

BAND SAW

SP SERIES

USE AND MAINTENANCE MANUAL



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2nd EDITION



NOTICE: read the instructions booklet carefully and keep it for future reference

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1. WARRANTY

Warranty consists of the replacement free of charge of defective mechanical parts, which will be shipped to you free at our plant.

It is valid for one year as of the date of our invoice and does not include the motors and electric and electronic components.

In addition, it does not cover the trouble or defects due to external factors, errors in maintenance, improper use of the machine, using the machine in overload conditions, errors in assembly, or other causes not ascribable to us.

Any requests for after-sales service or spare parts need to be addressed to our authorized area dealer.

2. TECHNICAL PARTICULARS



TECHNICAL SPECIFICATIONS		SP 400	SP 500	SP 600	SP 700	SP 800
Flywheel diameter	mm	400	500	600	700	800
Flywheel width	mm	22	35	35	40	40
Max. cutting height	mm	300	300	340	380	450
Max. cutting width	mm	380	480	580	680	780
Height of work table block of the ground	mm	880	900	920	910	970
Dimensions of the work table block	mm	500x400	700x500	810x580	950x650	1030x710
Max. blade dimensions	mm	20x0,5	25x0,5	30x0,6	35x0,6	40x0,6
Min. blade dimensions	mm	10x0,5	10x0,5	10x0,5	10x0,6	10x0,6
Max. blade length	mm	3.410	3.945	4.580	4.970	5630
Min. blade length	mm	3.370	3.860	4.520	4.870	5530
Motor power	kW (Hp)	0,75 (1)	1,8 (2,5)	2,2 (3)	2,9 (4)	4 (5,5)
Flywheel speed	giri/min	1000	930	730	780	780
Extraction mouth Ø	mm	1xØ100	1xØ100	1xØ100	2xØ100	2xØ120
Required extraction system flow rate (*)	m ³ /h	580	580	580	1.160	1.650
Net weight	kg	120	230	270	320	490
Overall dimensions	See diagram on paragraph 13.1					

(*) air speed: 20 m/s

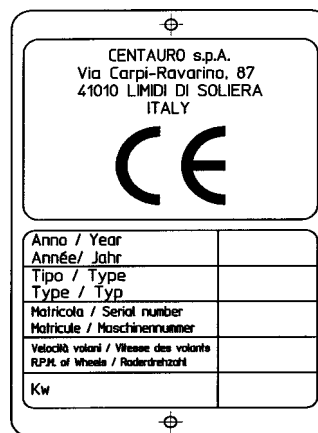
3. STANDARD EQUIPMENT OF THE MACHINE

- Tilting table block (20°)
- Top precision blade guide
- Blade tension gauge
- Rigid blade protection
- Rack device and clutch to adjust the top blade guide
- Automatic flywheel braking
- Steel blade ready for use
- Pusher for cutting small-sized pieces
- Spanners 10/13-17/19 mm
- Hexagon spanners 4-5-6 mm
- Use and maintenance handbook
- Wiring diagram

4. ACCESSORIES ON REQUEST

- Motor with uprated power:
- Single-phase version (SP400 - SP500 - SP600)
- Bottom precision guide blade
- Ground table
- Grooved table with light fence for angular cuts
- Grooved table with hard fence for angular cuts
- Laser unit Z3A with battery supply
- Automatic   starter for SP800

5. MACHINE SPECIFICATION LABEL



6. NOISE EMISSION

L_m = Mean level of acoustic radiation pressure
 L_w = Acoustic power level
 L_{pc} = Instant acoustic power level

	SP 400	SP 500	SP 600	SP 700	SP 800
L_m [dB (A)]	68.3	71.6	71.7	76.5	73.8
L_w [dBw (A)]	83.7	89.0	88.0	93.2	91.1
[mW (A)]	0.23	0.8	0.63	2.08	1.3
L_{pc} [dB (A)]	< 130	< 130	< 130	< 130	< 130

According to ISO 7960 standards attachment J

Constant of declaration: $k = 4$ dB

The values of noise level given are emission levels and do not necessarily represent safe operating levels. Although there is a relationship between levels of emission and levels of exposure, this cannot be used reliably to establish whether further precautions are necessary. The factors determining the level of exposure the labour force is subject to include the duration of exposure, the characteristics of the work room, other sources of dust and noise, etc., that is the number of machines and other adjacent processes. The allowed levels of exposure may also vary from one country to another. In any case, this information will enable the user of the machine to make a better evaluation of the danger and of the risk.

7. DUST EMISSION

	SP 400	SP 500	SP 600	SP 700
mg/m ³	1,11	1,35	1,36	1,14

8. INDIVIDUAL PROTECTION FACILITIES

- Gloves for handling material and changing blades
- Non-slip and crush-proof footwear
- Protective eyewear
- Soundproof helmet or earmuffs
- Dust-proof face-mask

9. FORESEEN USE OF THE MACHINE AND CONTRA-INDICATIONS OF USE

The machine has been designed and made to cut pieces of wood or similar materials (cork, cardboard, plastic materials, chipboard panels), in the dimensional limits indicated in the technical data and in compliance with the safety, use and maintenance instructions given in this manual. The wood can be cut either longitudinally or crosswise with respect to the grain.

Feeding is to be done manually. Unless specifically requested, it is not fitted for the application of mechanical feed appliances (feeders), **so no responsibility is accepted if this application is made by the user or by third parties.** It can be used by only one person in front of it so as to be able to operate the start and stop controls and to handle the pieces.

This person will need to have had a sufficient period of training on use and maintenance and to have the minimum age required by the law in force in the relative country.

The individual protection facilities will have to be used and the precautions given in this booklet will have to be taken. Use other facilities, if any, that may be necessary depending on the work environment and conditions.

All the safety measures have been taken in relation to the above, so it is forbidden to use the machine to carry out other work and/or to make modifications without the prior agreement of the manufacturer.

In particular, using the machine to cut metals is excluded.

Furthermore, in its standard version it cannot be used in places with a risk of explosion.

10. WARNINGS ON REMAINING RISKS

In this type of machine, access to the blade is always possible, even when the telescopic protection is correctly adjusted and locked in height, in relation to the piece to be cut (23 mm above the piece).

It is therefore essential to:

- keep hands as far away as possible from the blade between one passage and the next
- use the passage-end pusher for pieces with a small cross-section
- use special tools (e.g., special pushers, supports for short pieces, etc.)
- completely lower the protection to the level of the table block at the end of work
- in the event of the saw blade breaking, even when operating the stop control **the top flywheel is not braked**. It is therefore necessary to wait for it to have stopped completely before opening the doors to prevent the risk of the belt being thrown.

Keep, moreover, to the instructions for safe use given in this manual.

11. CONSTRUCTIVE SAFETY SYSTEMS

11.1. Controls

The control members are clearly visible, identifiable and easily accessible by the operator, situated far from dangerous areas.

They can only be operated intentionally by the operator.

After a period of downtime due to any reason, restarting is only possible after re-establishing the safety conditions (guards).

Models with direct starting are equipped with brake release button (with detent), while in models with star-delta starting, the switching device has an auxiliary position (F) (reached by pressing the lever in an axial direction before turning it). This allows the blade to be settled on the wheels by hand when it is fitted on the machine. Release is indicated by a yellow light close to the controls.

When the emergency stop control is operated (by pressing it), on those models that have it, it stays held in the stop position and to re-establish operating conditions it is necessary to turn it clockwise to be reset.

11.2. Insufficient or no power supply to the power and control circuits

Cutting off, resetting or changing the electrical power supply in any sense creates no situation of danger. In particular, they do not produce:

- untimely starting
- an obstacle to stopping if the order has already been given
- an obstacle to manual or automatic stopping of the moving parts
- inefficiency of the safety devices

11.3. Protection against mechanical risks

11.3.1. Stability

The machine is equipped with holes in its foot to be safely fixed to the floor. This has the purpose of only preventing it tilting over, but the screws must not be tightened fully since this would cause vibration during operation (it is therefore advised to use stud bolts and self-locking nuts that have to remain at a distance of 2÷3 mm from the foot).

11.3.2. Risk of breakage during operation

The entire path of the blade inside the machine is protected with interlocked fixed or mobile guards, except for the section strictly involved in sawing, minimizing this risk.

The passage of the blade through the work table block is protected by an insert of soft material (plastic or wood) to prevent its contact with the metal parts.

11.3.3. Risks due to rough surfaces and corners

All the precautions have been taken to prevent any risk of injury.

11.3.4. Risks of accessing moving parts

Flywheels, pulleys and belts are completely protected by cowlings obtained in the base and by doors interlocked by means of microswitches that prevent starting the machine if they are not closed.

An automatic braking system ensures the machine stops within 10 sec. of operating the control.

11.4. Protection against non-mechanical risks

11.4.1. Fire and explosion

There are sawdust extraction mouths and instructions are provided for their connection in order to obtain efficient extraction.

11.4.2. Noise

Measures have been adopted to reduce noise emissions. This manual gives the values measured and the test method (see paragraph 6).

11.4.3. Emission of shavings and dust

See paragraph 7.

11.4.4. Electricity

The electric system is in conformity with the EN60204-1 standards.

11.4.5. Ergonomics and positioning

All the controls have been positioned in relation to the ergonomic and anthropometric data, they are therefore fully visible and easily operated from the work position.

11.4.6. Vibration

The flywheels are balanced, so they do not give rise to vibration. It is however advised to place vibration-damping plates between the floor and the foot, also to reduce noise emissions.

11.4.7. Information for Use - Maintenance

In addition to the information contained in this booklet, indelible plates have been affixed to the machine to identify the controls.

12. RECOMMENDATIONS AND ADVICE FOR SAFE USE

12.1. Machine isolation procedure

Before doing any maintenance, repair, or other work, the machine must be isolated by disconnecting the line cable connector or by turning onto position "O" and padlocking the knob of the master switch (on models equipped with self-braking motor), to isolate the machine with plug connection it is necessary to remove the plug from the socket. This must be done by the same person doing the work. If it is a simple maintenance job, this person may be the operator. When the machine is out of order, mark it with a sign.

12.2. General recommendations

- Machines for processing wood, given the high speed of the tools and the speed of execution, are considered the most dangerous ones, therefore it is necessary not to underestimate the risks and to concentrate on the job.
- The safety devices must not be neutralized for any reason whatsoever, but on the contrary they must be kept at peak efficiency.
- Avoid using the machine if your psycho-physical condition is not good, which may impair your reflexes or attention.
- Wear clothing suited to the work requirements. Do not wear loose clothing, scarves, bracelets, or other objects that could get caught up or be dragged. Protect long hair with a cap.

12.3. At the workplace

- Use the individual protection facilities (see paragraph 8) if work conditions require them.
- Keep the work area in order, sufficiently illuminated; arrange spaces to store the raw and processed materials and to move around the machine. Likewise, keep the floor clean of dust and sawdust. Untidiness is synonymous with the risk of accident.
- Make sure the table block insert is in a good state; if the blade passage slot has widened or is chipped, replace it.

12.4. During work

- Always start up extraction even if cutting just a single piece.
- Do not use blades that are not sharp enough as they can produce abnormal vibration.
- In the event of trouble, never act on the machine in movement: operate the stop control and wait for it to stop completely.
- Never cut materials that can cause sparks or overheating of the shavings and therefore fire or explosion as they pass through the extraction pipes.

12.5. During maintenance

- Regular maintenance of the mechanical and electric parts, as well as extending the service-life of the machine and ensuring better performance, is an important safety factor.
- It is absolutely forbidden to set up mechanical members and do maintenance without having beforehand carried out the isolation procedure given above (see paragraph 12.1).
- Do not climb onto the machine.
- At the end of each operation involving opening or removing protections, reassemble them checking their correct positioning and operation and that no tool or foreign body has been forgotten inside.
- **ATTENTION: Check the efficiency of the guard safety micro switch monthly; Check that it intervenes before a slot measuring 3 mm is generated for access to the dangerous area. If this does not happen, adjust the position of the micro switch as shown in the figure in a way that its intervention is anticipated. (only SP-400/500).**
- Wear protective gloves while replacing the blade.
- Replacement of mechanical parts must be done exclusively with genuine parts. The electrical components must be the ones indicated in the list accompanying the wiring diagram, or with others having the same safety features. If in doubt, consult the manufacturer.

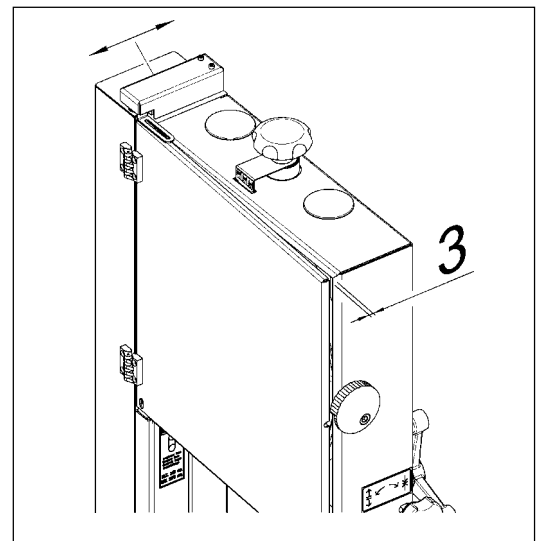


Fig. 13-2 During maintenance

Non-observance of this point involves losing the manufacturer's liability on the safety of the machine.

12.6. Advice for use

- Do not tighten the blade too much. Use the tension gauge and tighten according to the width of the blade fitted.
- Never work with blades that are not sharp enough or that cut obliquely. Sharpening and setting must be done correctly and frequently.
- Always unloose the blade after use.
- The thrust wheel of the blade guide must never be adjusted in contact with the back of the blade, but at a distance of 3÷4 mm. If the blade is well sharpened and the feed force regular, it must not intervene.
- On the contrary, the side wheels must skim over the blade as they have the specific task of eliminating its vibrations due to the processing.
- Periodically check the state of the flywheels to verify whether there is any rocking due to play in the bearings, too high a temperature of the bearings, errors in parallelism or alignment, or a bad state of the peripheral seal. This will have to be replaced every time it is worn or damaged.
- Keep the wheels/lining always clean. Check frequently the condition of cleaning brush fitted to bottom wheel.

13. INSTALLATION

13.1. Overall dimensions

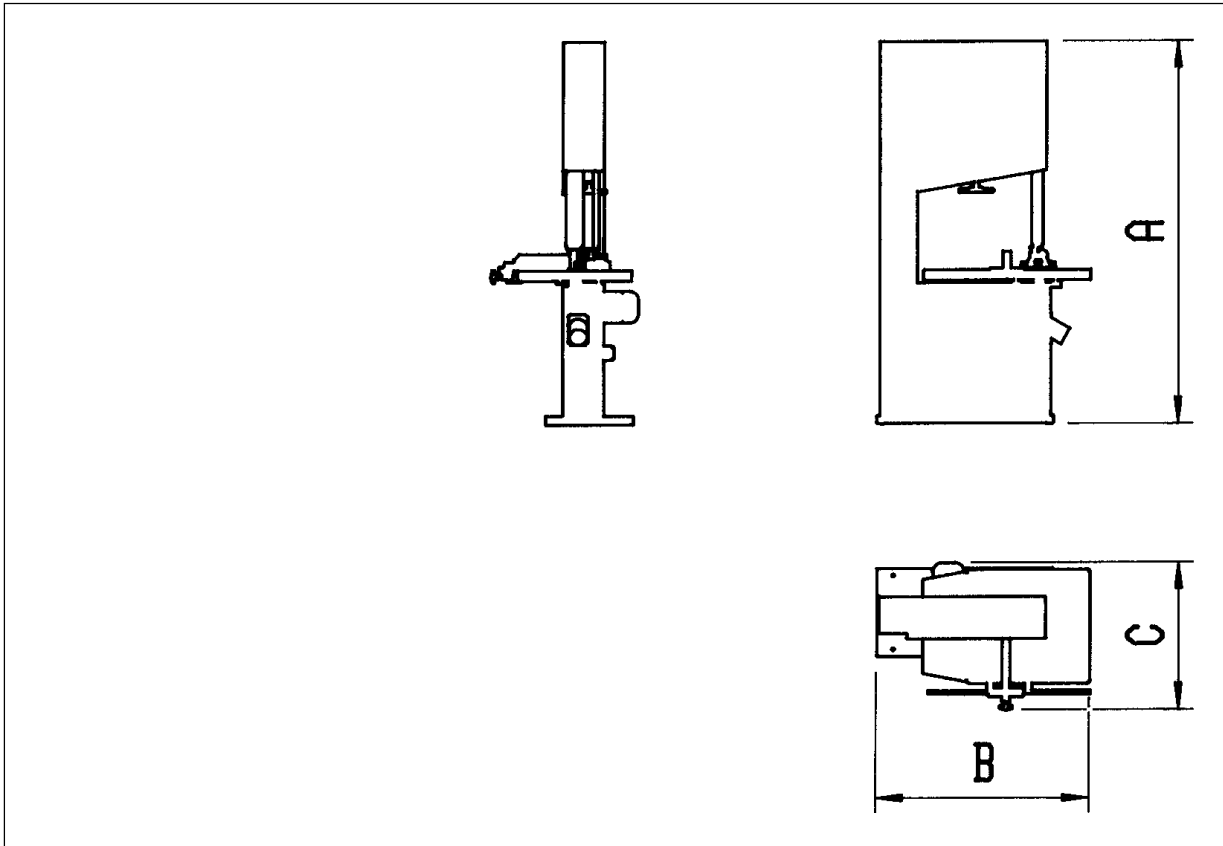


Fig. 13-1 Overall dimensions

13.2. Workplace

L_n = Length required for the machine
 L_w = Length required for work and maintenance
 L_a = Auxiliary length required

W_n = Width required for the machine
 W_w = Width required for work and maintenance
 W_a = Auxiliary width required

The working area must be sufficiently lighted (with 300 lux at least).

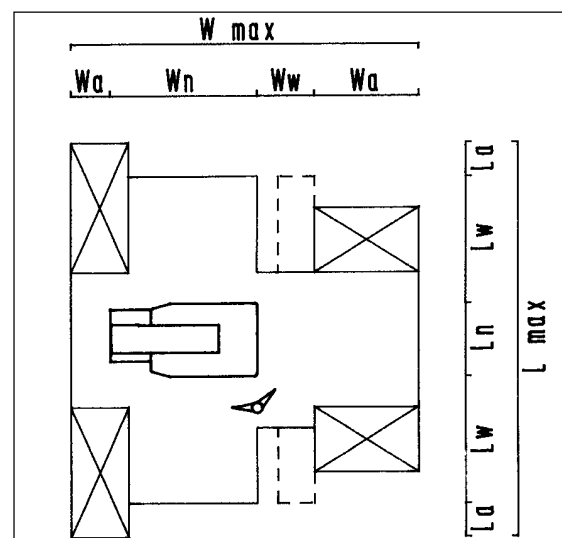


Fig. 13-2 Workplace

13.3. Lifting

Lifting is done by passing a rope through the holes in the top of the machine.

Weights:	SP 400	Kg 120
	SP 500	Kg 125
	SP 600	Kg 240
	SP 700	Kg 300
	SP 800	Kg 490

Do not lift or move the machine by acting directly on the work table block.

ATTENTION: After machine lifting, both top hole must be closed by proper plastic caps, which are included in the tools box.

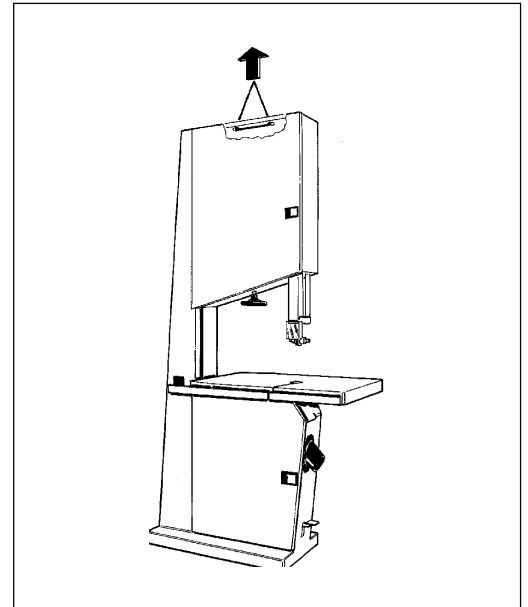


Fig. 13-3 Lifting

13.4. Positioning and levelling

The machine is provided with holes in the foot to be safely fixed to the floor. This has the purpose only of preventing it tilting over, but the screws must not be fully tightened since this would cause vibration during operation (it is therefore advised to use stud bolts and self-locking nuts that have to be at a distance of 2÷3 mm from the foot).

Carefully level the machine with wooden wedges inserted under the foot to compensate for the irregularities of the floor and to give the machine the utmost stability.

It is advised to put vibration-damping plates between the floor and the foot as well, to reduce noise emission.

13.5. Connection to the extraction system

It is compulsory to use the extractor.

The SP700 SP800 models have two mouths; one under the table block and one at the rear.

In the technical data table on paragraph 2, see the diameters of the above mentioned mouths and the capacity required by the system for effective extraction.

Then, by means of flexible hoses with an inner diameter corresponding to that of the mouths, connect the machine to the centralized system or to a single extractor.

13.6. Electrical connection

In the models equipped with electrical braking device, the power supply cable must be connected to the machine by means of the connector supplied.

In those having a self-braking motor, the power supply cable must be connected directly to the terminals of the master switch, passing through the cable-clamp that will have to be fully tightened once the connection has been made. The yellow-green earth lead is to go to the terminal marked PE.

The minimum cross-section of each conductor must be 2.5 mm². This operation must be entrusted to qualified personnel.

Note: If in the start up phase described in the following paragraph the flywheels are found to turn in the opposite direction, swap over two of the leads that have just been connected to the terminals of the switch. For models supplied with socket and plug, invert two wires **in the plug**.

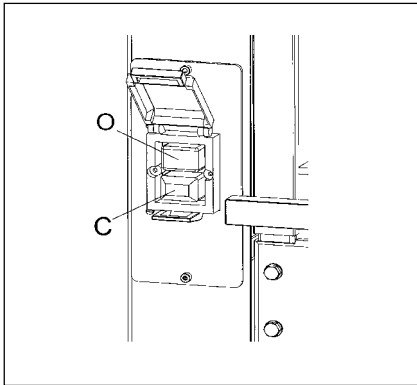


Fig. 13-4 Starting

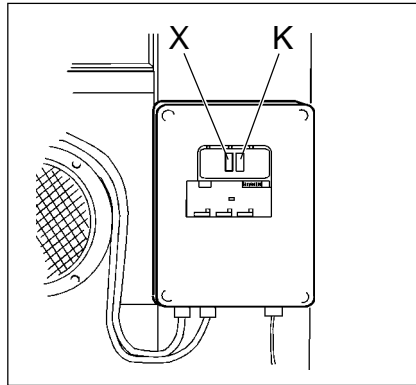


Fig. 13-5 Starting

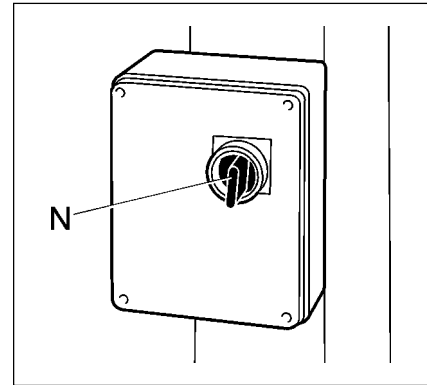


Fig. 13-6 Starting

13.7. Starting

Check beforehand that the doors are properly closed, the emergency stop button is not in the auto-detent position and that the telescopic protection of the blade is fully lowered onto the table block.

In the models equipped with a switch having an electric brake, once the lockable cover has been raised, press the green start button **O** (fig. 13-4).

It is necessary to turn the knob **I** of the control switch from "0" to "1".

In the event of the power being cut off, to restart it is necessary to repeat the same steps, whereas if the magnetic cut-out trips due to short-circuiting it will first be necessary to press the black push-button again.

Whereas, the models with self-braking motors, press the black key **K** (fig. 13-5) located in the rear of machine, or turn the knob of the master switch **N** (fig. 13-6) (depending on model), from position "0" to "1": the white indicator light **M** (fig. 13-7, 13-8) will come on signalling that the machine is ready for operation, turn knob **I** from the "0" position to the "1" position. whereas if the machine is equipped with a star-delta starter, turn the knob **I** as far as the first trip (\wedge); wait for a few seconds for the flywheels to reach full speed, then pass on to the second trip (\triangle) (optional).

In the event of the power being cut off, to restart it is necessary to turn the knob **I** back onto "0" before repeating the above procedure.

The same procedure must be adopted if the motor overload cutout is tripped, after resetting using the red button **X** (fig. 13-5), or the red button inside the box of the electric panel for star-delta starting (fig. 13-6).

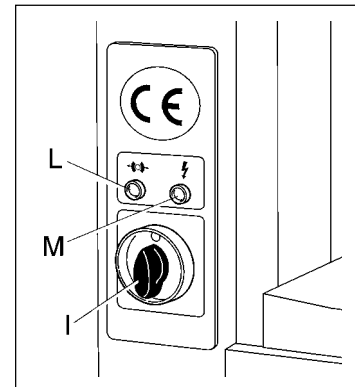


Fig. 13-7 Arresto

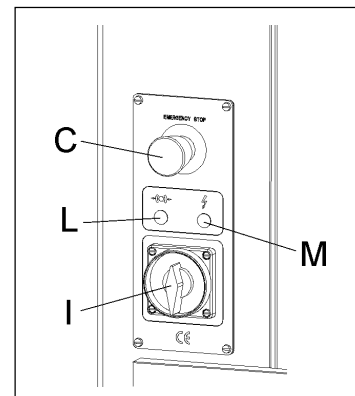


Fig. 13-8 Stopping

13.8. Stopping

Press red button **C** (fig. 13-8) or turn the knob **I** to the "0" position (fig. 13-7). The brake will cause the machine to stop completely in under 10 seconds.

13.9. Emergency stop (when present)

If problems of any kind occur during processing, press directly on the lockable cover fig.13-7-1 or emergency button **C** (fig. 13-9), which will stop all the machine's functions completely, while simultaneously activating the wheel braking system.

Caution: the push-button **C**, when pressed, remains held; to reset conditions of normal operation, it is necessary to release it by turning it clockwise.

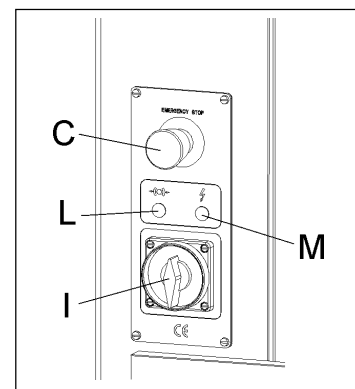


Fig. 13-9 Emergency stop

14. USING THE MACHINE

14.1. Fitting and adjusting the blade

Open the doors with the machine at a standstill.

With the machine stationary, open the doors, the protection door under the table block, and the transparent protection **E** (fig. 14-1) of the top blade guide (pull, then turn, revealing the slot through which the blade passes).

If the machine is equipped with an electric brake the flywheels are normally idle and it is definitely possible to go ahead and install the blade.

Whereas, the machine fit self-braking motors so it is necessary to release the brake beforehand. This is done keeping pushed the yellow button **Z** (fig. 13-8), or with the master switch on position "0", pressing the master switch **I** (fig. 13-4) and turning it to the left (onto position **F**). The yellow indicator light **L** (fig. 13-7) close to the control signals this situation of the machine.

Move the thrust wheel of the blade guide(s) fully back and, having inserted the blade in its seat, carefully check it is arranged well along its entire path and does not come into contact with metal parts. Partially stretch the blade with the handwheel **A** (fig. 14-1, 14-1-2) and then turn the flywheels by hand until it has reached a stable position.

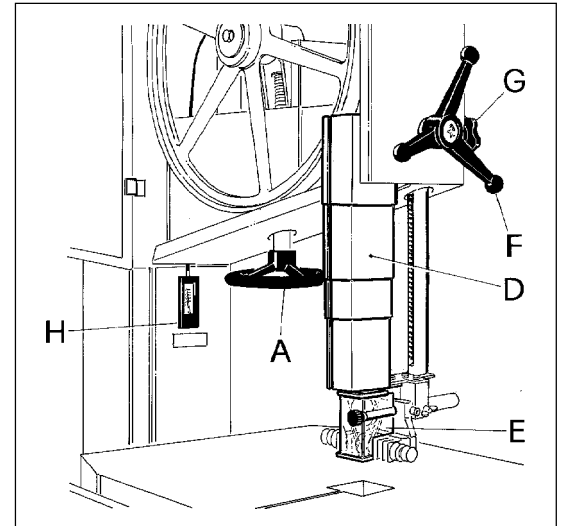


Fig. 14-1 Fitting and adjusting the blade

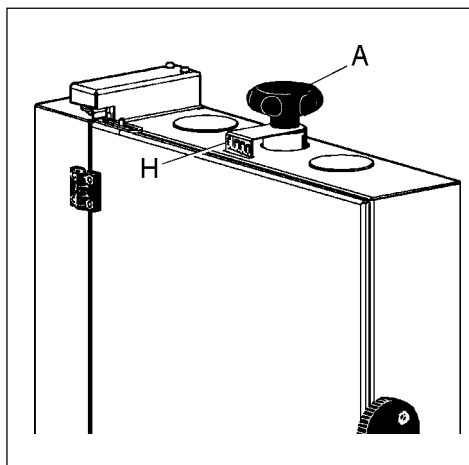


Fig. 14-1-2 Fitting and adjusting the blade

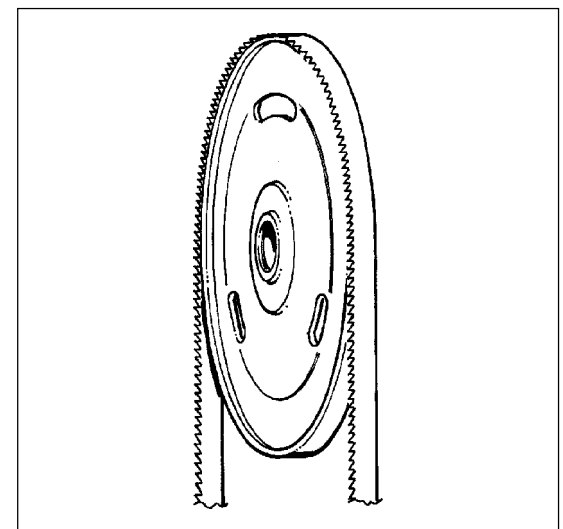


Fig. 14-2 Fitting and adjusting the blade

An ideal condition for correct operation over time is for the teeth of the blade to protrude from the face of the flywheels (fig. 14-2).

The machine is factory set for the maximum blade width.

When, after subsequent sharpening, this width reduces, it is possible to restore the original condition by tilting the top flywheel by means of the handle **U** (fig. 14-3).

It will then be possible to perfect the tension of the blade using the gauge **H** (fig. 14-1, 14-1-2). The blade-tightening handwheel will be turned until the gauge pointer reaches the value corresponding to the actual width of the blade.

If this, when it is correctly stretched, has changed its position on the face of the flywheel, it is necessary to repeat the tilting adjustment of the top flywheel.

When the operation is complete, return all the guards to their original positions and close the doors; with star-delta starting, return the master switch knob **I** to the "0" position.

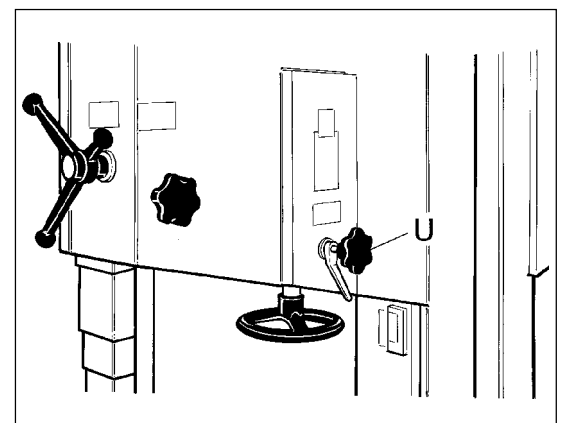


Fig. 14-3 Fitting and adjusting the blade

14.2. Blade guide adjustment

The blade guide thrust wheel must never be adjusted in contact with the back of the blade, but at a distance of 3÷4 mm. If the blade is sharp and the feed force regular, it must not trip.

On the contrary, the side wheels must skim over the blade, though without locking it, since they have the specific task of eliminating its vibrations, due to sawing.

The wooden buffers of the bottom blade guide have to be adjusted using the same criteria.

14.3. Table block insert

The table block insert has the important function of preventing the blade coming into contact with the table block during sawing. Moreover has a series of holes aiding sawdust extraction.

When, as a consequence of being used, the passage slot gets widened or chipped, it has to be replaced.

14.4. Extraction boards

The two boards **S** and **T** (fig. 14-4) have the function of improving sawdust extraction.

As for the table block insert, they must be replaced when the slot for the blade is damaged.

To make this slot on a new board, insert it into its seat with the blade fitted and, moving the flywheels manually, make a small cut on its head where the blade passes.

Then, after closing the door and putting the machine back in running order, complete the cut on the table normally down to the necessary depth.

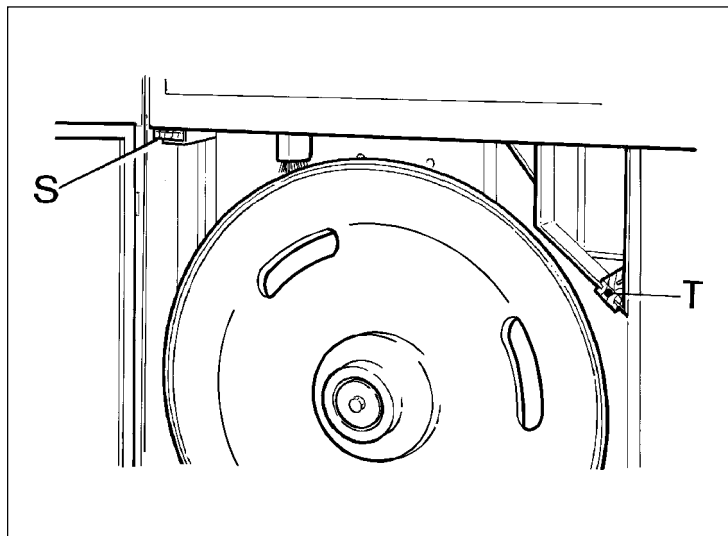


Fig. 14-4 Extraction boards

14.5. Cutting with guide

The guide **P** (fig. 14-5) needs to be used when you want to obtain parallel cuts or identical pieces. In addition, it is to be used to cut thick pieces for which there is the danger of tilting over sideways.

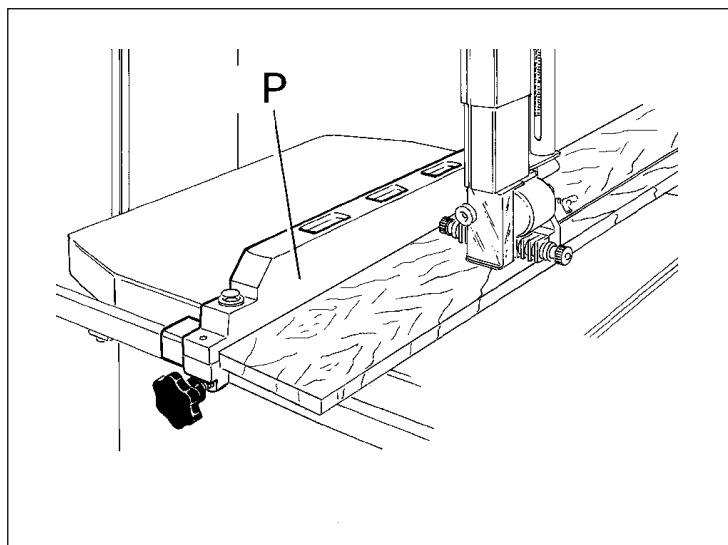


Fig. 14-5 Cutting with guide

14.6. Angled cuts device (when fitted)

To make angled cuts to use the mitre fence supplied with the machine.
It is equipped with a guide that has to be inserted in the groove on the table block and a goniometer to adjust the cutting angle.
On unloosing the screws **Z** (fig. 14-6), its distance from the blade can be adjusted in relation both to the length of the pieces and to the opportunity of avoiding the blade guide in cutting thin pieces, to keep it as low as possible. In the latter case it may also be convenient to use the second groove on the perpendicular side of the profiled body.

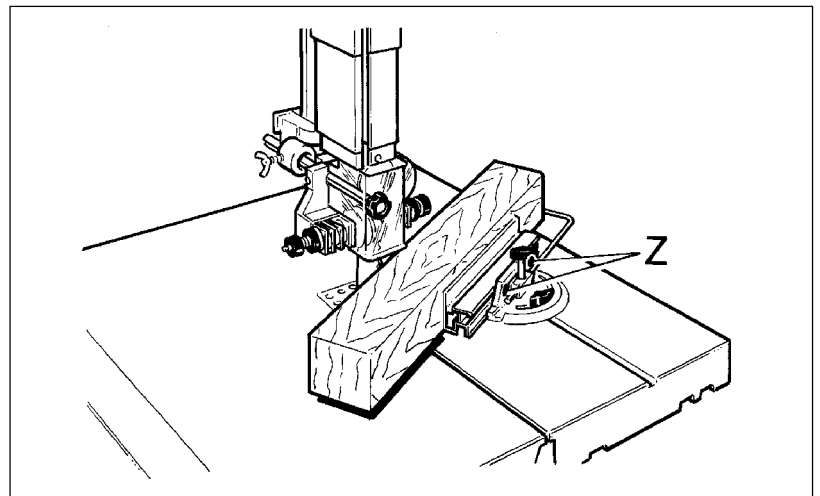


Fig. 14-6 Angled cuts device

14.7. Table block tilting

The work table block can take on a maximum tilt of 20°.

It is necessary to unloose the screw **R** (fig. 14-7) and with the aid of the graded scale, apply pressure on the end to get the desired value. Then lock the screw **R** again. For this work the guide will have to be moved to the right of the blade to support the piece better during cutting. To return to the normal position, turn the table block as far as the ledge, set originally to 0°.

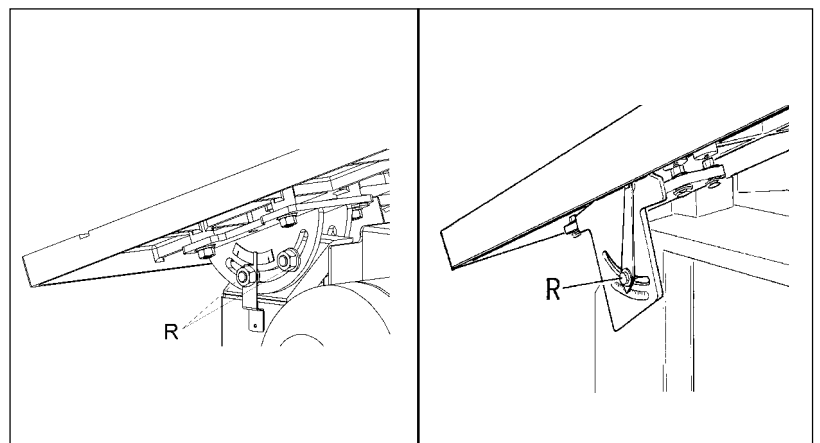


Fig. 14-7 Table block tilting

15. BLADE CHOICE AND UPKEEP

Blade maintenance must be done with the utmost care since the quality and volume of work done as well as the service-life of the blades depend directly on it.

Very often, the causes of trouble habitually attributed to the machine are in actual fact due to poor or even wrong handling of the blades.

We therefore believe it extremely useful to give hereunder some instructions taken from the manual which the Swedish firm "UDDEHOLM" promotes for a better use of the belt saw. For the belt saw to give the utmost efficiency it is necessary to observe the following instructions:

1) Right blade thickness

Below we give the table for choosing the blade thickness in relation to the diameter of the flywheels.

Diametro volani	mm	400	500	600	700	800
Spessore lama	mm	0,5	0,5	0,6	0,6	0,6

2) Appropriate toothing for the work to be carried out

The shape of the tooth should be chosen in relation to the type of wood to be cut:

Ordinary toothing is suitable for dry and seasoned woods, spaced toothing is suitable for soft, green or fibrous and even resinous woods, the gullet tooth is better if you have a sharpener suitable for sharpening this type of tooth. The pitch of the tooth should be chosen in relation to the type of wood and to the cutting height to be made: for dry woods and low cuts, short pitches, for green woods and high cuts, long pitches.

In other words, the empty space of the tooth must be able to discharge all the sawdust its cutting edge produces.

3) Exact setting of the teeth

The teeth must be set carefully and precisely. The teeth must never be bent down to the base because this causes the blades to crack. The teeth must be set so that the bending should not go over half their height and their side deviation (for each tooth) the blade thickness (figs. 15-1, 15-2).

Example: a blade of thickness 0.90 mm must have a maximum overall setting of 1.80 mm. It is necessary to observe that the maximum setting may be suitable for very green woods, whereas for seasoned woods an overall setting of roughly one and a half times the thickness of the blade is to be preferred. Example: thickness 0.90 mm., setting 1.35 mm.

Moreover, those who wish to leave the tooth neutral for discharging the sawdust (as normally occurs for soft, green and resinous woods) have to proceed as follows:

set a right-hand tooth, a left-hand one, then leave a straight tooth and so on. All other methods are wrong. With pitches over 25 mm it is better to leave one neutral tooth every four teeth.

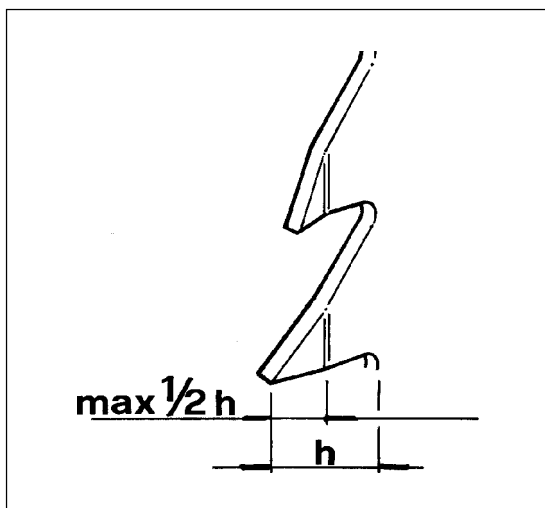


Fig. 15-1 Tooth bending

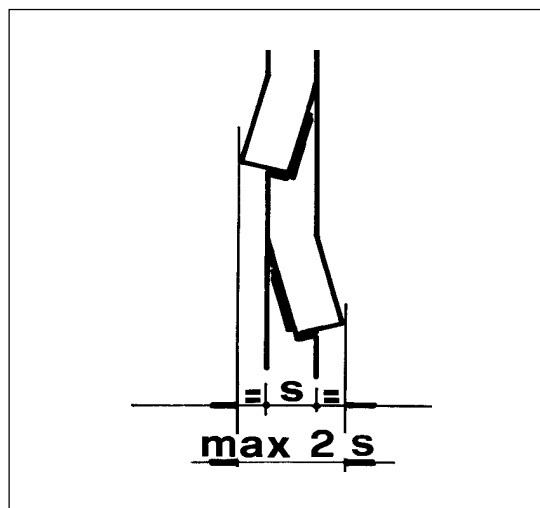


Fig. 15-2 Tooth bending

4) Perfect initial and subsequent sharpening

Sharpening must be done as soon as the teeth lose their cutting edge and the blade starts forcing the cut.

It can be done, especially for teething with a short pitch, with a triangle file. In this case the triangle, whether by hand or machine, must have round edges, to join the bottom of the teeth well and to prevent the start of cracking (fig. 15-3). When using emery grinding wheel sharpeners it is absolutely necessary to prevent the bottom of the teeth from heating up to a yellow or blue colour, which easily happens when not paying the due attention to using these machines. Overheating the teeth causes a self-hardening action and consequently a change in the structure of the steel that becomes hard like glass, with the consequence of inevitable cracking and breakage of the blades. In addition, the emery grinding wheels have often to be dressed with special equipment and the edge must be kept adequately round to the extent of the bottom of the tooth that has to be sharpened. It is generally advised to use number 60 for the grain of the emery grinding wheel.

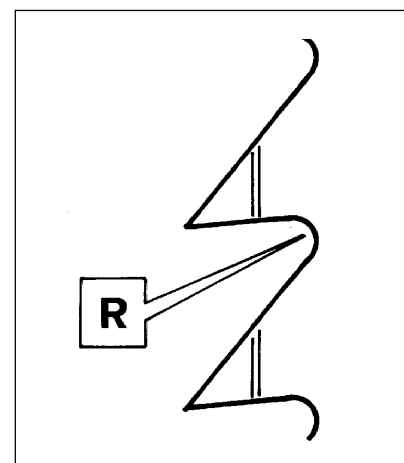


Fig. 15-3 Tooth bottom

5) Rational welding, well flattened and straight

The welding may be done in two ways: with the brazing system by overlapping, or by electric melting by means of automatic machines.

In the first case (brazing), the ends of the blade are cut square and bevelled so that they can overlap for a section of ten times the thickness of the blade (fig. 15-4).

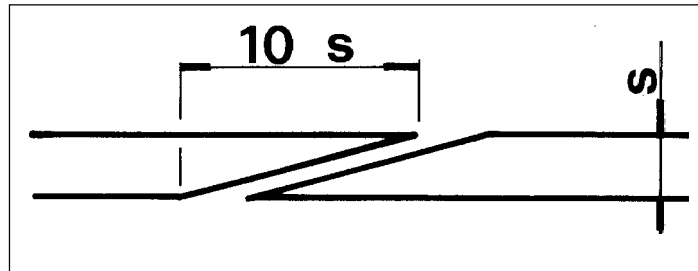


Fig. 15-4 Cut for brazing

The ends prepared in this way are then locked on the welding appliance, taking care of their alignment, and a plate of special alloy is placed between the surfaces of the bevel that have to be spread with de-oxidant (borax, which should be diluted with clean water so as to create a mush).

If the heating for welding is done electrically, it must be done slowly so as to reach incandescence; if it is done with pressed irons, they need to have a temperature of approximately 900°C (light red).

Cooling must also be done slowly so that a very fragile hardening structure is not formed in the steel. In the event of cooling coming about quickly (electric equipment for brazing), it is necessary to temper the part affected by taking it up to a dark red colour for over twenty seconds. If the welding is done by electric melting, it is necessary to take special care over the tempering operation. Having made the joint, it is necessary to flatten and level the blade so that the thickness is as equal as possible to the rest of the blade. It is likewise necessary to check by means of a check-rule that the welding is perfectly flat and straight to prevent dangerous oscillation of the blade during operation.

16. MAINTENANCE

16.1. Machine maintenance

16.1.1. Belt replacement

This is only possible after removing the bottom flywheel. Therefore, unloose the screws locking the motor and the belt tightener screw; afterwards unloose the two non-marked screws registering the flywheel at the rear of the machine and remove the head screw and relative washer that hold the bottom shaft in its seat. Then take out the flywheel with the relative shaft and replace the belts; reassemble it all taking care not to move the marked screws registering the shaft so as not to alter the alignment of the flywheel.

The belts have the type identifying their dimensions marked; if this marking is illegible, they can be requested, through our area dealer, specifying:

- machine model (with flywheel diameter)
- year of manufacture
- motor power and r.p.m.
- motor pulley diameter

16.1.2. Flywheel rubber covering replacement

Remember that this must be done when the covering appears worn or damaged (for example as a consequence of accidental breakage of the blade). It is necessary to call our area dealer.

16.1.3. Flywheel ring seal replacement

On some types of machine the seal covering the outer face of the flywheels (at the part in contact with the blade) is composed of a closed ring in a special material that requires no gluing. If the machine is always kept correctly registered, the wear on this seal is virtually null, so its service-life is virtually unlimited.

It may however get damaged, for example by accidental breakage of a blade, or when its teeth rest stably on the seal.

If for any reason it is necessary to replace it, it is necessary to comply with these instructions:

- The seal has a reference tooth which must be housed in the special ring groove on the face of the flywheel. This groove is not symmetric, but shifted forwards. It is therefore necessary to position the seal in the right sense (see figure to side).
- To facilitate assembly, we advise heating the seal in water at a temperature of 70-80°C for a time of 3/4 minutes. On completing assembly, wait for it to cool down completely before proceeding.
- Clean and face the convex surface carefully with course grain sandpaper and trim the edges to the edge of the metal face with a cutting blade. The ring seal already has the correct convexity.

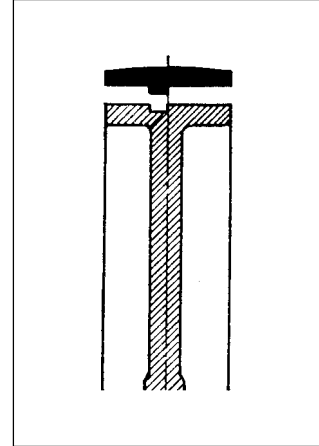


Fig. 16-1 Reference tooth

16.1.4. Flywheel bearing replacement

When the bearings, after having worked for a reasonable period of time, have to be replaced, a face of the upper flywheel will have to be previously marked so it can be refitted properly.

Both flywheels will then have to be removed. The upper flywheel can be taken directly off its shaft; for the lower flywheel, see paragraph 16.1.1. "Belt replacement". If the shaft is hard to remove, use an extractor.

Remove all the retaining rings and then the bearings with relevant spacer. These bearings are of the sealed type and consequently, when refitting the new ones of the same type, no grease need be applied.

Working in the opposite sequence, refit the unit, being careful not to knock directly on the bearings with the hammer - protect these first with soft material (wood, plastic, aluminium, etc.).

Note: If you have not marked the outer face of the top flywheel, you can make reference to the screws locking the balancing counterweights: the side of the flywheel with the head of the above mentioned screws will be fitted on the outside.

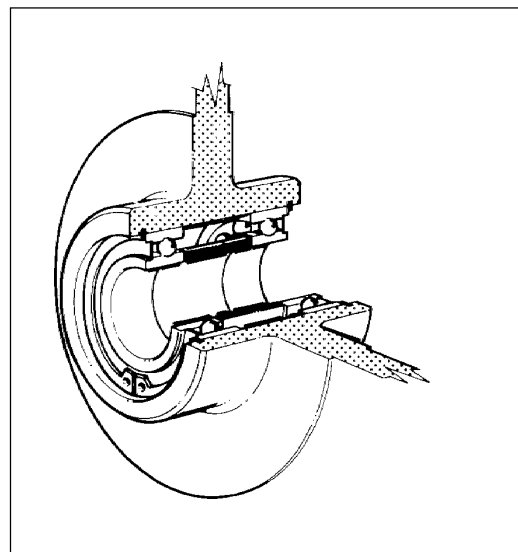


Fig. 16-2 Spacer

16.2. Maintenance of the electromagnetic brake

As explained above, when the stop control is operated, the flywheels stop in a time of under 10 seconds. If on models equipped with a self-braking motor, with use, you notice this time getting longer, it is necessary to adjust the brake on the motor. For this adjustment, see also the instructions sheet supplied by the motor manufacturer, attached to this booklet.

It is necessary to remove the fan cover and turn the adjustment screw to reach the value of the air gap shown in the table.

(air gap = distance between fixed portion and rotating portion).

The value of the air gap is checked with a feeler gauge (see fig.16-4).

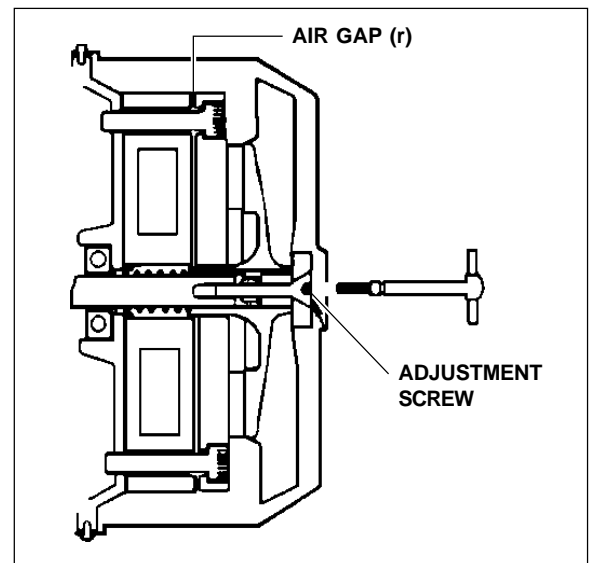


Fig. 16-3 Brake setting

Motor type	Air gap (r) (mm)
90	0.2
100	0.25
112	0.25

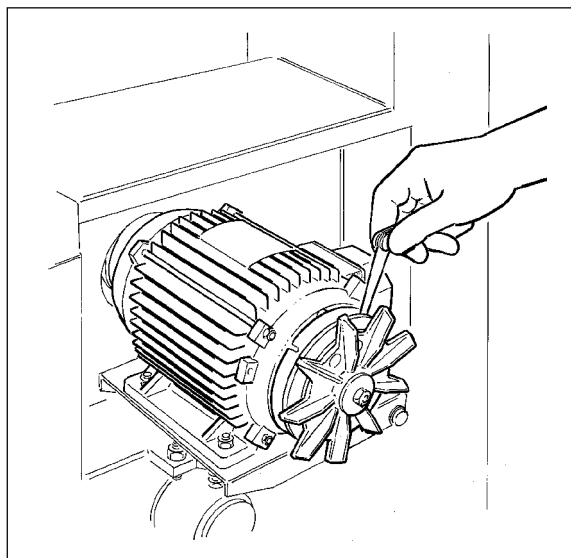


Fig. 16-4 Setting

(The type of motor is shown on its metal rating plate).

It is possible to make a quick adjustment without removing the fan cover: fully tighten the adjustment screw (turning it clockwise), then slacken it anticlockwise by 1/2 turn.

Finally check the correct tension of the belts and the braking time that, as mentioned above, **must be** under 10 seconds.

16.3. Electric brake maintenance

The duration of the injection of braking current into the motor is set at origin and cannot be adjusted afterwards since, as there are no parts subject to wear in the system, braking intensity does not deteriorate over time.

Therefore, if braking time is extended, check the tension of the belts only.

Not getting any positive result, please address to service centre.

17. MAIN TROUBLE AND RELATIVE REMEDIES

DEFECT	CAUSE	REMEDY
The motor will not start	Current is not getting to the motor	Have the electric system checked by qualified personnel
Poor motor efficiency	Wrong motor connection	Have the electric system checked by qualified personnel
The motor quickly overheats	The motor is connected to a different voltage than that of the line	Change the connection following the diagram given on its plate
The blade does not cut straight	Imperfect tooth sharpening and setting	Sharpen and set again (see paragraph 15) taking care this is symmetric, that is the same on the right and on the left
The blade cracks at the bottom of the teeth	Blade thickness inadequate for the diameter of the flywheels	Choose the thickness according to the table on paragraph 15
	Teething not appropriate for the work to be done	See paragraph 15
	Bottom of the teeth too sharp	See paragraph 15
	Wrong setting because the teeth are bent at the base	See paragraph 15
	Sharpening not correct because the bottom of the teeth has been overheated	See paragraph 15
	Flywheel seal in a bad state	Replace the seal (see paragraph 16.1.3)
	Blade not slackened after use	See paragraph 15
	Flywheels not aligned	Request the intervention of a qualified engineer
	Too much play in the bearings (especially in the bottom one)	Replace the bearings (see paragraph 16.1.4)
The blade is cracked on its back	Welding not perfectly straight	Eliminate the welded area and repeat the operation correctly (see paragraph 15)
	Back of the blade permanently rubs on the blade guide thrust wheel	Adjust the wheel to 3-4 mm from the blade
	Blade guide thrust wheel worn	Replace the wheel
The blade breaks close to the welding	Overheating of the blade during welding	Temper the part concerned or eliminate and redo the welding (see paragraph 15)
	Cooling too fast after welding	
The blade moves forwards and backwards during the movement	Welding not straight	Redo the welding (see paragraph 15)
The blade moves very far back when it receives the cutting force	Insufficient flywheel seal convexity	Notify the Technical Service of the area dealer

A. SAFE WORK PROCEDURES

A.1 GENERALLY

For the safe work procedures the provisions of Appendix A of EN 1807.

A.2 ADJUSTING THE MACHINE

A.2.1 To ensure that a band saw works precisely and efficiently, it is essential for:

- A** the type of blade to be suited to the material to be cut;
- B** the machine to be equipped with a blade of the correct width required by the operation carried out;
- C** the edge of the blade to be sharp and well formed and prepared;
- D** the maximum thickness of the blade to be adequate for the diameter of the wheel.

A.2.2 For the provisions regarding choice, adjustment, sharpening, maintenance, handling and storage of the blades, see paragraph A.9.

TENSION

A.2.3 When the machine is not in operation, for example at the end of a work shift, the tension of the blade must be slackened, placing a sign on the machine to indicate this state and to remind the next operator to adjust the tension before starting up the machine.

ALIGNMENT

A.2.4 Alignment is done to ensure that the blade runs on the pulleys correctly, tilting a pulley.

A.2.5 During alignment, the contrast wheel in band saws must be released from the blade to allow its free movement. With the machine isolated, the top pulley must be tilted to bring the blade into the correct position. If the blade is not aligned correctly when it is under tension, the procedure must be repeated. After alignment, it is necessary to check the tension of the blade again.

A.2.6 With feeders and rip saws, the blade has been designed to protrude from the edge of the pulley. Alignment can be made with the machine isolated from the source of energy and the wheel guards open. With machines with a table, the adjustable guard must be positioned on the table. With rip saws without a table, the adjustable guard must cover the blade.

BLADE GUIDES AND CONTRAST WHEEL

A.2.7 The blade guides, which can be composed of fixed buffers, pegs, or rotating rollers, perform an important function of supporting the blade. The guides must not lock the blade, but simply support it during cutting.

A.2.8 The purpose of the contrast wheel in table belt saws is to provide a support for the blade during cutting. The wheel must be positioned at a minimum distance on the rear side of the blade when the blade turns freely after being tensioned and aligned. The contact between the blade and the wheel causes a groove to be formed in the contrast wheel and the blade to break.

A.3 OPERATION OF THE MACHINE

A.3.1 The above described adjustable guard must be positioned as close as possible to the piece.

A.3.2 The blade or pulley of a band saw must never be cleaned manually with a brush or scraper while the blade is moving. Careful adjustment and periodical maintenance of the devices to clean the blade and pulley (see 5.2.2), likewise of the lubrication system in feeders and rip saws, will allow preventing the formation of deposits of material.

CUTTING WITHOUT A GUIDE

A.3.3 On the table band saw the piece must be fed regularly and locked securely onto the table to ensure maximum control during cutting, keeping hands in a safe position (see figure A-1).

Note: For this type of work feeders should not be used as they require the operator to use his hands close to the blade to support the piece.

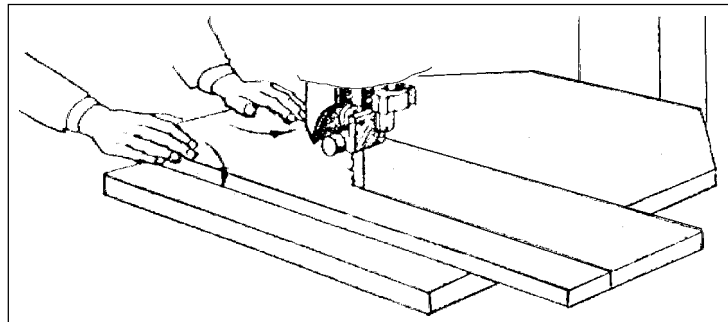


Fig. A-1 Cutting without a guide

CUTTING WITH A GUIDE ON A BAND SAW

A.3.4 For straight-line cuts a guide must always be used to prevent the piece rolling or slipping (see fig. A-2). For work on smaller thicknesses, the guide must be used in the bottom position to allow the guides and U-guard of the blade to be adjusted on the piece and, in addition, to allow safe removal of the material - from the area around the blade, with the aid of a special rod.

A.3.5 When possible, with table band saws, a removable towing device must be used. This device is precious in terms of safety and increases the production capacity of the machine. Keeping a constant feed speed, the towing device aids an extension of work time between two successive operations of sharpening the blade.

A.3.6 When a piece is inserted manually, exploiting the support of the guide, it is expedient to use a thrust rod to accompany the piece close to the blade.

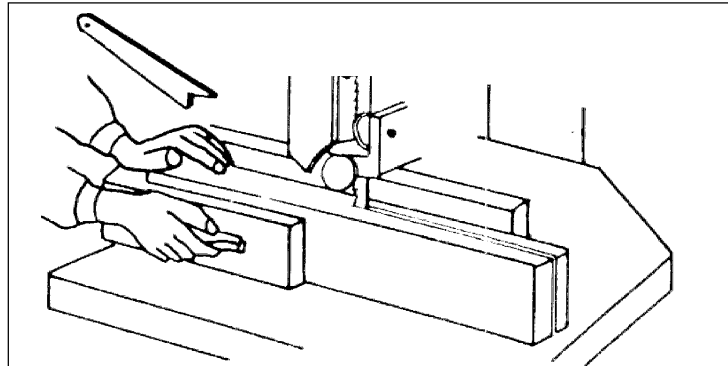


Fig. A-2 Cutting with a guide

A.3.7 BEVELLED CUT

The bevelled cut is generally made by tilting the guide. With machines with a fixed table, however, there must always be a support held firm by a jig. At the end of the cut it is expedient to use a rod to push the piece.

A.3.8 The diagonal cut of pieces with a square cross-section can be made by feeding the piece through a channel-type jig fixed to the table (see fig. A-3).

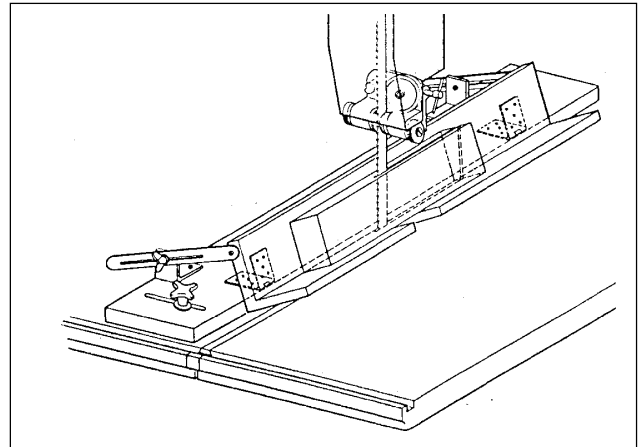


Fig. A-3 Diagonal cut

A.3.10 CUTTING WEDGES

Small sized wedges can be cut out safely with a band saw using the guide shown in figure A-4.

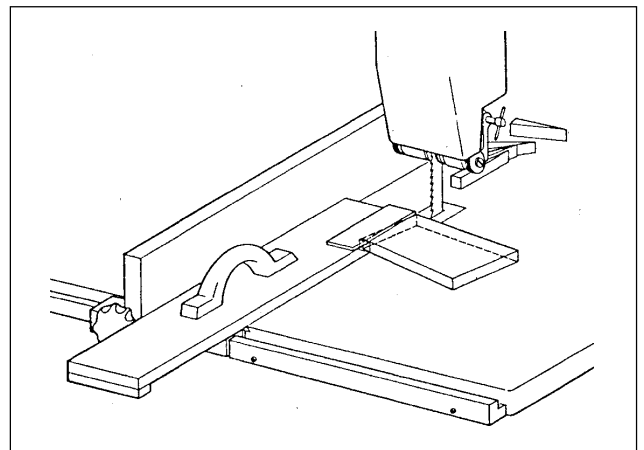


Fig. A-4 Wedge cut

A.3.11 CURVED AND IRREGULAR CUT

The band saw can be used with or without a template to make curved or irregular shapes (see figure A-5).

For repetitive work on curved and irregular shapes, it is possible to use a guide fixed in front of the blade and complete with a template, to improve working speed and safety.

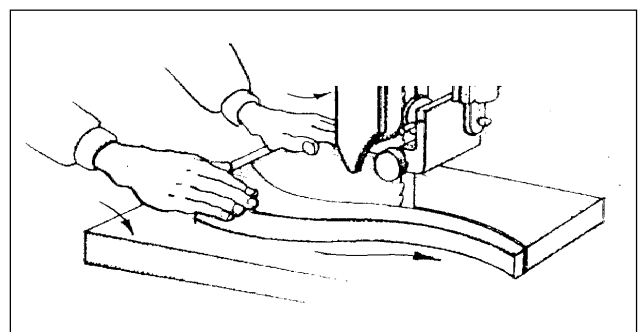


Fig. A-5 Curved cut

A.3.12 TRANSVERSE CUT OF ROUND PIECES

The piece has to be locked to prevent rotation caused by the cutting pressure. The piece must be locked by a jig or a retainer suitable for such a purpose. The blade must be of a type suitable for transverse cutting (figure A-6).

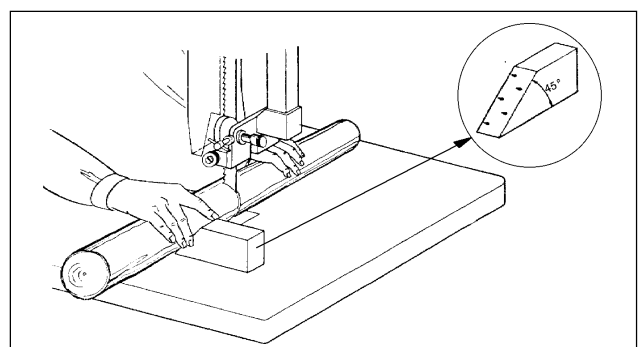


Fig. A-6 Transverse cut of round pieces

A.3.13 CIRCULAR CUT

The jig for circular cutting is shown in figure A-7.

A.4 RECOMMENDATIONS CONCERNING THE PIECE

A.4.1 If a table band saw or a feeder is used to cut round wood, a special locking system must be provided and used to prevent rolling or slipping, for example with hooks, wedges, or V-blocks. If hooks are used, they must be periodically sharpened to ensure a good hold.

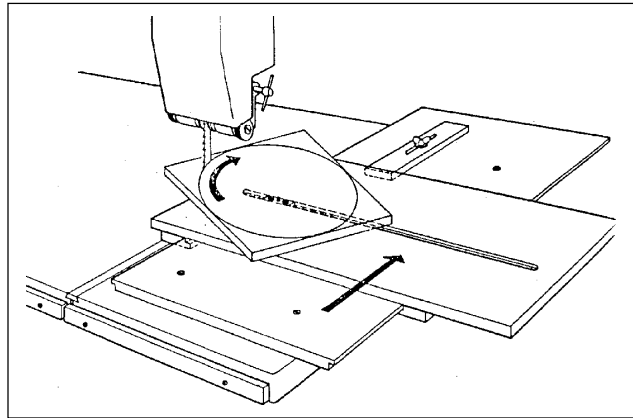


Fig. A-7 Circular cut

A.4.2 Additional supports for the piece, such as table extensions or roller conveyors must always be used for long pieces (see figure A-8) since the piece tilting over is a common cause of accident.

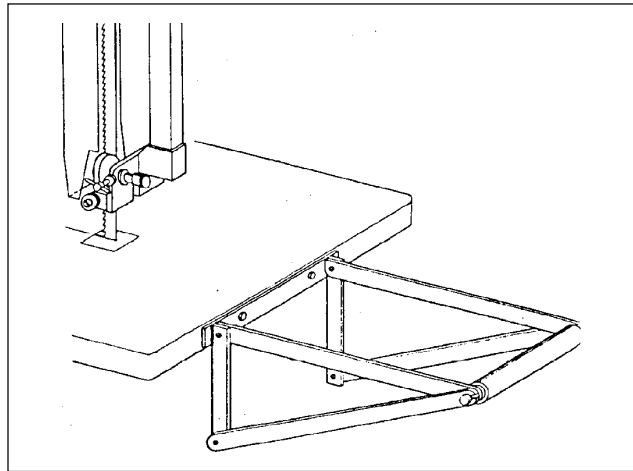


Fig. A-8 Additional supports

A.5 AMBIENT CONDITIONS

A.6 NOISE REDUCTION

Working procedure affect the levels of noise produced by band saws. To this regard the provisions of Attachment C must be taken into consideration along with the following.

A.6.1 Choice of blade. The choice of blade must take into account the information supplied by the manufacturer on the noise levels linked with the various forms and categories of tools.

A.6.2 The state of the blade is important for the limitation of the noise levels during cutting. The blade must be subject to careful maintenance, paying attention to the following points:

- A** The brazed or welded joint must be trued to the edge of the blade.
- B** The teeth must be set or prepared for the foreseen operation.
- C** The sharpness of the teeth must be checked at regular intervals.
- D** The cleaning devices must be checked regularly to see they prevent the formation of deposits of resin on the blade.
- E** A more appropriate choice of the feed speed.

A.6.3 The noise in loadless operation is caused by the vibration of the blade. It is possible to resort to some simple maintenance procedures to significantly reduce this phenomenon. For example, a band saw with a bad adjustment of the wheel scrapers causes a slow worsening from the maximum level of cutting noise to the minimum level of loadless noise.

- A** Careful adjustment of the wheel scrapers and of the sawdust deflectors.
- B** Maintenance of the dust extraction systems in observance of the planning parameters.
- C** Maintenance of the blade lubrication systems in the feeders and rip saws.
- D** Precise alignment of the blade.
- E** Care for the blades under tension.

A.7 DUST EXTRACTION

Routine checks and maintenance of the extraction system. Routine checks and maintenance of the seals of the pulley guards.

A.8 TRAINING THE OPERATORS

All the band saw operators must receive adequate training relative to:

- A** machine operating principles, correct use and adjustment of the tilting table and of the guide, use of jigs, locks and templates;
- B** choice of the most suitable blade for the work, setting the teeth, tensioning and aligning the blade;
- C** safe movement of the piece during cutting, position of hands with respect to the blade and safe stacking of pieces before and after cutting;
- D** correct adjustment of the top guide and of the guard.

A.9 TOOLS

A.9.1 CHOICE

With table band saws, the width of the blade must be chosen according to the cutting radius, the pitch of the tooth according to the thickness of the material and the shape of the teeth according to the type of material sawn.

A.9.2 HANDLING

It is necessary to pay great attention not to damage the blade. When not used, blades not under tension must be wound in a spiral (see figure A-9) and kept in this conformation in a dry and safe place. Before use they must be checked for the presence of damaged or cracked teeth.

To prevent the formation of cracks, tensioned blades must be kept as shown in fig. A-10.

To change a band saw blade of a certain length, at least two operators are needed.

The operators must wear special gloves (or other suitable clothing) while handling the blades.

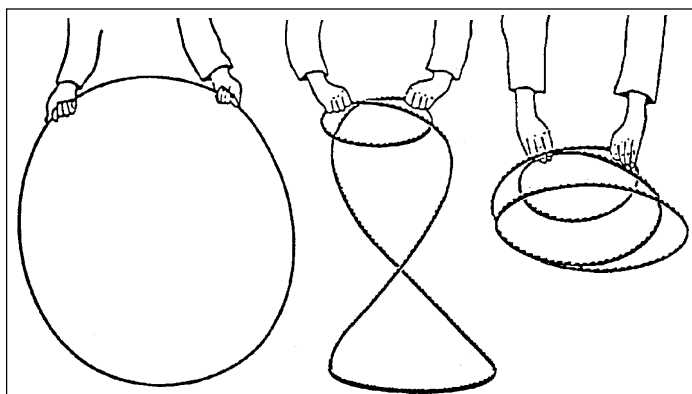


Fig. A-9 Winding blades

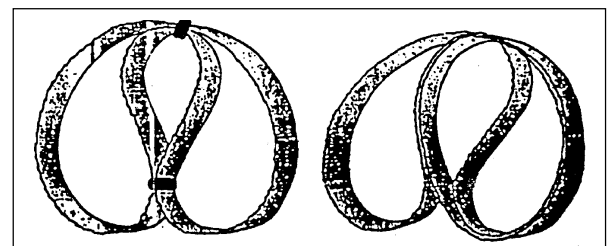


Fig. A-10 Handling

A.9.3 The blades must be set or prepared and sharpened carefully; setting must always be done before sharpening. Setting allows obtaining teeth of a greater width than the thickness of the belt and prevents the belt rubbing against the piece and overheating. Excessive setting easily causes the blade to break.

A.9.4 The information and advice given by the manufacturer for setting/sharpening, tensioning, aligning, and checking the blades must be incorporated in the users' work procedures.

A.9.5 TENSIONING WIDE BLADES

The blade is put under tension to:

- A** stiffen the cutting edge;
- B** prevent the saw "skidding" off the pulley;
- C** compensate for the expansion of the blade, especially on the cutting edge, due to the increase in temperature during work. It is important for the engineer assigned to the saw to apply the right tension to the wide blades (according to the manufacture's instructions). Too high or too low a tension determines a reduction in the contact between the blade and the edge of the wheel.

Consult the blade manufacturer for advice with respect to the most suitable procedures for "running in" new blades before applying the load.

A.9.6 BREAKAGE OF THE BLADES

The risk of blades breaking is increased by the following factors:

- A** incorrect use of blades jointed with imprecise brazing or butt welding;
- B** cracked blades;
- C** sharp corners in the space between the teeth causing the formation of cracks;
- D** bending of the blade during cutting, due to using too wide a blade;
- E** incorrect adjustment of the guides or of the contrast wheel, with the consequence that the guides restrain the blade;
- F** impossibility of the contrast wheel rotating under the pressure of the blade;
- G** residues wedging between the blade and a slot in the worn table;
- H** feeding the piece wrongly (the piece is forced against the blade with excessive speed);
- I** torsion of the piece during cutting;
- J** deposits of resin on the blade;
- K** wear on the rims;
- L** blade tensioning mechanism getting blocked;
- M** blade teeth blunt or badly set;
- N** wrong tensioning of the wide blades;
- O** burning or cracking due to wrong grinding;
- P** grinding at too distant intervals.

A.9.7 If cracks are formed in the space between the teeth, there is a danger of breaking the blade. The blades must be examined regularly to check for signs of cracking and to be repaired by a competent engineer or scrapped.

The impossibility of correct alignment of a blade may be indicative of the imminent formation of cracking.

B. SPAREPARTS

Notice

In order to ensure prompt despatch of the necessary spare parts, it is absolutely essential to keep meticulously to the following procedures:

- 1) Indicate the model and part number of the machine.
- 2) Indicate the table, code and reference number of the parts required.
- 3) Indicate the quantity required.

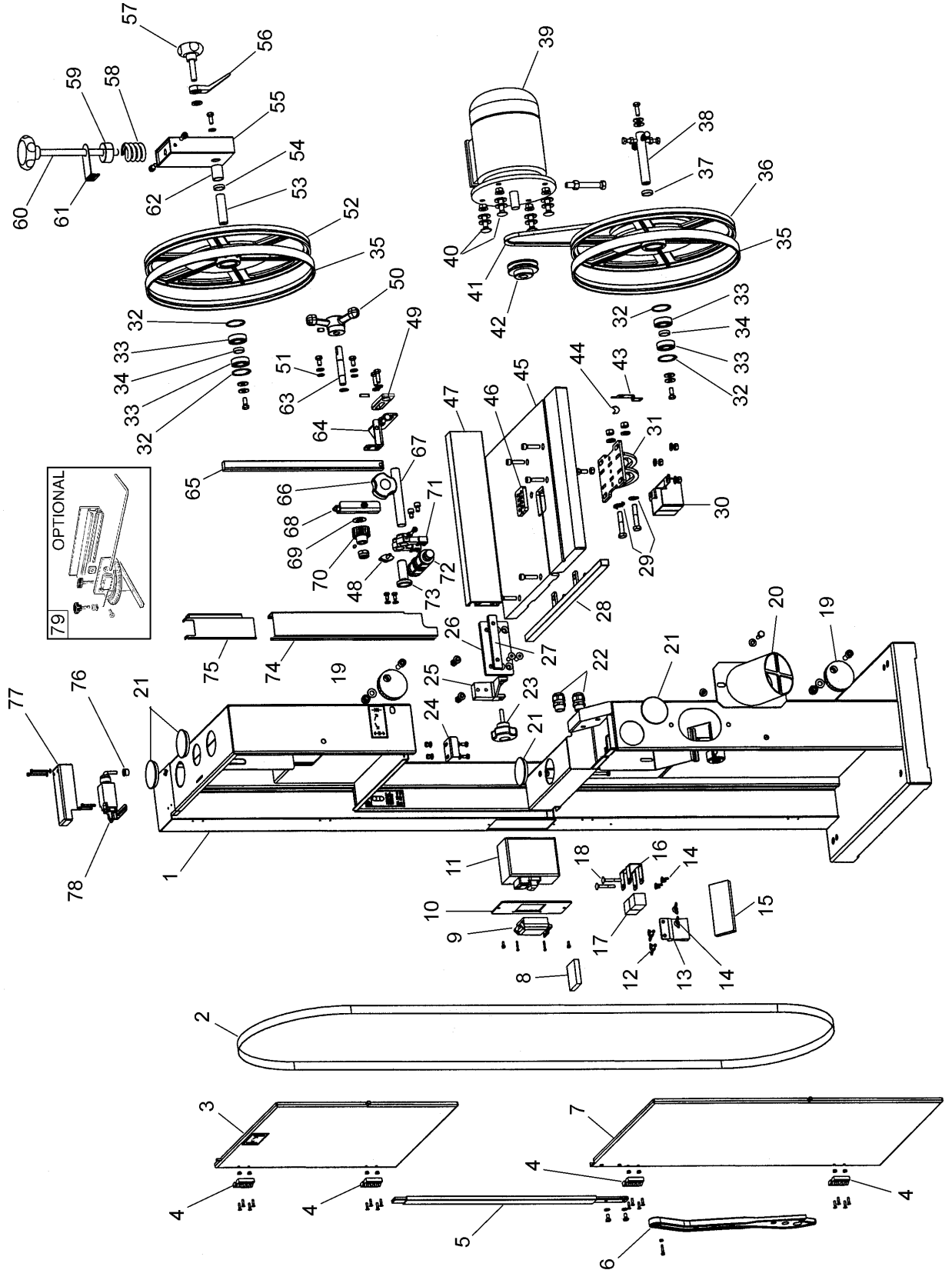
Tab. 1

SP 400

Rif. Ref. Nr.	CODICE - CODE	Rif. Ref. Nr.	CODICE - CODE	Rif. Ref. Nr.	CODICE - CODE
1	43042082	54	48200700	107	-
2	02230101	55	43042128	108	-
3	43042107	56	10160000	109	-
4	27111708	57	10140016	110	-
5	43042099	58	30020200	111	-
6	10170000	59	43042122	112	-
7	43042106	60	43042116	113	-
8	43042103	61	10010513	114	-
9	-	62	43042127	115	-
10	43040090	63	43042108	116	-
11	-	64	43042133	117	-
12	13101141	65	43042111	118	-
13	43070159	66	10140025	119	-
14	13710000	67	43042113	120	-
15	43042105	68	43042112	121	-
16	43042101	69	30212301	122	-
17	43042104	70	43042026	123	-
18	13140204	71	-	124	-
19	10140007	72	-	125	-
20	48097500	73	-	126	-
21	27510200	74	43042134	127	-
22	08034403	75	43042110	128	-
23	10140025	76	27420100		
24	43042100	77	43042115		
25	43042125	78	05061932		
26	43042120	79	27280000		
27	43210410	80	-		
28	48201801	81	-		
29	43042119	82	-		
30	43042118	83	-		
31	43042123	84	-		
32	12010129	85	-		
33	01380101	86	-		
34	48200700	87	-		
35	48132800	88	-		
36	48200100	89	-		
37	48200700	90	-		
38	43042038	91	-		
39	-	92	-		
40	13119178	93	-		
41	03630303	94	-		
42	43040045	95	-		
43	43042102	96	-		
44	43042121	97	-		
45	43042117	98	-		
46	43042126	99	-		
47	43042124	100	-		
48	-	101	-		
49	-	102	-		
50	43070231	103	-		
51	30212300	104	-		
52	48200200	105	-		
53	43042098	106	-		

Tab. 1

SP 400



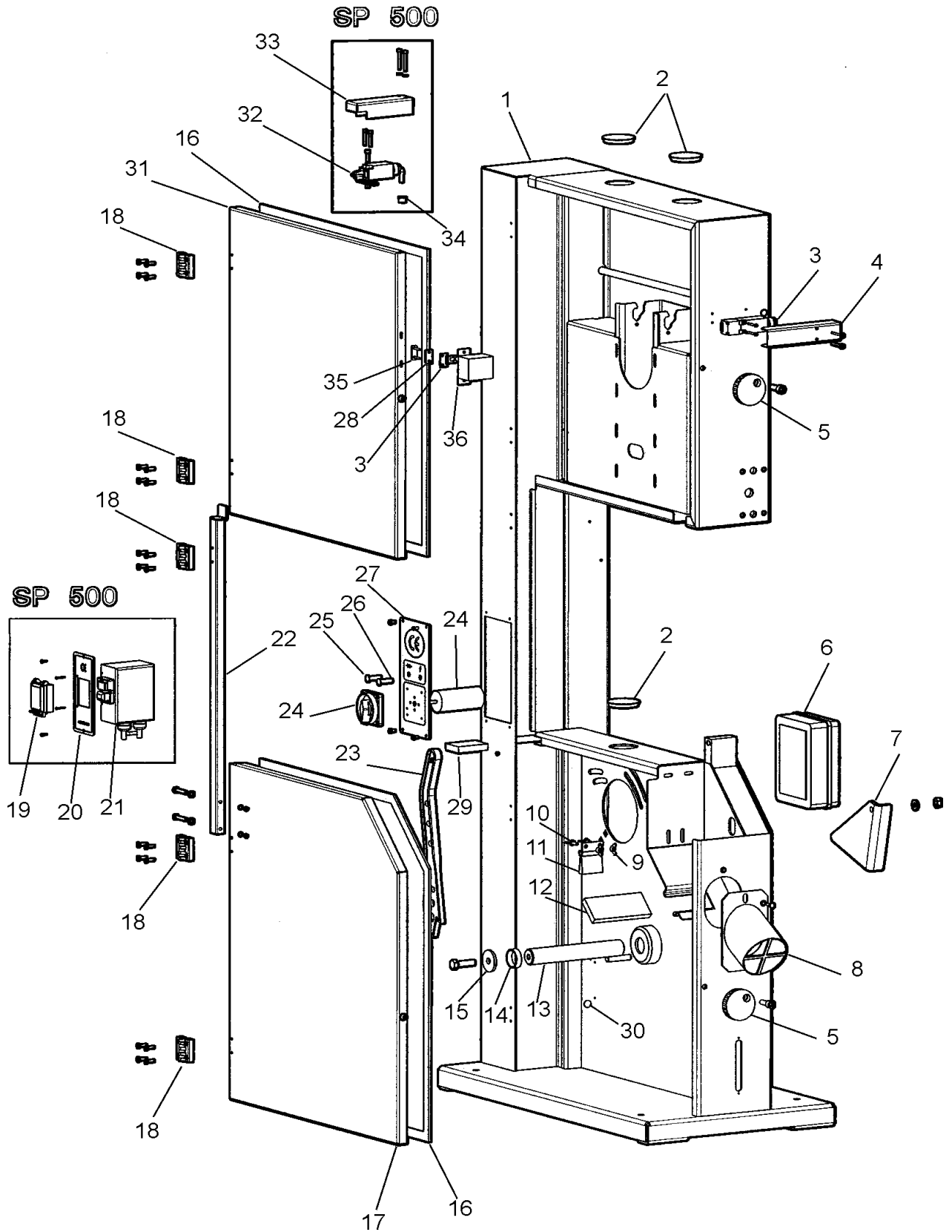
Tab. 2

SP 500 - SP 600 - SP 700 - 800 SP

Rif. Ref. Nr.	SP 500 CODICE - CODE	SP 600 CODICE - CODE	SP 700 CODICE - CODE	SP 800 CODICE - CODE
1	43052080	43062043	43072118	43082001
2	27510200	27510200	27510200	27510200
3	-	05061911	05061911	05061911
4	-	48108900	48142900	43060050
5	10140007	10140007	10140007	10140007
6	-	07400017	07400017	07350210
7	-	43070137	43070137	43070137
8	48097500	48097500	48097500	48115500
9	13710000	13710000	13710000	13710000
10	13101141	13101141	13101141	13101141
11	43070159	43070159	43070159	43070159
12	43052082	43062063	43072163	43082020
13	43060031	43060031	43070148	43070148
14	43060032	43060032	43070042	43070042
15	48022300	48022300	48022300	-
16	28010001	28010001	28010001	28080100
17	43052083	43062060	43072161	43082021
18	27111708	27111715	27111715	27111715
19	05531000	-	-	-
20	43040090	-	-	-
21	07400010	-	-	-
22	43050042	43072170	43072170	43082044
23	10170000	10170000	10170000	10170000
24	-	05012300	05012300	05021600
25	-	05072607	05072607	05072603
26	-	05072608	05072608	05072604
27	-	43070179	43070179	43082026
28	-	43060055	43060055	43060055
		43060060	43060060	43060060
		43060061	43060061	43060061
29	43052081	43060062	43060062	43082019
30	27510100	27510100	27510100	-
31	43052084	43062059	43072160	43082043
32	05061932	-	-	-
33	43052115	-	-	-
34	27420100	-	-	-
35	43070159	43070181	43070181	43070181
36	-	43060054	43060054	43060054
37	-	-	-	-
38	-	-	-	-
39	-	-	-	-
40	-	-	-	-

Tab. 2

SP 500 - SP 600 - SP 700 - 800 SP

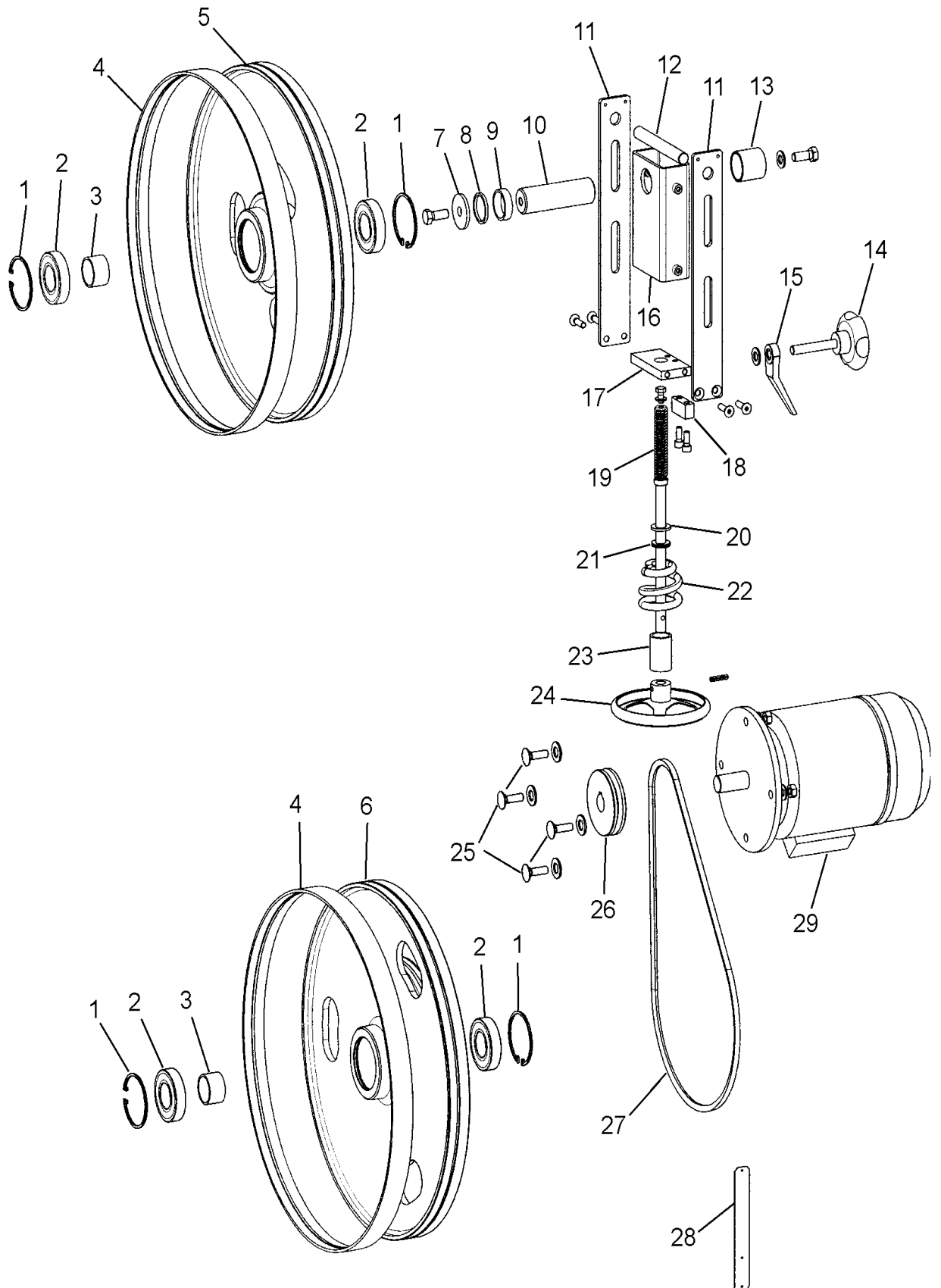


Tab. 3
SP 500 - SP 600

Rif. Ref. Nr.	CODICE - CODE SP 500	CODICE - CODE SP 600	CODICE - CODE
1	12010105	12010105	-
2	01020102	01020102	-
3	48011800	48011800	-
4	48012800	48023300	-
5	48149200	43060097	-
6	48149300	43060098	-
7	48022300	48022300	-
8	48141000	48141000	-
9	43060032	43060032	-
10	48095400	48095400	-
11	43052101	43052101	-
12	48140200	48140200	-
13	43052100	43052100	-
14	10140027	10140027	-
15	10160000	10160000	-
16	43052103	43052103	-
17	43052102	43052102	-
18	43083066	43083066	-
19	48205400	48205400	-
20	-	-	-
21	01210405	01210405	-
22	30030300	30030300	-
23	48097100	48097100	-
24	10044951	10044951	-
25	13119178	13119178	-
26	48013000 (2800 RPM)	43060068A	-
27	03190303	03190303	-
28	48109400	48109400	-
29	-	-	-
30	-	-	-
31	-	-	-
32	-	-	-
33	-	-	-
34	-	-	-
35	-	-	-
36	-	-	-
37	-	-	-
38	-	-	-
39	-	-	-
40	-	-	-
41	-	-	-
42	-	-	-
43	-	-	-
44	-	-	-
45	-	-	-
46	-	-	-
47	-	-	-

Tab. 3

SP 500 - SP 600

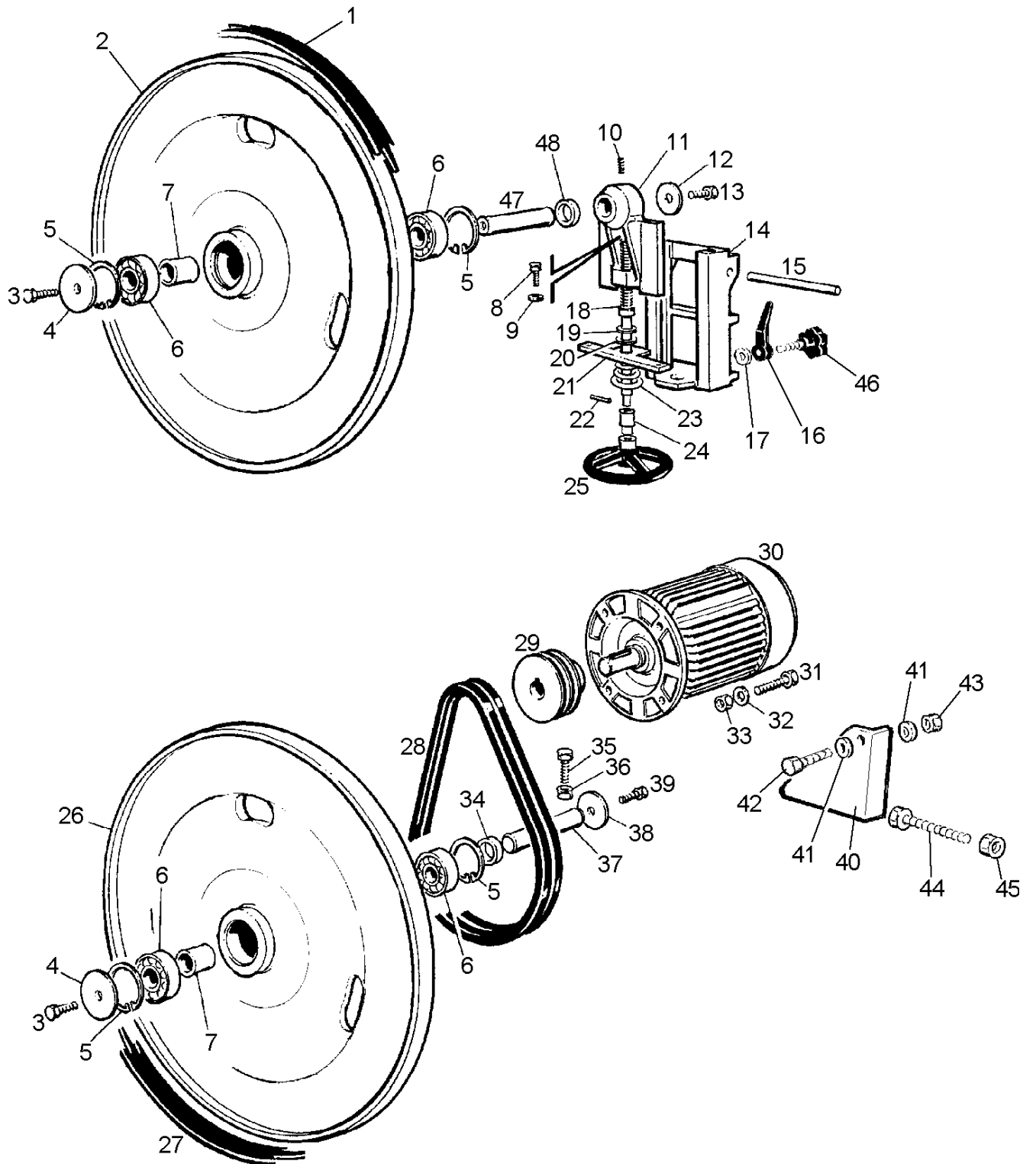


Tab. 4
SP 700

Rif. Ref. Nr.	CODICE - CODE	CODICE - CODE	CODICE - CODE SP 700
1	-	-	-
2	-	-	43070221
3	-	-	-
4	-	-	48022300
5	-	-	12010206
6	-	-	01030102
7	-	-	48033200
8	-	-	-
9	-	-	-
10	-	-	-
11	-	-	48207500
12	-	-	48033700
13	-	-	-
14	-	-	48146900
15	-	-	48145300
16	-	-	10160000
17	-	-	-
18	-	-	48011900
19	-	-	-
20	-	-	01220405
21	-	-	48140900
22	-	-	-
23	-	-	30030300
24	-	-	48097100
25	-	-	10045052
26	-	-	43070222
27	-	-	-
28	-	-	03200303
29	-	-	48032600
30	-	-	-
31	-	-	-
32	-	-	-
33	-	-	-
34	-	-	43070042
35	-	-	-
36	-	-	-
37	-	-	43070148
38	-	-	48033700
39	-	-	-
40	-	-	-
41	-	-	-
42	-	-	-
43	-	-	-
44	-	-	-
45	-	-	-
46	-	-	10140027
47	-	-	48105400
48	-	-	-

Tab. 4

SP 700



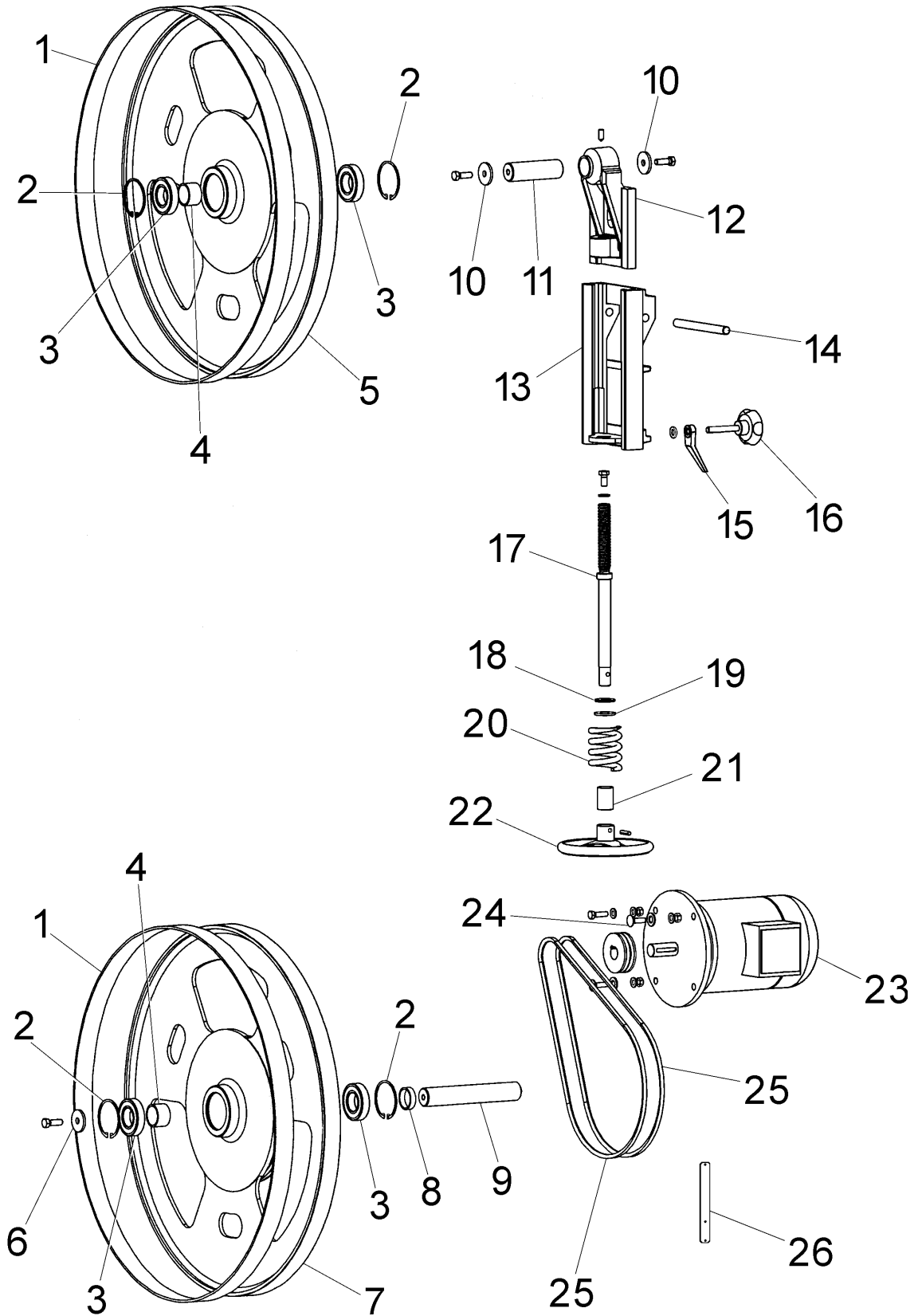
Tab. 5

SP 800

Rif. Ref. Nr.	CODICE - CODE	Rif. Ref. Nr.	CODICE - CODE
1	28040400		
2	12010106		
3	01030102		
4	48033200		
5	43082036		
6	48022300		
7	43082035		
8	43070042		
9	43070148		
10	48022300		
11	48105400		
12	48105800		
13	48150500		
14	48031300		
15	10160000		
16	10140027		
17	43070133		
18	01220405		
19	-		
20	30040400		
21	48097100		
22	10140027		
23	-		
24	13119178		
25	03210303		
26	48109400		

Tab. 5

SP 800



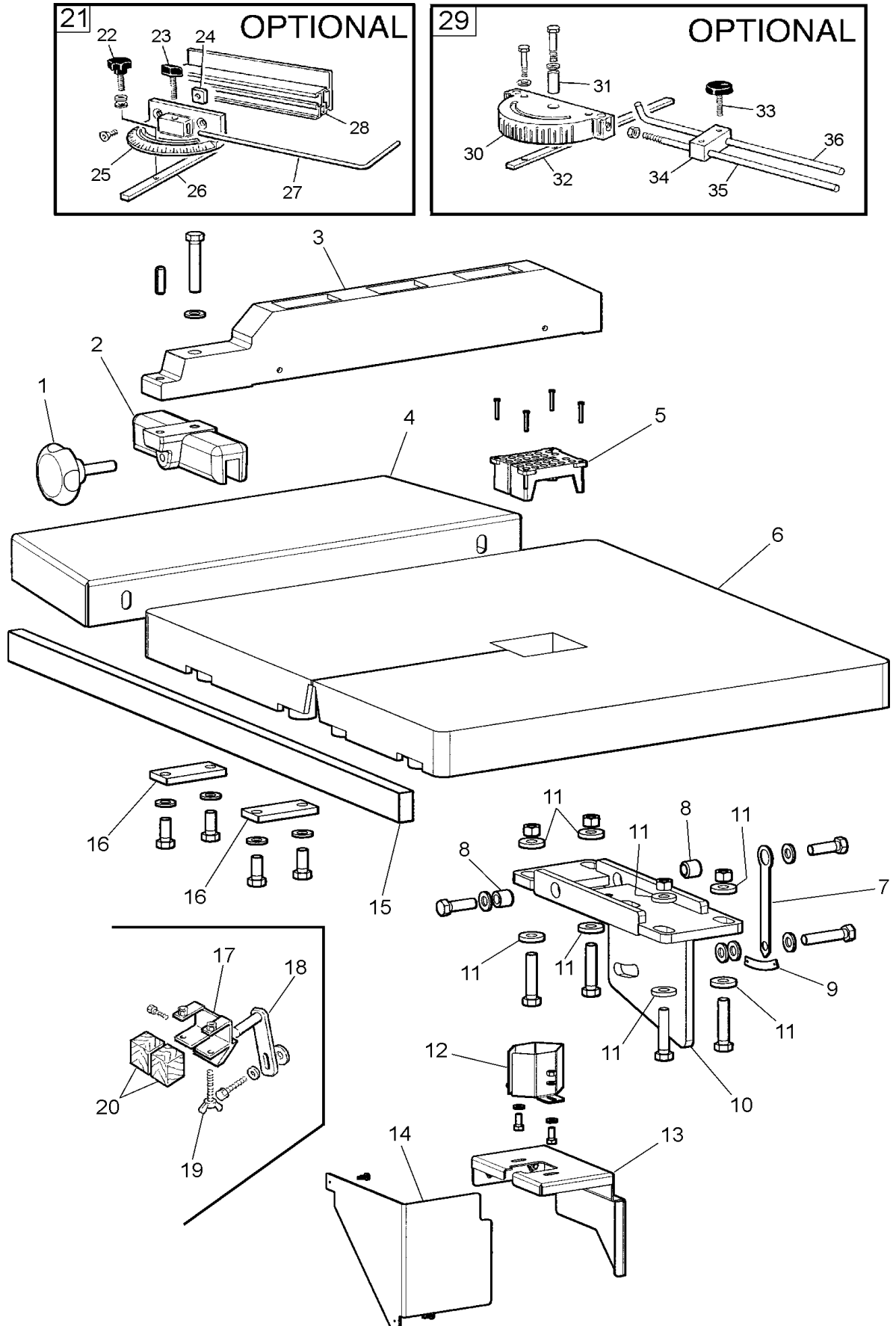
Tab. 6

SP 500 - SP 600 - SP 700

Rif. Ref. Nr.	CODICE - CODE SP 500	CODICE - CODE SP 600	CODICE - CODE SP 700
1	10066763	10140026	10140026
2	43040066-	48096700	48096700
3	43040059	48097300	48106300
4	-	-	48207800
5	43070129	43070129	43070129
6	43052048	43060049	48207601
7	43062034	43062034	43062034
8	43072133	43072133	43072133
9	43062035	43062035	43062035
10	43052093	43062066	43072166
11	43082037	43082037	43082037
12	43082030	43082030	43082030
13	43052097	43062067	43072167
14	43052098	43062068	43072168
15	43052063	48205600	48207700
16	43040062	48096900	48096900
17	43070157	43070157	43070157
18	43060030	43060030	43060030
19	13101181	13101181	13101181
20	43070158	43070158	43070158
21	27280000	27280000	-
22	-	-	-
23	-	-	-
24	-	-	-
25	-	-	-
26	-	-	-
27	-	-	-
28	-	-	-
29	27202900	27202900	27202900
30	-	-	-
31	-	-	-
32	-	-	-
33	-	-	-
34	-	-	-
35	-	-	-
36	-	-	-
37	-	-	-
38	-	-	-
39	-	-	-
40	-	-	-
41	-	-	-
42	-	-	-
43	-	-	-

Tab. 6

SP 500 - SP 600 - SP 700



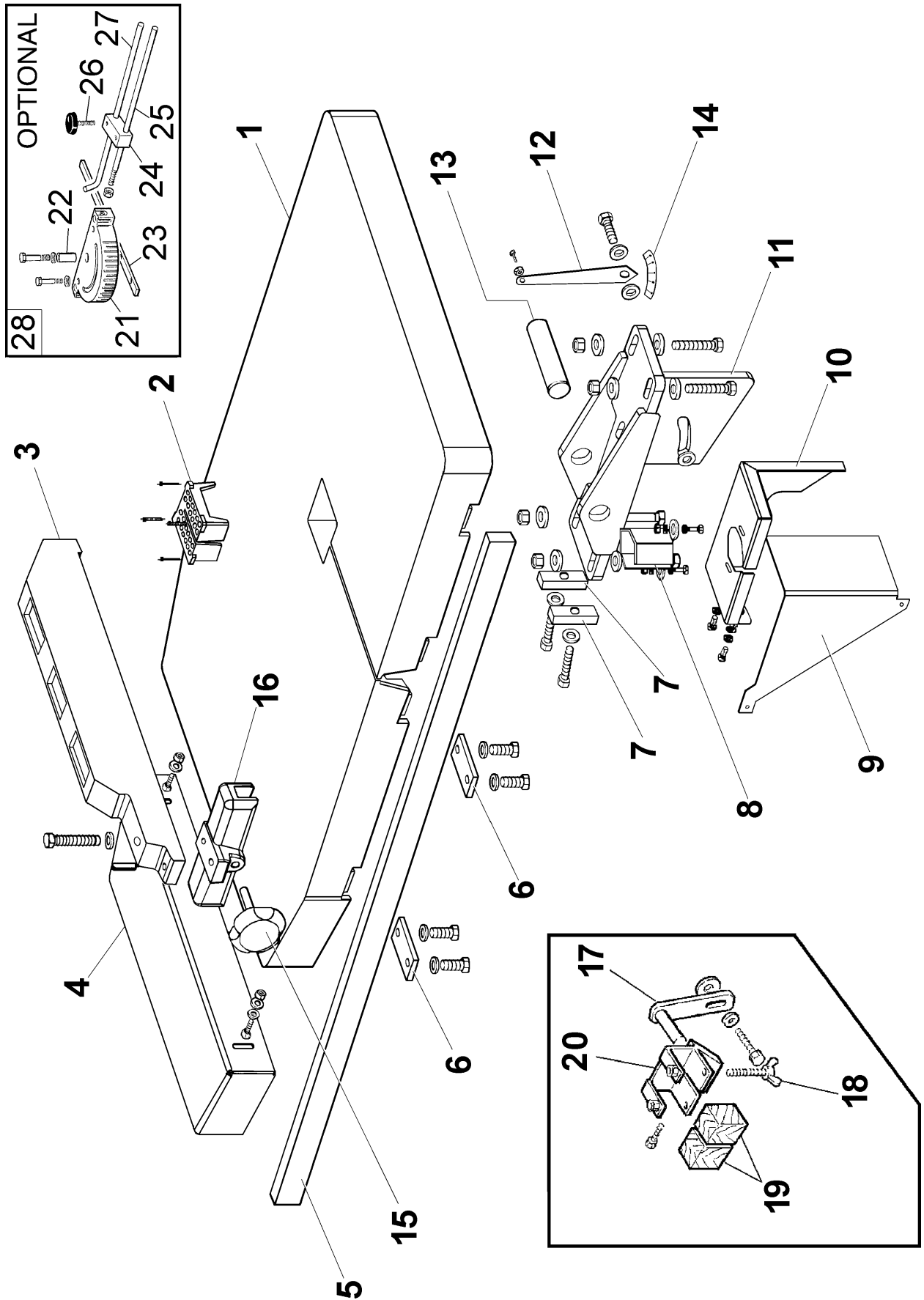
Tab. 7

SP 800

Rif. Ref. Nr.	CODICE - CODE	Rif. Ref. Nr.	CODICE - CODE
1	43070153		
2	43070129		
3	48106300		
4	43082031		
5	43082032		
6	48096900		
7	43070177		
8	43082030		
9	43082034		
10	43082033		
11	43070182		
12	43070172		
13	43070145		
14	43070165		
15	10140026		
16	48096700		
17	43060030		
18	13101181		
19	43070158		
20	43070157		
21	-		
22	-		
23	-		
24	-		
25	-		
26	-		
27	-		
28	27202900		
29	-		
30	-		

Tab. 7

SP 800



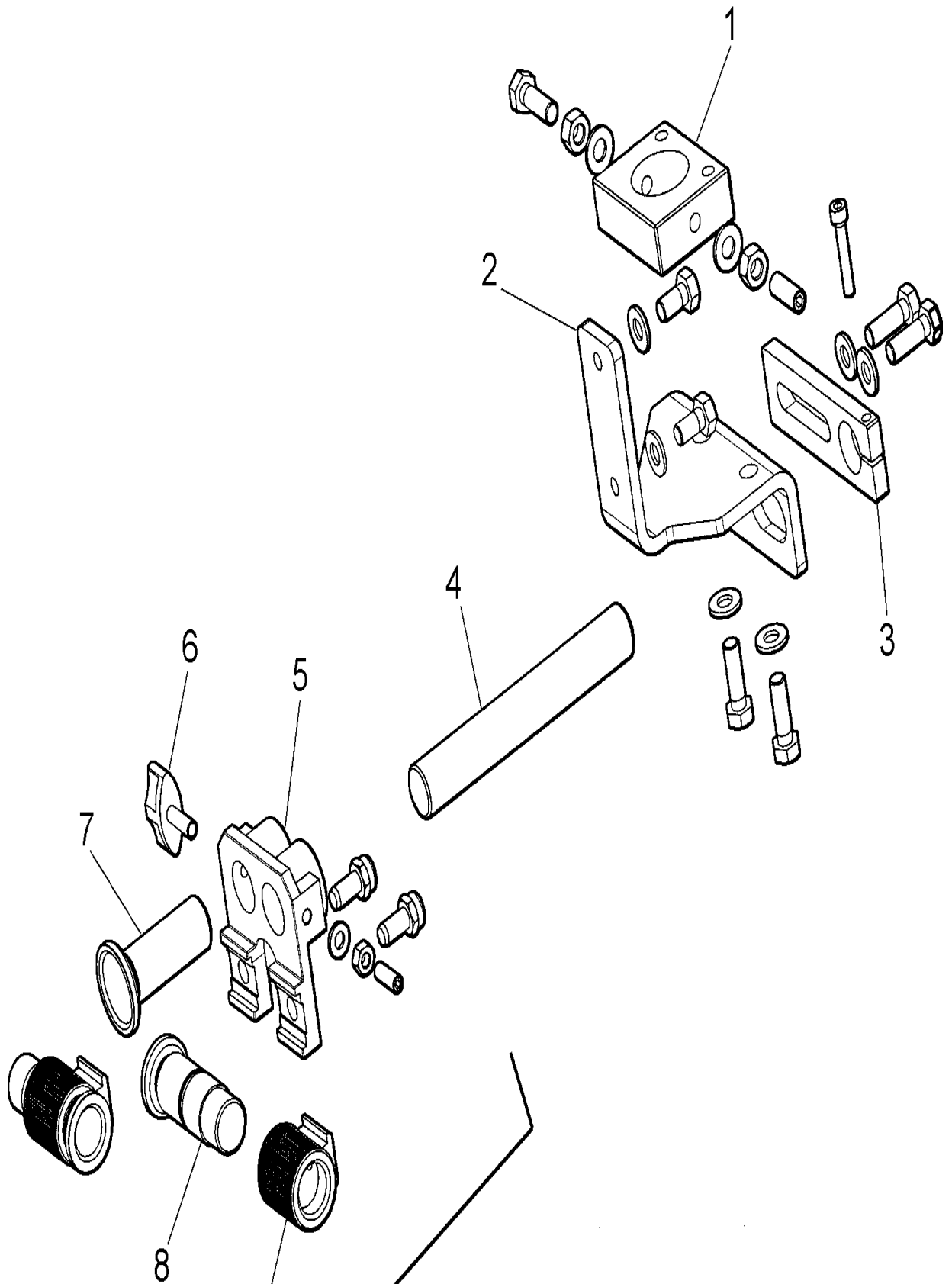
Tab. 8

SP 500 - SP 600

Rif. Ref. Nr.	CODICE - CODE 500 SP	CODICE - CODE 600 SP	CODICE - CODE -
1	43082028	43082028	-
2	43052089	43052089	-
3	27550109	27550109	-
4	43042113	43042113	-
5	27550108	27550108	-
6	10250001	10250001	-
7	27550107	27550107	-
8	27550106	27550106	-
9	27550105	27550105	-
10	65200005	65200005	-
11	-	-	-
12	-	-	-
13	-	-	-
14	-	-	-
15	-	-	-
16	-	-	-
17	-	-	-
18	-	-	-
19	-	-	-
20	-	-	-
21	-	-	-
22	-	-	-
23	-	-	-
24	-	-	-
25	-	-	-
26	-	-	-
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31	-	-	-
32	-	-	-
33	-	-	-
34	-	-	-
35	-	-	-
36	-	-	-
37	-	-	-
38	-	-	-
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41	-	-	-
42	-	-	-
43	-	-	-

Tab.8

SP 500 - SP 600



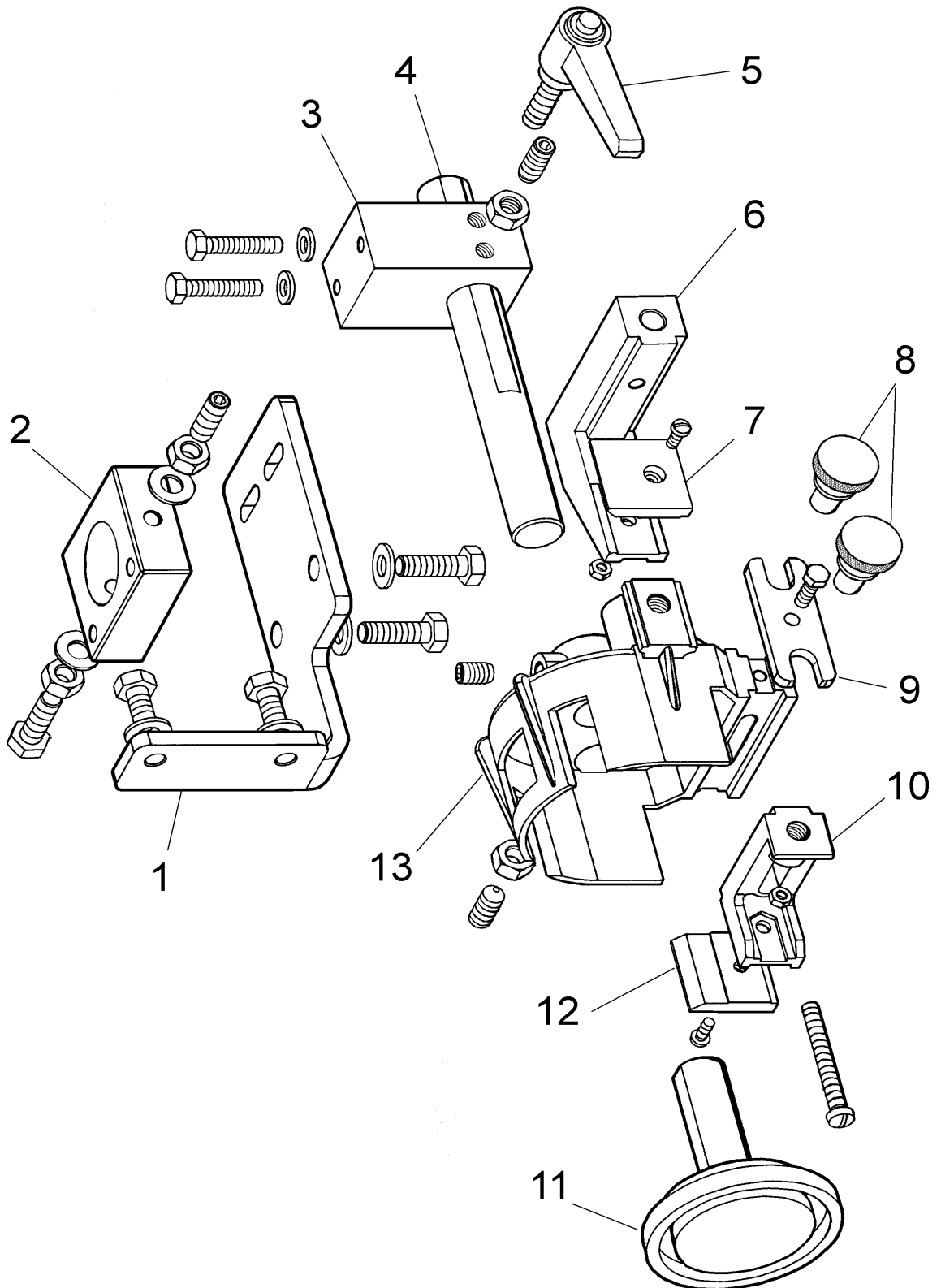
Tab.9

SP 700 - SP 800

Rif. Ref. Nr.	CODICE - CODE SP 700	Rif. Ref. Nr.	CODICE - CODE SP 800
1	43072169	1	43082027
2	43082028	2	43082028
3	43070233	3	43070233
4	43070240	4	43070240
5	10066602	5	10066602
6	12050101	6	12050001
7	12050102	7	12050002
8	12050100	8	12050000
9	-	9	-
10	12050104	10	12050004
11	12050105	11	12050005
12	12050102	12	12050002
13	12050103	13	12050003
14	-	14	-

Tab.9

SP 700 - SP 800



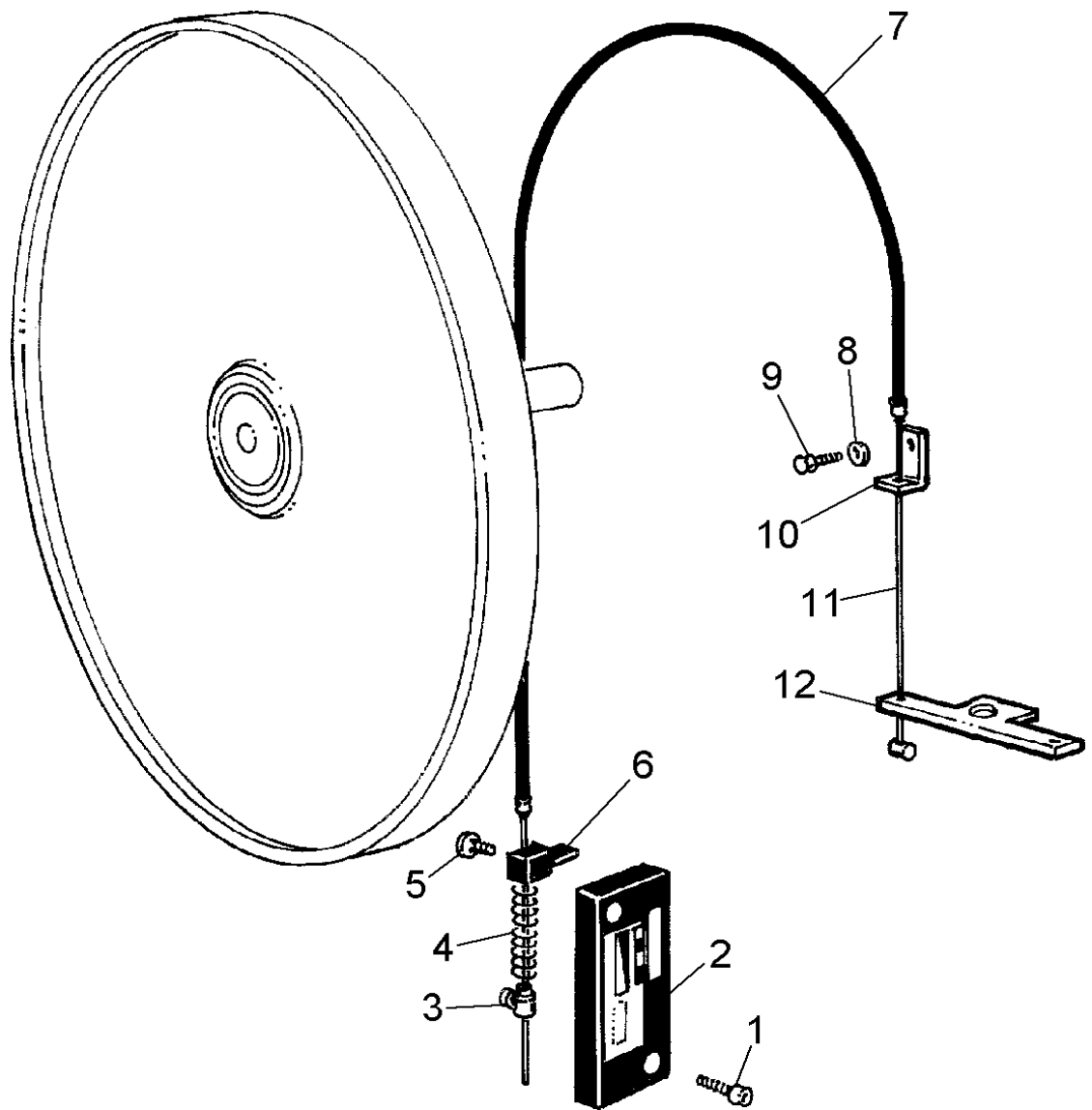
Tab. 10

SP 500 - SP 600 - SP 700 - SP 800

Rif. Ref. Nr.	SP 500 CODICE - CODE	SP 600 CODICE - CODE	SP 700 CODICE - CODE	SP 800 CODICE - CODE
1	-	-	-	-
2	48098801	48098801	48098801	48098801
3	27090000	27090000	27090000	27090000
4	30131400	30131400	30131400	30131400
5	13113006	13113006	13113006	13113006
6	48098802	48098802	48098802	48098802
7	27081400	27081400	27081500	27081400
8	-	-	-	-
9	-	-	-	-
10	43052090	43052090	48098804	48098804
11	27071200	27071200	27071300	27071200
12	43052091	43052091	48098806	48108001
13	-	-	-	-
14	-	-	-	-
15	-	-	-	-
16	-	-	-	-
17	-	-	-	-
18	-	-	-	-
19	-	-	-	-
20	-	-	-	-
21	-	-	-	-

Tab. 10

SP 500 - SP 600 - SP 700 - SP 800



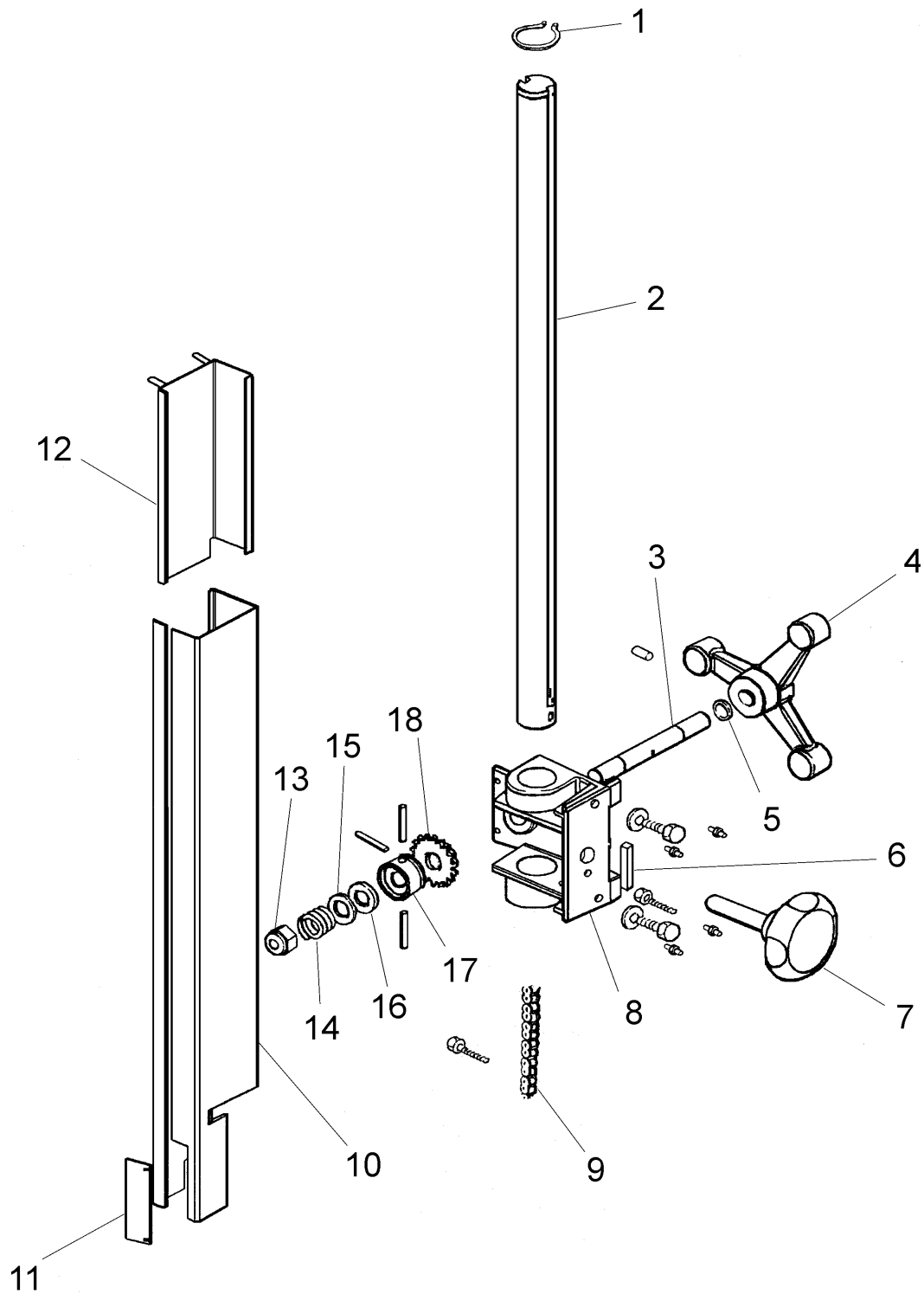
Tab.11

SP 500 - SP 600 - SP 700 - SP 800

Rif. Ref. Nr.	SP 500 CODICE - CODE	SP 600 CODICE - CODE	SP 700 CODICE - CODE	SP 800 CODICE - CODE
1	12040002	12040002	12040002	12040002
2	43060027	43060027	43060027	43070013
3	43070132	43070132	43070132	43070132
4	10140028	10140028	10140028	10140028
5	12040001	12040001	12040001	12040001
6	43070131	43070131	43070131	43070131
7	10140028	10140028	10140028	10140028
8	43070026	43070026	43070026	43070026
9	48123600G	48123600G	48123600G	48123600G
10	43052086	43062064	43072164	43082024
11	43052085	43052085	43052085	43082023
12	43052087	43062065	43072165	43082025
13	13427179	13427179	13427179	13427179
14	30141000	30141000	30141000	30141000
15	01550001	01550001	01550001	01550001
16	-	-	-	-
17	48152400	48152400	48152400	48152400
18	48152200	48152200	48152200	48152200
19	-	-	-	-
20	-	-	-	-
21	-	-	-	-

Tab.11

SP 500 - SP 600 - SP 700 - SP 800





MACCHINE PER LA LAVORAZIONE DEL LEGNO

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