

OPERATION MANUAL

HORIZONTAL BAND SAWING MACHINE WINTER TTM 800 / TTM 1100



WARNING!

The operator must thoroughly read this manual before operation. Keep this manual for future reference.

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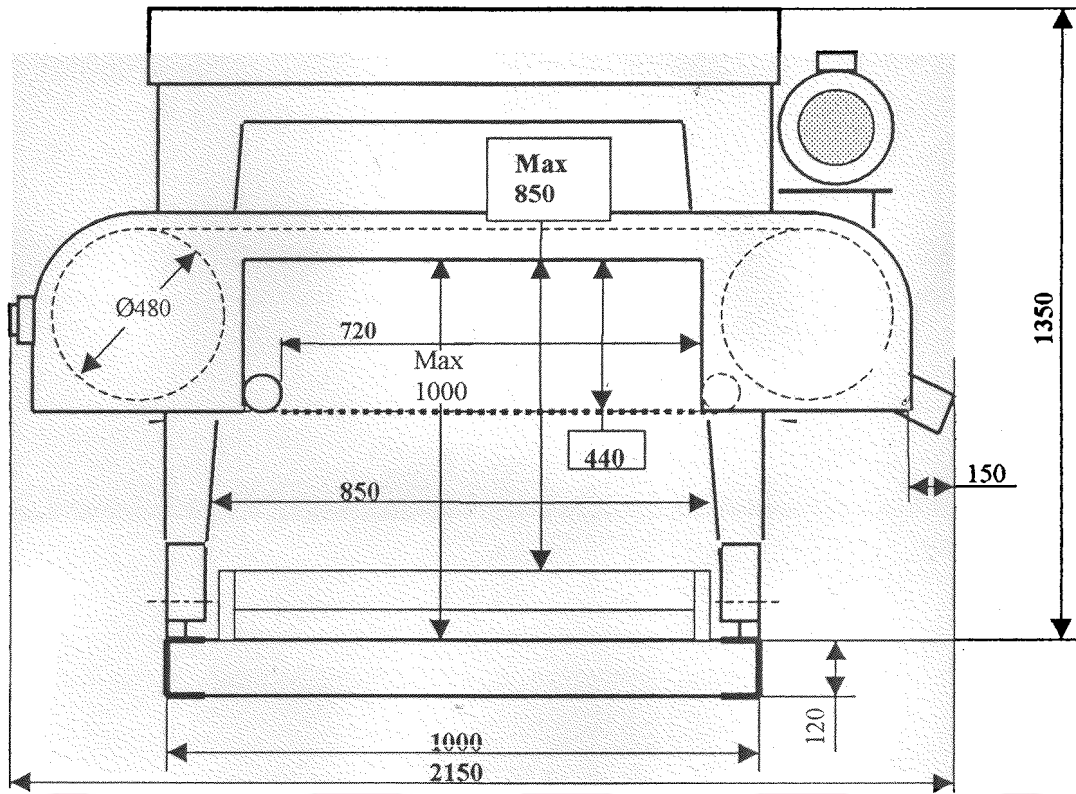
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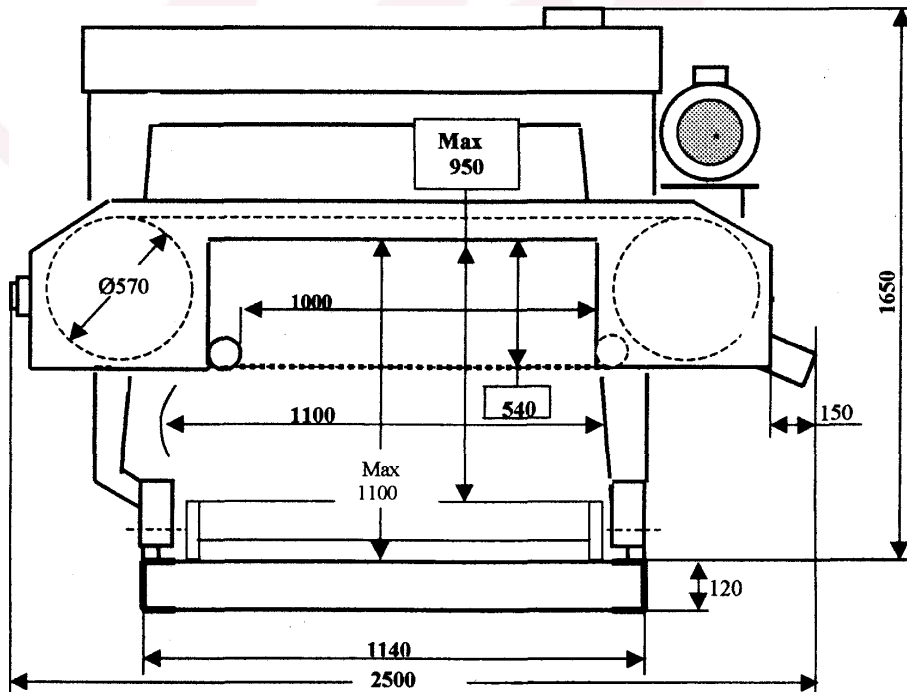
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TECHNICAL DATA

No.	Technical data	TTM-800	TTM-1100
1.	Thickness of log (max) - distance between the blade guide rolls	850 mm 720 mm	1 100 mm 1 000 mm
2.	Length of log (standard version)	max 11 m	max 11 m
3.	Length of track (standard version)	13 m (2 x 6,5 m)	13 m (2 x 6,5 m)
4.	Power installed: - main motor - drive of horizontal feed - drive of vertical feed - drive of travel of blade guide roll	10 kW (7,50kW) 1,10 kW 1,10 kW 0,18 kW	11 kW (10 kW) 1,10 kW 1,10 kW 0,18 kW
5.	Speed of horizontal feed (forward-backward) 2 ranges - each smoothly adjustable	1,5 - 20 m/min 5,0 - 30 m/min	1,5 - 20 m/min 5,0 - 30 m/min
6.	Speed of vertical feed (upward-downward)	11 mm/s	11 mm/s
7.	Parameters of band saw blade - length - width - thickness - tooth pitch	4,05 m 32-35 mm 0,9-1,0 mm 22 mm	4,85 m 35-38 mm 1,0-1,1 mm 22 mm
8.	Dimensions of sawing unit: - length - width - height	1,70 m 2,15 m 1,35 m	1,70 m 2,50 m 1,65 m
9.	Weight - sawing unit - track (2 x 6,5m) - track accessories	total 1650 kg 800 kg 580 kg 270 kg	total 1900 kg 900 kg 700 kg 300 kg



TTM-800



TTM-1100

STRUCTURE OF THE MACHINE

The names of the component parts are in Polish language. If you need any part, please check a number of this part in the drawings on the next pages and give it to the producer or dealer of the machine.

1. Rama nośna
2. Dźwignia naciągu
3. Odważnik naciągu piły
4. Prowadnica rolki przesuwnej
5. Osłona górna
6. Skrzynka prądowa
7. Koło napędowe (pod osłoną / *under the cover*)
8. Śruby posuwu pionowego, 2 szt./pcs
9. Panewki dolne, 2 szt./pcs
10. Rolka jezdna ciągnąca, 1 szt./pce
11. Torowisko 6,50m
12. Maszty, 2 szt./pcs
13. Rolka prowadząca stała (pod osłoną / *under the cover*)
14. Rolka prowadząca przesuwna
15. Rolki jezdne, 3 szt./pcs
16. Zbiornik wody
17. Płyta silnika
18. Panewki górne, 2 szt./pcs
19. Koło piłowe napinające (pod osłoną / *under the cover*)
20. Belka zawieszenia koła napinającego
21. Reduktor posuwu poziomego
22. Reduktor posuwu pionowego
23. Łańcuch napędu $\frac{3}{4}$ "
24. Pokrętło naciągu piły
25. Płyta napinacza
26. Rama suportu
27. Śruba regulacyjna naciągu
28. Linią z miarami
29. Przesuwna wskazówka z szybą
30. Wskazówka stała
31. Nakrętki suportu, 2 szt./pcs
32. Panewki prowadzące suportu, 2 szt./pcs
33. Pulpit sterowniczy
34. Silnik główny
35. Silnik posuwu pionowego

36. Uchwyt talerzowy mimośrodowy, 2 szt./pcs
37. Osłony piły (kpl./set)
38. Rura wylotu trocin
39. Podnośnik rolkowy, 2 szt./pcs (to extra order)
40. Uchwyty kłody, 4 szt./pcs
41. Linka
42. Zawór
43. Sprężyna
44. Skrobak torów, 3 szt./pcs
45. Włącznik główny z zabezpieczeniem
46. Przewód prądowy 5 x 2,5
47. Przyłącz prądowy
48. Podpora kłody, 4 szt./pcs
49. Kąt podpory
50. Płyta rolki
51. Elektrozawór
52. Oliwiarka

53. Zębatka napędu śrub Z22, 2 szt./pcs
54. Tulejki płyty napinacza
55. Wał napędowy (pod osłoną / under the cover)
56. Paski 1320B – TTM-800 lub/or 1500B – TTM-1100, 3 szt./pcs (pod osłoną /
under the cover)
57. Napinacz pasków (regulacja sprzęgła)
58. Dźwignia sterująca posuwem przód-tył
59. Oprawy łożysk wału, 2 szt./pcs
60. Dźwignia sprzęgła
61. Hamulec z regulacją
62. Śruba regulacji hamulca
63. Łożysko sprzęgła
64. Tarcza pomiarowa
65. Smarownica
66. Wózek jezdny prawy, kpl./set
67. Zespół śruba-nakrętki naciągu piły
68. Łańcuch przesuwu rolki
- 68A. Sprzęgło przesuwu rolki
69. Motoreduktor posuwu przód-tył
70. Reduktor posuwu przód-tył
71. Łańcuch posuwu ¾"
72. Pasek klinowy 1000A napędu posuwu
73. Zębatka Z16
74. Zębatka Z28

- 75. Dźwignia sprzęgła "włącz-wyłącz"
- 76. Siodełko
- 77. Wodzik sprzęgła z brązu
- 78. Oś napędu posuwu poziomego
- 79. Sprzęgło kłowe posuwu kpl./set

THE STANDARD EXCHANGEABLE COMPONENT PARTS:

1. The bearings:

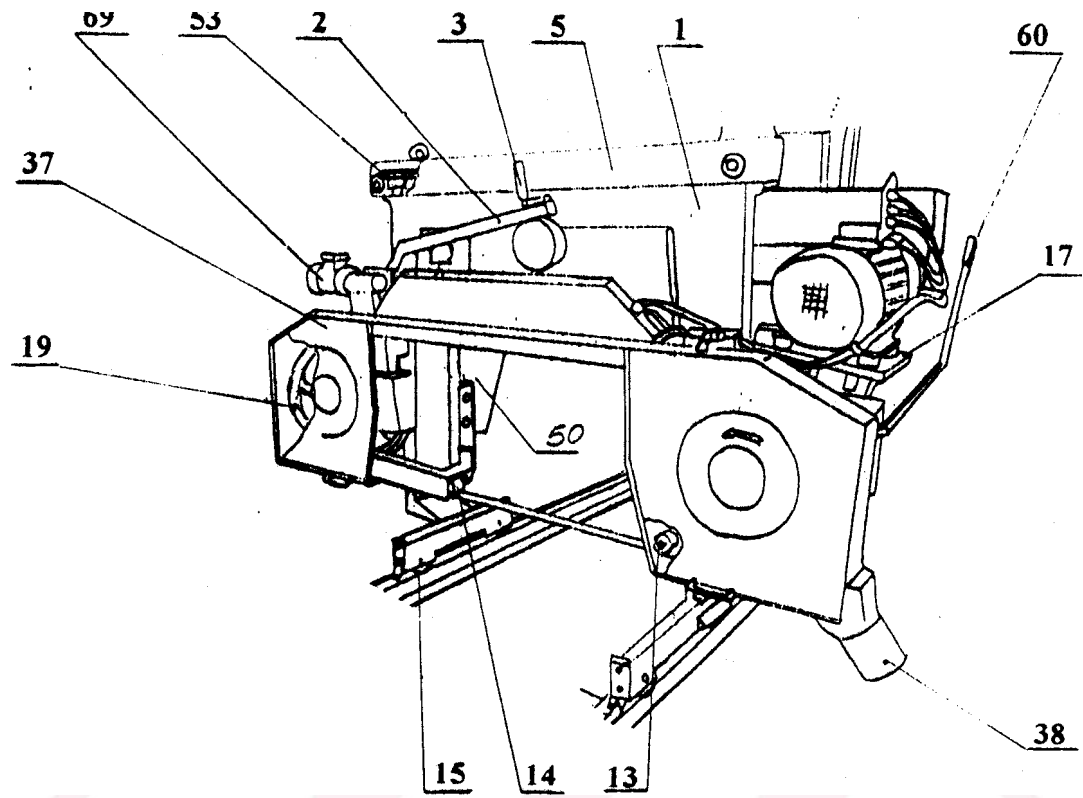
- **22207** **2 pcs.** **tightening wheel**
- 6204 RS 1 pce chain tighter of the screws' drive
- 6305 RS 4 pcs. movable rolls
- 6004 ZZ 4 pcs. blade guide rolls, 2 pcs./roll
- **21309 CC** **2 pcs.** **drive shaft**
- 51109 2 pcs. bottom bearing bushings(9)

2. The V-belts:

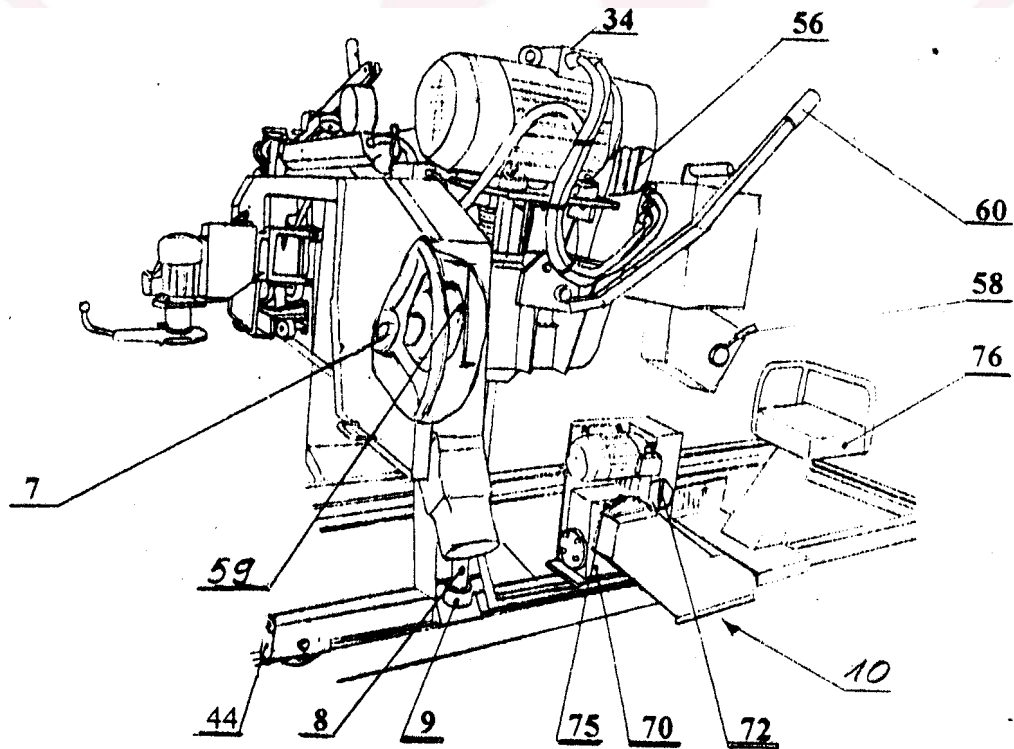
- 1500 B 2 pcs. wheels of band saw blade "7" and "19" (TTM-800 with the belts)
- B57 CE - counterpart in inch (")
- C66 2 pcs. wheels of band saw blade (TTM-1100 with the belts)
- 1320 B 3 pcs. drive of motor-shaft of band saw blade drive – TTM-800
- 1500 B 3 pcs. -//- -//- -//- -//- -//- -

TTM-1100

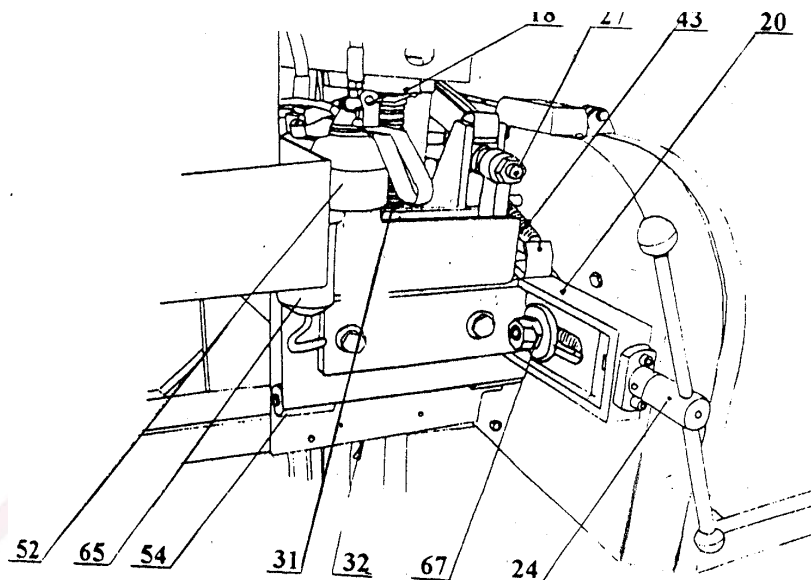
3. The Galla chain 3/4" - the drives of the vertical and horizontal feeds



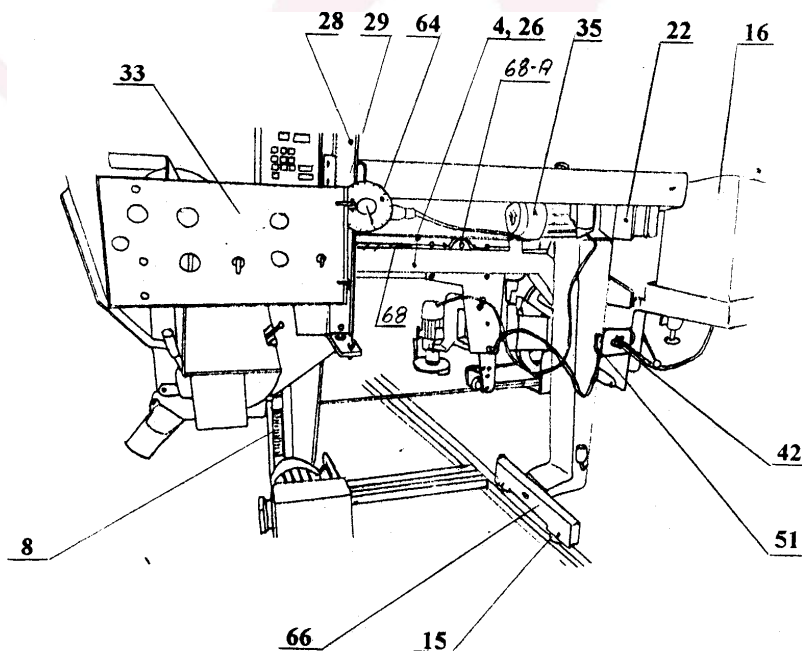
Picture 1. Front view of the sawing unit



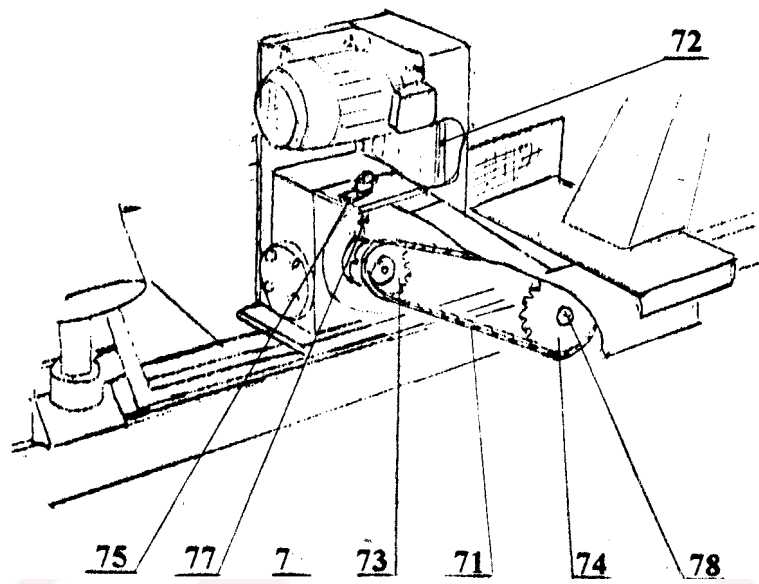
Picture 2. View of the sawing unit from left



Picture 3. View of the sawing unit from right.



Picture 4. Rear view of the sawing unit



Picture 5. View of the feed drive unit

INSTALLING THE BAND SAW

The machine should be installed on the covered concrete yard or in the room with the efficient sawdust extraction system.

The even foundation plane is essential for the straight cutting. For the concrete floor, the machine has to be fastened to the floor with the M12 bolts and big pads which are the standard equipment of the machine. It is also possible to install the band saw on the earth base on the wooden pads.

The band saw with the tracks covers area of 2,60 x 14 m (if the standard tracks are 13m long) but in fact it is necessary to prepare the several times wider area for the easy access to the both sides of the tracks when carrying the logs for cutting and taking away the planks.

The logs prepared for sawing should lay on the one side of the tracks and the processed logs (planks) on the other side.

The good labor organization improves the work output and job security.

CONNECTING THE MACHINE TO THE ELECTRICITY

To connect the machine to the electricity, use the L1, L2, L3, N and PE clips which are in the cable box under the main switch on the mast(12).

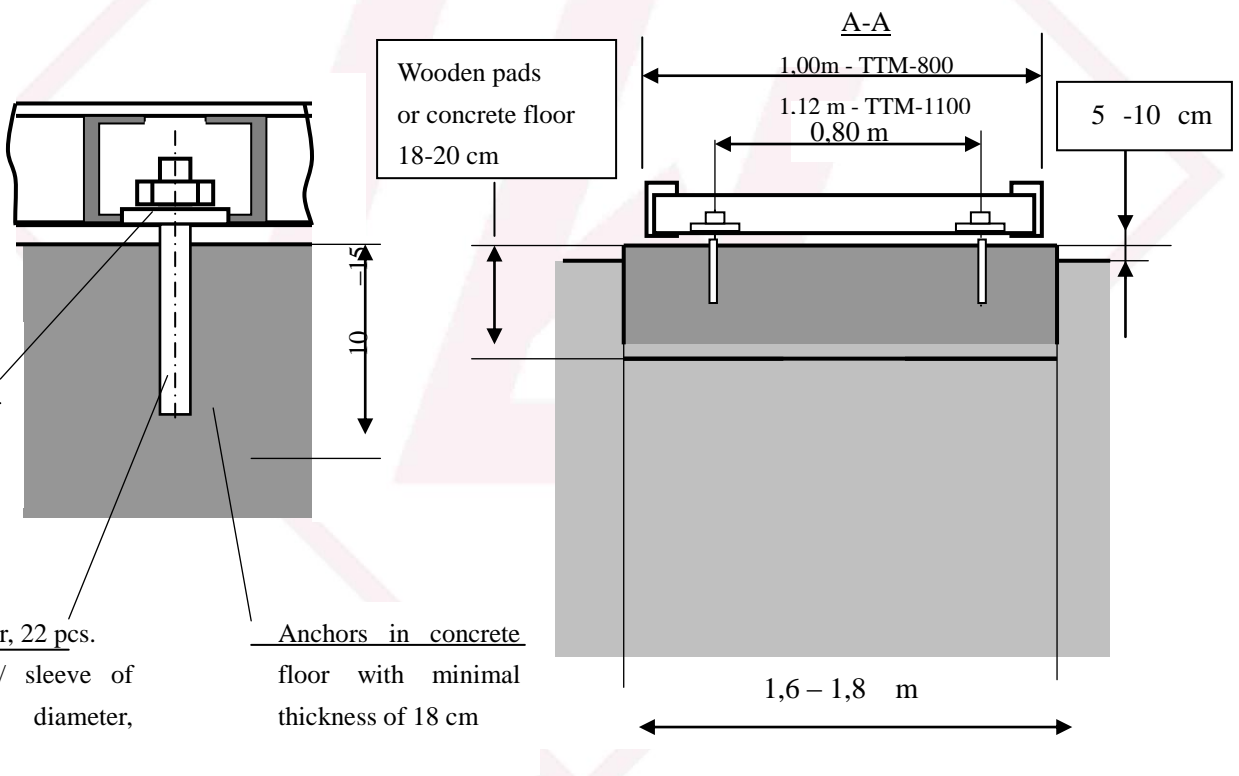
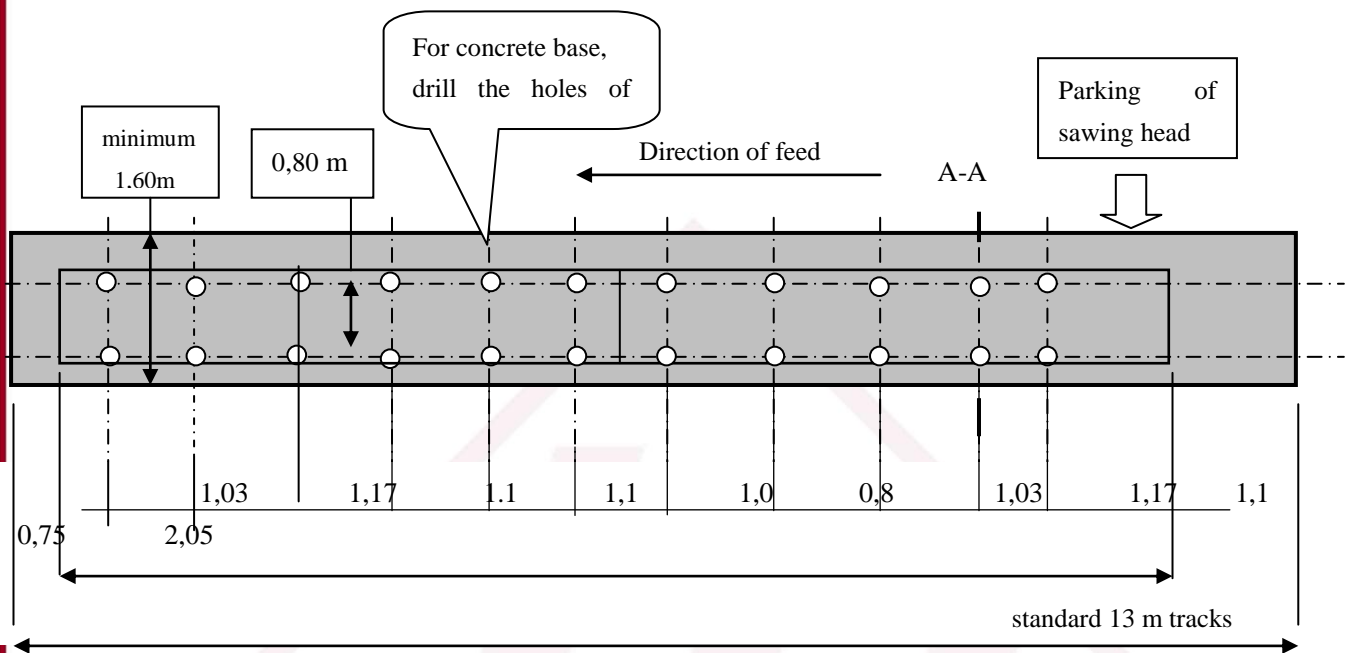
IMPORTANT!:

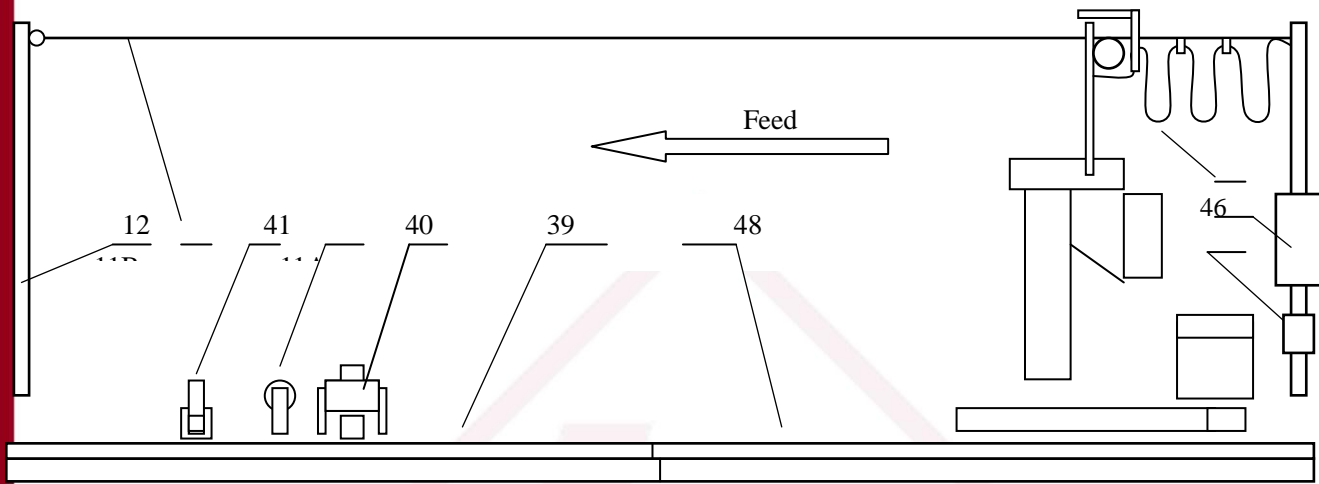
When starting the machine for the first time, make sure that the direction of rotation of the main motor is correct.

The correct direction of rotation of the main motor guarantees the correct direction of rotation of the other motors.

If in the mill there is the old 4-wire current installation, the N clip connected the "0" wire (neutral) has to be joined to the PE clip.

Only the qualified person which has got the suitable equipment can connect the machine to the electricity and check the fire protection





Picture 6. Foundation of the TTM-800/1100 band sawing machine.

STARTING THE BAND SAW

Before starting the TTM-800/1100 for the first time, read this manual carefully.

Each time, before starting the machine:

- grease the component parts according to the lubrication instructions on the pages 28- 30 (the table).
- the tank(16) should be filled with water.
- put the band saw blade on the wheels and adjust a position of the weight(3) appropriately with the use of the screw(24) (the weight(3) guarantees the right tension of the band saw blade).
- the all switches on the control panel should be in "0" position.
- at first start the motor of the band saw blade.
- the wheels of the band saw blade should spin to the right (when looking at them from an operator side); if the direction is different (to the left), the connection of the clips in the electric terminal(47) has to be changed appropriately.
- make sure that a direction of rotation of the main motor is correct. The correct direction of rotation of the main motor guarantees the correct rotations of the other motors.
- after checking the main motor, turn it off to avoid an idle work of the band saw blade and then test the other motors.
- check whether the all bearings and motors are not getting overmuch warm, the mechanisms are lubricated correctly and each unit of the machine does not work too loudly.

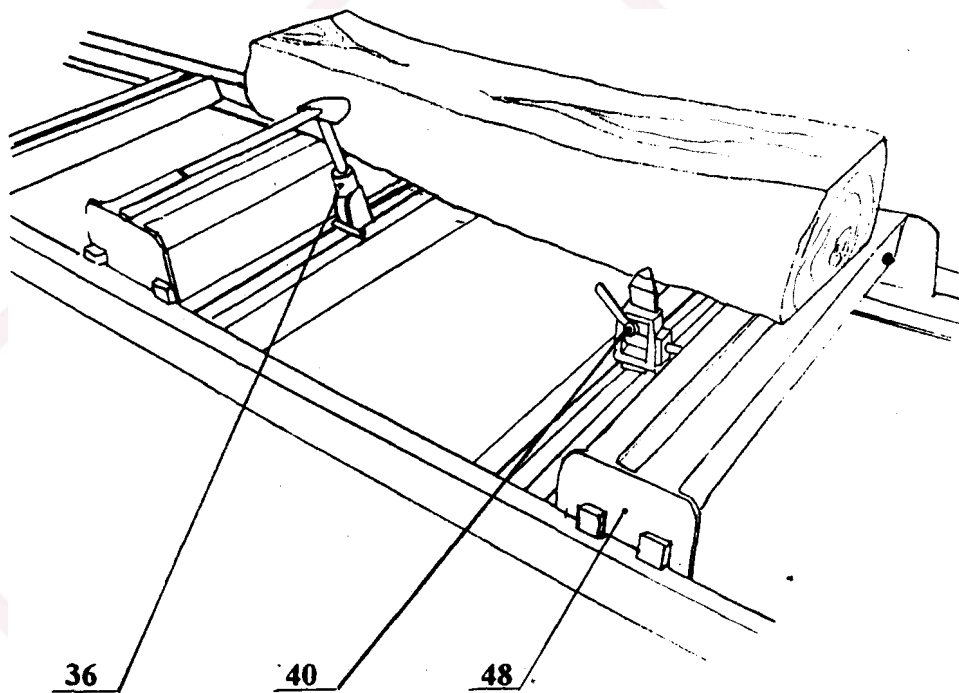
The machine operator should work very carefully and easy as long as he/she masters the all elements of operation to perfection.

In case of any problems, contact the producer or dealer of the machine.

OPERATING THE MACHINE

1. FASTENING THE LOG

The track (bench) of 13m long (standard version) is equipped with many various elements for fastening the log. The standard equipment enables fastening the log with length up to 11m or 2 shorter logs.



Picture 7. Accessories of the track

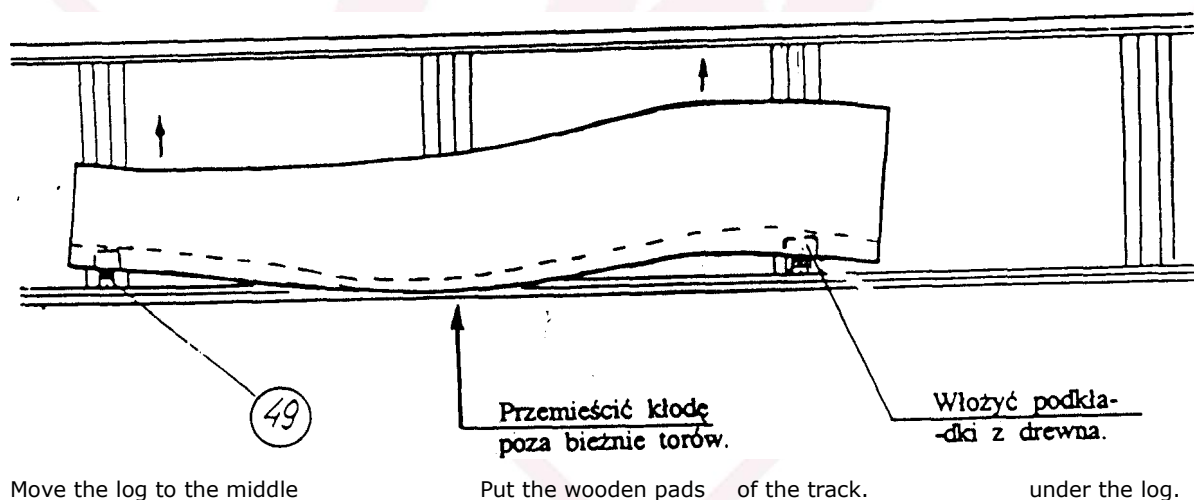
1. Before putting the log on the track, place the supports(48) /2, 3 or 4 pcs./ on the track according to the log length.
2. The thinner logs with diameter up to 800 mm can be put on the supports(48). Placing the logs on these supports is recommended when sawing a square-sawn timber because the supports have the pulling-out flat bars (49) for getting a right angle.
3. The thicker logs with diameter above 800 mm should be put directly on the track.
4. When closing the grips (40), be careful to no their elements stick out of the track rail. The longer clamps (flat bars) should be fastened to the grips when quite a high flitch is being cut.

The longer clamps should be exchanged for the shorter ones in time as the band saw blade is lowered for the next cuts. The limit switch protects against running the saw blade into the shorter clamp (clip).

The pulling-out flat bars for sawing a square-sawn timber should be lowered in time or pull out only at the planned level of sawing.

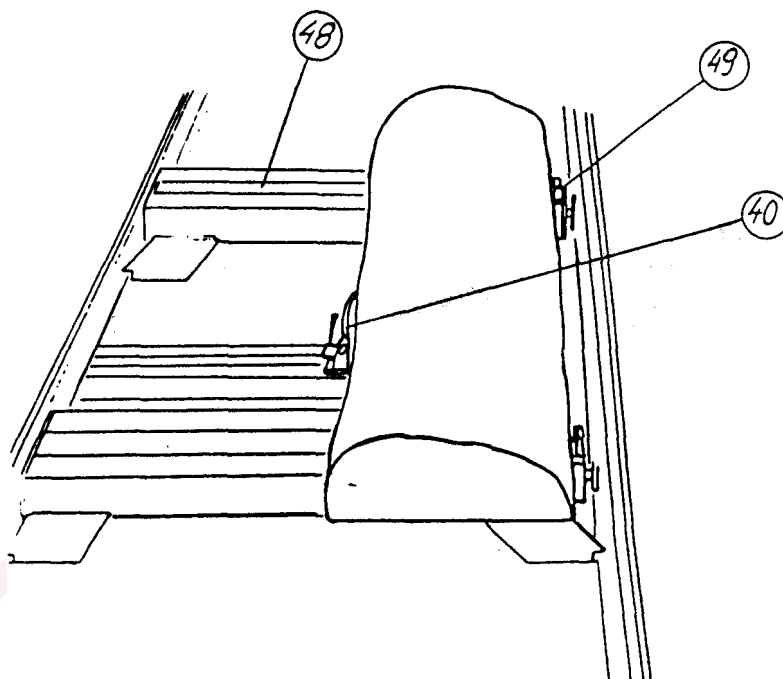
When putting the log on the supports(48), you can use the short clamps only. At first, install the grips(40) on the supports and then, after turning the log, place the grips(40) directly on the track.

5. If you want to saw very thick or very wavy logs, at first make a trial ride when a band saw blade is over a log in order to check that it is possible to work without any risk of collision between the cutting head and wood. **Any stoppage of the machine when a band saw blade is in the wood is very undesirable because it is very difficult to reverse the saw blade and start the main engine again. Every attempt at reversing the band saw blade from the scored wood ends usually in throwing down the saw blade from the wheels.** In case of a log with diameter above 700mm, make the trial ride when a saw blade is taken off from the machine completely.



Picture 8. Fastening the wavy logs

- The logs with length below 1.20m can be fastened onto two supports(48) with using only one grip(40).



Picture 9. Fastening the short logs

- After fastening the log onto the track, clean the sand off the log on the side where the band saw blade will be getting in or bark the log.
Using PK-800 device for scoring (undercutting) the bark made by the DROZDOWSKI Co. is also very good solution.

2. ADJUSTING THE PLANK THICKNESS

The plank thickness which you need to obtain can be adjusted on the calibrated straight-edge with the use of a sliding pointer(29).

- The straight-edge has four scales and three of them:
 - 4/4" - 26 mm
 - 5/4" - 32 mm
 - 7/8" - 22 mm

includes a kerf (saw cut).

For example:

If you want to obtain a board with thickness of 5/4" (32 mm),

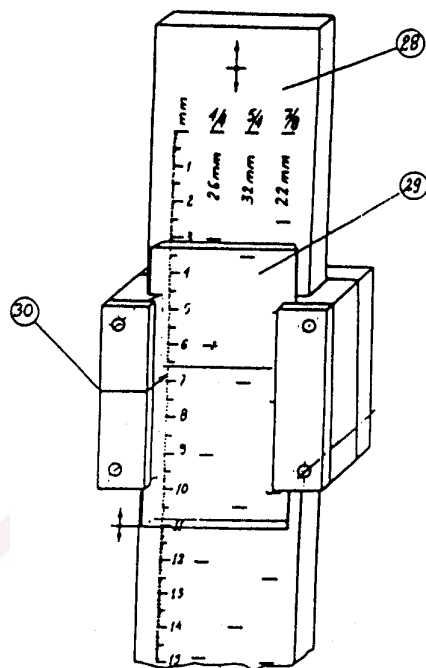
- 1) place the sliding transparent plate with pointer(29) on any closest horizontal short line of 5/4" scale on the straight-edge(28) - do it after the next cutting or during the current one,

- 2) reverse the sawing unit with a slightly raised blade to the starting position,
- 3) use the "up-down" control buttons to lower a blade on the closest horizontal short line of 5/4" scale.
- 4) start a saw blade,
- 5) start a working feed.

2. For adjusting any other sizes of the boards than these ones mentioned above, use the millimeter scale. Then you have to remember to add a kerf (saw cut) thickness. The kerf should be about 3 mm.

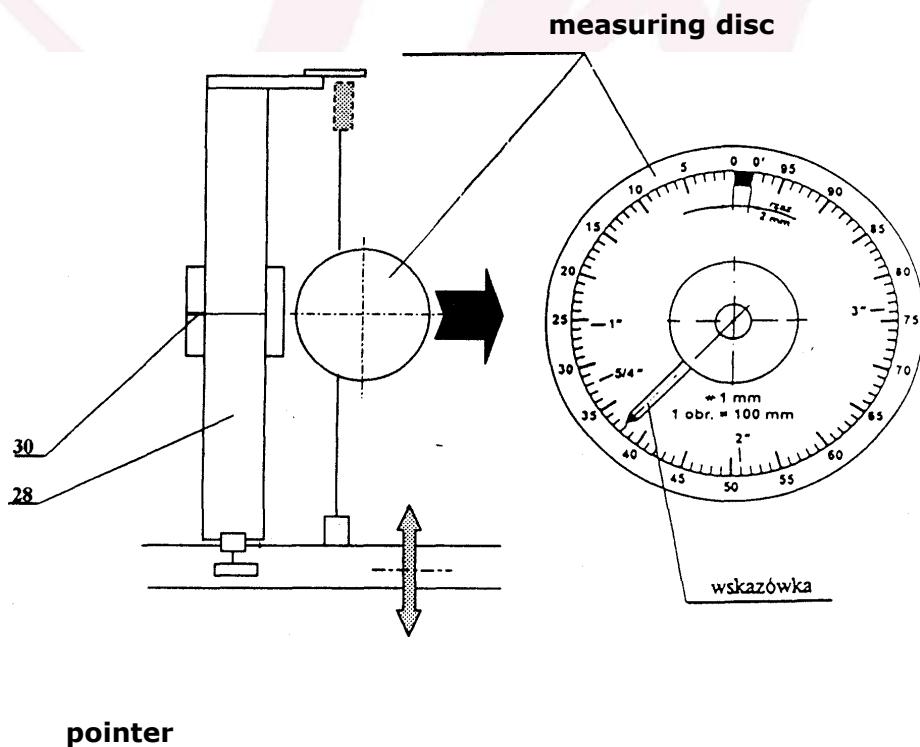
For example, if you want to obtain the plank with thickness of 15 mm:

- 1) after the next cutting or during the current one, place the sliding transparent plate(29) with pointer(30) on any closest full centimeter, for example 14 cm,
- 2) reverse the sawing unit with a slightly raised blade to the starting position,
- 3) lower a band saw blade to 12,2 mm [= 14 cm - (15 mm + 3 mm)]
- 4) use the "up-down" control buttons to adjust 122 mm on the scale,
- 5) start a saw blade,
- 6) start the working feed.



Picture 10. The straight-edge for adjusting the board thickness to be obtained.

TTM-800/1100 band saw is also equipped with the disc for adjusting and measuring the board thickness. The disc complements the straight-edge(28) and improves the accuracy in adjusting the measurements and makes the operation of the machine easier.



One 360-degree turn of the pointer = Motion of a band saw blade by 100 mm up/down.

If the pointer is on the "0" red range, a kerf (saw cut) of 2 mm is included in the required thickness of board.

OPERATION OF THE MEASURING DISC

1. Make the first cutting with the use of the straight-edge(28).
2. After turning a log, use the horizontal line-pointer(30) on the straight-edge to set a thickness of the log
3. During the cutting or after taking a board down, place the pointer in "0" position on the disc.
4. After cutting, lift a saw blade up by 3mm minimally and reverse the sawing unit to the starting position.
5. Press the "down" button to adjust the desired thickness on the disc, for example: 15, 25, 32 mm.
6. Perform the cutting.

3. SAWING THE WOOD

1. Before starting the machine, fill the tank(16) with water and check whether the feed pipes are clear. Also make sure that water falls on a centre of the saw blade, in front of the movable guide roll(14). The water flows automatically in a moment of pressing the lever(60) down.
2. The movable roll(14) should be quite close to the log but some safety distance should be kept to avoid any collision between the roll and uneven surface of the log. An experienced operator can keep the roll very close to the wood (up to 50mm) and bypass the curves during cutting.
3. The band saw blade with thickness of 1,0mm and saw set of 0,5mm per side makes a saw cut (kerf) of 2,0mm theoretically. However taking into consideration a slight vibration of the saw blade in the wood, the kerf can be 2,2mm in practice.
4. The band saw blade should be inserted into wood with a lower feed and then it can be sped up.
5. The working feed speed depends on:
 - thickness of log
 - kind of wood
 - degree of band saw blade bluntness

In practice, the most popular working feed is the range of 2-10m per minute.

The wavy surface on the log after sawing means that the saw blade has to be sharpened and/or set.

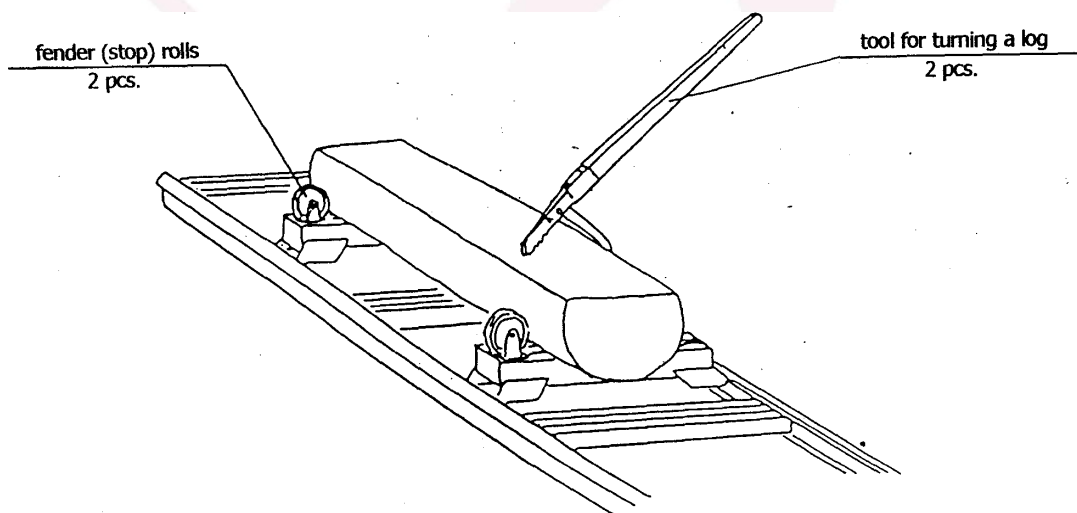
The band saw blades have to be sharpened very often and then the high sawing feeds can be used (instead of the long working time with the low feeds and without the frequent sharpening of the blades). Such a work increases the speed of sawing, improves the quality of sawing and extends the band saw blade life definitely.

The band saw blade should be sharpened every 1 working hour even if the wood is very clear.

6. Immediately after each leaving the log by the blade, turn the saw blade drive off and cut off the flow of water.
7. When reversing the sawing unit, the band saw blade has to be slightly raised (by about 5mm) to avoid settling the sawdust on the blade.

4. TURNING THE LOG

The TTM-800 and TTM-1100 band saws are equipped with two tools for turning the log and two fender (stop) rolls protecting the log against rolling off the truck.



Picture 11. The equipment for turning the log

5. CHANGING AND TIGHTENING THE BAND SAW BLADE

The saw blade tightening system ensures the fixed, correct tension of the blade and it is automatically adjustable during the work. The operators of the machine have to only care about the frequent lubrication of some elements according to the instructions on the pages 28-30 (the table).

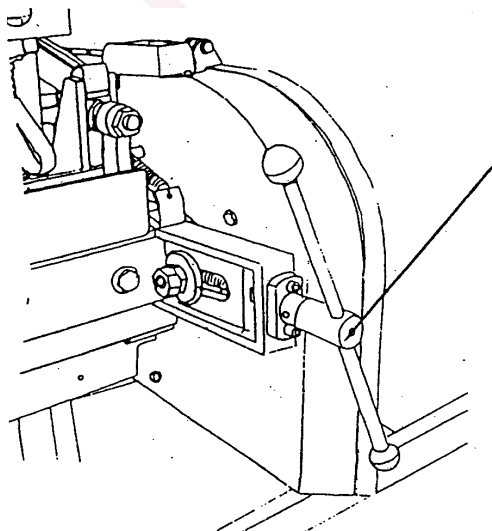
Releasing the saw blade tension

1. Press the P4 electric blockade.
2. Turn the handwheel(24) to the left as long as the weight(3) rests on the rubber support.
3. Lift the saw blade casing(37) up as long as it is blocked by the locking pawl.

Use the protective leather gloves when changing the band saw blade!!!

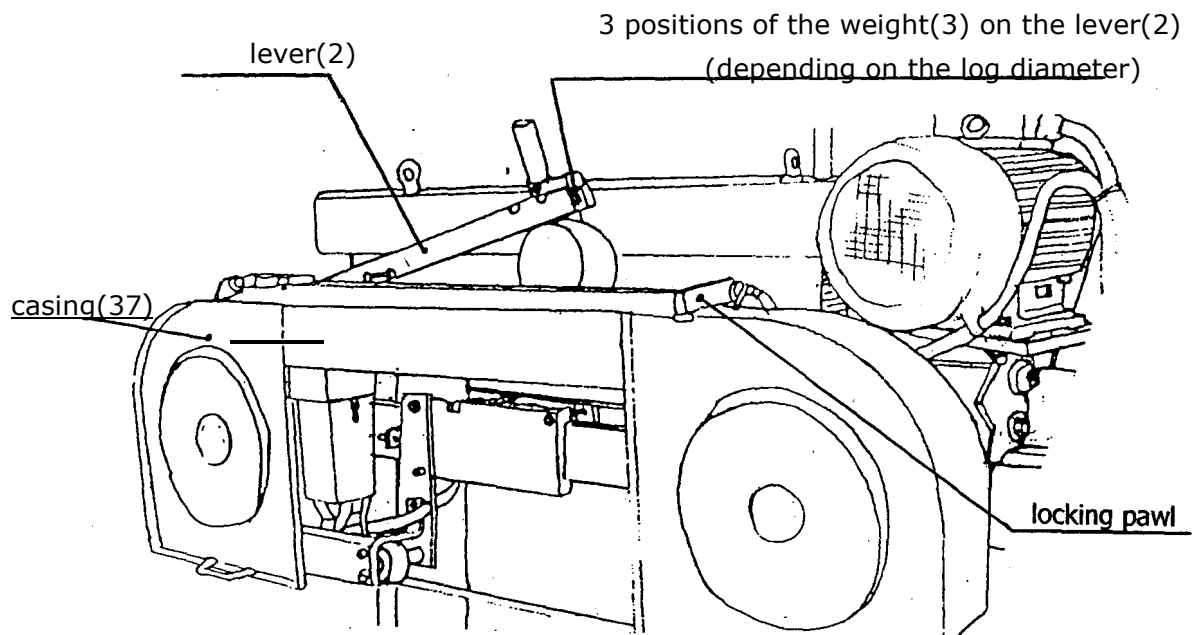
Putting the band saw blade on the wheels

1. Move the wheels(7 and 19) closer to each other as much as possible.
2. Turn the crank(24) to the right to tense the band saw blade gradually.
3. Release the break by pressing the clutch lever(60) down so that it can be possible to turn the wheel by hand twice or three times until the band saw blade fits itself on the wheels.
4. Turn the crank(24) to the right as long as the weight is over the beam and the lever(2) has an angle of 10-15 degree up and is over the rubber support (see the picture 13).
5. Close the casing(37).



crank (24) for tensioning
and releasing the band saw blade

Picture 12. Band saw blade tensioning mechanism



The maximum tension of the saw blade should be used only for very thick logs. The continuous work with the maximum tension will be a cause of the saw blade break due to the material fatigue.

Picture 13. The position of the tension lever and weight when the band saw blade is tensioned correctly.

6. SHARPENING AND SETTING THE BAND SAW BLADES

If the band saw blade waves in the wood, it means that the blade is blunt or set wrongly.

THE PRINCIPLES OF SHARPENING THE BAND SAW BLADES:

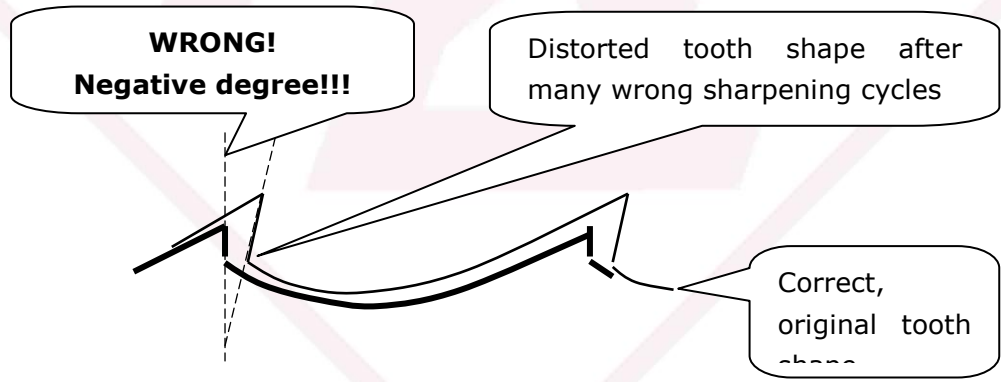
1. The correctly sharpened band saw blade can work for **1 hour maximally**. The blade has to be sharpened after 1 working hour, even if the quality of sawing is satisfying,
2. The band saw blade may need to be sharpened again even after one cut if the wood is very dirty on the side where the band saw blade is getting in the log.

- 3. Grind the front surface of tooth (rake angle) slightly!
Grind the back surface of tooth (clearance angle) heavy (deeply)!



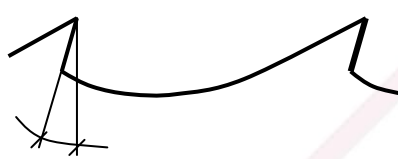
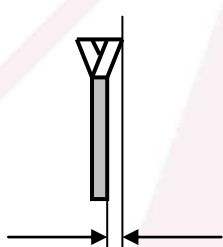

Picture 14. The sharpening proportions

- 4. Too heavy grinding of the front surface of tooth will be causing the gradual change of a rake angle until this angle is 0° (or even negative degree). Moreover the tooth shape will be getting more and more distorted and the grinding wheel will be needing the continuous, manual forming of its shape. The above symptoms indicates the wrong work of the sharpener operator, not any fault of the machine.



Picture 15. The distorted tooth shape after many wrong sharpening cycles

5. The recommended tooth parameters:

Kind of wood »	Hard wood (oak, beech, ash and the like)	Middle-hard wood (pine, spruce and the like)	Soft wood (poplar, aspen and the like)
Tooth parameters ↓ RAKE ANGLE 	7 - 8°	12 - 14°	16 - 18°
SAW SET 	0,40 - 0,50 mm	0,40 - 0,55 mm	0,50 - 0,60 mm
HEIGHT 	5,5 - 6,0 mm	5,5 - 6,5 mm	6,0 - 6,5 mm

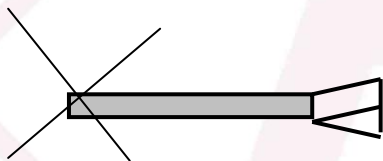
For the frozen soft wood, use the same tooth parameters like for the hard wood.

6. If the band saw blade has too big rake angle when sawing the hard wood, the saw blade works unsteadily (there are the yanks) and loudly. The blades may crack very soon.
7. If the band saw blade has too small rake angle when sawing the soft wood, the surface of the wood after sawing is wavy, even if the blade is quite sharp.

USING THE BAND SAW BLADES- THE PRIMARY PRINCIPLES

Observe the following most essential rules:

1. Start the band saw blade drive shortly before the blade gets into the wood and stop it immediately after coming out from the wood.
If the band saw blade moves idly (does not cut the wood), it undergoes a very high material fatigue.
2. Use the feeds according to the wooden material thickness/diameter but tend to use the high feeds to cut as many wood as possible and perform as less turns of a saw blade on the wheels as possible. Binding a saw blade on a radius of the wheels and straightening it on a length between the wheels fatigues a steel very much. The number of the binding and straightening determines a band saw blade life.
3. Sharpen the blunt saw blades instead of slowing down the working feeds overmuch.
4. Use the band saw blades with the rounded edges of the back.



A)



B)

- A)** the band saw blade with the wrong back (not rounded edges)
B) the band saw blade with the correct back (rounded edges)

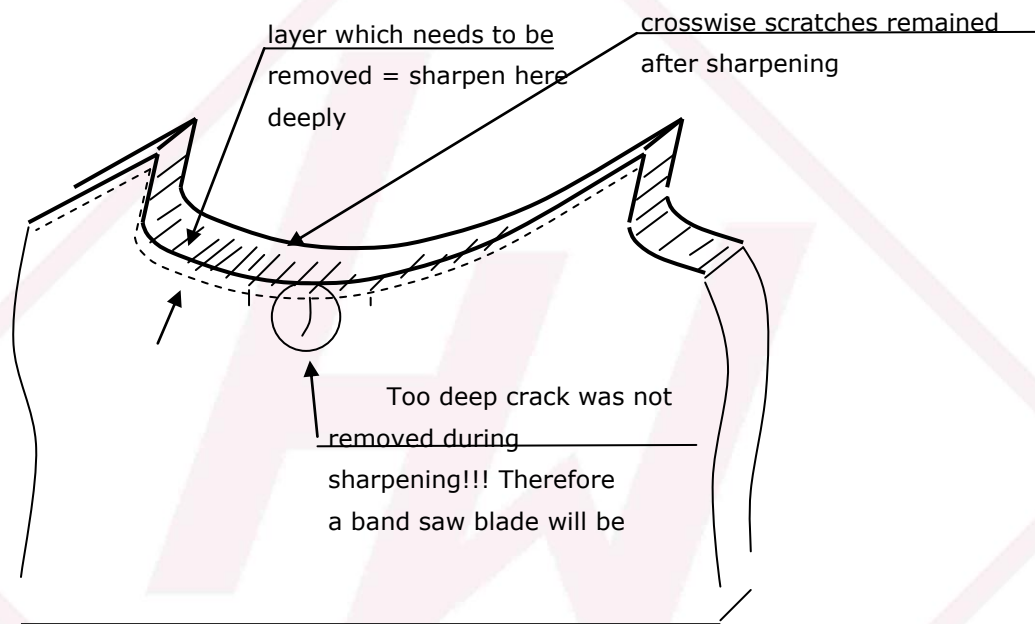
INFLUENCE OF SHARPENING ON THE BAND SAW BLADE LIFE

After each sharpening cycle, on the bottom surface of teeth there are the crosswise scratches which initiate the microscopic cracks invisible with the naked eye. Therefore:

1. Get a smooth surface of tooth by:
 - sharpening the band saw blade very slightly (not deeply) in the last cycle,
 - profiling the grinding wheel only initially after putting it on a spindle, later on the grinding wheel should fits its shape to the given tooth shape automatically and any manual profiling will be unnecessary,
 - using the grinding wheels with the correct hardness and granularity (these parameters should be given by the producer of the sharpening machine).
2. The sharpened band saw blade can work for **1 hour maximally**. Even if the quality of sawing is satisfying, the blade has to be sharpened after 1 working hour, otherwise the microscopic

cracks may be deepened and the next sharpening cycle may not remove them. See the picture 16 on the next page.

3. After sharpening, remove the barbs (splinters) on the cutting edge with the use of a file because the barbs speed up the process of the microscopic cracks (the sharpening machines equipped with a scraper eliminates this action).
4. The grey scratches (burns) on the bottom of tooth should be eliminated by slight (not deep!) sharpening.



Picture 16. The microscopic cracks on the band saw blade

The microscope cracks with a depth of 0,05 – 0,10 mm which were not removed during sharpening (by the deep/heavy sharpening) will cause a break of the saw blade during the first sawing hour.

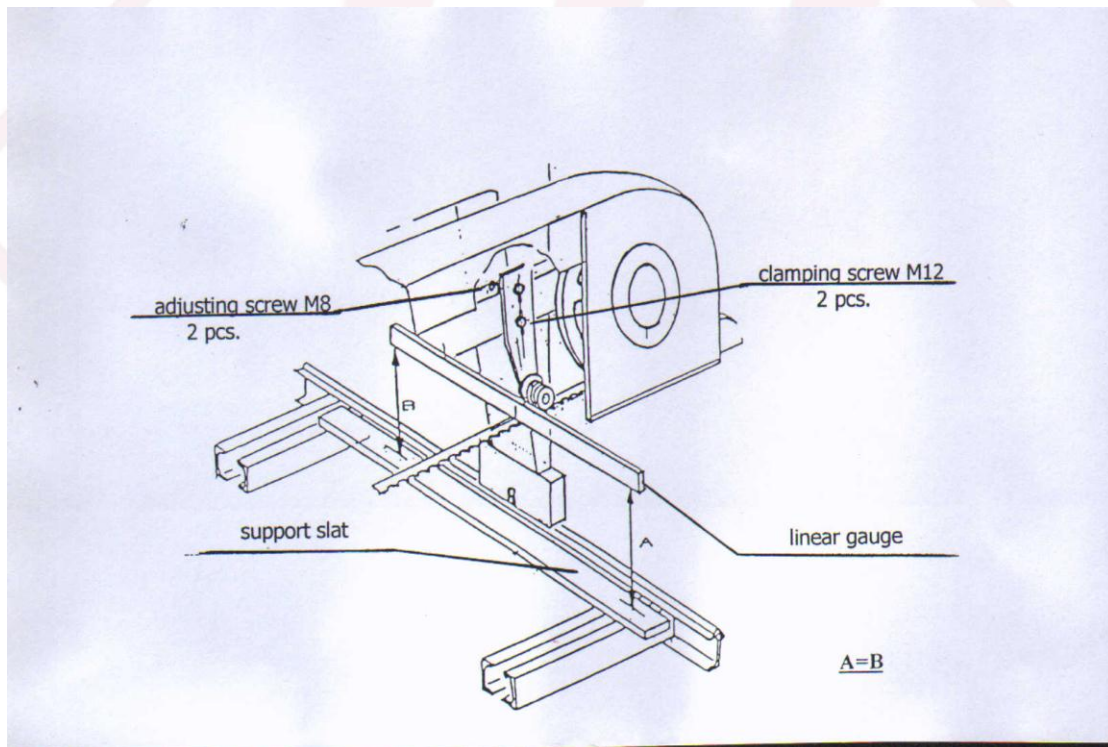
ADJUSTING THE GUIDE ROLLERS

The correct adjustment of the guide rollers has a large influence on the straight cut.

The following parameters are adjustable:

- I. parallelism of the surface of the band saw blade to the track,
- II. distance between the back edge of the saw blade and the guide roller collar (flange),
- III. pressure of the guide rollers down on the band saw blade.

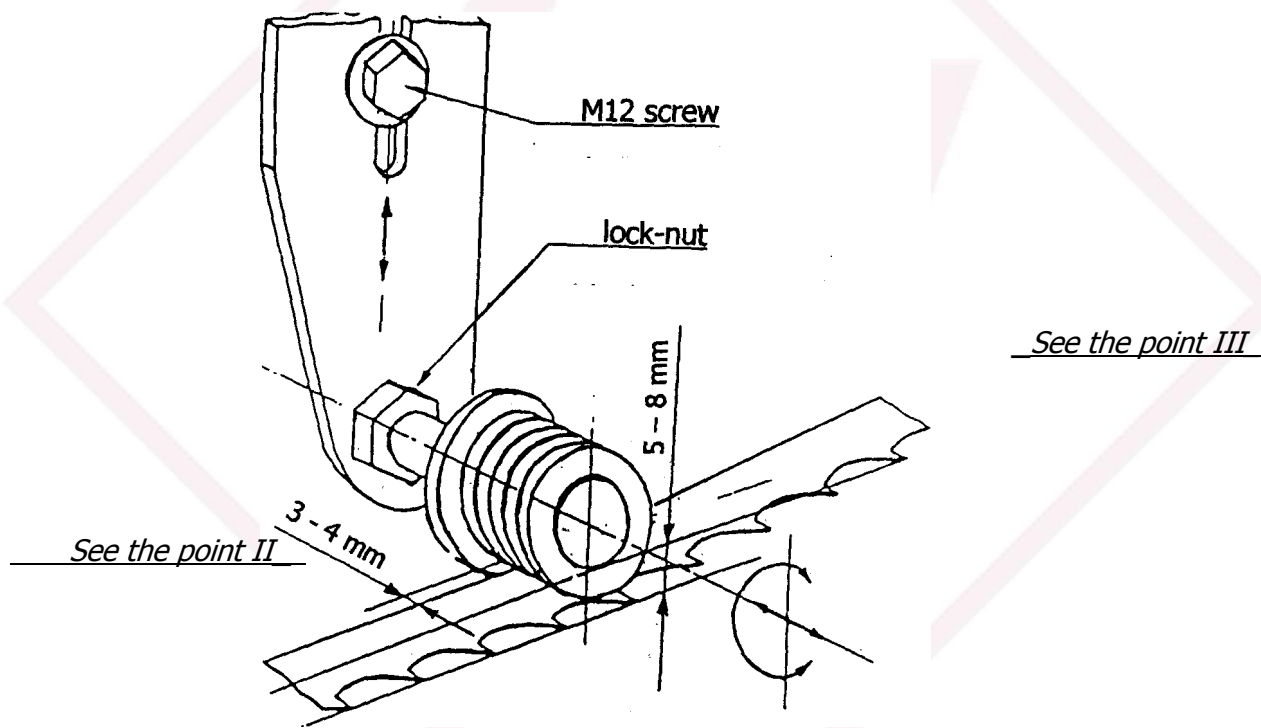
Each guide roller has to be adjusted separately.



Picture 17. Adjusting the guide rolls (concerns the point I below)

I. Adjusting the parallelism of the band saw blade surface to the track.

1. Put the linear gauge (straight edge) of 70-100cm long on the band saw blade surface (as presented above) on a straight (not set) tooth and as close to the guide rollers as possible.
2. Place the middle of the linear gauge in the middle of the band saw blade width.
3. Put the support slat on the track under the linear gauge (the ends of the support slat should rest on the neighboring crosspieces of the track).
4. Use the M8 adjusting screws and M12 clamping screws to adjust the position of the guide rollers so that A distance equals B distance ($A=B$).



Picture 18. Adjusting the guide roller (concerns the points II and III below)

II. Adjusting a distance between the back edge of the saw blade and the roll collar (flange).

1. Screw in/unscrew the axle of the roll to obtain the distance of 3 – 4 mm. Then block the setting with using the lock-nut.
2. Turn the drive wheel manually, check the setting and correct it if need be.

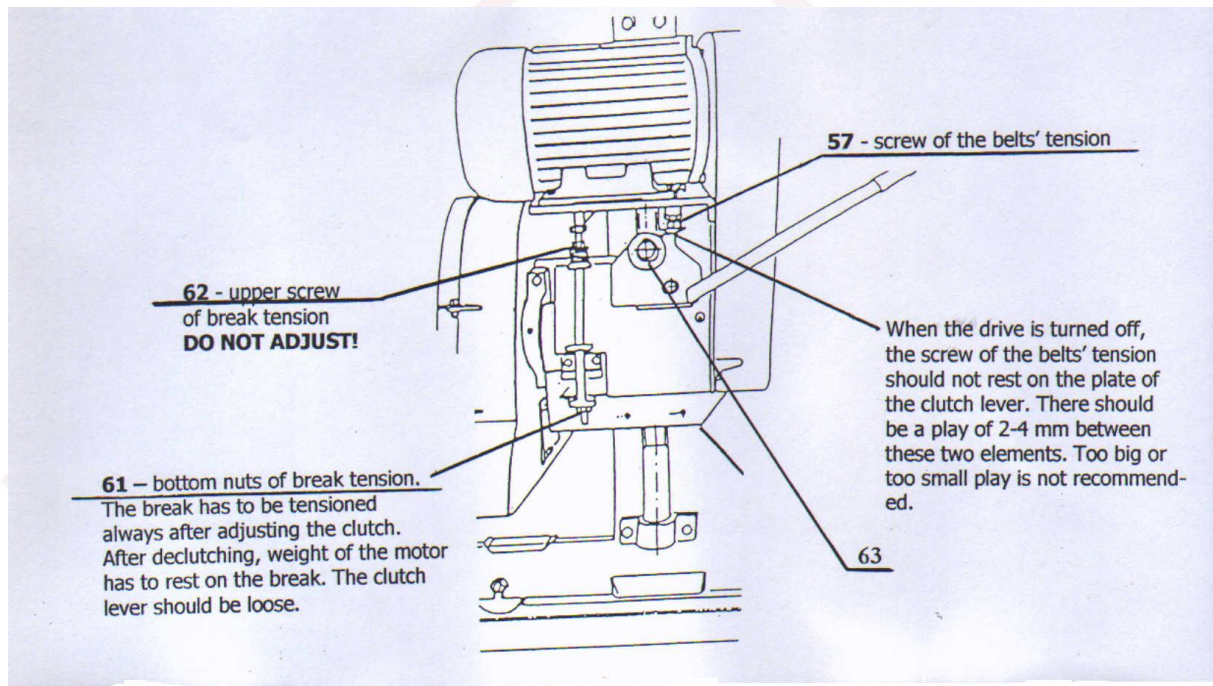
III. Lowering the guide rollers for pressing the band saw blade down.

1. The band saw blade tightened between the wheels should be pressed down by the guide rollers so that the saw blade be lowered by 5 – 8 mm.
2. The above operation enables also adjusting a parallelism of the saw blade to the folding roller supports No. 39 (to extra order) or to the standard supports No. 48.

ADJUSTING THE TENSION SYSTEM OF THE V-BELTS AND BRAKE

The main shaft is driven by the engine with the V-belts 1320 B, 3 pcs. or 1500B – TTM-1100. The belts need to be tensioned from time to time.

If the saw blade slows down during the cutting and an operator has a feeling that the motor loses the revolutions, it indicates that the belts have to be tightened (they are beginning to slide).



The belts can be tightened by driving in the screw **57**, by one or two 360-degree turns. If the clutch can be turned on not too hard but not too easy as well (a slight resistance should be perceptible), it means that the tension is correct.

The brake can be tightened by turning the nuts up on the pull rod of the element **61**. The brake should be tightened in such a way so that the wheels with a saw blade are slowing down noticeably after declutching but they should not stop suddenly.

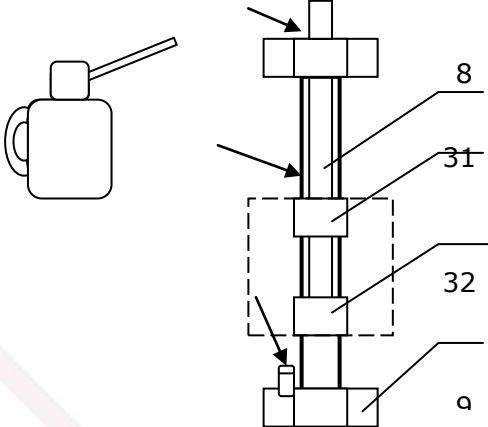
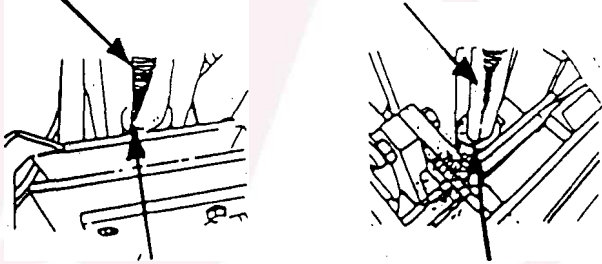
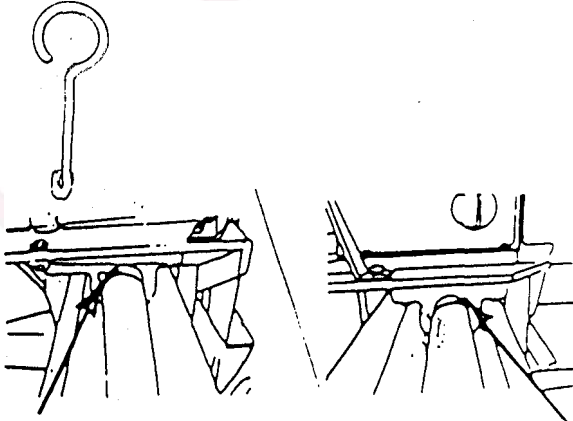
After adjusting the belts and brake tension, block the settings with using the locknuts.

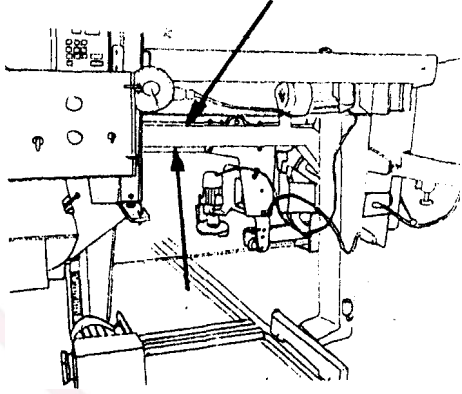
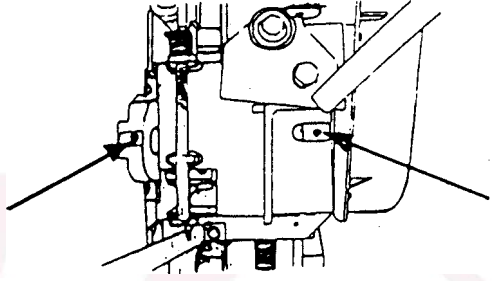
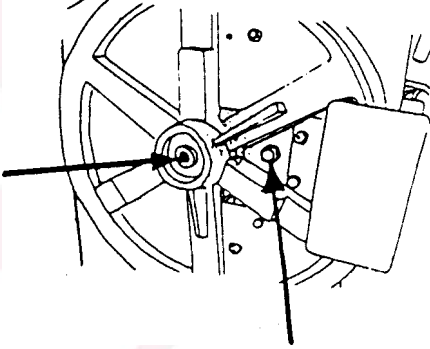
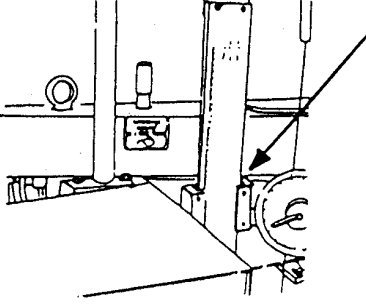
Do not forget to tighten the belts after the first working week!

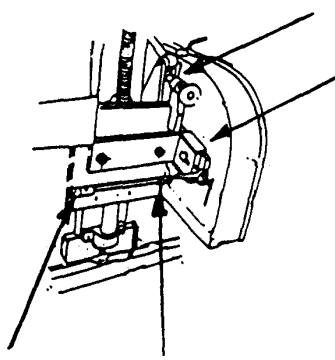
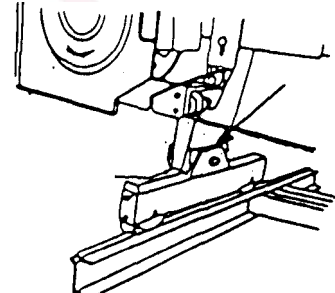
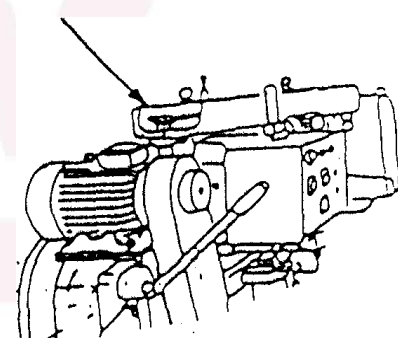
The sounds of squeal in a moment of starting or/and stopping by turning the clutch on/off are normal occurrence and can exist.

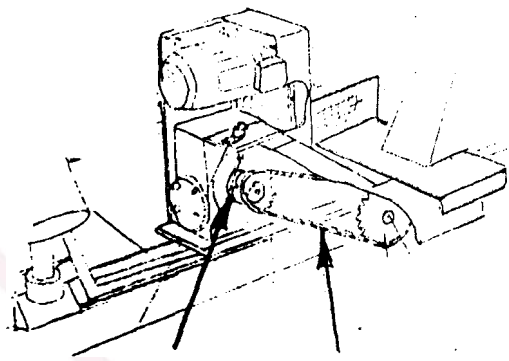
LUBRICATION AND MAINTENANCE OF THE TTM-800 AND TTM-1100 BAND SAWS

No.	Description of lubrication and maintenance	Kind of lubricant and frequency of lubrication	What should be oiled/greased?
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<p>1. Lubricating the screws of the up-down feed with using an oiler which is the standard equipment of the machine.</p> <p>Use 0,25 L / 8 hours</p>	<p>Thin machine oil Every 2 working hours</p> <p>Clean the screws of the up-down feed. After cleaning, oil them amply on the outside with using some thin oil or oil-diesel mixture.</p> <p>Thin machine oil Every 16 working hours</p> <p>Thin machine oil Every 40 working hours</p> <p>Also clear the canals in the nuts and bearing bushings with using a cleaning brush/rod with diameter of 2mm.</p> <p>IT IS VERY IMPORTANT OPERATION!</p>	  <p>The nuts(31) of the sawing unit (top view)</p>  <p>The bearing bushings(32) of the sawing unit (bottom view) Lift the sawing unit as high as possible</p>
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<p>2. Clean and oil the guide (slide way) of the sliding roller.</p>	<p>In case of very intensive work, clean the guide (slide way) even every 4 working hours!</p>	<p>Thin machine oil Every 8 working hours (or every 4 hours)</p>	
<p>3. Main shaft</p>	<p>Grease two "cask" bearings with using a grease gun. Remove the surpluses of the grease flowing from the mountings.</p>	<p>LT-43 grease Every 40 working hours</p>	
<p>4. Tightening wheel</p>	<p>Grease two ball bearings through the grease nipple in the axle of the wheel with using a grease gun. Clean and oil the slide of M16 screw being behind the wheel.</p>	<p>LT-43 grease Every 40 working hours Machine oil Every 40 working hours</p>	
<p>5. Straight edge</p>	<p>Clean the straight edge(28) carefully. Also oil it and its slider slightly.</p>	<p>Very thin machine oil Every 40 working hours</p>	

<p>6. Band saw blade tensioning system</p> <p>Clean the screw(24) and oil its thread. Also oil: - the weight hinge(3) - the hinges(54) of the tightener plate.</p>	<p>Thin machine oil Every 40 working hours</p>	
<p>7. Skid of the movable trolley</p> <p>Oil the slit between the sheets.</p>	<p>Machine oil Every 160 working hours (once a month)</p>	
<p>8. 3/4inch driving chain of the up-down feed drive</p> <p>Take the covers off for oiling and then remove the dirt and clean the bottoms of the wheel's teeth.</p> <p><u>The loose chain should be tightened!</u></p>	<p>Machine oil Every 6 months</p>	

<p>9.</p>	<p>¾inch driving chain of the horizontal feed drive</p> <p>Take the cover off and then remove the dirt from the bottoms of the ratchets and from the clutch.</p> <p><u>The loose chain should be tightened!</u></p>	<p>Machine oil</p> <p>Every 6 months</p>	
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Complying with the above instructions ensures a failure-free work of the band saw for many years. The screw system of the up-down feed can work without any breakdown even for over 15 years of intensive sawing (the best evidence are the band saws which have worked for many years without any signs of wear and tear).

Faulty work of the up-down feed unit (burning the terminals of the contactors, the sudden stoppage of the sawing head) means that an operator does not comply with the lubrication instructions included in the above table, item 1. Any further work without the immediate maintenance may cause a serious failure of the band saw.

The damaged and worn out component parts being a result of the wrong work of the machine operator (not complying with the lubrication instructions included in the above table) **WILL NOT BE CHANGED IN GUARANTEE!**

HELPFUL HINTS

This chapter has been written based on the experiences of the people working with the TTM band saws.

1. After sawing, the surface of wood has got the vibrating saw blade marks.

The causes:

- the movable roll(14) is too far from the log,
- the saw blade is very sharp but the working feed is too slow,
- the log is thin and the working feed is too low.

2. The band saw blade right after sharpening is "going" in the log downwards and this occurrence repeats itself.

The causes:

- the teeth of the band saw blade are set wrong. There is no symmetry of set – the teeth "outside" the saw blade loop are set overmuch or the teeth "inside" the loop are set too less.

Check whether your tooth setter is adjusted correctly.

3. The band saw blade right after sharpening is "going" in the log upwards and this occurrence repeats itself:

The causes:

- the same cause as in the point 2 (there is no symmetry of set) but in the opposite way.
- Check whether your tooth setter is adjusted correctly.

4. The band saw blade is very sharp but there is a curvilinear sawing at the end of the first sawing and every next sawing is worse and worse. The occurrence repeats itself after every sharpening and when the different logs are being cut.

The causes:

- the band saw blade is of a poor quality - it is too soft and the cutting edges are getting blunt very quickly. Most of the users complains about a batch of such the too soft blades. Some of the users use the soft blades consciously for sawing very soft wood (aspen, poplar) but then they use also very high rake angles – 17-18 degrees. Thanks to that they can keep the standard frequency of sharpening and they can save expenses (the soft saw blades are usually cheaper but more resistant to cracks and breaks causing by material fatigue).

5. The "wheels - band saw blade unit" works too loud.

The causes:

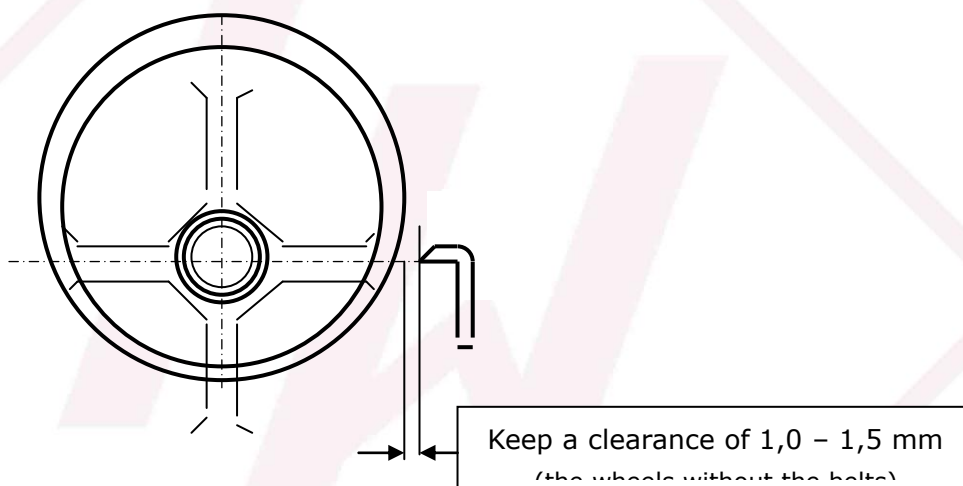
- there is no water in the tank(16) – in effect the band saw blade and wheels are overmuch covered with the sawdust and resin,

- the water is being used overmuch - in effect the wheels are too clean, there is no layer of sawdust insulating the races of the wheels from the band saw blade (it concerns the version of the wheels without the belts),
- the cleaning knives are too close the races of the wheels (it concerns the version of the wheels without the belts).

The grooves in the main wheels should be covered with the sawdust and just for this purpose the grooves are made.

Both using too much water and not using it at all is a mistake of an operator.

The cleaning knives should collect only the surplus of the sawdust from the wheels and can not touch the wheels.



6. The band saw blades crack, even a few pieces per day – the problem appears suddenly.

The causes:

- a batch of the saw blades was using evenly and they all were undergoing a material fatigue at the same time.

Check whether the band saw blades are being sharpened correctly.

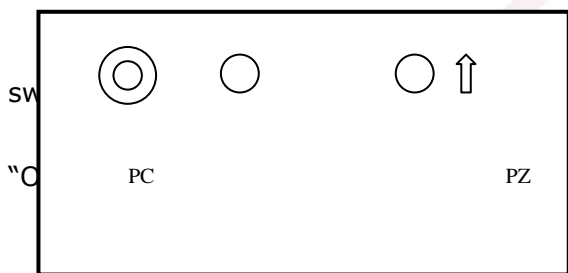
Check whether the band saw blades are thinner by 6mm minimally compared to the new ones, if they are, it means that they are unable to work any longer. If they are still quite wide, it means that they are being used wrong – they were working for too long time without the breaks for sharpening (read carefully the chapter VI).

7. The TTM-800 is adapted for using the band saw blades with the width of 32 -35 mm and thickness of 0,9 – 1 mm. For the TTM-1100 the producer recommends to use the blades with the width of 1,1mm and thickness up to 38mm.

Using the band saw blades with the other parameters than the above ones is not recommended by the producer (for the wider and thicker band saw blades, there would have to be the wider wheels and guide rollers, the bigger diameter of the wheels and the other tension of the saw blade used).

WIRING

CONTROL PANEL:



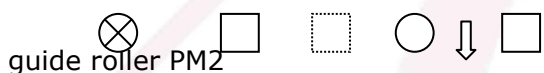
PC - "STOP" - P4 main "Off"

PZ - "START" - P1 main

LS - indicator light

WP - "SAW BLADE" - PM1

"On" switch-key



PP - moving the blade

PZG - P3 - saw blade

"Up" I.S

WP

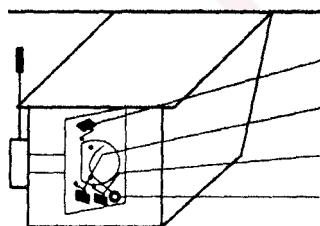
PK

PZD - P2 - saw blade

"Down"

PK - scoring device

PM3 for bark



SM2 - micro switch-key of backward feed

SM1 - micro switch-key of forward feed

SM3 - micro switch-key of water electro-valve

PO - potentiometer of feed speed adjustment

THE COMPONENTS OF THE WIRING:

No.	Symbol	Name (in Polish)	Qty	Producer
1.	M1	Silnik Sg 132M-4 7,5 kW/1400ob. lub/or Sq 132M-4PC 11 kW/1400ob.	1	TAMEL Tarnow
2.	M2	Silnik Sg90L4/8 1,0/0,55 kW	1	TAMEL Tarnow
3.	M3	Silnik Sg90 S4 1,1 kW 1400 Ob.	1	TAMEL Tarnow
4.	M5	Skg 63-B1 0,18kW 140 obr/min	1	TAMEL Tarnow
5.	PM-1	Wyłącznik ŁUK 40-228-2 (±A)	1	Elektromet Dzierzaniow
6.	PM-2	Łącznik P016	1	Giovenzana
7.	P1,P2,P3	Przyciski sterownicze NI	3	PROMET Sosnowiec
8.	P4	Przycisk sterowniczy NEF 30	1	PROMET Sosnowiec
9.	S1,S5	Wyłączniki krancowe LM-10	2	PROMET Sosnowiec
10.	S2,S3,S4,	Wyłączniki krancowe LM-IOR	3	PROMET Sosnowiec
11.	B	Obud. PKZO-GR i wył. gł. PKZMO-32	1	MOELLER
12.	B1	Wyłącznik sil. SFKOM 20-25A	1	General Electric
13.	B2	Bezp. elektrozaworu wody 0,25A	1	POKOJ t6dz
14.	B3	Wyłącznik S 191 C2 2A	1	General Electric
15.	ST1	Stycznik CL45	1	General Electric
16.	ST1-1,ST1-2,ST1-3	Styki pomocnicze BCLF10	3	General Electric
17.	ST2.ST3	Stycznik MC1A301AT	2	General Electric
18.	LS	Lampka sygnalizacyjna	1	WIKAMA
19.	LZ1.LZ2	Listwa zaciskowa TLZ-4	2	POKOJ t6dz
20.	LZ3	Listwa zaciskowa	3	POKOJ t6dz
21.	TR	Transformator separa. PSS 50	1	BREVE t6dz
22.	SM1.SM2.SM3	Mikrowłącznik VS 15	3	HIGHLY"
23.	PO	Potencjometr M22-R4K7	1	MOELLER
24.	EW	Elektrozawor wodv tvp 319	1	
*23.	*PM3	Wyłącznik Łuk 16-1.2	1	Elektromet Dzierzoni6w
*24.	*M4	Silnik 0.75kW 400V	1	TAMEL Tarn6w
*25.	*B4	Wyłącznik sil. SFKOG 1,6-2,5A	1	General Electric

* Elements of the scoring device for bark

See the diagrams on the next pages

ATTENTION!: The machine is adapted for the neutral grounding.
The protection should be installed by the user.

The explanations of the symbols in the electric diagrams on the next pages:

M1 – 7,5 or 11 kW motor, 400V, 1450 r.p.m.

M2 – 1,1 kW motor, 400V, 50Hz, 1450 r.p.m.

M3 – 0,75 kW, 400V, 2780 r.p.m. - version with scoring device for bark

M4 - 0,18 kW feed motor of blade guide roller, 400V, 50Hz, 1400 r.p.m.

M5 - 1,1 kW feed motor, 400V, 50 Hz, 1400 r.p.m.

ST1 – main contactor

ST2 – executes the feed down

ST3 – executes the feed up

PM2 – switch of moving the blade guide roller

PM3 – switch of scoring device for bark (**installed by the producer!**)

Z2 - potentiometer of feed speed adjustment

SM2 - micro switch of backward feed

SM1 - micro switch of forward feed

SM3 - micro switch of water electro-valve

ST1-1, ST1-2, ST1-3 - support contacts of ST1 main contactor

S1 - limit switch in case of break of band saw blade

S2 - limit switch of feed down

S3 - limit switch of feed up

S4 - limit switch of open cover of band saw blade

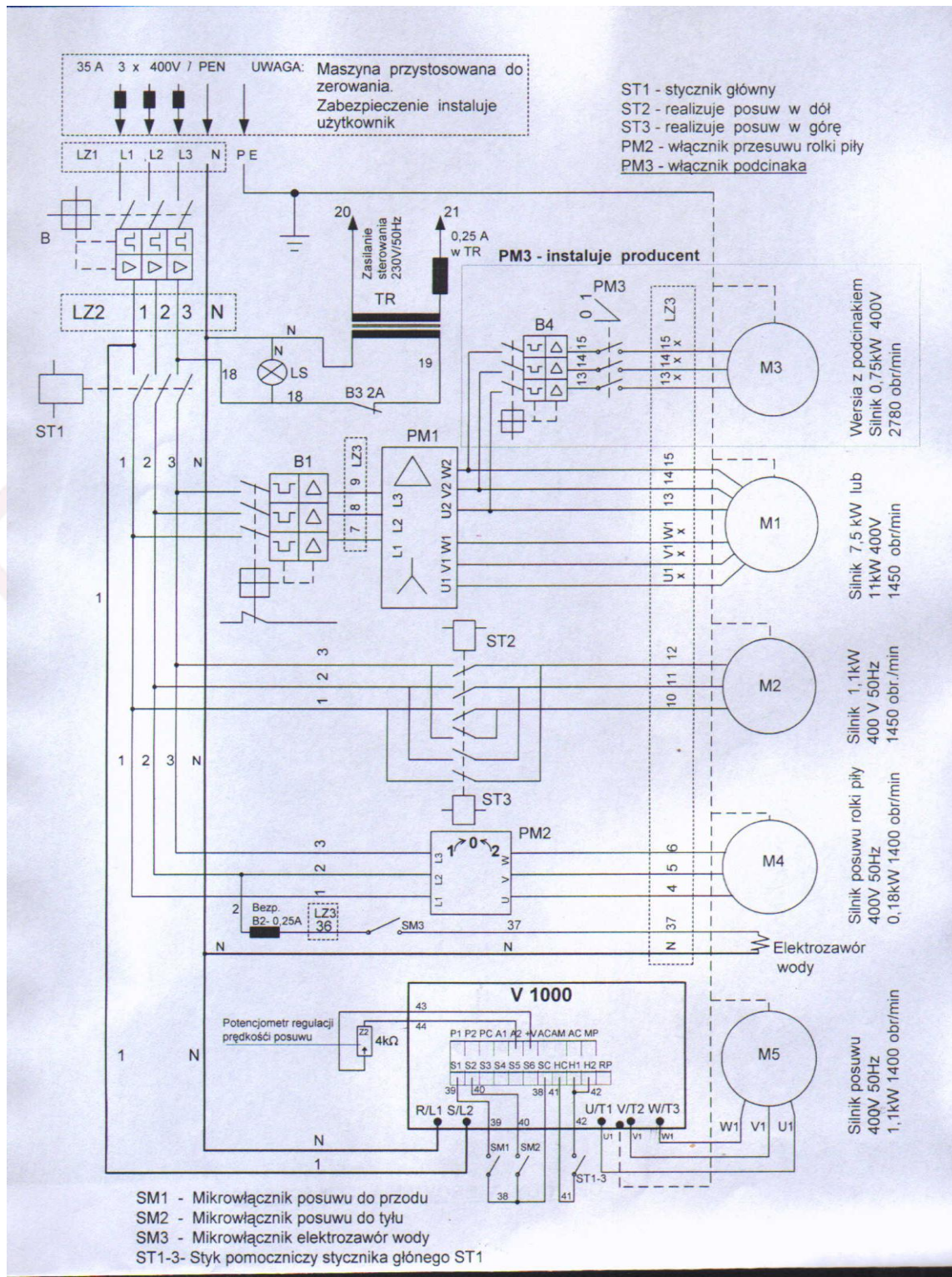
S5 - limit switch of open control box

P1 - START

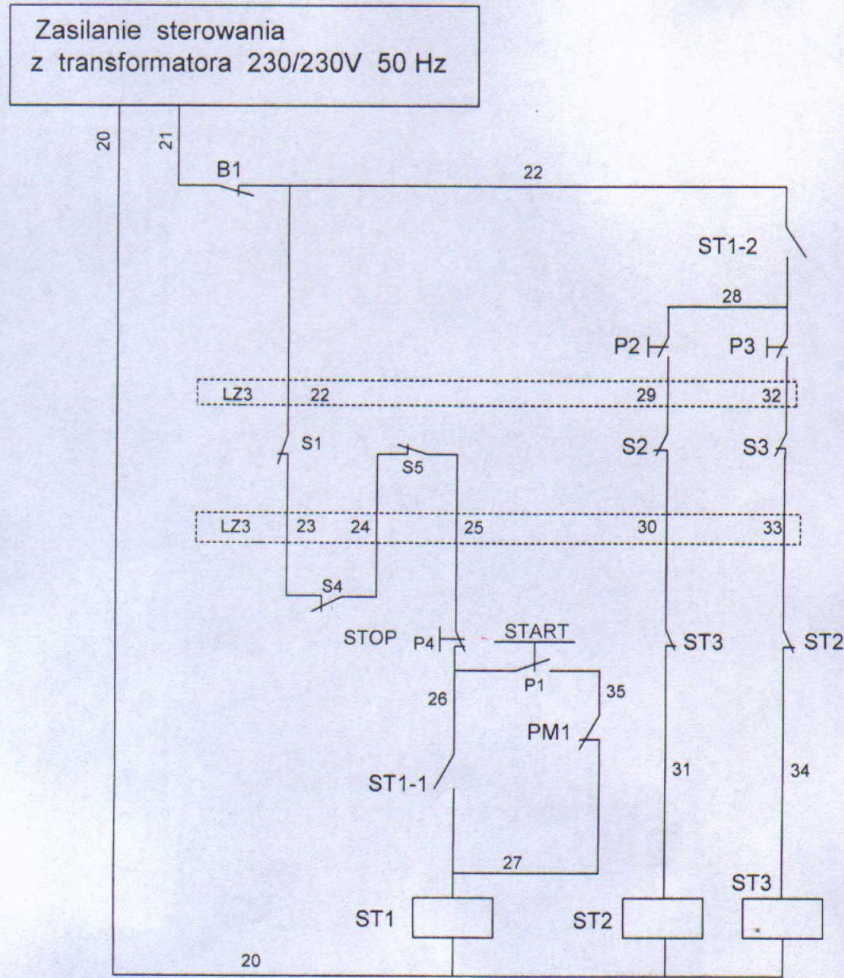
P2 - button of feed down

P3 - button of feed up

P4 - emergency STOP



**THE ELECTRIC FORCE CIRCUITS OF TTM-800/1100 BAND SAW
CONNECTING THE INVERTER CONTROL**



S1 - wyłącznik krańcowy zerwania piły
 S2 - wyłącznik krańcowy posuwu w dół
 S3 - wyłącznik krańcowy posuwu w górę
 S4 - wyłącznik krańcowy otwarcia osłony piły
 S5 - wyłącznik krańcowy otwarcia szafy sterowniczej

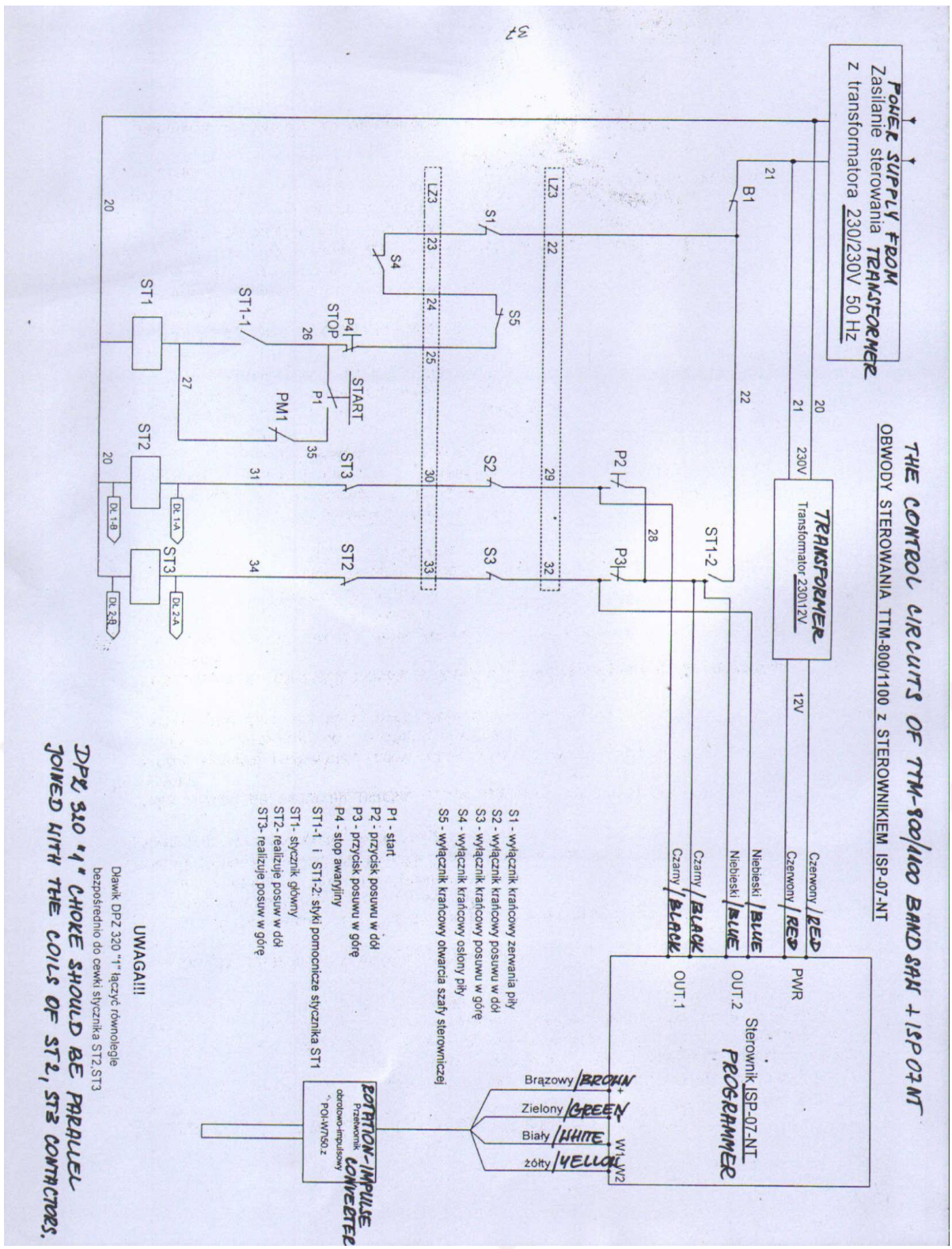
ST1- stycznik główny
 ST2- realizuje posuw w dół
 ST3- realizuje posuw w górę

P1 - Start
 P2 - przycisk posuwu w dół
 P3 - przycisk posuwu w górę
 P4 - stop awaryjny

ST1-1 i ST1-2: styki pomocnicze stycznika ST1

THE CONTROL CIRCUITS OF TTM-800/1100 BAND SAW





THE CONTROL CIRCUITS OF TTM-800/1100 BAND SAW WITH ISP 07-NT PROGRAMMER

ADDITIONAL EQUIPMENT

1. ISP 07-NT PROGRAMMER

Working with the **standard mode** of the ISP 07-NT:

- enter the required dimension by using the numeric keypad,
- press the START button,
- after sawing, press the RETURN button to turn the sawing head back to the starting position

The **extra modes** of the ISP 07-NT:

- function 1 – the band saw blade will be returning above the log to the starting position at the same height each time (read the description of the “log with the arrows” button).
- function 2 – measuring the sizes “from the bottom” (read the description of the “Program / On-Off” button) – this function is the most useful when you want to keep the first board or square-sawn timber on the tracks and saw the left material above this board/square-sawn timber.

- 1) Displays the number of the consecutive sawing
- 2) Displays when working with the saw blade at the constant height from the tracks' level during return of the sawing head to the starting position

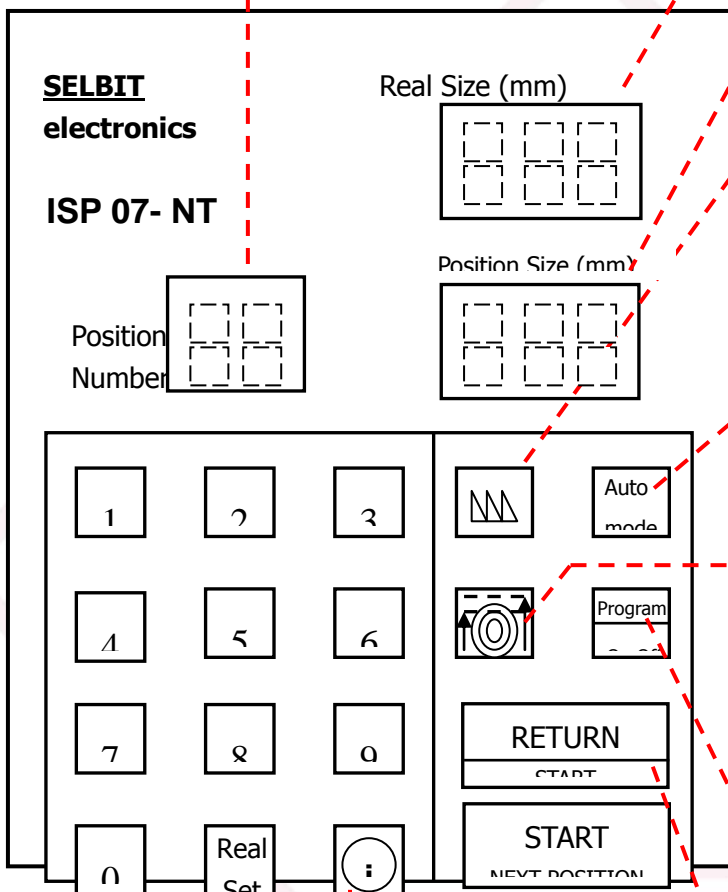
- 1) Displays the actual distance between the saw blade and tracks' level
- 2) Displays the current position of the saw

Displays the current dimension of sawing

Entering the kerf (saw cut)

- 1) Press and keep this button for a moment (3-5 seconds)
- 2) Enter the kerf size, there have to be always two digits! **For example: kerf of 2mm - enter "2 0"**

Divisor value according to the screw pitch.
Entered by the producer!



Function of sawing the log without a necessity of taking the boards off after each sawing ride (function of working with the saw blade at the constant height from the tracks' level when sawing head returns to the starting position)

- 1) Adjust the height at which the saw blade will be returning above the log to the starting position.
- 2) Press and keep this button until 6 horizontal lines appear on the display.

After pressing and keeping this button for a moment, enter a real dimension you need to obtain (visible on the Position Size display)

- 1) save by pressing the green START button
- 2) the saved dimension will be visible on the

- 1) Moving the band saw blade to the next position of sawing

Lifting a band saw blade for return

Function of measuring the sizes "from the bottom"

- 1) Set the band saw blade on the first dimension from the bottom.
- 2) Press the „Program On-Off“ button.
- 3) Enter the required dimension and save by pressing the green START button... and so on.
- 4) After entering and saving the all required dimensions press the "Next"

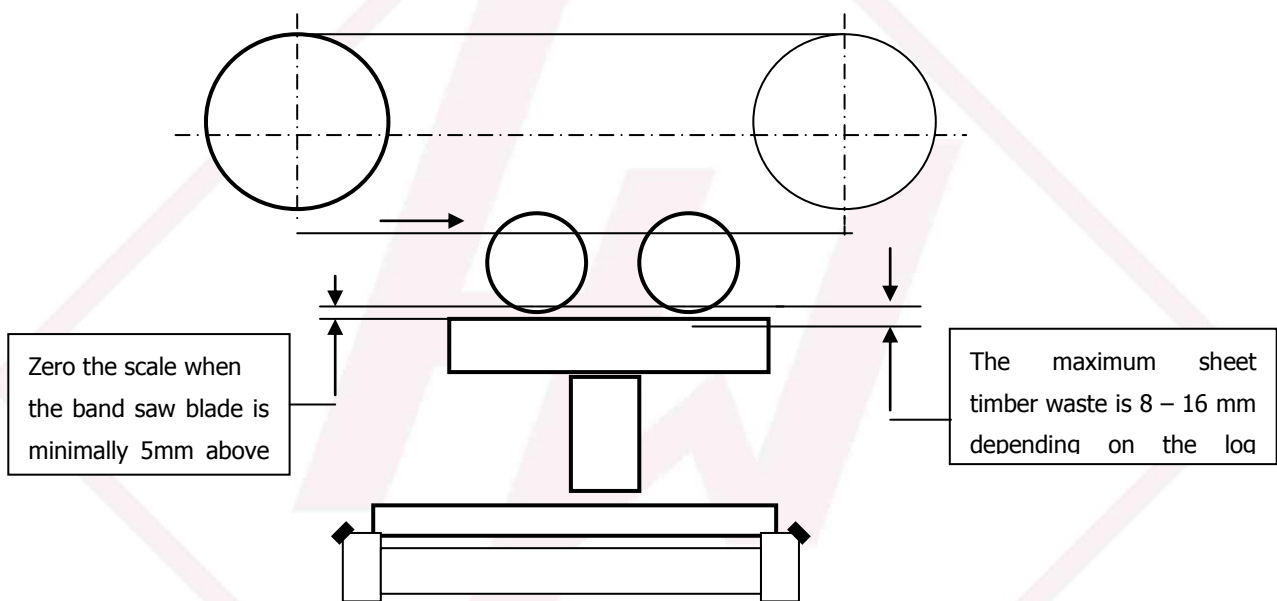
Checking the divisor value during work
Entered by the producer! Do not change!

2. TABLE FOR THE SHORT LOGS

This additional equipment is useful mainly when the bigger quantity of the short logs is being cut non-stop.

Technical data:

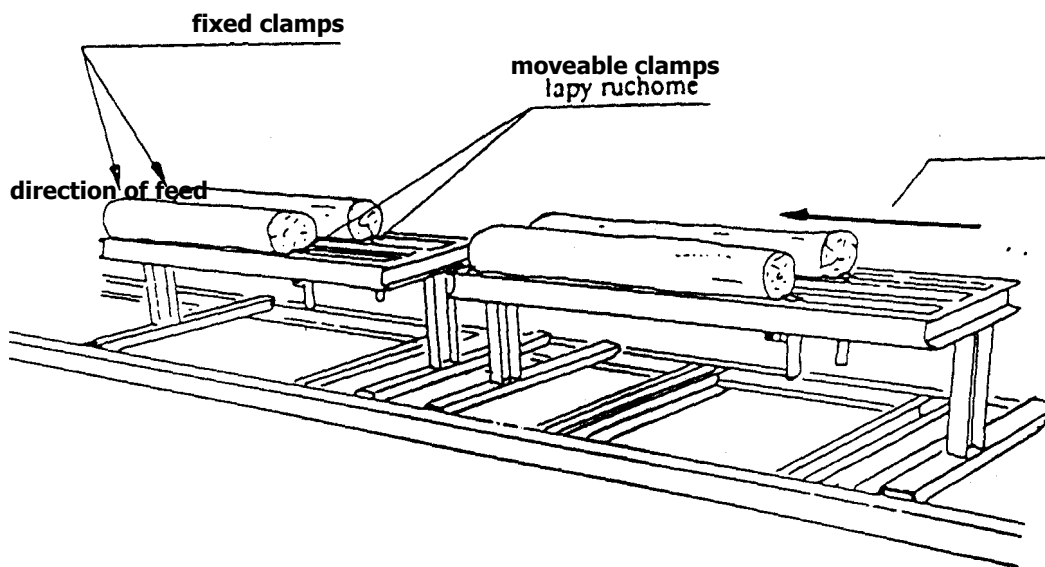
- diameter of the logs: 120 – 350 mm
- number of the logs: 2 pcs / one table
- length of the logs: up to 1300 mm (above 1300 mm – to special order)
- height of the table: 450 mm
- weight of the table: 90 kg



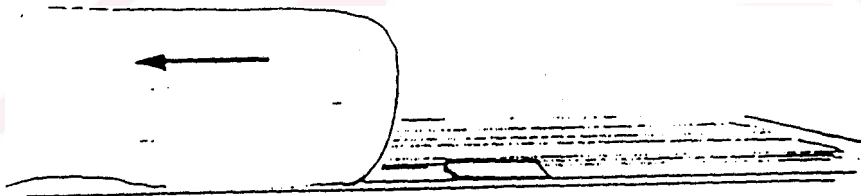
The lowest permissible position of the band saw blade should be marked on the straight-edge. Be careful to not lower the band saw blade below the marked zone.

The zero position can be also marked on the measuring disc provided that the pointer/needle will not being moved.

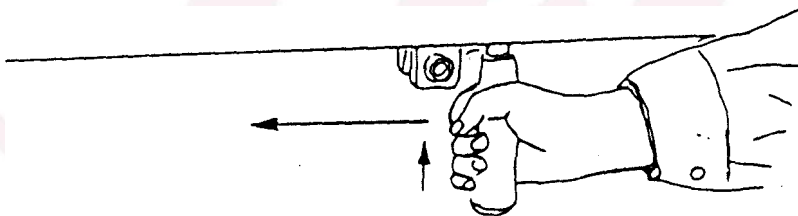
The lowest point of lowering the sawing head should be on 295mm compared to the pointer(30) of the straight-edge. However it should be checked carefully and, if need be, marked correctly on the straight-edge by the user before starting work.



Step 1.



Step 2.



1. Put the log on the table and move it vigorously toward the fixed clamps.
2. Lift the hilt slightly upwards and hit with the clamp to the log vigorously.

3. WINTER TANK FOR COOLANT

This tank is useful when TT-700 band saw works in above-zero air temperature. Diesel or fuel oil should be used as the working liquid.

The capacity of the tank is 1,5 L – it should be enough for 4-8 working hours.

Use the control knob to adjust the dripping frequency - 1 drop every 2-3 seconds (on average).

The oil hose should be as close the band saw blade as possible, in front of the guide roller so that every drop falls on the blade.

PRODUCTIVITY OF THE TTM-800

The test was carried out on 28-03-1997.

1. Test time: 8 hours (in it 30 min break)
2. Staff: 3 workers
3. Support equipment:
 - OWM-4 sharpener for band saw blades
 - RWM saw set for band saw blades
 - 2 pcs of band saw blades (made by Polish "RO-MA")
 - forklift truck
4. 300m² concrete sawmill yard.

Kind of wood	Qty of logs	Thickness of sawing	Sawn (% of whole)
POPLAR	16 logs	70 mm	50%
		32 mm	40%
		25 mm	10%
In total:			7,73 m ³
ALDER	6 logs	70 mm	25%
		25 mm	25%
		22 mm	50%
In total:			2,02 m ³
PINE	4 logs	50 mm	20 %
		25 mm	80 %
In total:			1,55 m ³
IN TOTAL:		26 logs	
11,30 m³			

COMMENTS:

1. During this test, the saw blades were changed one another 11 times for sharpening. The saw blades were being sharpened by one of the a/m 3 workers. Around 1,5mm of the saw blades' thickness has been sharpened off.
2. Thanks to the frequent sharpening of the saw blades, the most of sawing was being executed on the 2'nd feed gear – 4-6m/min, what definitely raised the productivity and the sawing quality.
3. The logs with the length below 4,50m (there were 19 logs of this type) were being cut with the use of so-called "two-workstation system"***.

4. If the "one-workstation system" was used for the above dimensions of sawing, probably the productivity would fall by 30% and the 3'th worker would be unnecessary.
5. The saw blades and equipment have been cleaned and maintained after the test (after 8 working hours).

*** The two-workstation system is used when sawing the short logs (below 4,5m long). When the log is being processed on the beginning of the tracks, the next log is being put on the end of the tracks at the same time. After cutting the first log, the band saw is moved to process the next log and at that time the log being on the first workstation is being turned or the next, new log is being put on the tracks... and so on. This system eliminates the stoppages of the band saw when the next log is being turned or put on the tracks.