space, it is possible to rent a locker and/or a pallet. For more information, contact: *post@kroloftet.no*

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2. Extraction System

2.1 Main Extraction:

The chip extraction system is located in the corner of the workshop next to the windows. Instructions must be followed, and these are provided on the side of the unit.

If, when using the saw (**3**) or the combined machine (**6**), the extraction system "spits out" or is not effective enough, it means that the chip bags need to be emptied (***see 1.7 / 1.5***).

2.2 Vacuum Cleaner (see 1.5):

The workshop has 3 vacuum cleaners. Changing the bags is very simple, just like with a regular vacuum cleaner

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3. Table Saw

A table table saw is a circular saw mounted on a table, designed for cutting wood both transversely and longitudinally.

3.1 Uses:

The table saw is mainly used for making two types of cuts: crosscuts and rip cuts.

- *Crosscut*: A cut made across the wood grain.
- *Rip cut* : A cut made parallel to the wood grain.

It is important to plan the type of cut to decide how to use the rip fence.

- The ***rip fence*** helps to push the workpiece while cutting, maintaining a consistent angle.
- The ***side guide*** is placed horizontally on the side of the table, assisting in cutting long pieces.

3.2 Advantages and Disadvantages:

✅ *Advantages*:
- The blade height of the table saw can be easily adjusted, allowing for precise and uniform cuts.
- It allows for beveling the material since the adjustment wheel enables tilting the blade to any angle.
- Offers great precision in cuts, achieving detailed and high-quality finishes.
- It is a powerful machine, capable of cutting even the hardest woods.

❌ *Disadvantages*:
- It is dangerous: Most accidents with saws occur with table saws.
- It generates a lot of noise, which should be considered in the work environment.
- The circular blade shape limits the thickness of the material to 90 mm.
- It does not allow working with the same level of detail as a band saw, as table saw blades are larger.

3.3 Blade Dimensions:

Table saw blades have five key dimensions:

1. External diameter
2. Cut thickness (kerf)
3. Blade thickness
4. Arbor diameter
5. Number of teeth (Z)

Example: A blade 300 x 3.0 / 2.5 x 30 Z 48 means that:
- External diameter: 300 mm
- Cut thickness: 3.0 mm
- Blade thickness: 2.5 mm
- Arbor diameter: 30 mm
- Number of teeth: 48

3.4 Types of Saw Blades

🔹 **Rip Blades**
These blades are designed for making quick cuts along the wood grain.
- They have fewer teeth (10-30), allowing for faster cuts, but with a rougher surface.
- A higher number of teeth results in a cleaner cut, reducing the need for finishing.
- They typically have a flat top grind (FT), leaving a flat bottom in the cut.
- They are also good for making grooves.

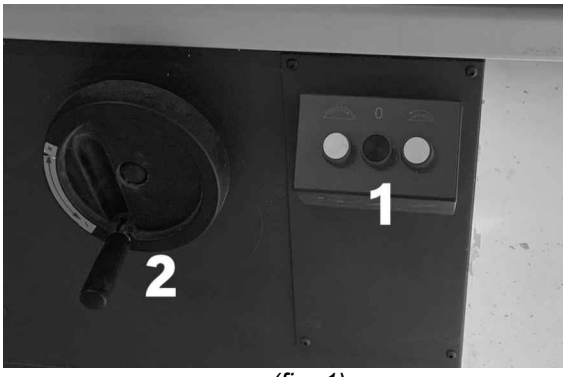
🔹 **Crosscut Blades**
These blades have more teeth (60-80 TPI), allowing for cutting across the wood fibers with greater cleanliness and leaving a smooth finish.
- Due to the smaller spaces between teeth, they remove less material.
- They usually have a alternating tooth bevel (ATB) design, creating a sharp blade-like cut.
- They are ideal for clean crosscuts, fine woodworking, and plywood cuts.

3.5 Basic Operation

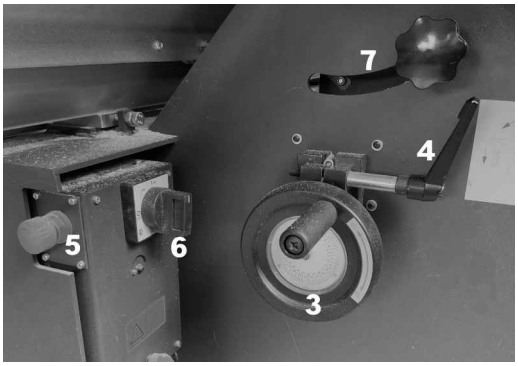
On the front panel, there are three buttons *(**see fig. 1**)*:
- Left: On (**1**)
- Center: Off (**1**)
- Right: Pre-cut (**1**)(**not in use**)

Next to the buttons is the adjustment wheel for raising or lowering the saw blade. (**2**)

Under the fixed table, there is another adjustment wheel for changing the blade angle. To tilt the blade:
1. Loosen the locking lever (**4**)
2. Select the desired angle (**3**)
3. Tighten the lever again (**4**) (***see fig. 2***)



(fig. 1)



(fig. 2)

1. Power switch 2. Saw blade height adjustment wheel 3. Saw blade angle adjustment wheel 4. Locking mechanism	5. Emergency stop button 6. Main switch 7. Incision blade height adjustment (not in use!)

3.6 Cleaning

The machine should be cleaned frequently, both the machine itself and the surrounding area. The saw blade should also be cleaned after each use to remove the resin that builds up between the teeth and reduce the risk of fires.

3.7 Safety

Do not use materials on the saw that do not have a flat side, are unstable, or have loose parts, nails, screws, staples, etc.

Maintaining good posture and balance while standing is crucial to reduce the risk of accidents and ensure safe work.

It is important to maintain eye and verbal contact with others for a safe working environment. If you need help, ask. If you have doubts about how to use a machine, ask another operator, the workshop master, or check the manual. **DO NOT try to learn by yourself or experiment with the machines.**

The workshop does not have accident insurance.

3.8 "Kickback"

A dangerous kickback situation can occur when the piece of wood gets caught between the blade and another part of the saw, such as a guide. This can also happen if the blade catches an irregularity in the wood.

In both cases, more force is required to move the piece forward than backward, and the energy of the rotating blade pushes the piece in the opposite direction.

Kickback occurs when the blade catches the piece and throws it back toward the operator.

Kickback can occur if the blade height is not set correctly or if the blade is not properly maintained. It is more likely to happen during rip cuts than cross cuts. It can also happen if safety devices are not used or if low-quality wood is being cut.

We recommend watching the video on «kickback"at this link:
https://www.youtube.com/watch?v=8f8VWwtaudU&t=206s

3.9 Freehand Cutting

Do not perform freehand cuts. Use one hand or a clamping device to secure the workpiece.

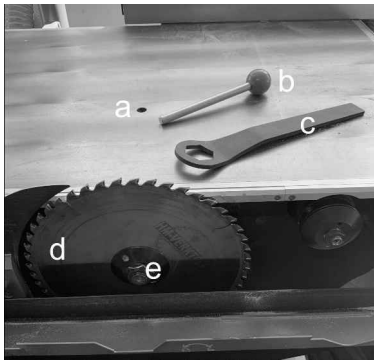
3.10 Other Hazards

- Kickback of the workpiece or parts of it.
- Detachment of individual teeth from the saw blade with carbide tips.
- Breakage and ejection of the saw blade.
- Prolonged exposure to noise when working for extended periods without hearing protection.
- Dust emissions can be harmful to health if the machine is used without a dust or chip extraction system.
- *Avoid any danger arising from these other risks by being especially careful when preparing, operating, and maintaining the machine*.

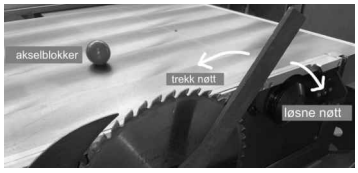
3.11 Changing and Cleaning the Blade

To change the blade, you must slide the table (fig.3), open the red cover, lock the shaft, and loosen the nut (fig. 5).
Clean the blade with “Formula 40” and a brush.
To mount the blade, repeat the steps and tighten the nut again.

(fig3)



(fig 4) a) hulle b) akselblokker c) nøkkel d)sagblad e) mutter

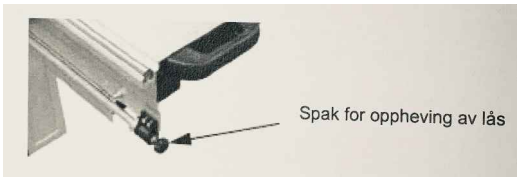


(fig 5)

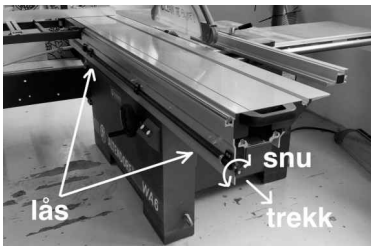
«Formula 40», the brush, the shaft blocker, the wrench, the saw blades, and the paper towels are in the cabinet next to the saw, beneath the windows.

3.12 Locking the Table

The locking of the sliding table automatically locks the table in its final position, allowing the pieces to be cut to slide against the miter gauge without any unwanted movement of the easily tiltable sliding table. The locking of the table is unlocked by manually turning the lever at the end of the upper carriage.



(fig6)



(fig 7)

With an additional locking adjustment, the sliding table can be locked in its central position using the carriage lock

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4. Bandsaw

4.1 Uses:

It is used for cutting wood and is especially useful for cutting irregular or curved shapes. It can also be used for straight cuts.
In woodworking, this saw simplifies the task of making curved and complex cuts.
With it, you can perform an infinite number of tasks that would otherwise take much longer or be extremely difficult to accomplish.

4.2 Description:

<table>
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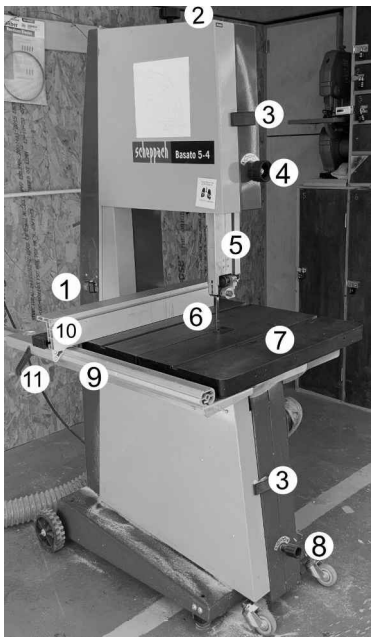
<td> 
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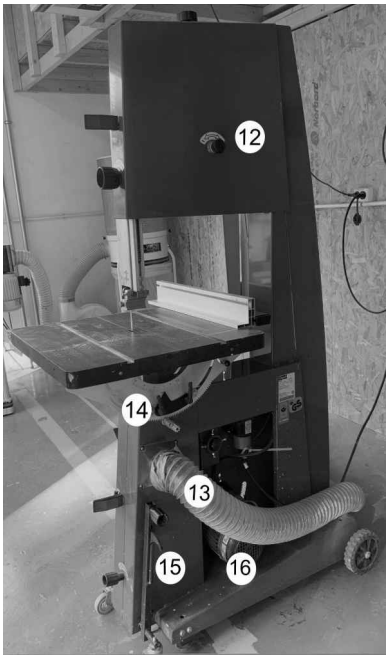
<td> 
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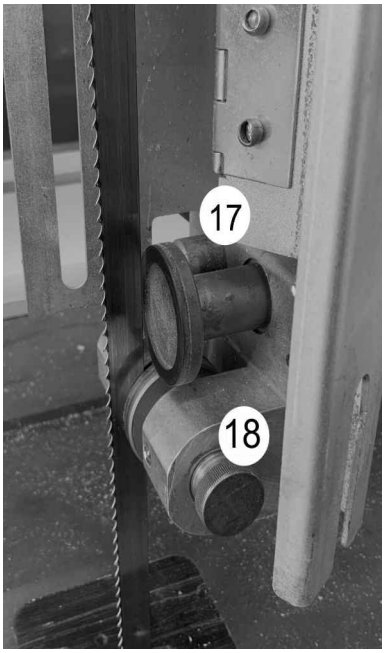
<td> 
</td>
</tr>
<tr>
<td>1. On/Off switch
2. Bandsaw blade tension
3. Wheel housing lock
4. Cutting height adjustment
5. Cutting height stop
6. Bandsaw blade</td>
<td>7. Saw table
8. Motor tension adjustment
9. Guide tube
10. Parallel stop
11. Clamping lever
12. Lateral blade tracking adjustment</td>
<td>13. Dust extraction hose
14. Saw table angle adjustment
15. Unit movement lever
16. Motor
17. Support rollers
18. Guide rollers</td>
</tr>
</table>

4.3 Advantages and Disadvantages:

✅*Advantages*:
- Since bandsaws use thinner blades, the waste produced when cutting material is considerably less.
- Bandsaws can handle thicker materials than the 9 mm. limit of table saws.
- Compared to table saws, the noise levels of bandsaws are very low.
- They are much safer to operate than a table saw, primarily because the area of the blade exposed to the operator is much smaller.
- Bandsaws are excellent for cutting irregular shapes and designs.
- A high level of detail can be achieved when cutting circles and curves with ease.

❌*Disadvantages*:
- Bandsaws have much less power than table saws. They cannot cut as quickly as a table saw.
- Pieces produced with a bandsaw will require more sanding and finishing processes, as the cuts are not as smooth and leave a rough surface.
- Bandsaws cannot be adjusted to cut grooves.
- While it is possible to tilt the blade on a bandsaw, it is a very difficult task to perform.

4.4 Blade Dimensions

Bandsaw blades have 3 measurements:
- Length: 3420 mm (related to the size of the machine).
- Width: 6, 8, 10, 12, 15, 18, 20, 25 mm.
In the woodworking workshop, only 20 mm widths are used.
- Number of teeth per inches.

4.5 Cleaning

Always clean the machine after use! Use a brush and/or a vacuum to clean both the surfaces and the interior of the machine.

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5. Cut and Miter Saw

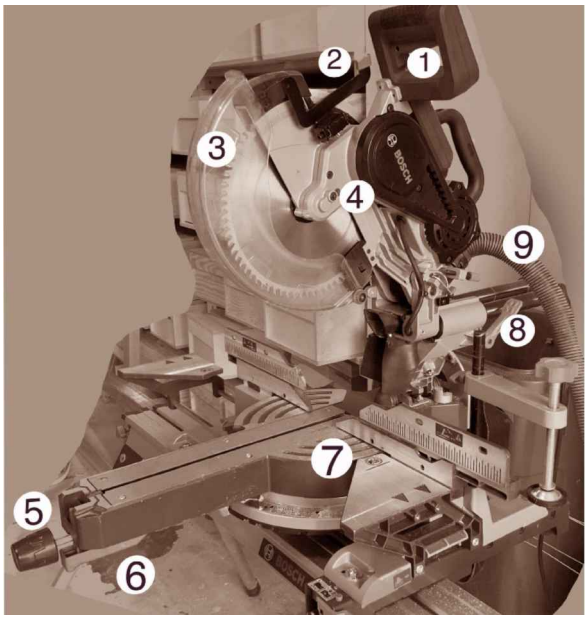
5.1 Uses

In principle, a miter saw is used to control the movement of the saw and achieve more precise cuts, especially angle cuts and edge cuts.

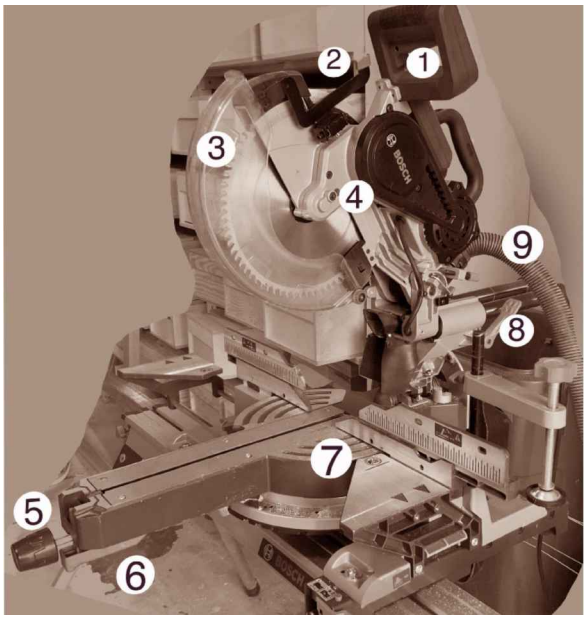
5.2 Blade Dimensions

300 x 3 x 30 z 72 (***see 3.3***)

5.3 Machine Description



(*fig 8*)



(fig 9)

1. On/Off switch 2. Safety lock for the on/off switch 3. Pendulum protective cover 4. Spindle lock 5. Lock button for optional miter angle (horizontal)	6. Angle preset lever for miter angle (horizontal) 7. Saw table 8. Clamping lever for optional miter angle (vertical) 9. Dust port/vacuum hose 10. SDS screw/clamping flange

5.4 How to Adjust the Machine Angle Vertically and Horizontally

To adjust the horizontal angle of the saw:
Pull the preset lever for the miter angle (**6**) and move the saw table (**7**) left or right to the desired angle.

To adjust the vertical angle of the saw:
Loosen the lever for the miter angle adjustment (**8**). Move the saw to the desired angle and tighten the lever (**8**) again.

5.5 How to Change and Clean the Blade

To change the blade, hold the spindle lock and use a 6mm Allen wrench.
To clean the blade (***see 3.11***).

5.6 Connecting to the Vacuum

The machine should always be connected to the vacuum both with the power cable and the suction hose. The setup should be intuitive, and the process is very simple.

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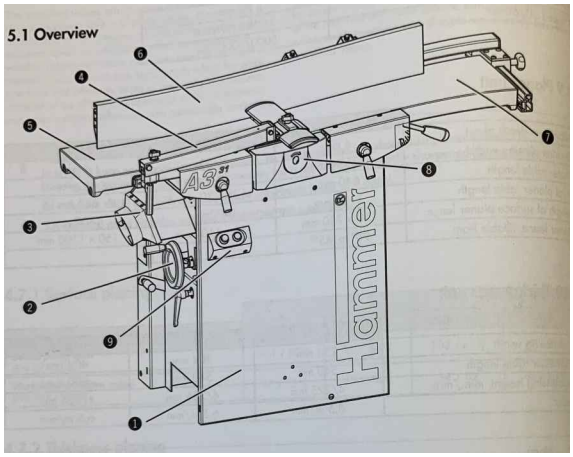
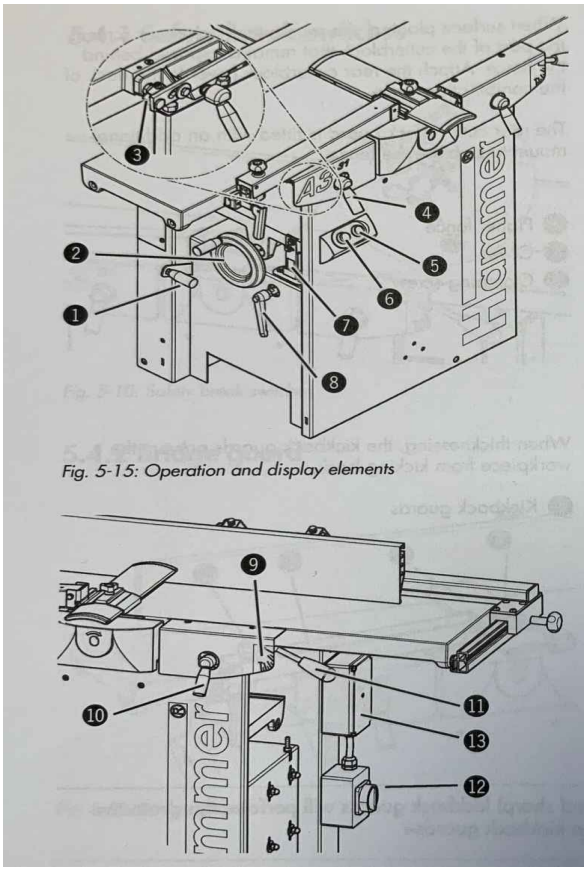
6.Kombi

This machine is a combination of a planer and a thicknesser.



(fig 10)

1. Housing with drive motor and gearbox
2. Planing unit
3. Dust cover with vacuum connection
4. Protective cover
5. Planing table, output side
6. Combined guide (with rear cover for the blade block)
7. Planing table, feed side
8. Not in use
9. Connection point



(fig 11)

1. Change lever
   - Position O: (extract)
   - Position I: Thickness planing
2. System adjustment wheel
3. Not in use
4. One-hand clamping lever
5. On button
6. Off button
7. Measurement
8. One-hand clamping lever
9. Measurement
10. One-hand clamping lever
11. Adjustment handle
12. Main switch
13. Phase converter

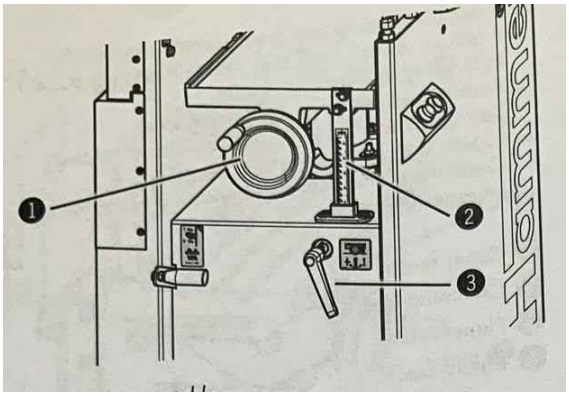
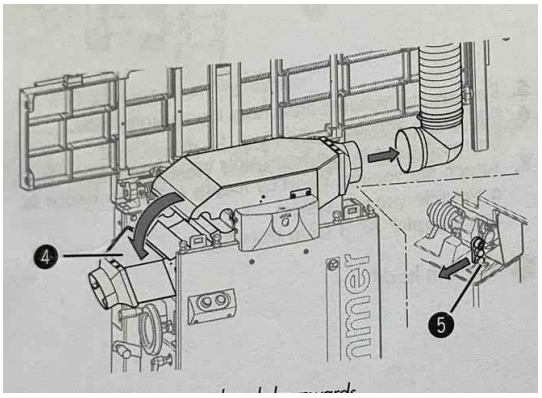
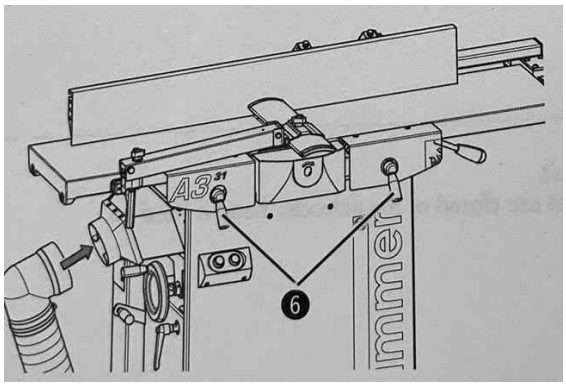
To switch from planer to thicknesser: Loosen the clamping levers, raise the table, and change the position of the vacuum hose.

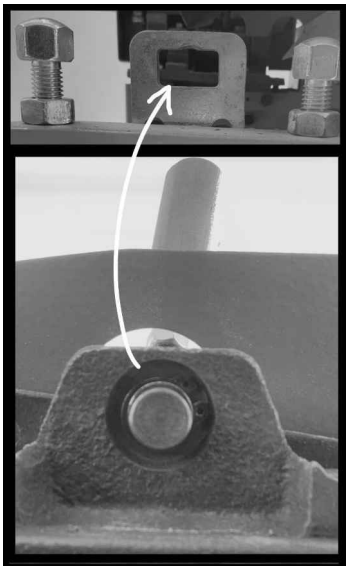
6.a Planer

6.a.1 Use:

A planer is used to flatten a material that is twisted, warped, or curved. Once the boards are flat on one side, that flat side can be used to align and create perpendicular edges.

6.a.2 Changing from Planer to Thicknesser

 *(fig 12) 1.Systemhåndhjulet 2.Målebånd 3.Klemspaken*	1. Before starting the machine maintenance, turn it off and ensure it cannot be turned on accidentally. 2. Loosen the clamping lever. 3. Use the system adjustment wheel to lower the planing table to at least 200 mm below the cutter block. 4. Secure the clamping lever.
 *(fig 13) 4. Vakuumhetten 5. Sikkerhetslås*	5. Remove the vacuum hose from the dust cover. 6. Tilt the dust cover downward. 7. Release the drop-lock and tilt the planing table toward you.
 *(fig 14) 6. Klemespaker*	8. Press the clamping lever inward and lock it in place. 9. Attach the dust cover using an appropriate vacuum system connector.



(fig 15) Slik festes eksentrisk aksel i firkantlåsen

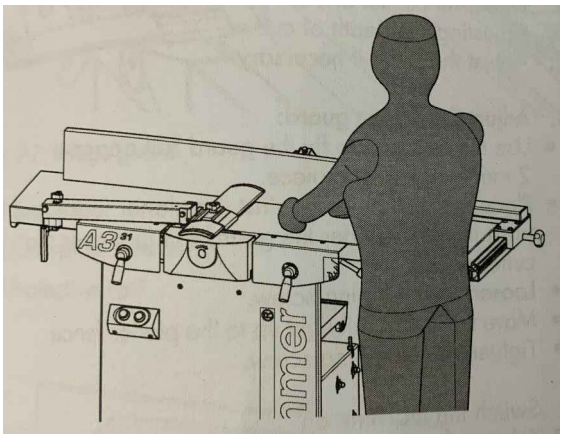
The planer has two tables: a fixed one (output side) (**5**) and a movable one (feed side) (**7**) (***see fig. 10***). These tables are connected to an axis and should be secured to the unit using an eccentric axle (*see fig. 15)*.

⚠ **The axle has no threads and must not be screwed in.**

To move the tables, it is necessary to loosen a small lock (*see fig. 16*). (**See 6.B.2)**.

(fig 16) Den lille låsen, er en plate med to hettemuttere som må flyttes senke bordet.

6.a.3 Safe Operation



(fig 17) Riktig arbeidsposisjon

The planer is the second most dangerous machine after the table saw. Therefore, it is crucial to maintain a good posture and balance while working with it (***see fig. 17***).

⚠ **Keep the floor free of debris that may pose a dangerous obstacle.**

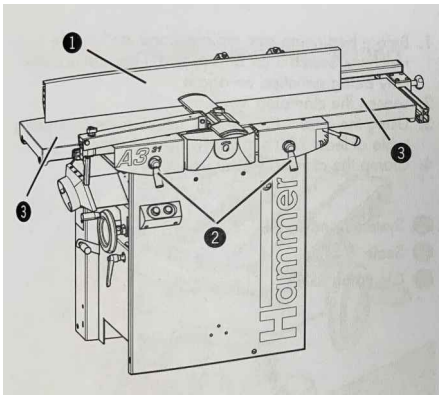
6.b Thicknesser

6.b.1 Use:

A thicknesser is used to create pieces with uniform thickness.

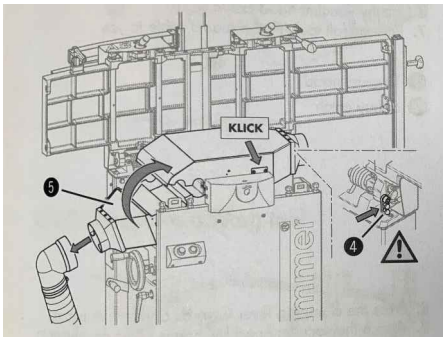
A flat piece is placed on the planer table (the bed) and pushed inward. The machine's feed roller grabs the piece and pulls it through a set of rotating cutter heads over the bed, which removes material. The distance between the bed and the cutter head determines the resulting thickness.
All planers have a limit on the amount of wood they can remove in a single pass, so achieving the final thickness will likely require several passes. In the workshop, as a general rule, we use **2 mm** for softwoods (pine, spruce, poplar, etc.) and **1 mm** for hardwoods (oak, elm, ash, etc.).

6.a.1 Changing from Planer to Thicknesser Tool:



(fig 18) 1. Kombigjerde 2.Klemespaker 3.Avretter bord

Before starting any maintenance work on the machine, turn it off and ensure it is secured to prevent accidental turning on.
1. Push the planer guide forward.
2. Loosen and remove the clamping lever.
3. Open the planer table and ensure that the safety lock is engaged.
4. Remove the vacuum hose from the dust cover.



(fig 19) 4.Sikkerhetslås 5.Vakuumhette

5. Lift the dust cover and ensure that the extraction nozzle is properly placed.
6. Secure the dust cover by connecting it to an appropriate vacuum system.
7.Attach the vacuum hood using the connector to a suitable vacuum system.

6.b 2 How to Adjust the Planer Table (the Bed)

To adjust the height or thickness, you need to loosen the one-hand clamping lever (**8**), use the manual adjustment wheel (**2**) until the desired thickness is achieved, and then retighten the one-hand clamping lever (**8**).
*Note:** The measurements are not precise, they are just for reference (+/- 3 mm). Use the gauge*

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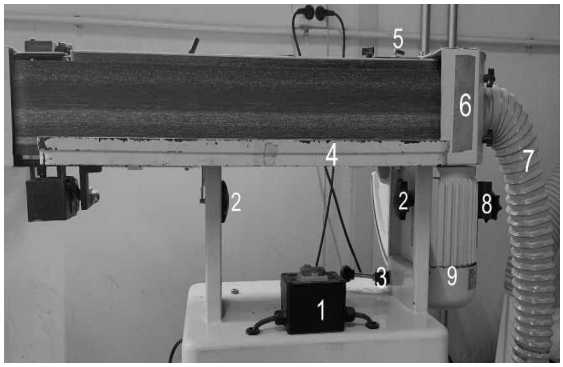
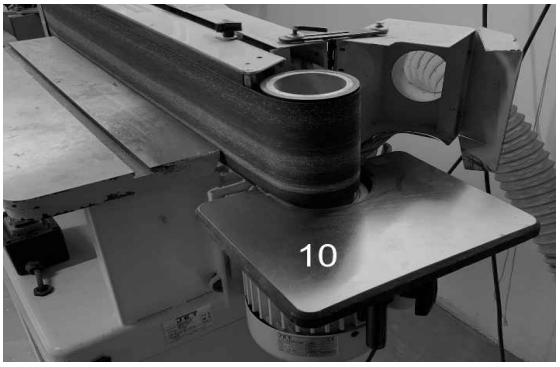
7. Belt Sander

7.1 Machine Description:



(fig 20)



(fig 21)

1. Power switch 2. Height screw 3. Angle adjustment lever 4. Work table 5. Stiffness	6. Dust cover 7. Suction hose 8. Spindle 9. Motor 10. Round work table

7.2 How to Raise the Work Table:

To raise the work table (**4**), loosen the screws (**2**), adjust the table to the desired height, and tighten the screws (**2**) again. Simple!

7.3 How to Change the Angle:

To change the angle, loosen the adjustment lever (**3**), adjust the belt sander to the desired angle, and then tighten the adjustment lever (**3**) again.

7.4 How to Sand Round Pieces:

To sand round pieces, you should:
- Loosen the lever (**5**)
- Open the dust hood (**6**)
- Adjust the round work table (**10**)

7.5 Connecting to the Dust Extraction System and Cleaning:

The machine must always be connected to the main dust extraction system (***see 2.1***). After use, it should be cleaned with a brush and a vacuum cleaner. The use of a semi-rigid mask or a mask with FFP3 filter is recommended.

7.6 Cleaning:

The machine should be cleaned with a brush and a vacuum cleaner after each use to prevent dust and chips from accumulating.

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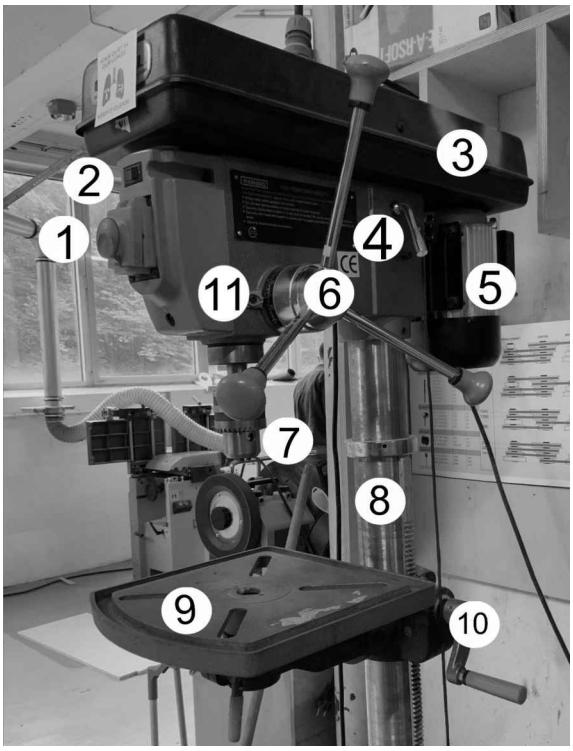
8. Drill Press

8.1 Use:

A drill press drills consistent and precise holes in different materials. It ensures that each hole is not only perfectly straight vertically but also at the exact depth you determine.

8.2 Machine Description:



(fig 22)

(fig 23)

1.Power switch 2. Light 3. Belt cover 4. Tension lever 5. Motor 6. Handle	7. Chuck 8. Column 9. Work table 10. Adjustment lever 11. Depth gauge and stop

8.3 How to Change Speed:

(fig 24)

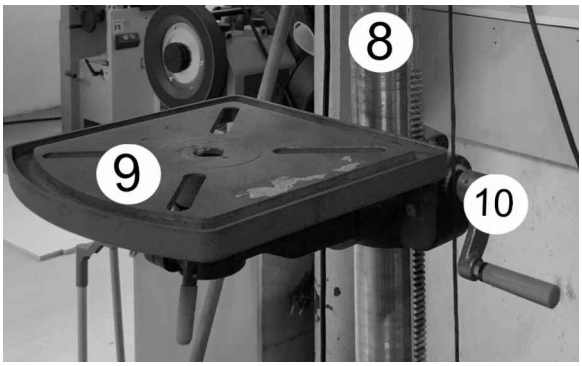
To change the speed, you need to loosen the screws on both sides of the lever (**4**). Then, release the tension lever (**4**) and move the belts in the belt cover (**3**) (there is a speed chart on the cover of the belt box). When you are done, readjust the tension lever (**4**), tighten the screws, and close the cover of the belt box.

8.4 How to Change the Drill Bit:

(fig 25) 1. Chuck 2.Chucknøkkel

To change the drill bit, you need to open the chuck (**1**) with the chuck key (**2**). Place the drill bit into the chuck and lock the chuck with the chuck key.

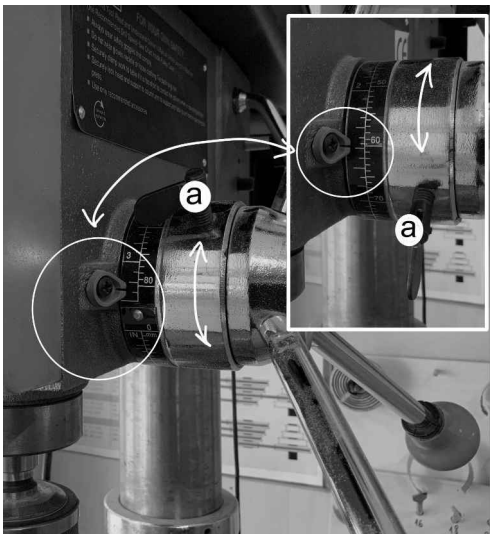
8.5 Adjusting the Worktable:



(fig 26) 8.Søyle 9. Benk 10. Justeringspak

To adjust the worktable, you must:
Loosen the lock lever next to the adjustment lever (**10**), move the table up or down, and tighten the lock lever.

8.6 Adjusting Depth:



(fig 27) a. Låskru til dypmåleret

To adjust the depth, you must:
Loosen the lock screw (**a**), adjust the depth as shown in ***Figure 32***, and then tighten the lock screw (**a**) again.

8.7 Cleaning:

The drill press must always be cleaned after use with a brush and a vacuum cleaner. The floor around the machine should also be swept.

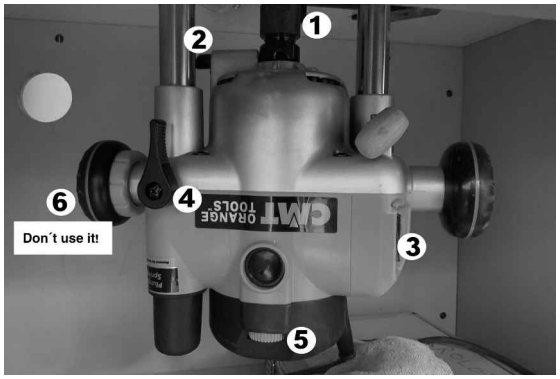
***

9. Router Table

9.1 Use:

A router table is a useful tool for serious woodworkers or DIY enthusiasts who want to perform tasks and create projects that require more precision than a conventional handheld router.
The router table consists of a flat, stationary work surface with a router tool protruding from a hole, usually in the center of the table.

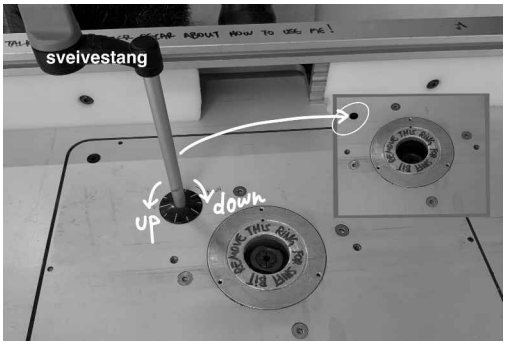
9.2 Machine Description:



(fig 28)

1 Chuck – Clamping mechanism
2 Spindle lock
3 Switch (always on)
4 Clamping lever
5 Speed
6 Clutch (not in use)

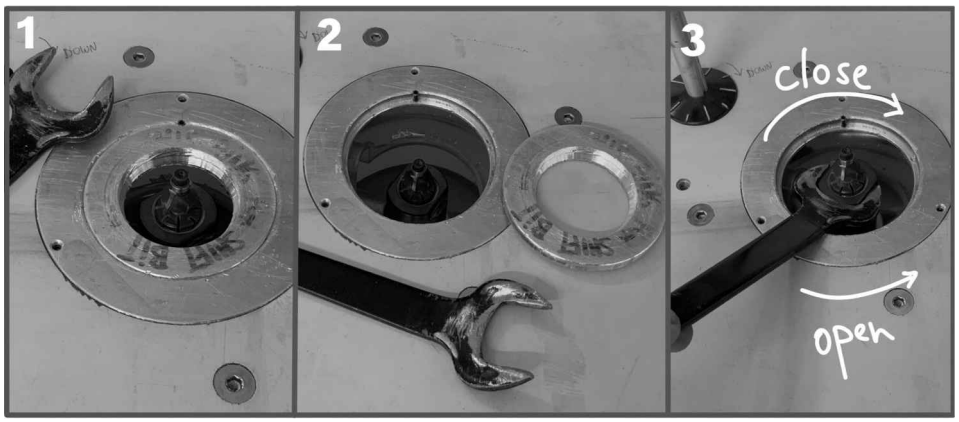
9.3 Machine Setup:



(fig 29)

To adjust the router height, you must: Loosen the clamping lever (**4**), move the chuck (**1**) using the crank handle (up or down), and then tighten the clamping lever (**4**) again.

9.4 How to Change the Bit:



(fig 30)

To change a bit, follow the steps in ***Figure 30***:
1) Raise the chuck (**1**) (***see 9.3***).
2) Remove the central ring.
3) Pull and hold the spindle lock (**2**) and loosen/tighten the chuck nut.

9.5 Size:

Routers can use different sizes of chucks, but in the workshop, we have 6 mm and 8 mm.
Any other size must be purchased separately (CMT 7E router model).

9.6 Connection to Power:

The machine should be connected as shown in the image (***Figure 31***).

(fig 31)

9.7 Connection to Vacuum:

It is mandatory to always use the vacuum system with the router!

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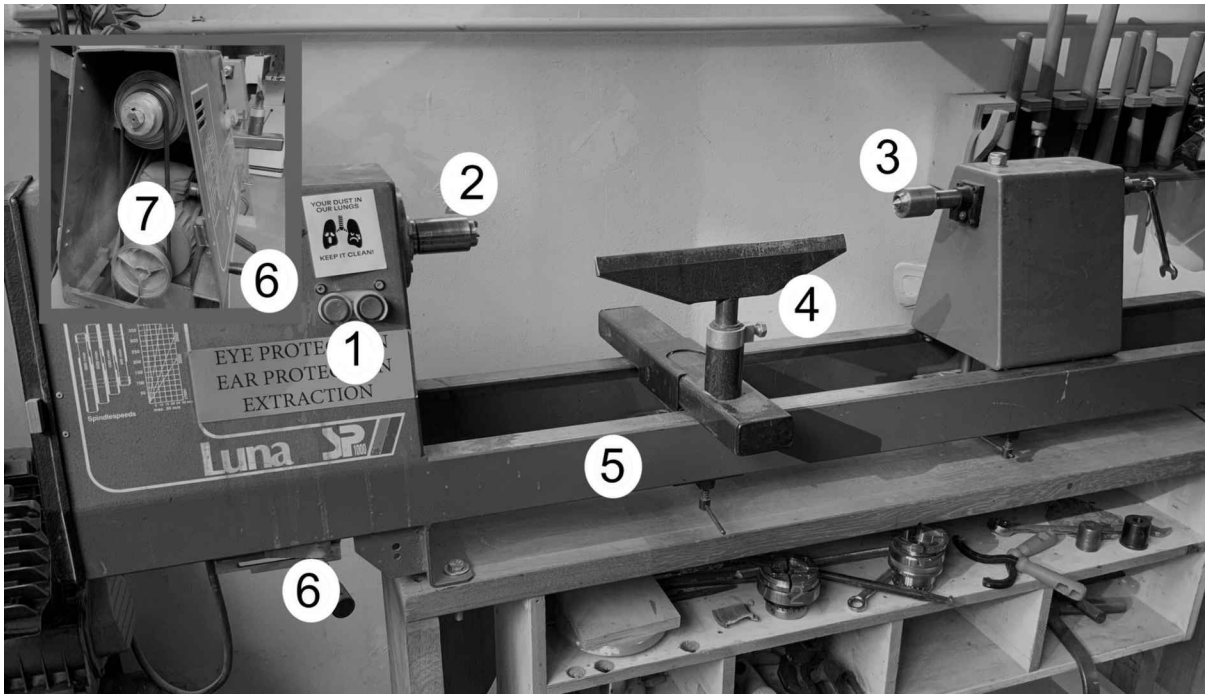
10. Wood Lathe

10.1 Use:

Wood lathes are commonly used to shape wood into cylindrical profiles. Items made on a wood lathe include objects such as furniture legs, streetlight posts, baseball bats, bowls, and other decorative shapes. Tools for a wood lathe include clamping and holding devices for the workpiece, a mobile tool rest, and handheld cutting tools in the form of chisels with long handles, gouges, scrapers, and separating tools. Special tools are also available to shape the interior and develop surfaces.

10.2 Machine Description:



(fig 32)

1. On/Off switch 2. Threaded connector with conical hole 3. Center point 4. Rest	5. Table 6. Tension lever 7. Spindle box

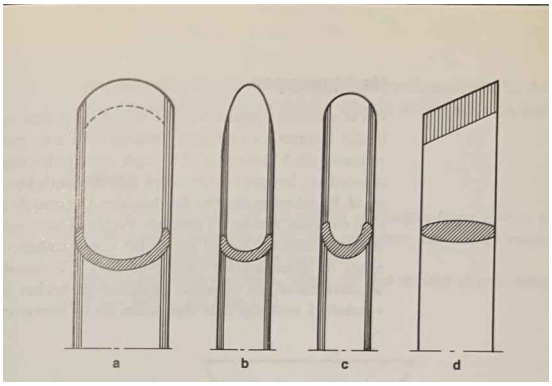
10.3 How to Change the Speed:

To change the speed, you must lift the lever (**6**) and move the belt found in the spindle box (**7**).

10.4 How to Change the Chuck:

Hold the end of the rotating shaft (**7**) with a 15 mm wrench and turn the chuck toward you. You can use a "custom-made" wrench that can be found on the shelf beneath the table.

10.5 Tools:



(fig 33)

a) Roughing Chisel

b) Forming Lathe Chisel. This tool typically has a more specialized shape than (a).

c) Bowl and Plate Gouge (also called "bowl turning gouge").

d) Bevel Gouge (or Chisel) with an oval shape, used for smoothing round sticks, for interior turning cuts, and for shaping forms.

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