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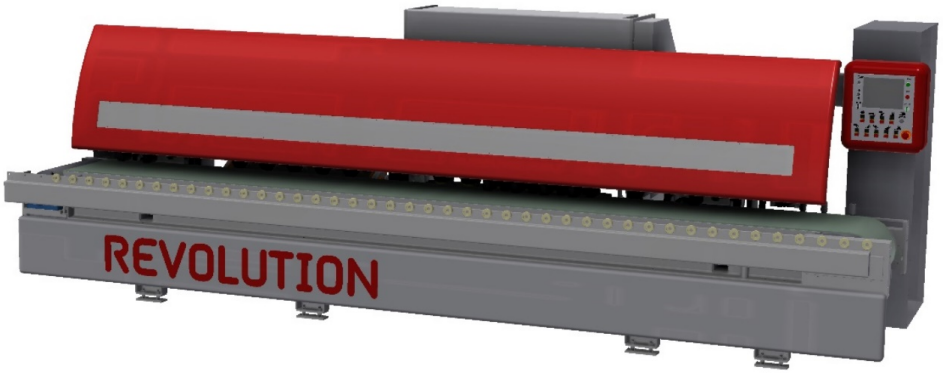

BULL EDGE POLISHER

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1 GENERAL INFORMATION

1.1 MANUFACTURER'S IDENTIFICATION DATA

COMPANY NAME
SASSOMECCANICA Spa

HEADQUARTERS
via del Lavoro, 2 63076 Monteprandone, Italy tel. +39 0735 650988 • fax +39 0735 657741

VAT NUMBER	00342060449

E-MAIL	info@sassomeccanica.it

1.2 WARRANTY

The duration of the warranty covering the machine and the relative components depends on relevant standards in force if not established differently by the Buyer/Vendor parties during negotiations.

Current validity of the warranty can only be demonstrated by exhibiting the tax documentation.

The warranty consists in the supply of the part acknowledged as being faulty and will be granted after ascertaining that breakage occurred due to material or manufacturing defects. The Warranty exclusively regards faulty parts, and does not include transport, labour and travel and minimum charge fees.

The Warranty does not cover Machine damage owing to:

- transport and/or handling (if not borne by the manufacturer SASSOMECCANICA Spa);
- misuse or improper use of the machine;
- lack of maintenance as set out in this Manual;
- failures and/or breakage not attributable to faulty parts;
- changes made without the written consent of the manufacturer;
- parts subject to normal wear and tear.

1.3 CERTIFICATION

The machine was built in compliance with relevant Community Directives applicable at the time it was placed on the market, as detailed in the declaration of conformity attached to this manual.

Putting the machine into service, as well as issuing the declaration of conformity to the relevant applicable Community Directives, is subject to the following conditions:

- INSTALLATION of the machine according to that prescribed by the manufacturer and indicated in this manual
- INSTALLATION of all the intended safety systems
- Post-installation TESTING of the correct operation of the safety devices and the complete configuration of the machine.

1.4 DECLARATION OF CONFORMITY

Declaration of conformity CE

(according to European Directive 2006/42/EC Ann. II.A)

THE MANUFACTURER	SASSOMECCANICA Spa via del Lavoro, 2- 63076 MONTEPRANDONE (AP) ITALY tel +39 0735 650988 Fax +39 0735 657741 info@sassomeccanica.it

DECLARES

under its own responsibility

that the machine called	model	serial number	year of manufacture
BULL EDGE POLISHER			

COMPLIES WITH

THE COMMUNITY DIRECTIVES:	2006/42/EC	Machinery Directive
	2014/35/EU	Low-Voltage Directive

That the individual components installed on the machine comply with directive 2014/30/EU (Electromagnetic compatibility directive).

Harmonised standards applied:	EN 60204-1:2015	Safety of machinery - Electrical equipment of machines. Part 1: General rules
	EN 15571:2015	Machines and plants for mining and tooling of natural stone - SAFETY - Requirements for surface finishing machines

the person authorised to compile the technical file of the machine is Mr. Fabio Di Felice

Monteprandone, dated

The Manufacturer

1.5 DEFINITIONS

MANUFACTURER: this term in this manual indicates SASSOMECCANICA Spa which issues the Declaration of Conformity of the SAW.

MACHINE USER: the owner of the said machine who uses it directly or has it used by trained personnel.

OPERATORS: workers in charge of using the machine employed or appointed by the user. They can use the machine only after having been trained according to that indicated in this user manual.

PPE: personal protective equipment

RESIDUAL RISKS: The risks which remain despite the inherent safe design measures. These risks are listed in this manual. They require operator training and personal protective measures.

1.6 STRUCTURE AND CONTENT OF THE MANUAL

The user must carefully read the information in this manual as correct set-up, installation and use of the machine are necessary requirements for its regular and above all safe operation. For this purpose you are strongly recommended to consult all of the documentation accompanying the product you purchased (wiring, hydraulic diagrams, etc.).

This manual is intended to give the user all of the information necessary so that, in addition to adequate use of the machine, he/she is capable of managing it as autonomously and safely as possible. It carries information regarding technical aspects, operation, maintenance and safety.

Before performing any operation on the machine, operators and qualified technicians must carefully read the instructions herein.

IMPORTANT

BEFORE PERFORMING ANY OPERATION ON THE MACHINE, OPERATORS AND AUTHORISED TECHNICIANS MUST CAREFULLY READ THE INSTRUCTIONS IN THIS MANUAL AND FOLLOW THEM DURING EXECUTION OF THE INTERVENTIONS.

KEEP THIS MANUAL WITH CARE AND PUT IT IN A SAFE PLACE

IF DOUBTS ARISE REGARDING THE CORRECT INTERPRETATION OF THE INSTRUCTIONS, CONTACT OUR SUPPORT SERVICE FOR THE NECESSARY CLARIFICATIONS.

PLEASE NOTE

Whenever the “danger” symbol is used in this manual, it means that the warning the symbol refers to regards a situation requiring special attention for the safety of operators, of persons who could be in the vicinity of the machine and for proper operation of the machine itself.

1.7 GENERAL INFORMATION ON USE OF THE MACHINE

Before proceeding with maintenance and repair operations, read the manual carefully, as it contains all the information necessary for the correct use of the machine and for accident prevention.

2 DESCRIPTION OF THE MACHINE

2.1 OPERATING PRINCIPLE

The machine was designed and built to perform all the smoothing, polishing and chamfering processing of linear flat or rounded edges on marble and granite.

The mechanical sequence of the machine changes according to the models.
The following operating heads are available for the REVOLUTION model:

- N°1 FRONT CALIBRATOR OF THE EDGE(OPTIONAL)
  for the recovery of off-square cuts

- N° 1 CALIBRATING SPINDLE (OPTIONAL)
  for height and depth adjustment.

- N° 1 PRE-CUTTING UNIT (ROUGHING)/CHAMFERING
  fitted on the opening support to ease the replacement of tools, composed of:
  - n° 2 pneumatic pressure regulation mandrels provided, as well as mechanical limit switch.This enables the mandrels to roughen the rounded profiles and chamfer the flat edges.

- N° 1 POLISHING UNIT (BULLNOSE AND STRAIGHT EDGE)
  fitted on the oscillating support to enable flat and rounded processing, composed of:
  - n° 1 pneumatic pressure regulation mandrels provided, as well as mechanical limit switch.
    This enables the first mandrel to work as a roughing function on the flat edges and a shaping function on the rounded profiles.

  - n° 5 mandrels provided with pneumatic regulation only.
    These mandrels can smoothen / polish both the flat and rounded edges.

- N°1 POLISHING UNIT ONLY FOR STRAIGHT EDGE
  - n° 5 mandrels equipped with pneumatic pressure adjustment

- N°1 CHAMFERING UNIT
  fitted on the opening support to ease the replacement of tools, composed of:
  - n° 2 pneumatic pressure regulation mandrels This enables the mandrels to chamfer the flat edges.

- N° 1 DRIPPING CUTTING UNIT (OPTIONAL)
  assembled on swinging support to make possible insertion / exclusion directly from panel without forcing operator to go behind the machine.

- N°1 MULTIFUNCTION MANDREL (OPTIONAL)

fitted on a swivel support with vertical and horizontal adjustment, enabling the incision (even tilted) of the top of the part, bush hammering with adjustable tool inlet and outlet and the cleaning of the top of the part.

The following operating heads are available for the EVOLUTION model:

- N° 1 CALIBRATOR/DRIP HEAD (OPTIONAL)
  provided with height and depth adjustment and also with pneumatic pressure for the possible application of abrasive tools. Possibility of 90° rotation for use in calibration or drip cut operations.

- N° 1 PRE-CUTTING UNIT (ROUGHING)/CHAMFERING
  fitted on the swivel support to ease the replacement of tools, composed of:
  - n° 4 pneumatic pressure regulation spindles provided, as well as mechanical limit switch. This enables the mandrels to roughen the rounded profiles and chamfer the flat edges.

- N° 1 POLISHING UNIT
  fitted on the oscillating support to enable flat and rounded processing, composed of:
  - n° 1-2 pneumatic pressure regulation spindles provided, as well as mechanical limit switch.
    This enables the first mandrel to work as a roughing function on the flat edges and a shaping function on the rounded profiles.
  - n° 6 spindles provided with pneumatic regulation only.These mandrels can smoothen /polish both the flat and rounded edges.

- N° 1 DRIPPING CUTTING UNIT (OPTIONAL)
  assembled on swinging support to make possible insertion / exclusion directly from panel without forcing operator to go behind the machine.

- N°1 MULTIFUNCTION MANDREL (OPTIONAL)
  fitted on a swivel support with vertical and horizontal adjustment, enabling the incision (even tilted) of the top of the part, bush hammering with adjustable tool inlet and outlet and the cleaning of the top of the part.

The following operating heads are available for the BULL 126 model:

- N° 1 CALIBRATOR/DRIP HEAD (OPTIONAL)
  provided with height and depth adjustment and also with pneumatic pressure for the possible application of abrasive tools. Possibility of 90° rotation for use in calibration or drip cut operations.

- N° 1 PRE-CUTTING UNIT (ROUGHING)/CHAMFERING
  fitted on the opening support to ease the replacement of tools, composed of:

- n° 2 pneumatic pressure regulation mandrels provided, as well as mechanical limit switch.This enables the mandrels to roughen the rounded profiles and chamfer the flat edges.

- N° 1 POLISHING UNIT
  assembled on swinging support to make possible working of normal and curvilinear edges, composed of:
  - n° 1 spindle with regulating pneumatic pressure and also with mechanical regulator of maximum depth of the tool.
    With this dotation, the spindle can produce grinding of normal edge or profiling of curvilinear edges.
  - n° 5 spindles with regulating pneumatic pressure.
    These spindles smooth/polish normal and curvilinear edges.

The following operating heads are available for the FLYING BULL model:

- N° 1 CALIBRATOR/DRIP HEAD (OPTIONAL)
  provided with height and depth adjustment and also with pneumatic pressure for the possible application of abrasive tools. Possibility of 90° rotation for use in calibration or drip cut operations.

- N° 1 PRE-CUTTING UNIT (ROUGHING)/CHAMFERING
  fitted on the opening support to ease the replacement of tools, composed of:
  - n° 2 pneumatic pressure regulation mandrels provided, as well as mechanical limit switch.
    This enables the mandrels to roughen the rounded profiles and chamfer the flat edges.

- N° 1 POLISHING UNIT
  fitted on the oscillating support to enable flat and rounded processing, composed of:
  - n° 1 pneumatic pressure regulation mandrels provided, as well as mechanical limit switch.
    This enables the first mandrel to work as a roughing function on the flat edges and a shaping function on the rounded profiles.

  - n° 5/6 mandrels provided with pneumatic regulation only.
    These mandrels can smoothen / polish both the flat and rounded edges.

- N° 1 CHAMFERING UNIT (OPTIONAL)
  fitted on the opening support to ease the replacement of tools, composed of:
  - n° 2 pneumatic pressure regulation mandrels. This enables the mandrels to chamfer the flat edges.

- N° 1 DRIPPING CUTTING UNIT (OPTIONAL)
  assembled on swinging support to make possible insertion / exclusion directly from panel without forcing operator to go behind the machine.

- N°1 MULTIFUNCTION MANDREL (OPTIONAL)
  fitted on a swivel support with vertical and horizontal adjustment, enabling the incision (even tilted) of the top of the part, bush hammering with adjustable tool inlet and outlet and the cleaning of the top of the part.

The following operating heads are available for the SEVEN model:

- N° 1 CALIBRATOR/DRIP MANDREL (OPTIONAL)
  provided with height and depth adjustment and also with pneumatic pressure for the possible application of abrasive tools.
  Possibility of 90° rotation for use in calibration or drip cut operations.

- N° 1 PRE-CUTTING UNIT (ROUGHING)
  fitted on the swivel support to ease the replacement of tools, composed of:
  - n° 2 pneumatic pressure regulation mandrels provided, as well as mechanical limit switch.
    This enables the mandrels to roughen the rounded profiles and chamfer the flat edges.

- N° 1 POLISHING UNIT
  fitted on the oscillating support to enable flat and rounded processing, composed of:
  - n° 1/2 pneumatic pressure regulation mandrels provided, as well as mechanical limit switch.
    This enables the first mandrel to work as a roughing function on the flat edges and a shaping function on the rounded profiles.

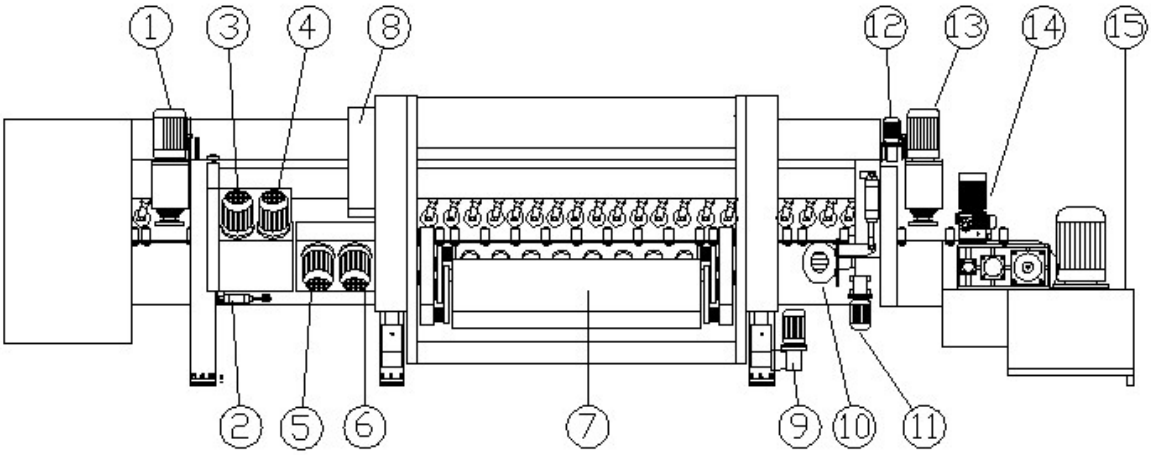
  - n° 6 mandrels provided with pneumatic regulation only.
    These mandrels can smoothen / polish both the flat and rounded edges.

- N°1 CHAMFERING UNIT
  fitted on the swivel support to ease the replacement of tools, composed of:

  - n° 2 or 4 pneumatic pressure regulation mandrels provided, as well as mechanical limit switch. These mandrels can chamfer flat edges.

- N°1 MULTIFUNCTION MANDREL (OPTIONAL)
  fitted on a swivel support with vertical and horizontal adjustment, enabling the incision (even tilted) of the top of the part, bush hammering with adjustable tool inlet and outlet and the cleaning of the top of the part.

As an example, the rear view of the EVOLUTION model is shown:



1) calibrator 3) 1° upper chamfer 5) 1° lower chamfer 7) spindles edge/bull bar 9) positioning group transporting spindles bar 11) transfer support group bar (optional)	2) chamfer group locking 4) 2° upper chamfer 6) 2° lower chamfer 8) motor swing accomodation 10) water drip motor (optional) 12) lift group pressing bar 14) movement group conveyor 15) hydraulic central

2.2 ENVIRONMENTAL CONDITIONS

The machine does not require particular environmental conditions: it must be used sheltered against weather conditions. Check that the supporting floor surface is solid and level so as not to lose stability. Only operate with suitable natural or artificial lighting and adequate ventilation. The ambient temperature for safe and correct operation must range from -5 °C to +40 °C.

Use the machine sheltered against weather conditions!
The machine was built with a protection rating of IP 54 protecting it against the entry of dust and water jets.

2.3 LIGHTING

The machine is not equipped with its own lighting.
The environment where the machine is used must allow good visibility of all the points of the work area pursuant to current regulations.

2.4 SOUND EMISSIONS

The machine was designed and constructed to reduce the sound emission level at the source. COMPLY with the instructions in this manual and with the working parameters of the TECHNICAL DATA table to minimise noise emissions.
Measurements were made according to that set forth by standard EN 15572:2015 Annex A.

The results of the tests carried out provide the following information on the noise emitted by the machine:

MACHINE OPERATING WITHOUT PIECES BEING PROCESSED:

From 81.0 dB(A) to 82.5 dB(A)

MACHINE OPERATING WITH PIECES BEING PROCESSED:
For performed measurements the maximum value of the C weighted instantaneous sound pressure is less than 130 Dba

EQUIVALENT SOUND LEVEL IN CORRESPONDENCE OF THE WORKING POSITION

workstation	equivalent sound level
front	85.4 db(A)
rear	84.3 db(A)

AIRBORNE NOISE VALUE PRODUCED BY THE MACHINE

Although there is a connection between emission levels and exposure levels, this cannot be reliably used to determine whether or not additional precautions are required.
The factors which determine the level of exposure that the worker is exposed to, include exposure duration, workplace characteristics and other sources of noise (e.g. number of machines, adjacent processes, etc.).
In any case, the information mentioned will allow the user of the machine to perform a better assessment of the danger and the risk to which he is exposed.

2.5 SAFETY DATA SUMMARY PLATE

SASSOMECCANICA Srl ITALIA via del Lavoro, 2 63076 MONTEPRANDONE, Italy tel +39 0735 650988 Fax +39 0735 657741 info@sassomeccanica.it					
Read the user manual carefully before using this machine		It is strictly prohibited to remove or tamper with the protections and safety devices		disconnect the power supply upstream of the electrical panel before opening the door	
Unauthorised personnel must keep away from the machinery while in motion		it is prohibited to oil, grease or adjust moving parts		Slippery floor: use footwear with non-slip soles	
This machine must only be used by trained and authorised personnel		Presence of laser beams: do not look at the laser beam		It is strictly forbidden to handle the machine with anchors other than those provided	
Wear hearing protection as indicated in the noise risk assessment document		Safety footwear (EN 20345 EC) with toecap and non-slip soles		Mandatory to wear protective gloves against mechanical risks (EN 388 EC)	

3 INSTALLATION

3.1 HOW TO INSTALL

The machine must be installed by the manufacturer or a technician authorised by them. After the machine has been installed, final testing is carried out in the presence of the user.

If the result of final testing is POSITIVE, a copy of the USER INSTRUCTIONS and the DECLARATION OF CONFORMITY of the manufacturer are released.

3.2 POSITIONING THE MACHINE

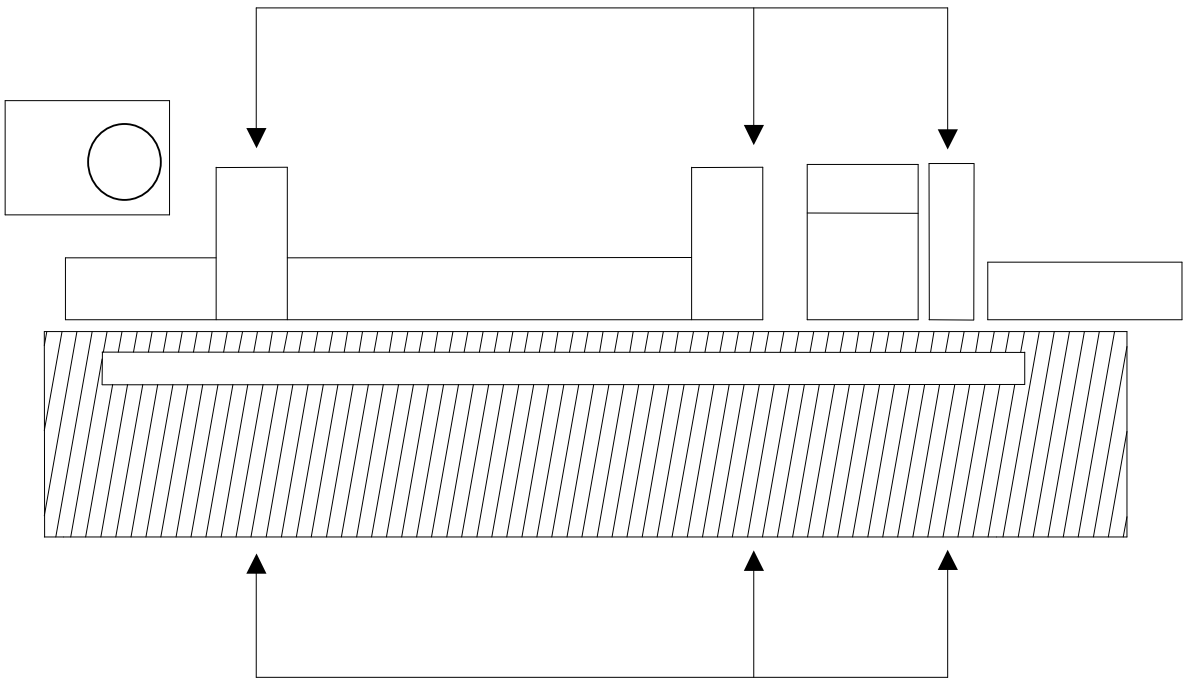


Figure 3-1

The figure shows the positions of the machine support points.

When first positioning the machine, the supports must be adjusted as shown in the following figure.

Check that the machine is level by placing a spirit level in several points of the belt surface in the direction of travel and crosswise.

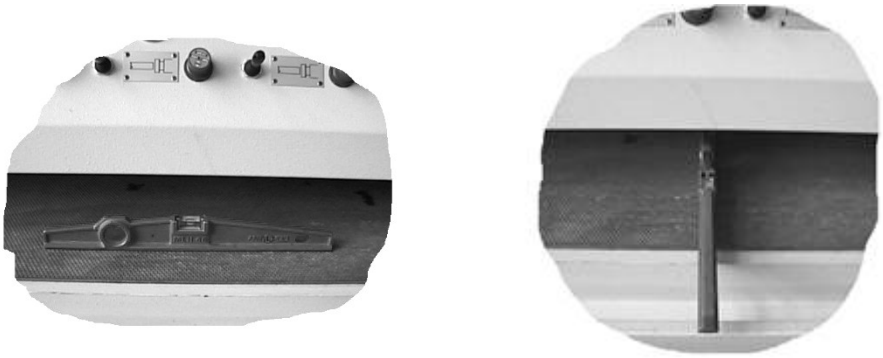


Figure 3-2

To obtain flatness, use the adjusting screws B of the supports to change the distance between the machine plate and the counter plate resting on the ground.

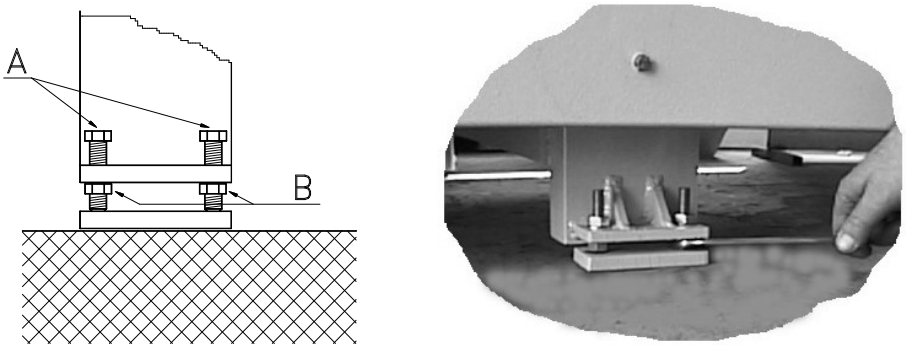


Figure 3-3

Once flatness has been obtained, make sure that all the adjusting screws B of all the supports on the ground are equally tightened so that the weight of the machine is properly distributed on all screws.

At the end of the operation, slightly tighten the fixing screws A.

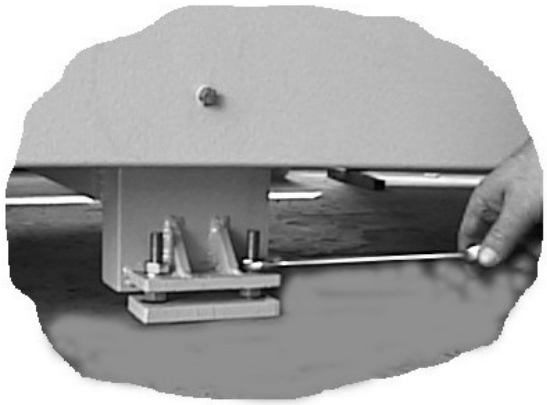


Figure 3-4

The machine does not need any special foundation works.

3.3 LIFTING AND HOOKING POINTS

When it is necessary to remove the machine, it is recommended to only use the grip points, as detailed below, in order to avoid damage to the machine itself and to avoid creating hazardous situations for the operators.

It is also necessary to fasten the bridge to the position suitable for handling the machine to keep it balanced.

The following pictures show the general lifting pattern and the specific hooking points of the machine.

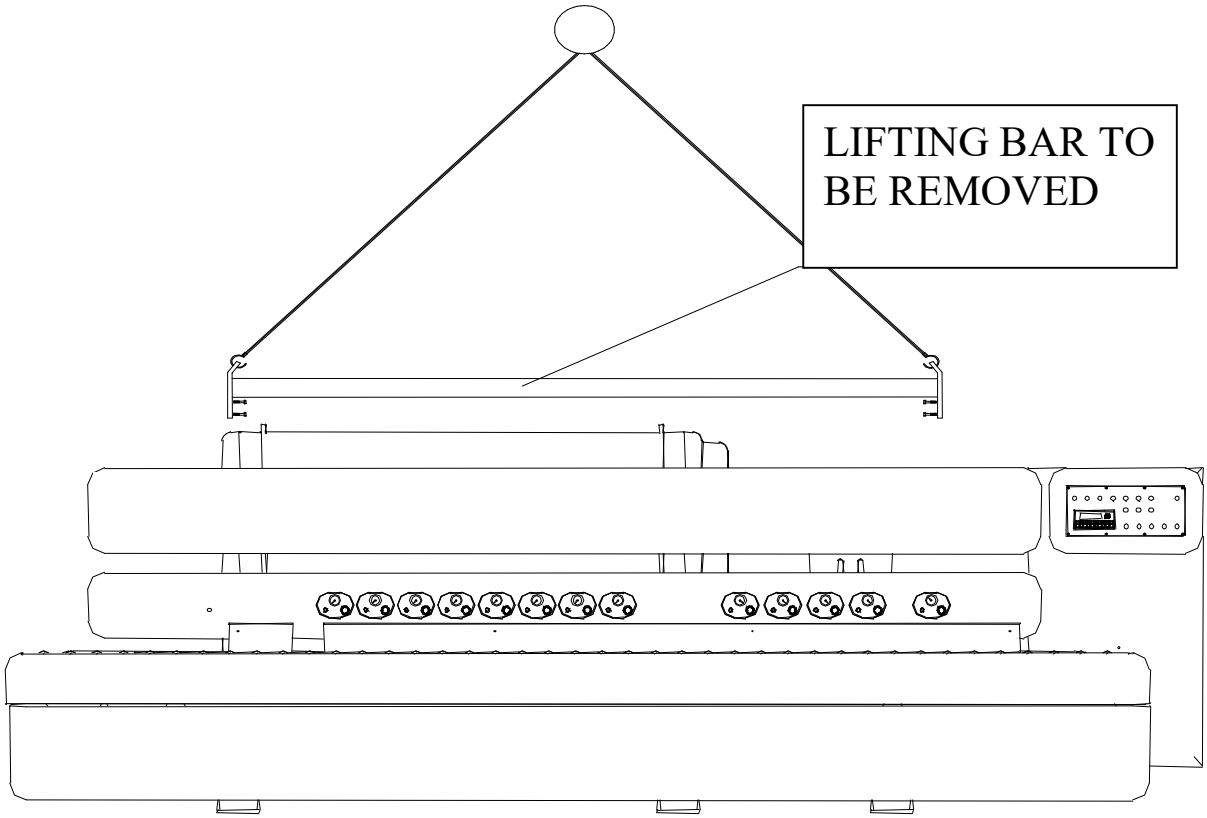


Figure 3-5

The figure shows one hooking point of the machine to lift it safely.

It is recommended to only lift the machine by its gripping point.

Only for the BULL 126 model the lifting system differ from that shown in the previous image; the following images show the general lifting scheme:

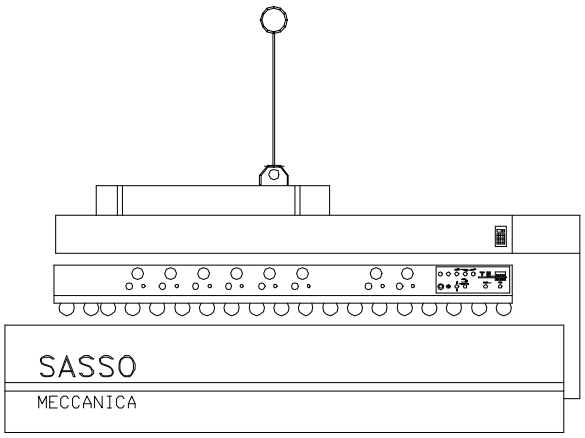


Figure 3-6

The figure shows the only gripping point of the "BULL 126" machine, which makes its lifting safe and balanced.
It is recommended to lift the machine by picking it up only by the appropriate gripping point.

Once the machine has been positioned, the locking screws must be removed as shown in the following figure.

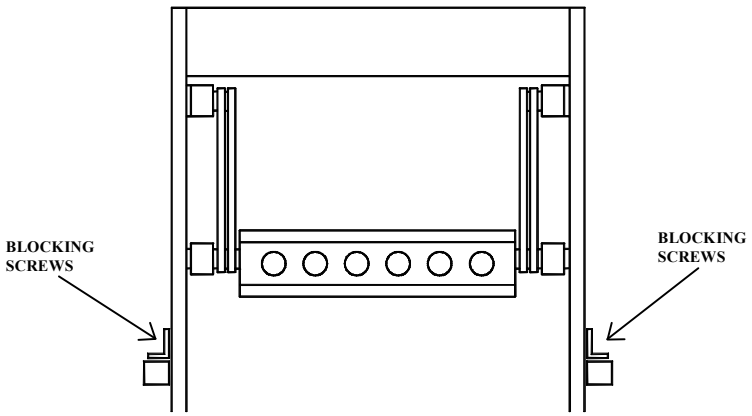


Figure 3-7

ATTENZION: it is absolutely necessary to remove the locking screws before carrying out the first start-up procedure.

Before moving and then lifting the machine or the various parts, make sure that the lifting devices (crane, ropes or ropes, etc.) used are suitable to withstand the loads indicated on the plate.

3.4 CONNECTIONS

As the hydraulic unit controlling the motors is separate from the machine, it must be connected before the machine is turned on.

The first thing to do is to insert the oil pipes as shown in the picture.
There are three connectors: two smaller connectors and a larger one.
The two smaller connectors can be connected without distinction in either position, while the larger connector must be connected into its socket.
Remember to tighten the connections to prevent any oil leaks.

Figure 3-8

After connecting the oil pipes, plug the electrical connector into its socket, as shown in the picture, and lock the two shutters above and below to activate also the electrical connection between the control unit and the machine.

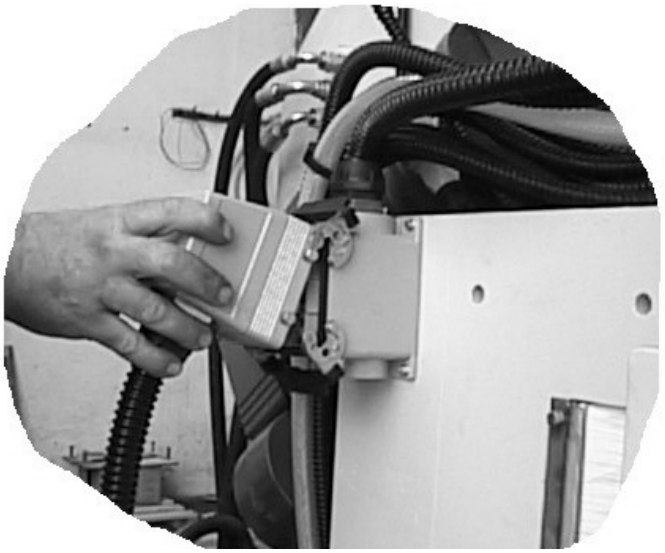


Figure 3-9

3.5 ELECTRICAL CONNECTION

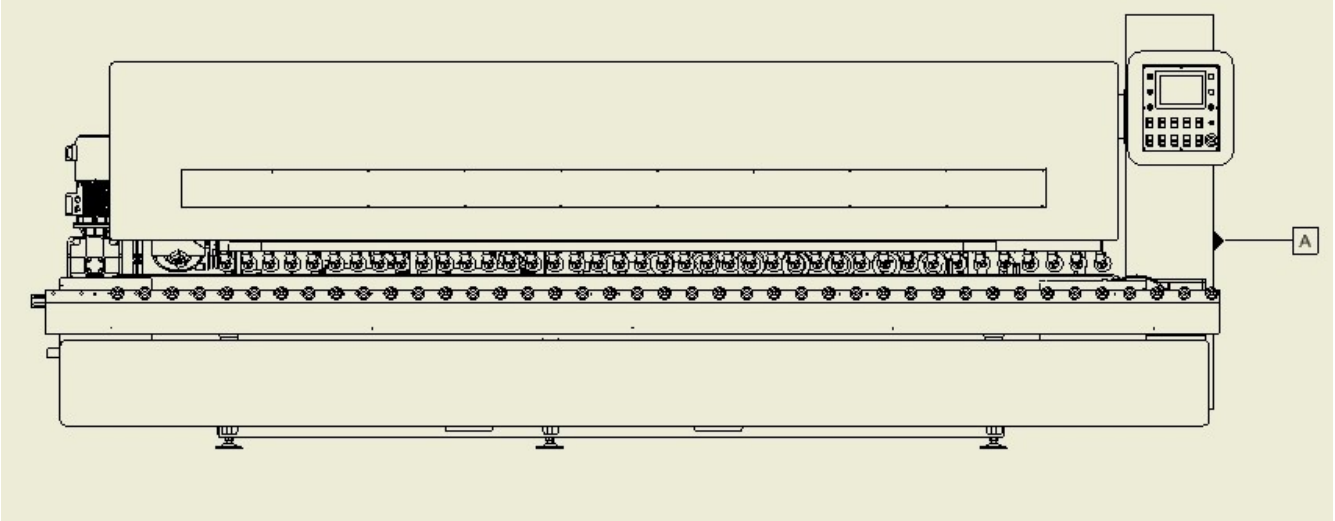


Figure 3-10

Install a three-pole residual current device near the machine of at least 125 Ampere.

Connect the electricity taken from the above-mentioned device using a regulation 4 x 25 mm^2 cable.

Insert the cable into the electrical board through passage A and connect it to the appropriate terminals.

Connect the earth wire to the electrical panel's earth terminal.

Check the power supply polarity when starting the belt. If the belt does not turn in the right direction (namely from the infeed to the outfeed of the machine where the gearmotor is positioned), swap the middle pole with one of the two side poles and repeat the check.

You will find further detailed explanations in the chapter on first start-up.

3.6 WATER CONNECTION

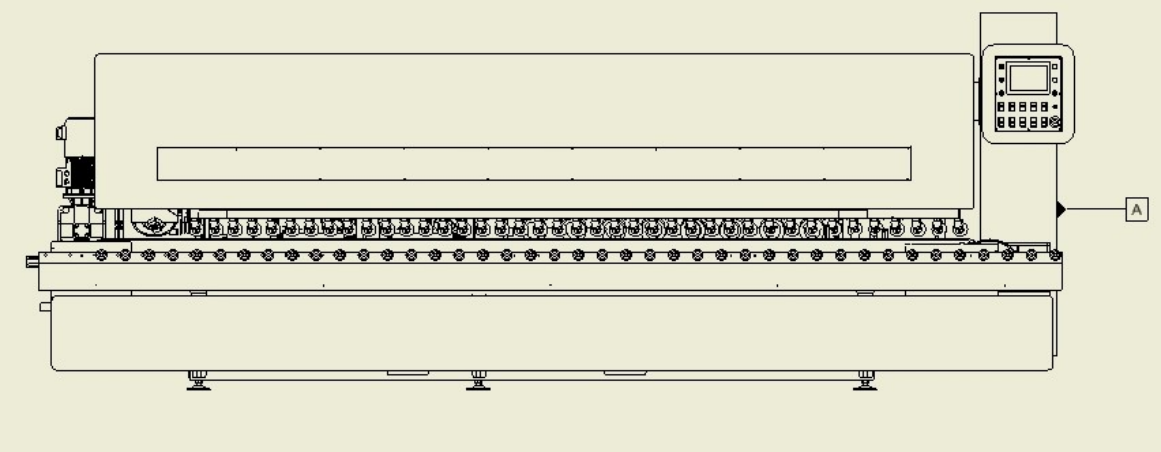


Figure 3-11

Connect the water supply at the point indicated by the letter A using a 1”1/2 GAS pipe.
It is advisable to place a closing tap between the water supply fitting and the machine.

The motors of the bullnose/edge spindles are driven by the hydraulic power unit located at the end of the machine, near the workpiece outfeed. Let the motor cool down, as prolonged use causes oil to be excessively heated.
Cooling is obtained with a coil heat exchanger in the oil tank.
A connection to running water is therefore required, as shown in the figure above, to constantly supply the exchanger

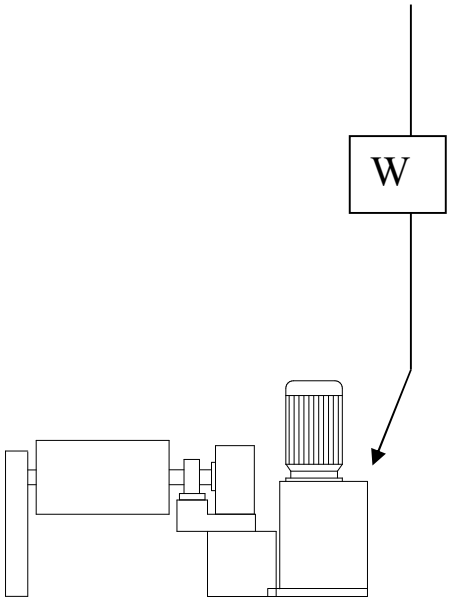


Figure 3-12

It is recommended to always keep the water tap open, as the cooling water, in addition to feeding the exchanger, is also conveyed to the belt washing system during unloading.

3.7 COMPRESSED AIR CONNECTION

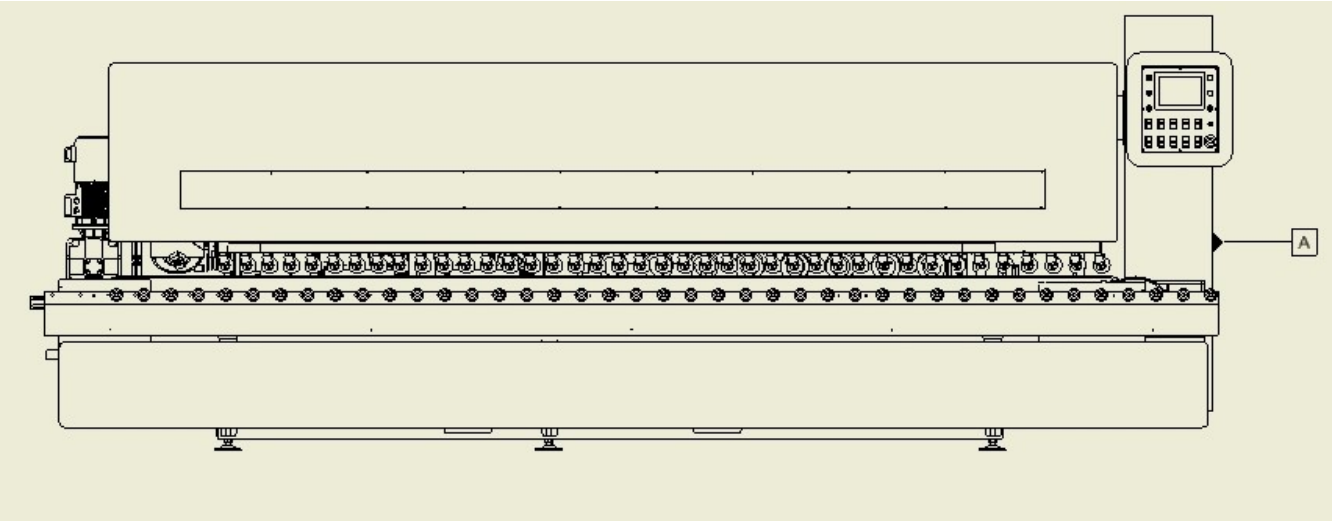


Figure 3-13

Connect the compressed air supply at the point indicated by the letter A using a standard 1/4" GAS pipe.

It is advisable to place a closing tap between the water supply fitting and the machine.

It is recommended to deliver clean and dehumidified air into the machine in order to avoid damaging the internal pneumatic components.

3.8 LIGHTING IN THE WORK AREA

The machine is not equipped with its own lighting. The area where the machine is installed must have an average lighting of at least 300 Lux (standard EN 12464).

3.9 ERGONOMICS

The ASSESSMENT of the WORKING RATE and of the aspects regarding discomfort, fatigue, POSTURE and mental and physical stress of the operator are closely related to the work organisation of the user.

The OCRA method or an equivalent method must be used for these ASSESSMENTS by the EMPLOYER.

4 SAFETY

4.1 SAFETY INFORMATION ON THE MACHINE

The operator must carefully read the information in this manual, paying special attention to the safety precautions listed in this chapter.
It is also essential that the operator follow the warnings listed below:

- keep the machine and the work area clean and tidy
- provide areas to store the material being processed
- use the machine in adequate mental-physical conditions
- wear adequate clothing and suitable personal protective equipment as indicated
- **do not remove** or alter the plates applied on the machine
- **do not remove** or bypass the machine's safety systems
- use the machine indoors and sheltered against weather conditions
- **do not perform** maintenance with the machine running
- **do not use** the machine in an explosive atmosphere
- **do not use** the machine to processes materials other than those for which it was manufactured: **marble, granite or agglomerates.**
- Use suitable tools for correct assembly, clamping and alignment, as per the instructions
- Before starting a job, make sure that the material to be cut is positioned correctly on the machine.
- If the type of process can cause the piece to move in an uncontrolled manner, it must be clamped to the table.
- The material being processed must not protrude from the supporting table
- Before starting the machine, the operator must always check that:
  - The machine is in good working order
  - All of the safety devices are in place and working
  - Periodical maintenance has been performed regularly
  - There was no one in the danger zone
  - The zone around and underneath the machine is clear and there are no flammable materials in the vicinity of the machine

4.2 SAFETY INFORMATION REGARDING PERSONNEL

Personnel in charge of using the machine must be appropriately instructed and trained on its use. This manual is an essential support for the training of the appointed personnel.

- Instruction and training, in addition to the specific instructions regarding operational management of the machine, must include all the indications regarding safety in normal operating conditions, in the management of materials directly involved in the process, in the management of consumables, in the management of faults and in the execution of maintenance.
- Personnel must be instructed and trained under the constant supervision of a person experienced in the use of the machine designated by the employer.
- During training, the appointed person can only work with the machine under the constant supervision of qualified personnel.

- Personnel are considered qualified to use the machine when the supervisor issues a positive assessment on the outcome of the instructional/training course.
- It is strictly prohibited to have the machine operated by persons not qualified with the methods indicated above.

4.3 GENERAL PRECAUTIONS REGARDING USE OF THE MACHINE

These guidelines refer to normal behaviour which operators must have regarding the machinery and therefore the manufacturer considered them known by the operator in the design and construction of the machinery. The user must inform (through this manual) and train workers (operators and maintenance technicians) so that these indications are made known to personnel who will operate on the machine.

Read the user manual carefully before using this machine.	
This machine is only intended to process marble, granite and agglomerates with suitable tools.	
This machine must only be used by trained and authorised personnel.	
No one must be in the work area while the machine is being used.	
Do not use the machine without the safety protections correctly installed and efficient.	
Adequately illuminate the work area, as set forth in chapter 10.1 Ann. IV of Italian Legislative Decree 81/2008.	
Disconnect power and water and air pressure before performing maintenance, repairs or tool changes.	
Wear hearing protection as indicated in the noise risk assessment document, also in relation to the machine's work environment	
Wear gloves to handle the material, to replace the tools or to perform any maintenance operation	
Wear safety footwear (EN 20345 EC) with toecap and non-slip soles.	
Properly clamp the material before starting the process	
Perform the maintenance indicated in the user manual at the prescribed deadlines.	
Do not spray water on the machine or on the electric components.	
Presence of laser beams: do not look in the direction of the laser beams.	

4.4 GENERAL SAFETY INSTRUCTIONS

Common sense must always prevail in the actions of a machine operator. The fact that potentially hazardous conditions exist, not only requires compliance with all of the safety standards, but also always observing and analysing the surrounding environment so as to take measures to avoid dangerous situations. If doubts arise, contact your immediate superior.

- Before starting any job, focus all your attention on what you are about to do

Always stay out of the danger zone while the machine is operating. Avoid any contact with the tool: risk of cutting, crushing, impact and shearing.

- DO NOT REMOVE THE SAFETY PROTECTIONS INSTALLED ON THE OUTSIDE PERIMETER OF THE MACHINE. They may only be removed to perform extraordinary maintenance, which must only be done by qualified personnel.
- Do not place your hands or other body parts in proximity of moving parts.
- It is prohibited to use means which can increase natural accessibility.
- Working without the necessary attention, looking around, carrying on conversations are imprudent actions which can cause serious injury.
- Do not work on the machine if you are tired or distracted.
- Do not use the machine under the effect of alcohol, medicine and/or drugs: if you, the operator, are taking medicine, consult your doctor to avoid any side effects of the treatment which could jeopardise your capability of working with the machine.
- If the operator is feeling ill or is in unfit physical conditions, even slightly, which can reduce the degree of vigilance, avoid operating the machine and inform the plant manager.
- The machine is equipped with mushroom shaped emergency/stop pushbuttons: get to know their position, remember where they are to always be able to reach them quickly in any occasion.
- Always leave the safety devices and emergency/stop button clear and accessible.
- If situations of imminent danger arise, press the emergency/stop pushbutton well visible on the pushbutton panel: this operation will stop the machine.
- Before starting any operation and at the beginning of each work shift, the operator must check that all the personal safety devices, the guards and the machine are in proper conditions: any failures must be immediately reported to the manager and no intervention can be carried out without being authorised by them.
- At the beginning of each work shift, check that all safety and warning stickers are legible: report and immediately replace any which are missing, damaged or hard to read.
- Do not allow other persons to approach the machine while running. Always make sure that no unauthorised personnel are in the immediate vicinity of the machine.
- At the end of a job, immediately remove all scrap material from the work area: the table of the machine must always be clean and clear of residual material, leaked lubricants, if any, or any other material which could be dangerous.
- Do not use TOOLS whose maximum operating speed, indicated by the manufacturer, is slower than the intended rotating speed of the machine.

- Do not allow unauthorised personnel to intervene on the machine.
- DO NOT SMOKE OR USE MOBILE PHONES DURING WORK
- MAKE SURE that all guards are in place and all safety devices are installed and efficient.
- Keep flammable fumes (petrol, solvents, etc.) away from the electrical parts inside the machine.
- Lubricants are poisonous and hazardous to health: do not inhale or ingest them, avoid contact with eyes and skin. Inhaling or ingesting these liquids causes vomiting: should this occur, gargle with clean running water and seek medical attention. In case of contact with eyes, wash them immediately with running water and see an eye doctor. In case of contact with skin, wash immediately with plenty of water.

All routine maintenance, inspections and general lubrication must be carried out with the machine stopped and power supplies disconnected (electrical and other).

4.5 SAFETY SIGNS

	**The following danger sign is normally placed on the box containing the electric panel. A door lock mechanism does not allow the door to open without first having disconnected the power. However, it is recommended to remove the power supply upstream of the electrical board before opening the door.**
	**Slippery floor: use footwear with non-slip soles**
	**IT IS PROHIBITED TO OIL, GREASE OR ADJUST MOVING PARTS**
	**IT IS STRICTLY PROHIBITED TO REMOVE OR TAMPER WITH THE PROTECTIONS AND SAFETY DEVICES**
	**UNAUTHORISED PERSONNEL MUST keep away from the machinery while in motion. The operator must check that the work area of the machine is completely clear of unauthorised personnel.**
	**MANDATORY TO READ THIS MANUAL**
	**PROTECTIVE EARMUFFS MANDATORY**
	**MANDATORY to wear safety footwear (EN 20345 EC) with toecap and non-slip soles.**

	**Mandatory to wear protective gloves against mechanical risks (EN 388 EC).**
	**The signal shown at the side indicates the grip points for total or partial lifting of the machine.** **It is strictly forbidden to handle the lifted machine with anchors other than those provided.**

4.6 SAFETY DEVICES

Operation of the safety devices installed on the machine (fixed casings, movable guards, safety doors, emergency stop buttons) **must be checked daily** before starting work. The operator must immediately notify the maintenance manager in case of failed operation of the safety devices.
The machine user and the operators are responsible for complying with the safety standards and must have the necessary technical know-how.

- Those in charge of the organisation must therefore guarantee:
- that the machine is entrusted to personnel trained on its used according to the contents in this manual
- that personnel always have the user manual at hand
- that the safety devices are checked daily: emergency buttons, fixed casings, movable guards.

	it is strictly prohibited, in normal machine operating conditions, to work with the light curtain excluded and the front protection open. The machine must be operated by only one person to guarantee the inviolability of the light curtain.

4.7 OPERATOR STATION AND DANGER AREA

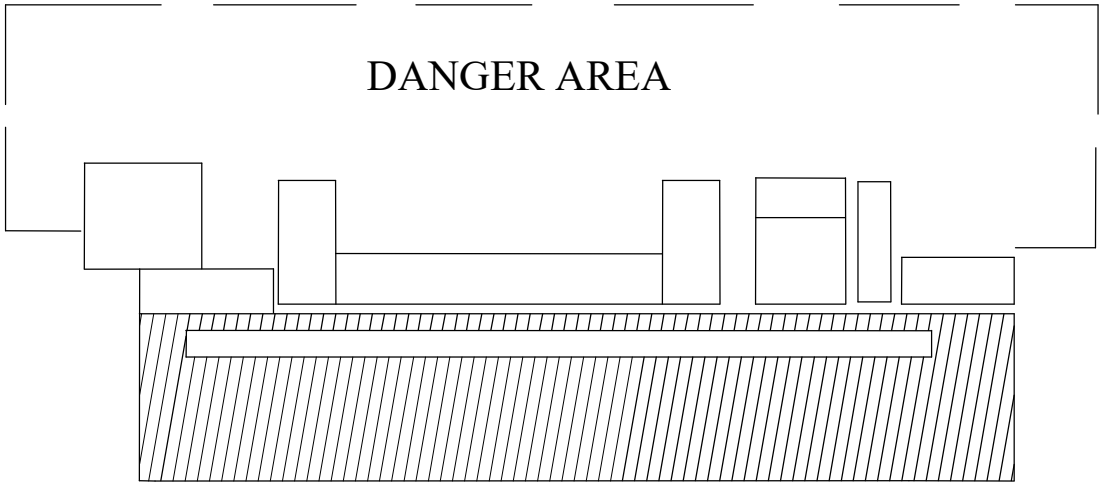


Figure 4-1

- The machine has been designed and constructed so as to make the manned area as safe as possible.
- All of the material loading and unloading, adjustments and control operations take place at the front of the machine where there is no danger for the operator.
- Nonetheless it is necessary to access the rear area, identified as a danger zone, in order to replace tools and to set the calibrating/water drip spindle.
- Replacement of tools or setting of the calibrating/water drip spindle cannot be carried out with the machine running and assumes that machine operation is stopped.
- Though there is no risk in the danger zone when the machine is stopped, nonetheless it is recommended to place the machine in emergency conditions before accessing this area.

Check the efficiency of the safety devices at the frequency indicated in the maintenance table.
IT IS NOT ALLOWED TO WORK WITH THE SAFETY DEVICES DISABLED

4.8 INSTRUCTIONS ON ELECTRICAL MAINTENANCE

All of the tasks carried out on the electrical part of the machine pose a potential risk of electrocution.
The intervention on the electrical part must only be carried out by qualified personnel.

The machine is equipped with an equipotential protective circuit against indirect contact. Every live part of the machine is isolated from parts that can come into contact with the operator

- Before removing any guard/protection and starting maintenance on the electrical part of the machine, personnel must:
  - Disconnect power
  - Use a specific instrument to make sure that there is actually no phase-to-phase or line-to earth voltage.
  - Follow the insulation and tagging procedure as specified in current standards.
- Always use tools with an insulated grip and in good conditions, rubber gloves, rubber matts. Floors and sheaths should not be considered safe if they are not marked with the insulation test.
- Do not perform measurements using metal tape measures.
- Before working on any circuit connected to capacitors or other capacitive elements, discharge the capacitors and the capacitive elements to earth, even after having disconnected power to the circuit.
- Before replacing any component, make sure there is no voltage in the circuit.
- Do not use water or foam to put out fires on electrical material or in the vicinity of electrical wires, electrical machines and devices: only use powder, carbon dioxide or Halon.

PREVENT the power cables of the machine from being crushed or coming into contact with moving parts or equipment.
PREVENT the power cables from coming into contact with water or other liquids.

4.9 INTENDED USE

The machine this manual refers to is designed and built to perform polishing, bevelling, bush hammering, incisions and dripping on marble, granite or agglomerate slabs or blocks, using abrasives, diamond discs and tools, of suitable features, normally found in the market.

Processing other materials than those indicated are not compatible with the features of the machine and can cause dangerous situations.

4.10 REASONABLY FORESEEABLE MISUSE

It is reasonably foreseeable for an operator to perform the following incorrect manoeuvres with respect to what is intended for processing on this machine:

- problems could come up related to the quality of the required finished; there are no problems relative to the safety of the machine.
- The material is loaded with materials other than what it was designed for:
- problems linked to wear of the abrasives could come up. There are no hazardous situations

4.11 PROHIBITED USE

The machine must be used as intended by the manufacturer, as indicated in this manual.
In particular it is prohibited to use the machine:

- for uses other than those indicated in this manual;
- with guards or protective devices removed, damaged or inefficient;
- with electric jumpers made to bypass safety devices;
- in explosive atmosphere;
- in case of serious maintenance shortcomings;
- after unauthorised changes or interventions;
- beyond the operating limits indicated in this manual;
- with total or partial failure to comply with the instructions;
- in altered mental-physical conditions;
- in case of power supply defects.

	**ANY OPERATION IN THE POLISHING AREA MUST BE DONE WITH THE MACHINE OFF.**
	**DO NOT ATTEMPT TO MAKE THE INSTALLED SAFETY SYSTEMS INOPERATIVE**
	**DO NOT REMOVE THE FIXED GUARDS INSTALLED ON THE MACHINE. ANY MAINTENANCE OPERATION WHICH ENTAILS REMOVING THESE GUARDS MUST BE DONE WITH THE MACHINE OFF**
	**IF MOVING PARTS GET STUCK, REQUEST THE INTERVENTION OF THE MACHINE'S MAINTENANCE TECHNICIAN**
	it is strictly prohibited to make any type of changes to the machine's management software without prior consent of the manufacturer.

4.12 PERSONAL PROTECTIVE EQUIPMENT

In relation to the processes on the MACHINE carried out by the operator, it is deemed that said individual be supplied with the following personal protective equipment:

PROTECTION OF BODY PARTS	INTENDED PPE	OBLIGATION SIGN
PROTECTION OF EYES AND FACE	WEAR PROTECTIVE GOGGLES with side shields, protection rating B or higher (EN 166 EC), when the protections are open, if there are moving parts or pipes pressurised with air or water	
PROTECTION OF LOWER LIMBS	Safety footwear (EN 20345 EC) with toecap and non-slip soles.	
PROTECTION OF HANDS	Protective gloves against mechanical risks (EN 388 EC), with oil resistance, with a good degree of adherence and ergonomics and at least the following mechanical resistance levels: abrasion: 2 - cut: 2 - tear: 2 - perforation: 2	
PROTECTION OF BODY	Protective work clothing (EN 340 EC)	
HEARING PROTECTORS	Hearing protectors intended for the work environment where the machine is placed	

4.13 RESIDUAL RISKS

By RESIDUAL RISK we mean a potential hazard, impossible to eliminate or partially eliminated, which can harm the operator if intervening with incorrect work methods or practice.

The various machine components were designed to reduce or eliminate the risks.

The RISK ANALYSIS associated to use of the machine HIGHLIGHTS THE FOLLOWING RESIDUAL RISKS OF A CONTROLLABLE LEVEL.

RESIDUAL RISK	RESIDUAL RISK REDUCTION METHOD
RISK DUE TO SPINDLE MOVEMENT (residual risk of CONTROLLABLE level after the adoption of safety systems installed on the machine and of a training program and the definition of the minimum requirements for machine operators)	 ADOPTION OF A PERSONNEL TRAINING PROGRAM REPEATED AT REGULAR INTERVALS. The application of a PREVENTIVE MAINTENANCE PROGRAM is INTENDED and an inspection process of the installed safety systems.
RISK DUE TO CORRECT USE AND OPERATION OF THE EMERGENCY SAFETY BUTTONS	 ADOPTION OF A PERSONNEL TRAINING PROGRAM REPEATED AT REGULAR INTERVALS. The application of a PREVENTIVE MAINTENANCE PROGRAM is INTENDED and an inspection process of the installed safety systems.
RISK OF PERMANENT HEARING LOSS	 OBLIGATION of using hearing protective equipment, as indicated in this manual.
RISK DUE TO THE POSSIBILITY OF USING THE MACHINE WITH INOPERATIVE OR INEFFICIENT PROTECTIONS	 TRAINING OF PERSONNEL on the correct use of the machine. The application of a PREVENTIVE MAINTENANCE PROGRAM is INTENDED and an inspection process of the installed safety systems.
RISK OF CUTTING due to contact with sharp edges	 Protective gloves against mechanical risks (EN 388 EC), with oil resistance, with a good degree of adherence and ergonomics and at least the following mechanical resistance levels: abrasion: 2 - cut: 2 - tear: 2 - perforation: 2
RISK OF SLIPPING/FALLING in the work area	 MANDATORY to wear safety footwear (EN 20345 EC) with toecap and non-slip soles.
RISK FOR THE EYES when the protections are opened, if there are moving parts or tubes pressurised with air or water	 OBLIGATION of WEARING PROTECTIVE GOGGLES with side shields, protection rating of B or higher (EN 166 EC).

OPERATOR TRAINING BASED ON READING THE MANUAL, WITH SHADOWING OF EXPERT PERSONNEL, MAKES IT POSSIBLE TO KEEP ALL RESIDUAL RISKS UNDER CONTROL.

4.14 OPERATING METHODS TO BE FOLLOWED IN CASE OF INJURY

IN CASE OF INJURY TO A WORKER, IMMEDIATELY STOP THE MACHINE, MOVE THE VICTIM AWAY FROM THE MACHINE AND HELP HIM ACCORDING TO THE FIRST AID PROCEDURES DEFINED IN THE COMPANY.

5 MACHINE USE

5.1 REPLACEMENT OF ABRASIVES

When replacing tools, as for the openable supports, please refer to the picture below.

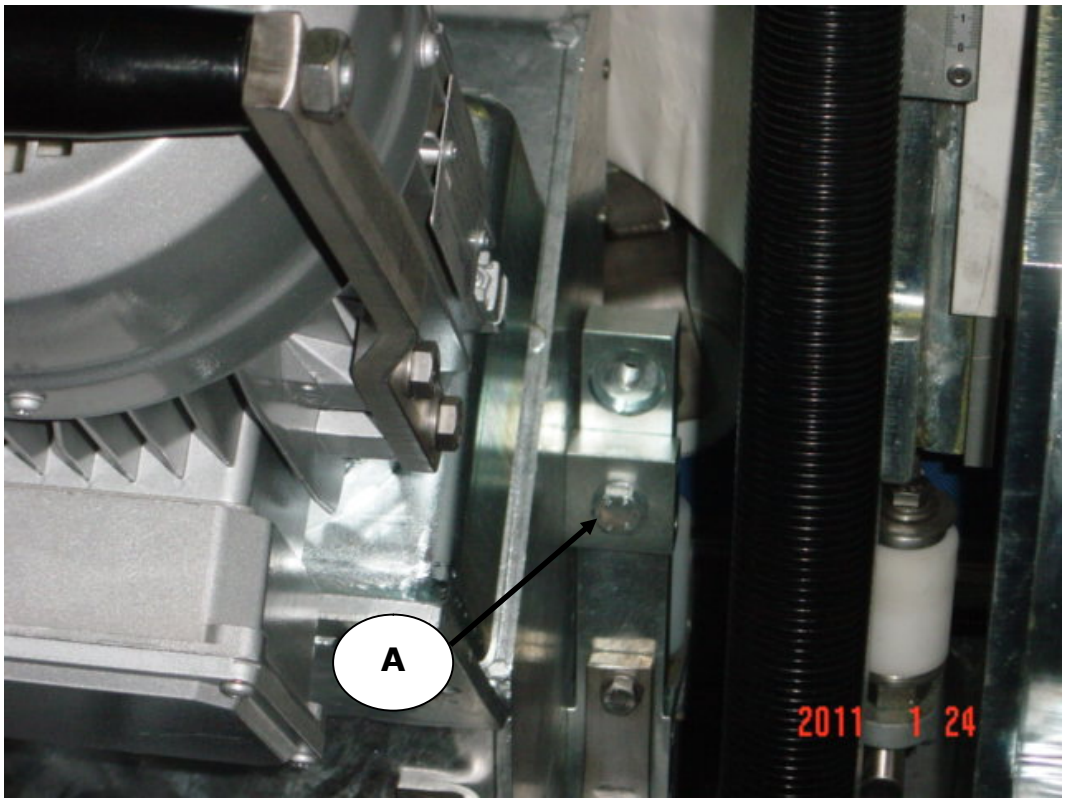
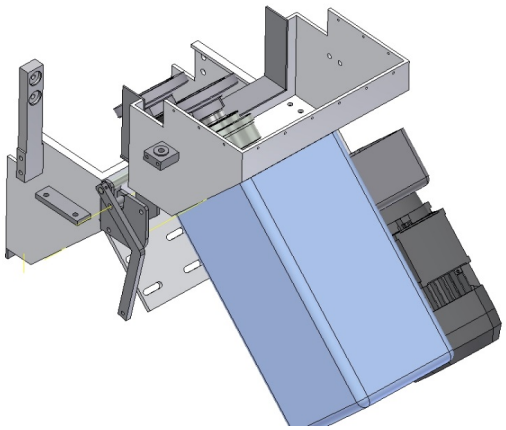


Figure 5-1

To facilitate the frequent replacement of the tools used to perform bevelling and roughing, the machine is designed so as to open the upper bevel to perform the replacement in a convenient position and in complete safety.
The upper bevel is opened by undoing the two sides screws (A) and tipping over the upper unit, holding it by the specific handle.



This operation must be carried out after having strictly disconnected the power to the machine or with the machine in emergency status.

Figure 5-2

As for the rotating supports, please refer to the picture below.

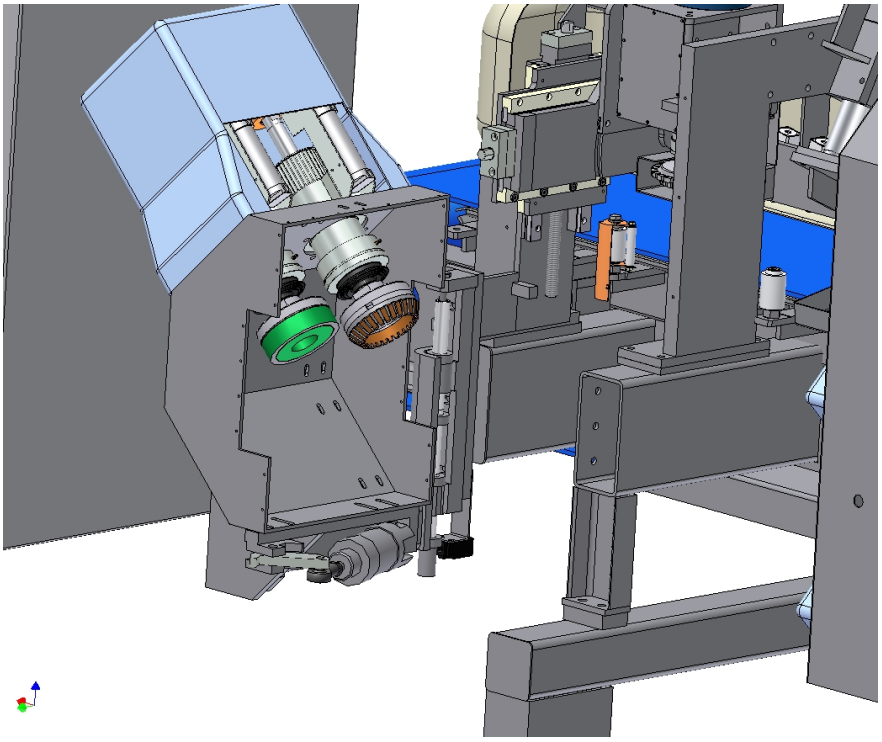


Figure 5-3

To simplify the frequent replacement of the tools used for bevelling, the machine is designed in such a way that the whole support can be turned, thereby performing the replacement in a convenient position and in complete safety.

This operation must be carried out after having strictly disconnected the power to the machine or with the machine in emergency status.

The necessary tools to replace the abrasive equipment are supplied as per standard with the machine for both the EVOLUTION and REVOLUTION models.
Since the tools have quick helical couplings, the abrasive only needs to be slightly rotated with the specific gripper supplied (**Errore. L'origine riferimento non è stata trovata.**), and the abrasive backing pad to be held still with the specific key, also supplied as per standard, so as to unclamp it.

This operation must be carried out after having strictly disconnected the power to the machine or with the machine in emergency status.

Always CHECK that the speed of the spindles is compatible with the maximum rotating speed of the tools as indicated by their manufacturers

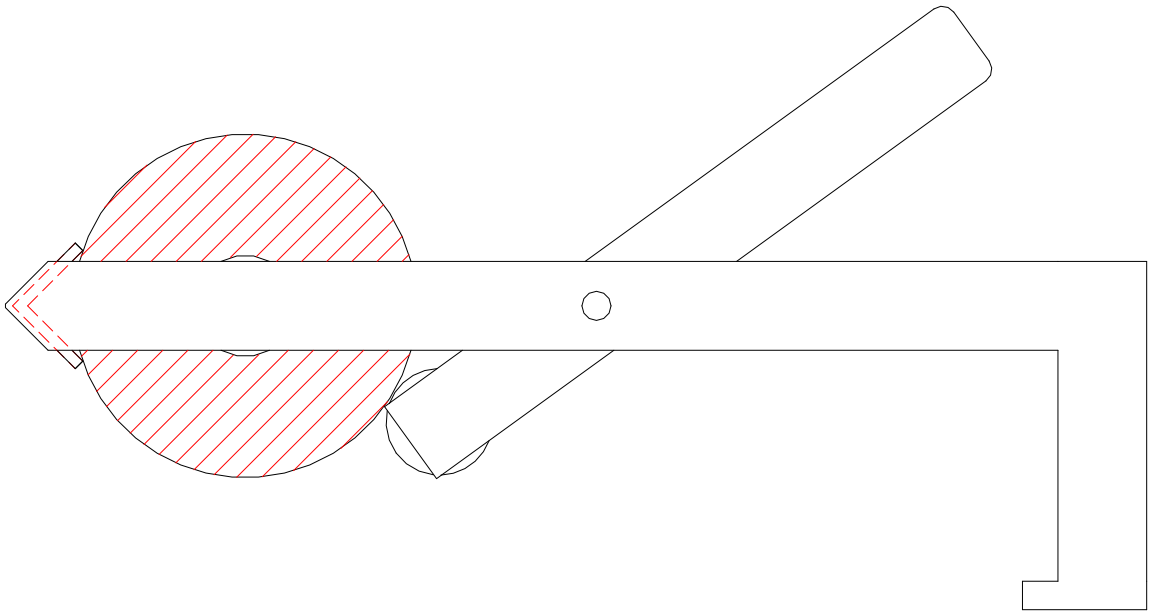


Figure 5-4

5.2 HEIGHT ADJUSTMENT OF SPINDLES FOR BEVELS (SEVEN/EVOLUTION)

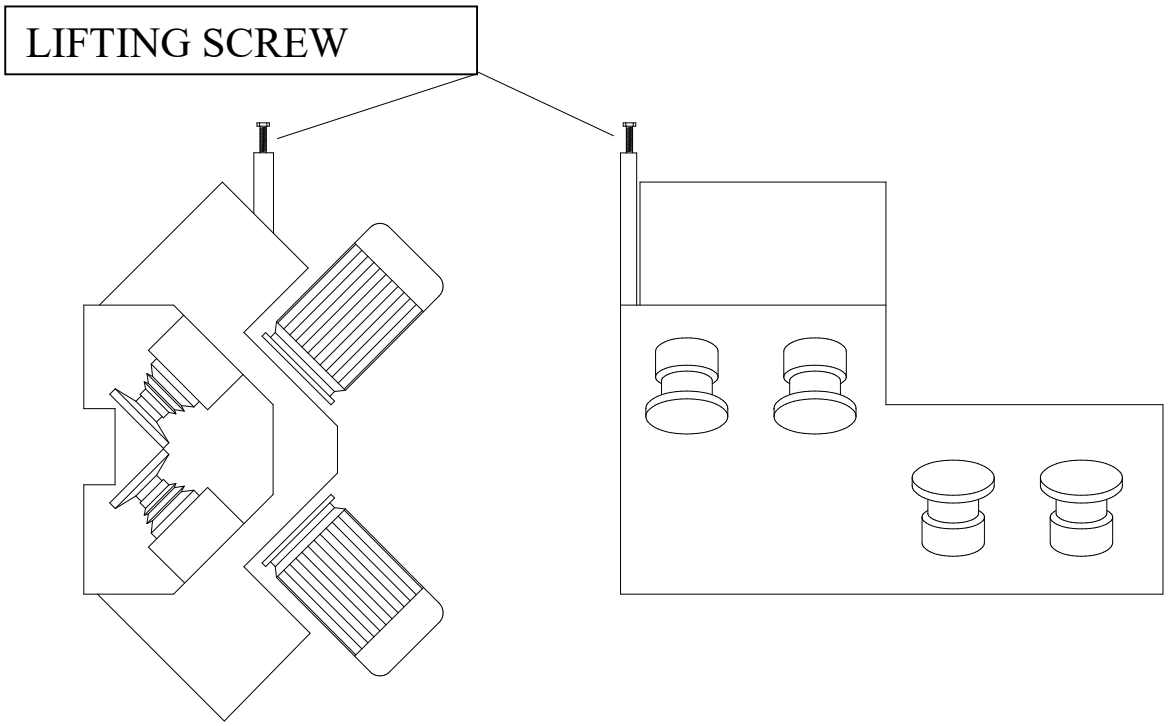


Figure 5-5

The machine can process up to 10 cm thick pieces.
For over 6 cm thick pieces to be machined, the height of the whole unit supporting the spindles for performing bevels needs to be adjusted.
This can be performed by releasing the rapid pneumatic clamping and operating the unit lifting screw.

This operation must be carried out after having strictly disconnected the power to the machine or with the machine in emergency status.

5.3 PRE-CUT ADJUSTMENT

This machine is equipped with an automatic pre-cut depth adjusting unit, but if this is damaged, adjustments can be performed manually as follows:
Pull the lever (A) and then fit the handwheel (B) onto the position indicator (C). Then turn the handwheel until the measurement displayed on the touch-screen can be read on the position indicator. Once the measurement has been reached, the lever (A) can be released.

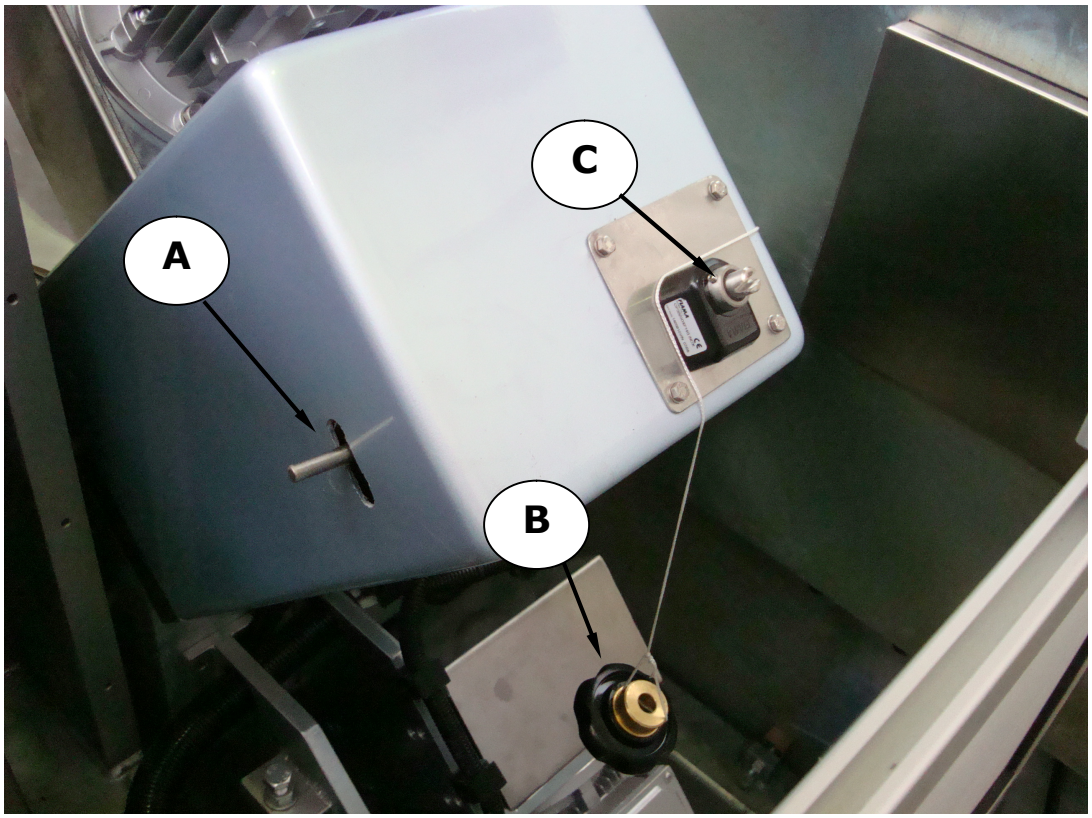


Figure 5-6

5.4 POSITIONING THE SHAPING WHEEL

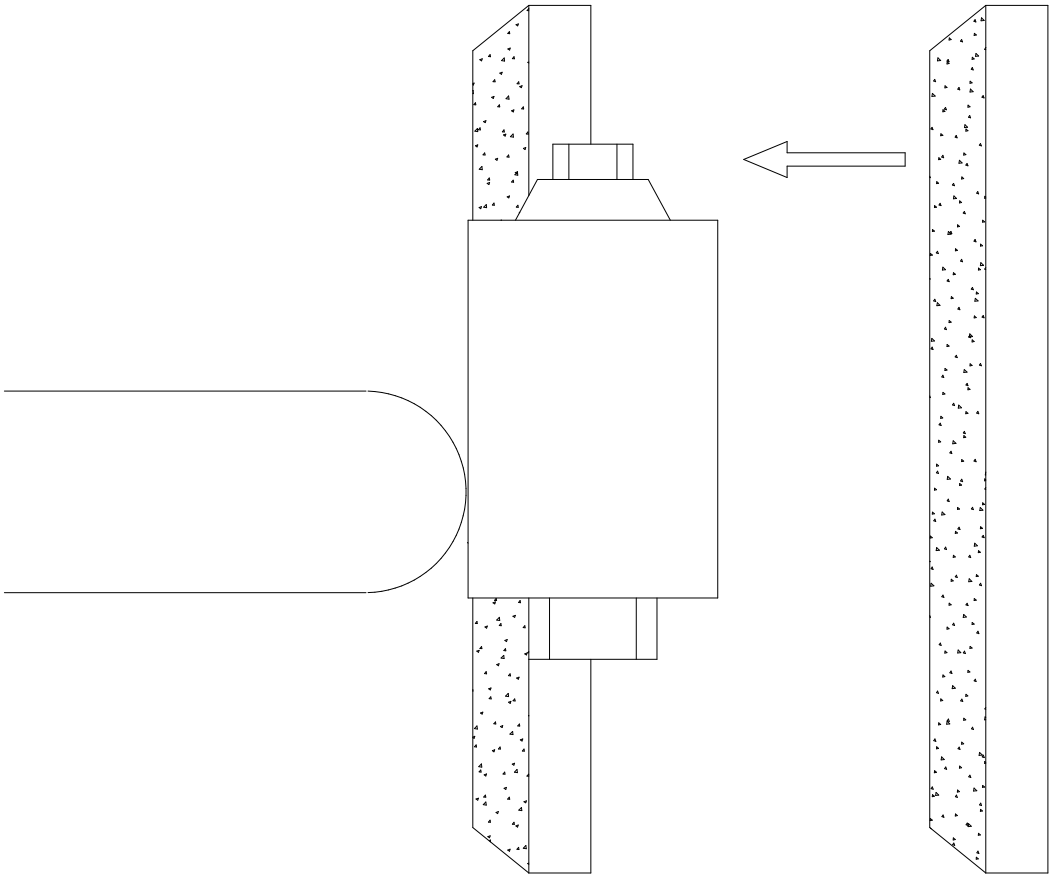


Figure 5-7

The shaping wheel performs the main task of giving the correct shape to the piece to subsequently be polished by the abrasive wheels.
Since the piece machining line is exactly in contact with the guide rollers, the roughing wheel must also be positioned exactly on the same line.
Once the data has been set in the computer, after the machine has moved to the selected radius position, the motor support bar will automatically reach the horizontal position for the wheel to be easily adjusted.

At this point, the pneumatic pressure can be reactivated to move the wheel towards the piece, and then an exact adjustment be performed by operating the appropriate handwheel.

5.5 POSITIONING ROUGHING WHEELS

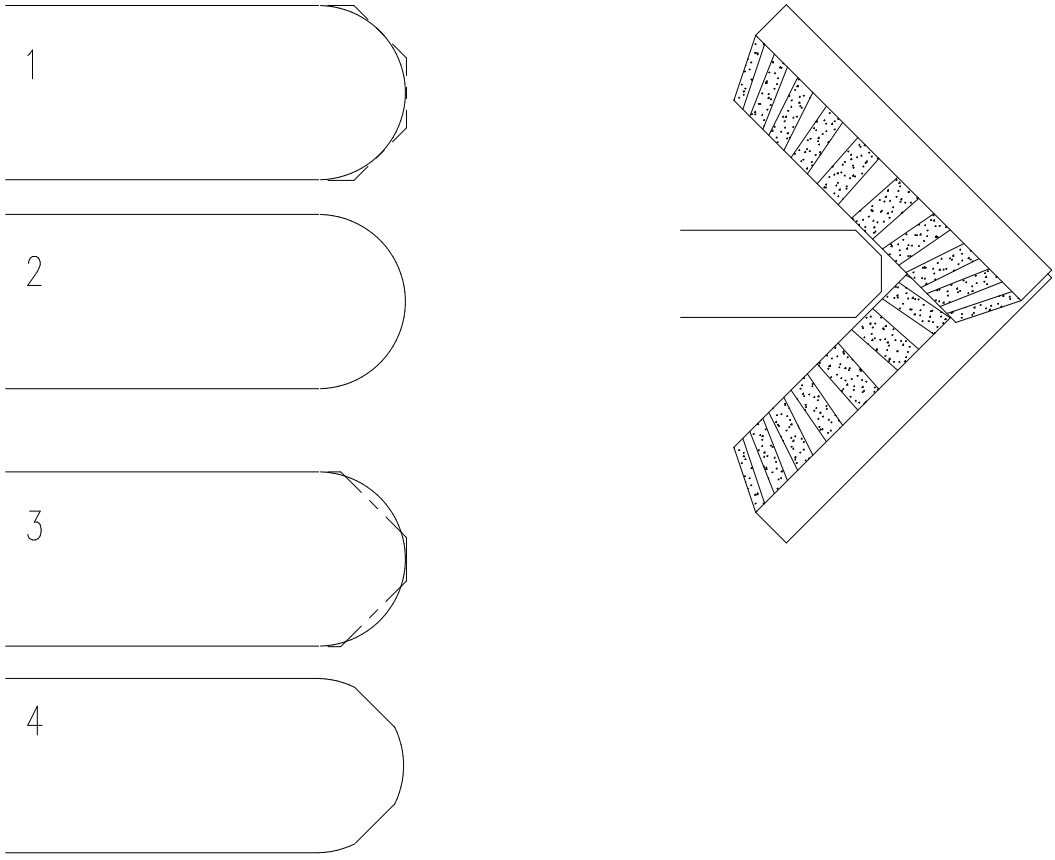


Figure 5-8

Roughing wheels must be positioned precisely.

Figures 1 and 2 show correct bullnose machining prepared by correctly positioning the roughing wheels.

Figures 3 and 4 show the effects of too deeply adjusting the roughing wheels: the bullnose will be crushed in the two points where the wheels have penetrated too deeply.

It is always advisable to refer to the equipment tables by performing some tests to fine-tune exact positioning.

5.6 CALIBRATING/WATER DRIP SPINDLE (optional)

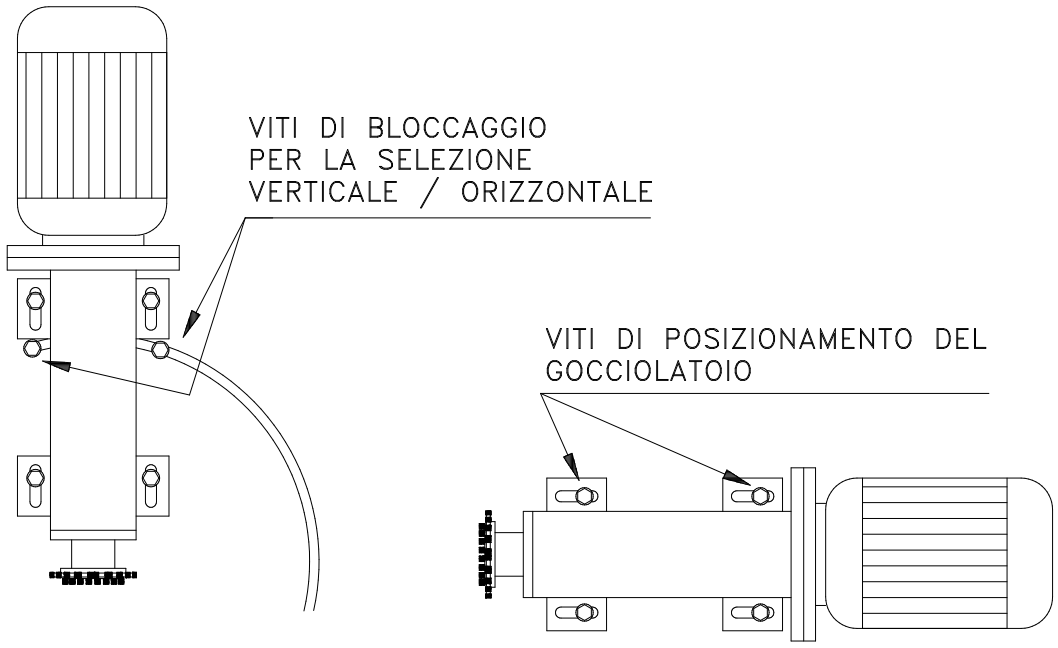


Figure 5-9

The initial machine spindle can be positioned vertically for calibration or horizontally for dripping.

A special tool is installed for this purpose, with a double diamond core cutter, intended to perform both processes without need for replacements.

After having positioned the spindle horizontally (water drip),the cutting position can be adjusted by acting on the positioning screws of the water drip. This operation must be repeated only if you want to change the cutting position.

You may therefore choose the desired operation by acting on the fixing screws for the vertical/horizontal selection and the work position can easily be reached by acting on the specific adjustment screw located above the entire unit.

This operation must be carried out after having strictly disconnected the power to the machine or with the machine in emergency status.

5.7 MULTIFUNCTION SPINDLE (optional)

The multifunction Spindle can perform the following processes:

BUSH HAMMERING

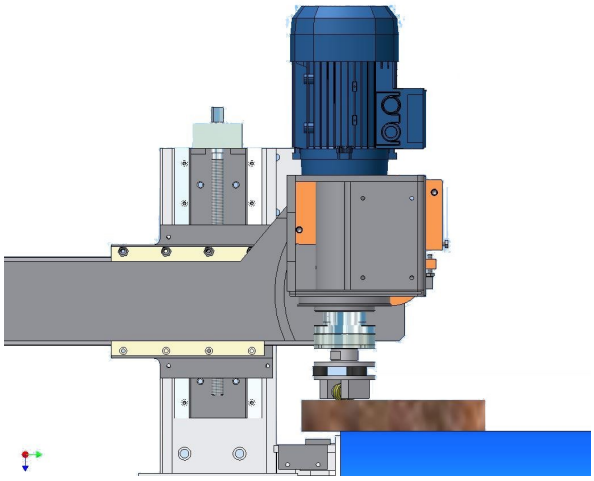


Figure 5-10

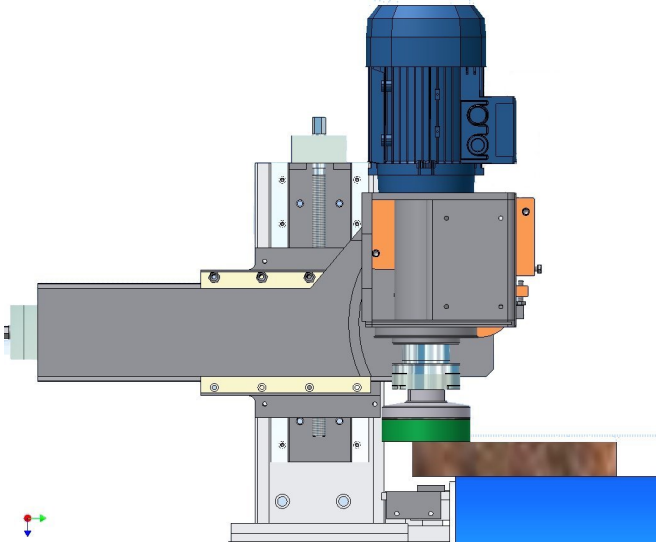


Figure 5-11

SANDING

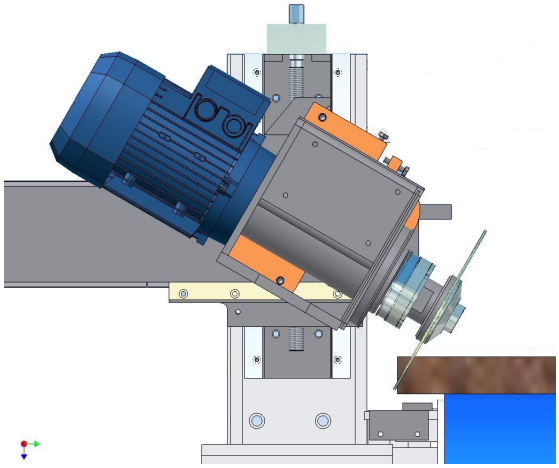
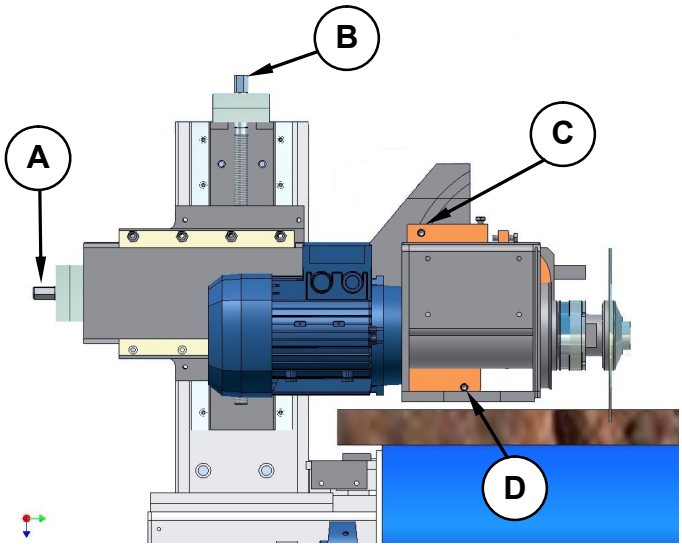


Figure 5-12

BEVEL CUT



UPPER NOTCHING

Figure 5-13

The horizontal adjustment of the spindle is done by acting on screw **A**
The vertical adjustment of the spindle is done by acting on screw **B**
The angular adjustment of the spindle is done by acting on screws **C and D**

There is a pressure gauge indicating the air pressure and a pressure regulator on the spindle casing. The pneumatic action is used for bush hammering and cleaning, while it is excluded by a pneumatic valve for all operations done with the cutting tool.

5.8 PIECE SUPPORT BAR ADJUSTMENT

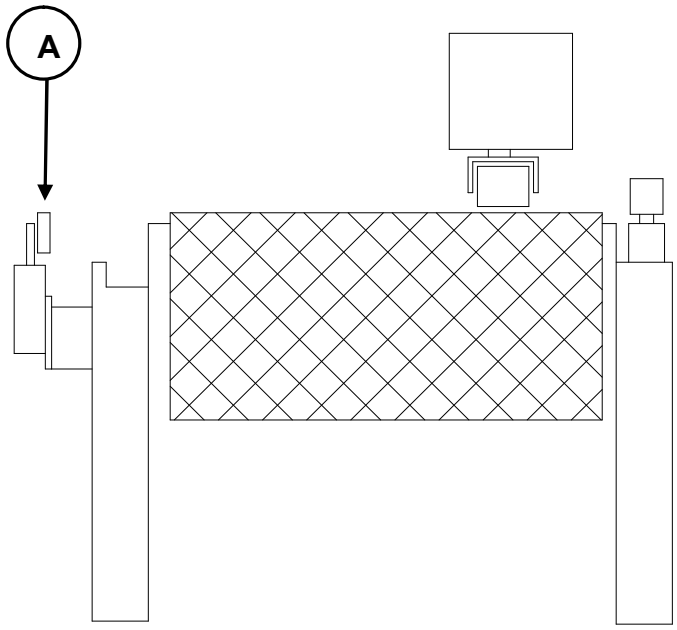


Figure 5-14

The machine is equipped with a support bar for especially large pieces.

Before starting work on the pieces, it is recommended to adjust the opening of the bar A by finding the best position with respect to the width of the pieces.

5.9 UPPER PANEL OPENING

Figure 5-15

To open the casing of the presser zone, pull the panel outwards from a middle position.
The gas springs located inside will help the operator open the panel, keeping it in the “open” position.

5.10 CONTROL PANEL

Figure 5-16

The control panel consists of a touch screen where you may execute all of the work functions.

Furthermore there are an emergency button, an emergency reset button and a selector to configure the machine in the set condition.

5.11 PRESSURE ADJUSTMENT

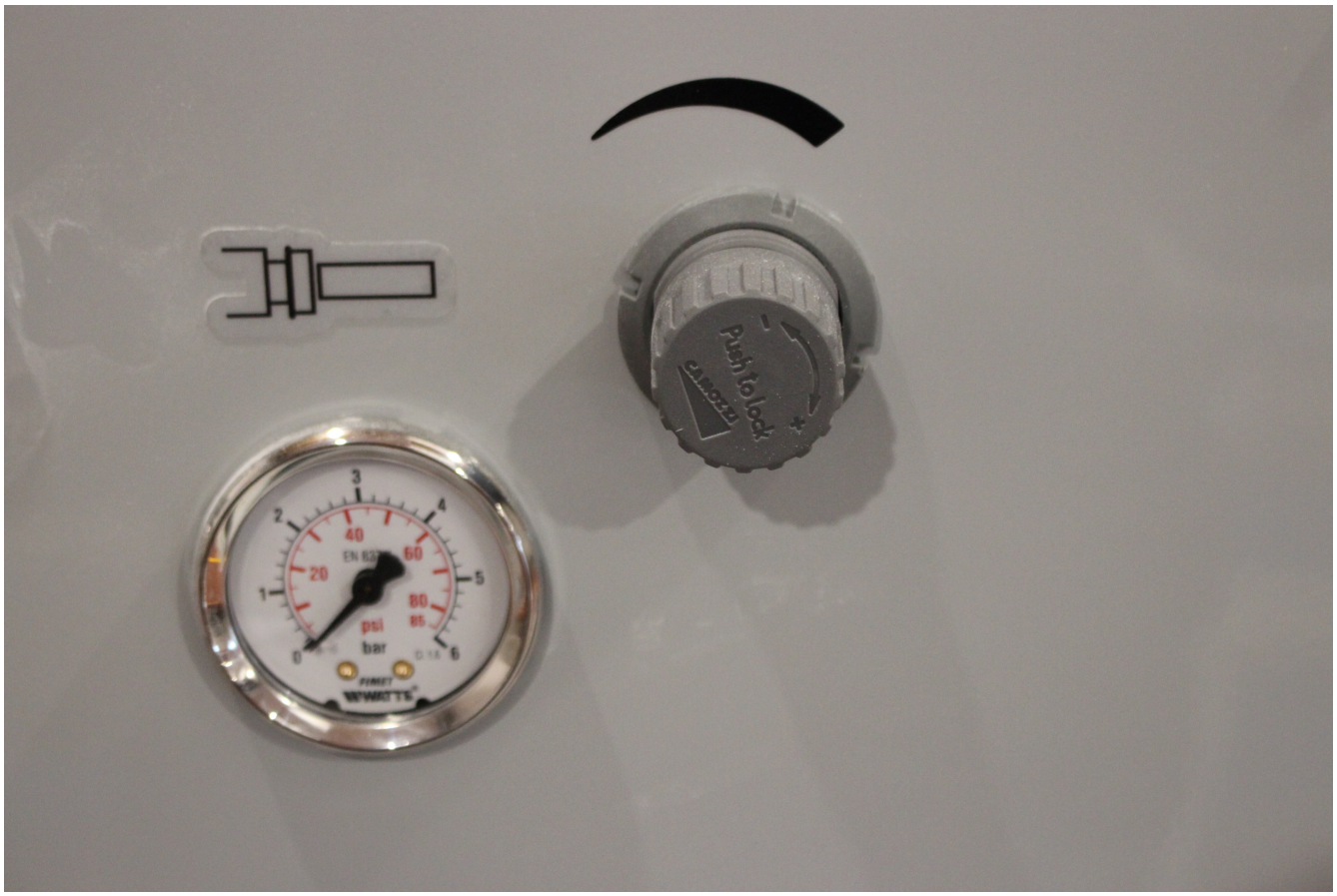


Figure 5-17

Each spindle is equipped with an autonomous work pressure adjustment.

The pressure must be adjusted depending on the type of abrasive, the type of material and the advancement speed.
Normally the working speed which can be read on the pressure gauge for abrasives is between 3 and 4 atm while it is at least 5 for diamond tools.

5.12 PNEUMATIC RESET

For safety purposes, whenever the machine triggers an alarm or the emergency button is pressed, you must reset pneumatic consent by pressing the button on the control panel ***Figure 5-16***.

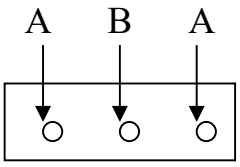
6 FIRST START-UP

6.1 PRELIMINARY CHECKS

After having verified that the machine is level and checked that all the screws on the ground supports are secured, it is possible to start the machine for the first time.

Make sure that the machine is supplied with compressed air of at least 5 bar and that all the safety limit switches are closed, otherwise the computer will display the word “RESET”.

The safety limit switches warn if any of the various protective casings are opened.



The first thing to do is to make sure that the power phases are correct. To perform this check, simply move the presser bar: the connection is correct if the bar moves up by pushing the manipulator up on the control panel. If the bar does not move at all or if it moves in the opposite direction, you must disconnect power to the machine and swap one of the power wires A with the middle wire B.
Try to move the presser bar again and make sure that it goes up and down in the right direction.
After having performed these checks, certain that the power supply is connected properly, it is possible to try to start the hydraulic control unit and then, after a few seconds, motor rotation.

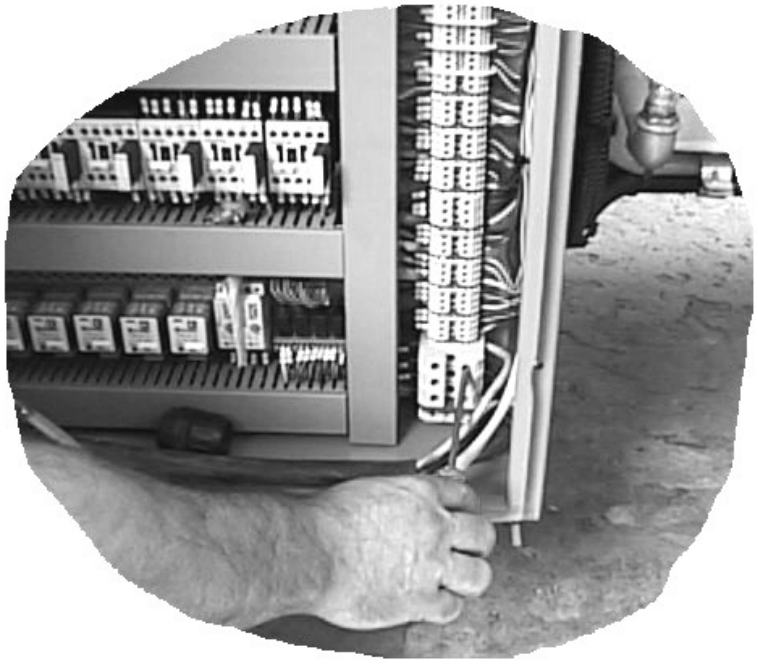


Figure 6-1

When the efficiency of the motors has been verified, they can be stopped and you may proceed verifying the overall movements of the machine. A sudden stop in rotation of the motors could unscrew the abrasive or diamond backing pads; in this case, which is perfectly normal, you must retighten the backing pads and make sure that they are well clamped using the supplied keys.

7 SOFTWARE USE

7.1 PLANNING MACHINING

The machine is equipped with a touch screen which allows the operator to program all of the required processes.

The **HOME** page is displayed below.

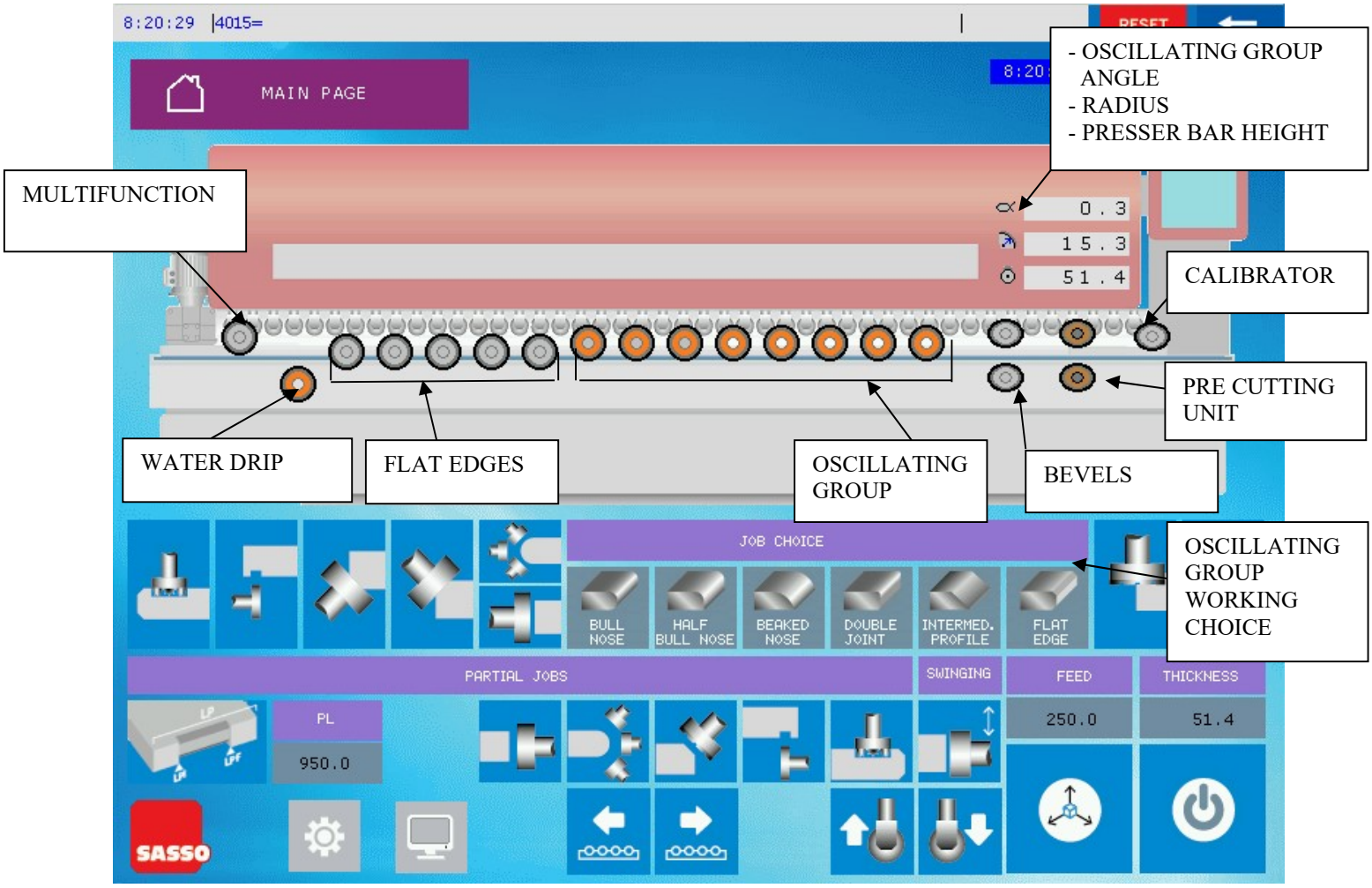


Figure 7-1

As seen in ***Figure 7-1***, the following spindles are represented:

- calibrator spindle (optional; several calibrators may also be installed)
- pre-cut spindles (upper and lower)
- spindles for bevels (upper and lower) The position of the bevels on the **HOME** screen depends on the machine configuration.
- spindles of the oscillating unit
- spindles of the fixed edge unit (optional)
- water drip spindle (optional)
- multifunction spindle (optional, several multifunction tools can also be installed)

Press the relevant icons on the touch screen to select which spindles to operate during the flow of the material.
As shown in ***Figure 7-1***, once selected, the spindles enabled for working will turn orange, while the disabled ones will be grey.
At this point, use the oscillating bar to define the machining to be performed; you can choose between:

- BULL NOSE
- HALF BULL NOSE
- BEAKED NOSE
- DOUBLE JOINT
- INTERMEDIATE PROFILE
- FLAT EDGE

Press the desired machining icon on the **HOME** screen to enter the set up page for the machining in question.

7.1.1 BULL NOSE

To obtain a perfectly centred bullnose, first accurately measure how thick the material is; the radius shall be exactly half the thickness.

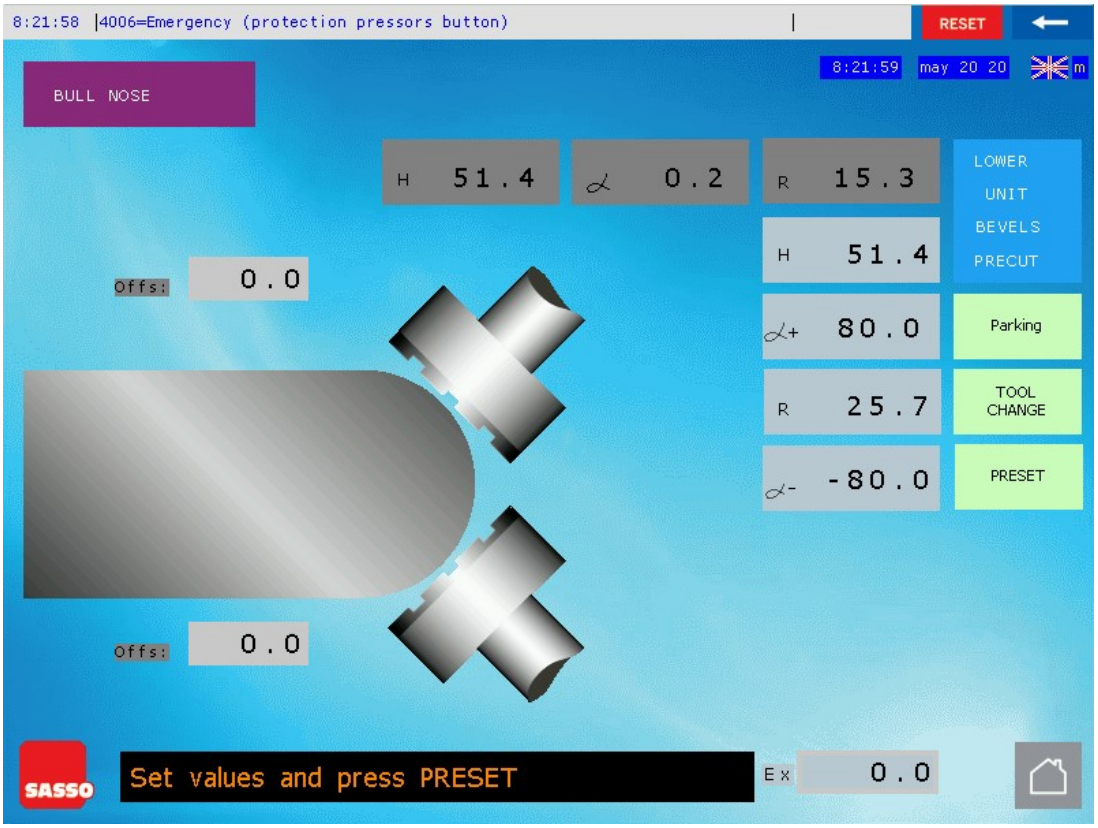


Figure 7-2

The dark grey icons at the top of the screen are for display only and refer to the values currently set for H (piece height), α (angle at which the oscillating bar is positioned), R (radius at which the swinging bar is positioned).
The **PARKING** button is used to move the oscillating bar to the rest position.
The **TOOL CHANGE** button to move the oscillating bar to a position in which the abrasives can be easily changed.
The two **OFFs** buttons are used to define the spacing to be left with the first pre-cut, if the machine is set to use two upper and lower pre-cuts. If a value other than 0 is set, a window will appear, as shown in
Figure 7-3, indicating the position to which the second precut must be manually brought.

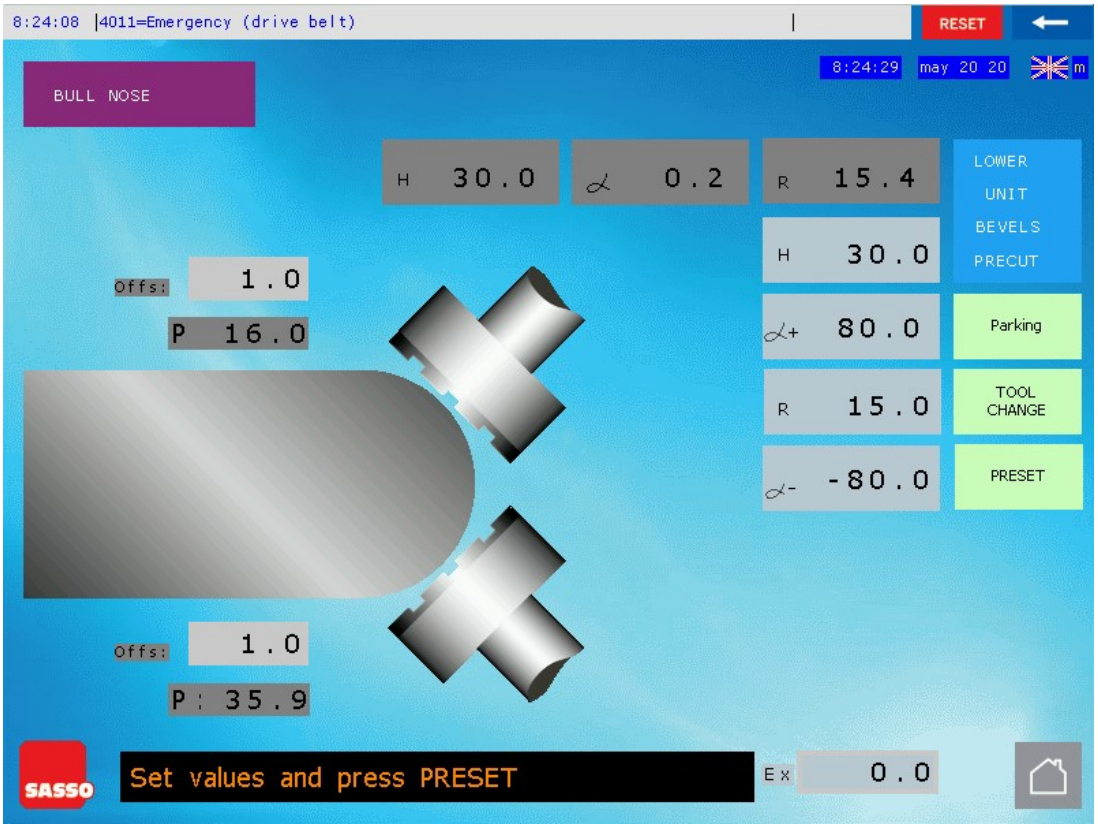


Figure 7-3

The **EX** button, on the other hand, is used to enter an offset value for the first wheel, in the case of an automatic positioning forming wheel.
This option is especially useful for very high thicknesses where working with two forming wheels is preferred.
The light grey icons, instead, can be edited and are used to enter the values desired for the machining in question.

H = Thickness of the material to be machined
α+ = Upper oscillation angle
R = Radius value (half the thickness)
α- = Lower oscillation angle

Enter the thickness of the material to be machined and confirm.
Enter the upper reverse angle in degrees and confirm.
Enter the radius to be performed (half the thickness of the piece to be machined) and confirm.
Enter the lower reverse angle in degrees and confirm.
If the **PRESET** button is pressed now, the machine will make the necessary positioning for machining.
At this point, you will need to turn the key to the **SET** position (see ***Figure 5-16***), press the **RESET** button (see ***Figure 5-16***), enable the pneumatic outfeed of the first head of the oscillating unit (see ***Figure 7-15***), move to the back of the machine, open the closing panel, and the forming tool can be adjusted on the material feed line with a simple ruler.

Once the protection panel has been closed, machining can be started by turning the key back to the **AUT** position (see ***Figure 5-16***) and pressing the **PRESET** button again (because the machine went into emergency due to the opening of the guard); then, upon request, press the green "**START**" button on the machine's control panel.
At this point, go back to the HOME screen and the set machining will be highlighted in green, as shown in ***Figure 7-10***.

7.1.2 HALF BULL NOSE

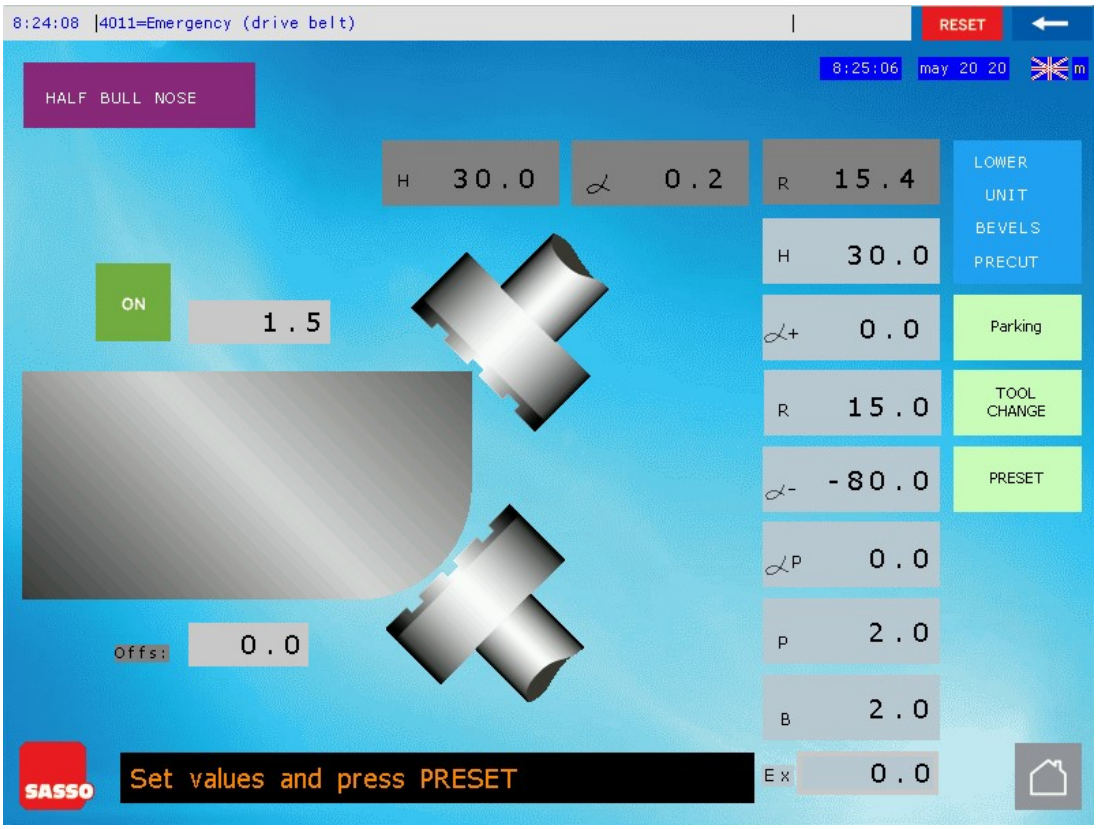


Figure 7-4

The dark grey icons at the top of the screen are view only and refer to the values currently set for H (piece height), α (angle at which the oscillating bar is positioned), R (radius at which the swinging bar is positioned).
The **PARKING** button is used to move the oscillating bar to the rest position.
The **TOOL CHANGE** button to move the oscillating bar to a position in which the abrasives can be easily changed.
The **OFFs** button is used to define the spacing to be left with the first pre-cut, if the machine is set to use two lower pre-cuts. If a value other than 0 was set, a window would appear, as shown in ***Figure 7-5***, indicating the position to which the second pre-cut must be manually brought.
The **EX** button, on the other hand, is used to enter an offset value for the first wheel, in the case of an automatic positioning forming wheel.

This option is especially useful for very high thicknesses where working with two forming wheels is preferred.
As shown in ***Figure 7-4***, the bevel value to be obtained with the upper pre-cut can be entered. This option can be disabled, as shown in ***Figure 7-5***, by pressing the relevant button. The upper pre-cut can now be used as a bevel with abrasive. It will be necessary to enable the related spindle on the HOME screen, and equip the relevant unit with abrasive (see ***Figure 7-20***).

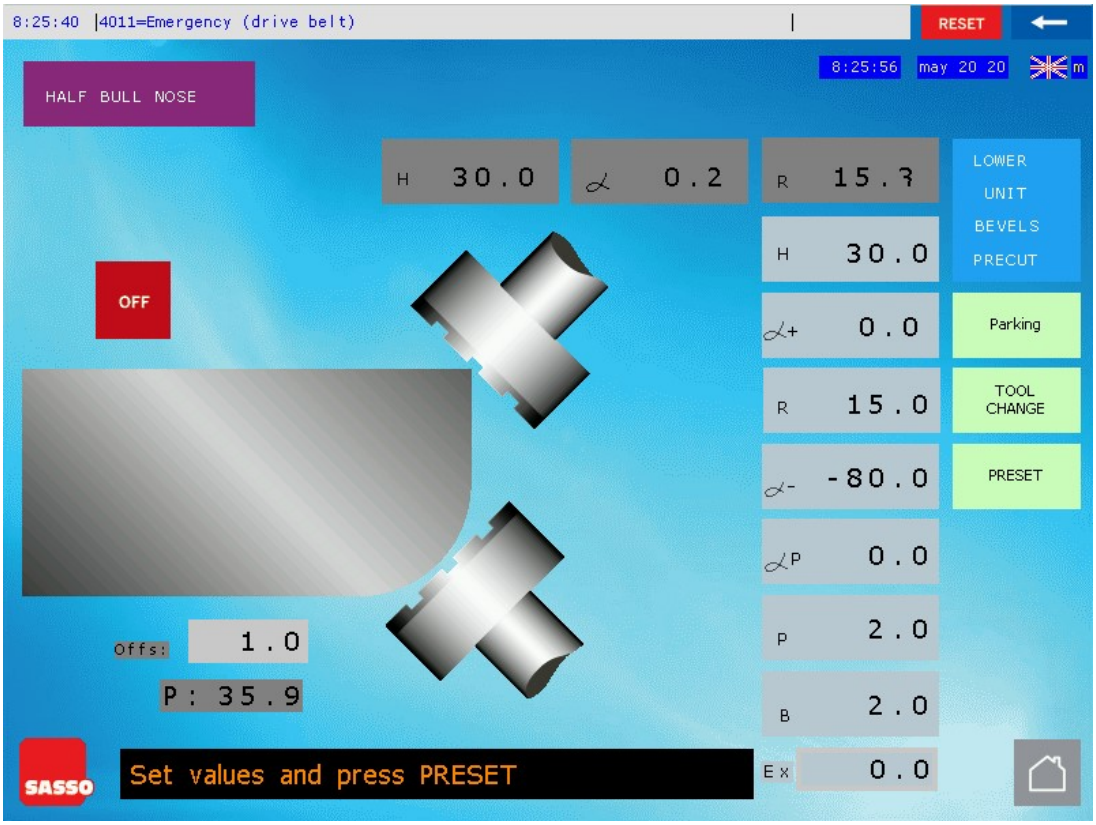


Figure 7-5

The light grey icons, instead, can be edited and are used to enter the values desired for the machining in question.

H = Thickness of the material to be machined
α+ = Upper oscillation angle
R = Radius value (half the thickness)
α- = Lower oscillation angle
α^P = Pause angle
P = Pause time in seconds
B = Swinging angle

Enter the thickness of the material to be machined and confirm. It is important to enter the exact thickness of the material being machined, as it is considered a calculation basis for positioning the upper pre-cut and the presser bar.
Enter the upper reverse angle in degrees and confirm.
Enter the radius to be performed (half the thickness of the piece to be machined) and confirm.

Enter the lower reverse angle in degrees and confirm.
Enter the angle at which to pause and confirm.
Enter a value for the pause in seconds and confirm.
Enter the swinging angle and confirm.
It should be borne in mind that the abrasive works on the flat part of this type of profile for a very short time only when it reverses.
This makes the polishing process much harder than continuous straight edge machining, and the flat surface may not be perfectly shiny, especially when the thickness of the material being processed increases.
To overcome this drawback, a higher angle slightly beyond “0”: e.g. **α+**= 0.5/1.0. can be set.
This setting brings the abrasive slightly above the “0” angle and enables it to machine the flat part of the piece more effectively.
If this is not enough, a pause and a swing on the flat side of the profile can be set.
For example, the pause angle $\boldsymbol{\alpha^P}$ = “0” can be entered (the pause angle must always be equal to the upper reverse angle **α+**), a pause **P** = “2” and a swing **B** = “0.4”.
If the **PRESET** button is pressed now, the machine will make the necessary positioning for machining.
At this point, you will need to turn the key to the **SET** position (see ***Figure 5-16***), press the **RESET** button (see ***Figure 5-16***), enable the pneumatic outfeed of the first head of the oscillating unit (see ***Figure 7-15***), move to the back of the machine, open the closing panel, and the forming tool can be adjusted on the material feed line with a simple ruler.
Once the protection panel has been closed, machining can be started by turning the key back to the **AUT** position (see ***Figure 5-16***) and pressing the **PRESET** button again (because the machine went into emergency due to the opening of the guard); then, upon request, press the green “**START**” button on the machine’s control panel.
At this point, go back to the HOME screen and the set machining will be highlighted in green, as shown in ***Figure 7-10*** for the BULLNOSE.

7.1.3 BEAKED NOSE

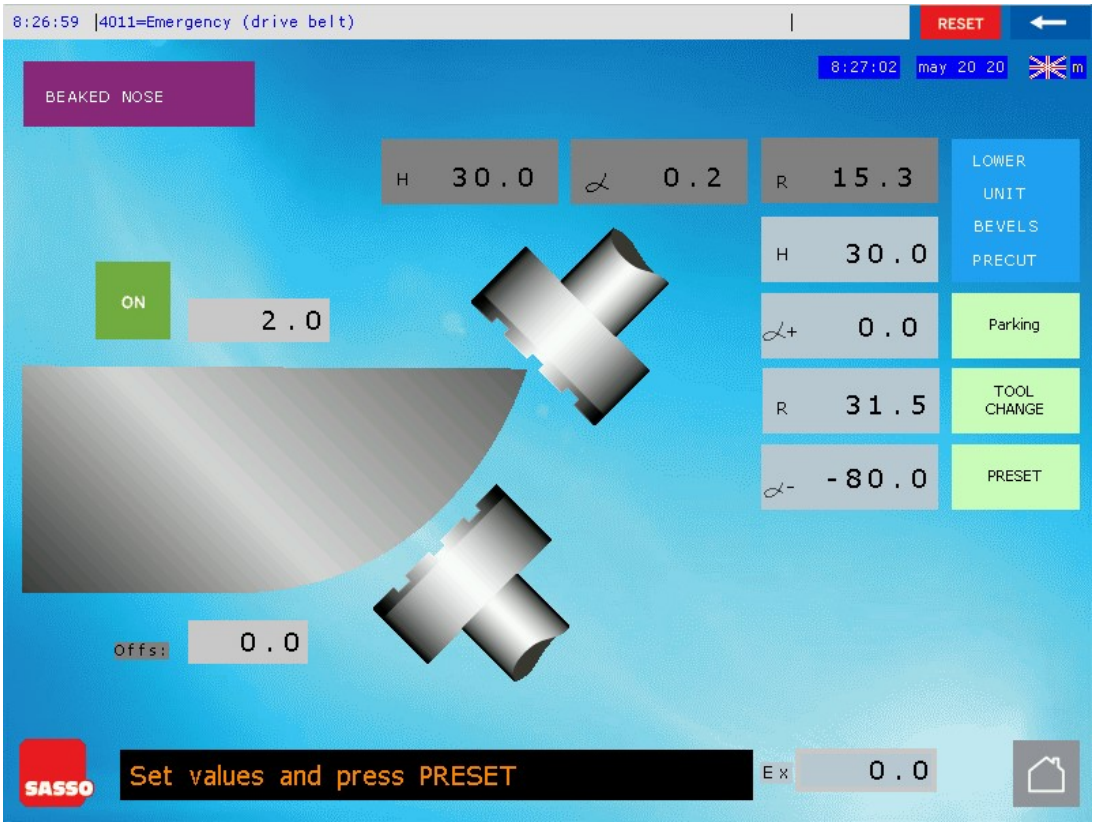


Figure 7-6

The dark grey icons at the top of the screen are view only and refer to the values currently set for H (piece height), α (angle at which the oscillating bar is positioned), R (radius at which the swinging bar is positioned).
The **PARKING** button is used to move the oscillating bar to the rest position
The **TOOL CHANGE** button to move the oscillating bar to a position in which the abrasives can be easily changed.
The **OFFs** button is used to define the spacing to be left with the first pre-cut, if the machine is set to use two lower pre-cuts. If a value other than 0 was set, a window would appear, as shown in ***Figure 7-5*** for the half bullnose, indicating the position to which the second pre-cut must be manually brought.
The **EX** button, on the other hand, is used to enter an offset value for the first wheel, in the case of an automatic positioning forming wheel.
This option is especially useful for very high thicknesses where working with two forming wheels is preferred.
As shown in ***Figure 7-6***, the bevel value to be obtained with the upper pre-cut can be entered. This option can be disabled, as shown in ***Figure 7-5*** for the half bullnose, by pressing the relevant button. The upper pre-cut can now be used as a bevel with abrasive. It will be necessary to enable the related spindle on the HOME screen, and equip the relevant unit with abrasive (see ***Figure 7-20***).
The light grey icons, instead, can be edited and are used to enter the values desired for the machining in question.

H = Thickness of the material to be machined

α+ = Upper oscillation angle
R = Radius value (equal to the thickness)
α- = Lower oscillation angle

Enter the thickness of the material to be machined and confirm. It is important to enter the exact thickness of the material being machined, as it is considered a calculation basis for positioning the upper pre-cut and the presser bar.
Enter the upper reverse angle in degrees and confirm.
Enter the radius to be performed (thickness of the piece to be machined) and confirm.
Enter the lower reverse angle in degrees and confirm.
If the **PRESET** button is pressed now, the machine will make the necessary positioning for machining. At this point, you will need to turn the key to the **SET** position (see***Figure 5-16***), press the **RESET** button (see ***Figure 5-16***), enable the pneumatic outfeed of the first head of the oscillating unit (see ***Figure 7-15***), move to the back of the machine, open the closing panel, and the forming tool can be adjusted on the material feed line with a simple ruler.
Once the protection panel has been closed, machining can be started by turning the key back to the **AUT** position (see ***Figure 5-16***) and pressing the **PRESET** button again (because the machine went into emergency due to the opening of the guard); then, upon request, press the green "**START**" button on the machine's control panel.
At this point, go back to the HOME screen and the set machining will be highlighted in green, as shown in ***Figure 7-10*** for the BULLNOSE.

7.1.4 DOUBLE JOINT

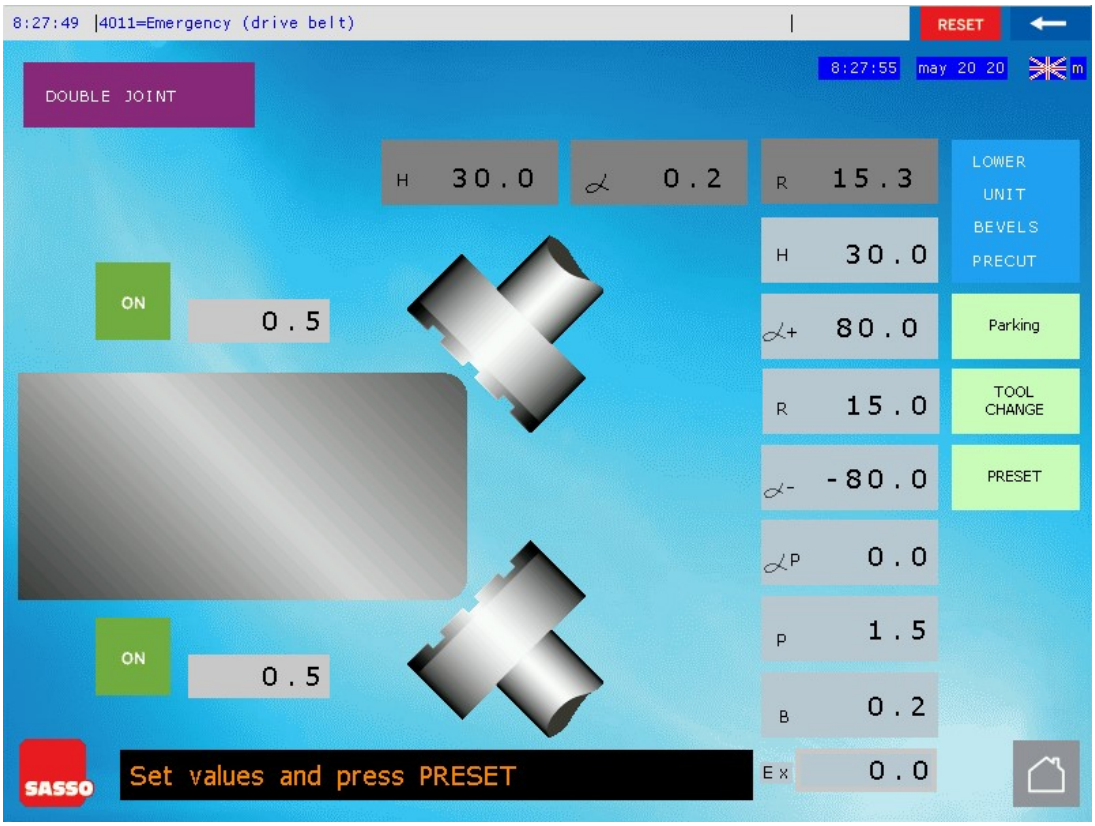


Figure 7-7

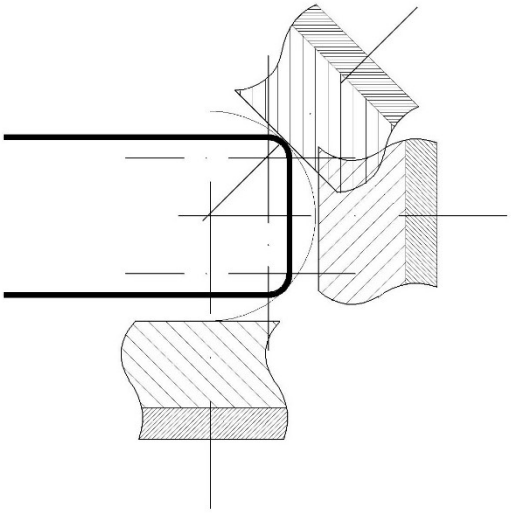
The dark grey icons at the top of the screen are view only and refer to the values currently set for H (piece height), α (angle at which the oscillating bar is positioned), R (radius at which the swinging bar is positioned).
The **PARKING** button is used to move the oscillating bar to the rest position.
The **TOOL CHANGE** button to move the oscillating bar to a position in which the abrasives can be easily changed.
As shown in ***Figure 7-7***, the values of the bevels to be obtained with the upper and lower pre-cuts can be entered. This option can be disabled, as shown in ***Figure 7-5*** for the half bullnose, by pressing the relevant button. The upper and lower pre-cuts can now be used as bevels with abrasive. It will be necessary to enable the related spindle on the HOME screen, and equip the relevant unit with abrasive (see ***Figure 7-20***).
The light grey icons, instead, can be edited and are used to enter the values desired for the machining in question.

H = Thickness of the material to be machined
α+ = Upper oscillation angle
R = Radius value (half the thickness)
α- = Lower oscillation angle
α^P = Pause angle
P = Pause time in seconds
B = Swinging angle

Enter the thickness of the material to be machined and confirm. It is important to enter the exact thickness of the material being machined, as it is considered a calculation basis for positioning the upper pre-cut and the presser bar.
Enter the upper reverse angle in degrees and confirm.
Enter the radius to be performed (half the thickness of the piece to be machined) and confirm.
Enter the lower reverse angle in degrees and confirm.
Enter the angle at which to pause and confirm.
Enter a value for the pause in seconds and confirm.
Enter the swinging angle and confirm.
If the **PRESET** button is pressed now, the machine will make the necessary positioning for machining.
At this point, turn the key to **SET** (see ***Figure 5-16***), press the **RESET** button (see ***Figure 5-16***), go to the back of the machine, open the closing panel and make sure that the forming wheel is in the retracted position.
Once the protection panel has been closed, machining can be started by turning the key back to the **AUT** position (see ***Figure 5-16***) and pressing the **PRESET** button again (because the machine went into emergency due to the opening of the guard); then, upon request, press the green "**START**" button on the machine's control panel.
At this point, go back to the HOME screen and the set machining will be highlighted in green, as shown in ***Figure 7-10*** for the BULLNOSE.
N.B. Perform this machining without using a forming diamond and, therefore, disable the machining of the oscillating bar's first spindle by pressing the relevant icon on the HOME page, making sure it turns grey (see *Figure 7-1*), or equip the first head of the oscillating unit with abrasive (see *Figure 7-14*).

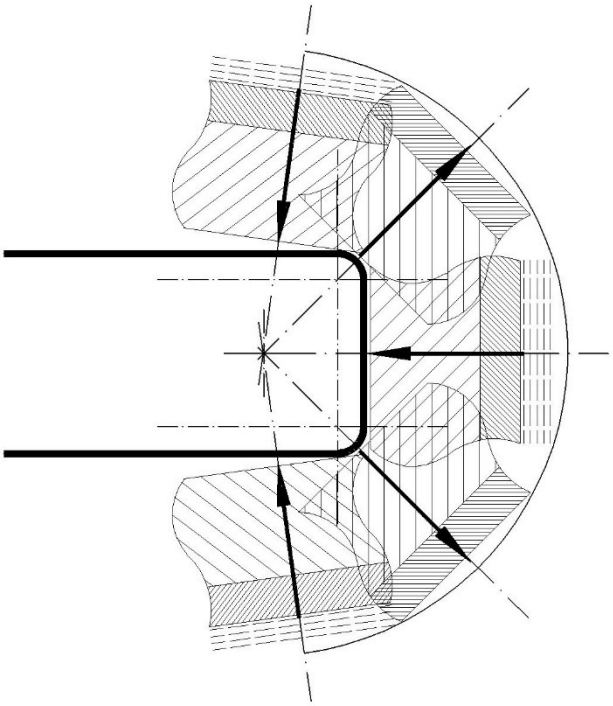
OBSERVATIONS ON ROUNDED DOUBLE JOINT

In theory the rounded double joint is a type of process that the machine cannot perform.
In fact, the bar of the mandrels turns around a single centre point located inside the piece, while the double rounded joint is developed around two different centres.



As can be seen in the figure, the movement of the mandrels follows the theoretic line of the bull-nose, which is quite different from the desired profile.

However, thanks to the "pause" function, which allows the abrasive to stop on the flat part of the profile, and by using the tilting function during the pause, by which the abrasive can tilt slightly in respect of the flat part of the profile, it is possible to overcome the theoretic limits of the machine and to obtain a good result in a single passage all the same.



Of course, the forward speed must be **adequately** reduced, and this will also depend on the thickness of the flat part, which, in this case, is more difficult to polish.
However, it must always be remembered that all the mandrels are forced to follow a different profile than that of their natural path and must advance and withdraw many times for each cycle.
The continual movement generated by this particular type of profile can cause early wear of the sliding parts.

7.1.5 INTERMEDIATE PROFILE

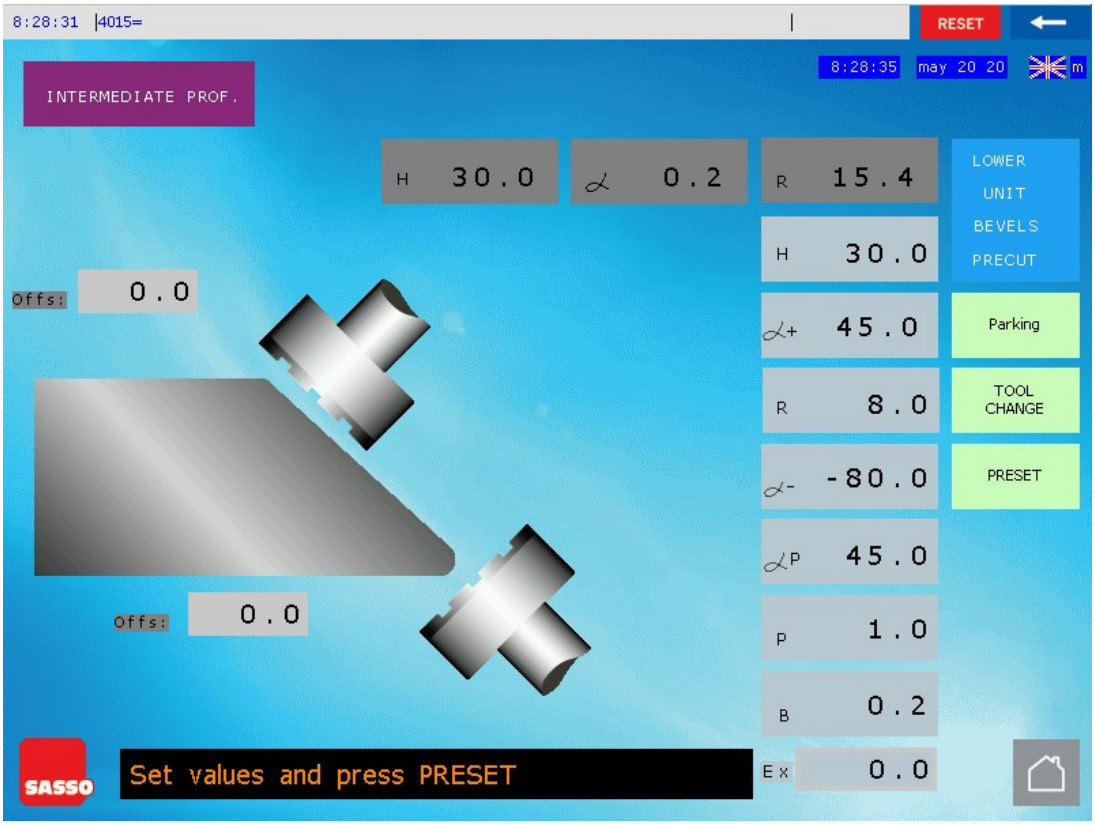


Figure 7-8

The dark grey icons at the top of the screen are view only and refer to the values currently set for H (piece height), α (angle at which the oscillating bar is positioned), R (radius at which the swinging bar is positioned).
The **PARKING** button is used to move the oscillating bar to the rest position
The **TOOL CHANGE** button to move the oscillating bar to a position in which the abrasives can be easily changed.
The two **OFFs** buttons are used to define the spacing to be left with the first pre-cut, if the machine is set to use two upper and lower pre-cuts. If a value other than 0 is set, a window will appear, as shown in
Figure 7-3 for the bullnose, indicating the position to which the second pre-cut must be manually brought.
The **EX** button, on the other hand, is used to enter an offset value for the first wheel, in the case of an automatic positioning forming wheel.
This option is especially useful for very high thicknesses where working with two forming wheels is preferred.
The light grey icons, instead, can be edited and are used to enter the values desired for the machining in question.

H = Thickness of the material to be machined
α+ = Upper oscillation angle
R = Radius value (half the thickness)
α- = Lower oscillation angle
α^P = Pause angle
P = Pause time in seconds
B = Swinging angle

Enter the thickness of the material to be machined and confirm. It is important to enter the exact thickness of the material being machined, as it is considered a calculation basis for positioning the upper pre-cut and the presser bar.
Enter the upper reverse angle in degrees and confirm.
Enter the radius to be performed and confirm.
Enter the lower reverse angle in degrees and confirm.
Enter the angle at which to pause and confirm.
Enter a value for the pause in seconds and confirm.
Enter the swinging angle and confirm.
If the **PRESET** button is pressed now, the machine will make the necessary positioning for machining.
At this point, you will need to turn the key to the **SET** position (see ***Figure 5-16***), press the **RESET** button (see ***Figure 5-16***), enable the pneumatic outfeed of the first head of the oscillating unit (see ***Figure 7-15***), move to the back of the machine, open the closing panel, and the forming tool can be adjusted on the material feed line with a simple ruler.
Once the protection panel has been closed, machining can be started by turning the key back to the **AUT** position (see ***Figure 5-16***) and pressing the **PRESET** button again (because the machine went into emergency due to the opening of the guard); then, upon request, press the green "**START**" button on the machine's control panel.
At this point, go back to the HOME screen and the set machining will be highlighted in green, as shown in ***Figure 7-10*** for the BULLNOSE.

7.1.6 FLAT EDGE

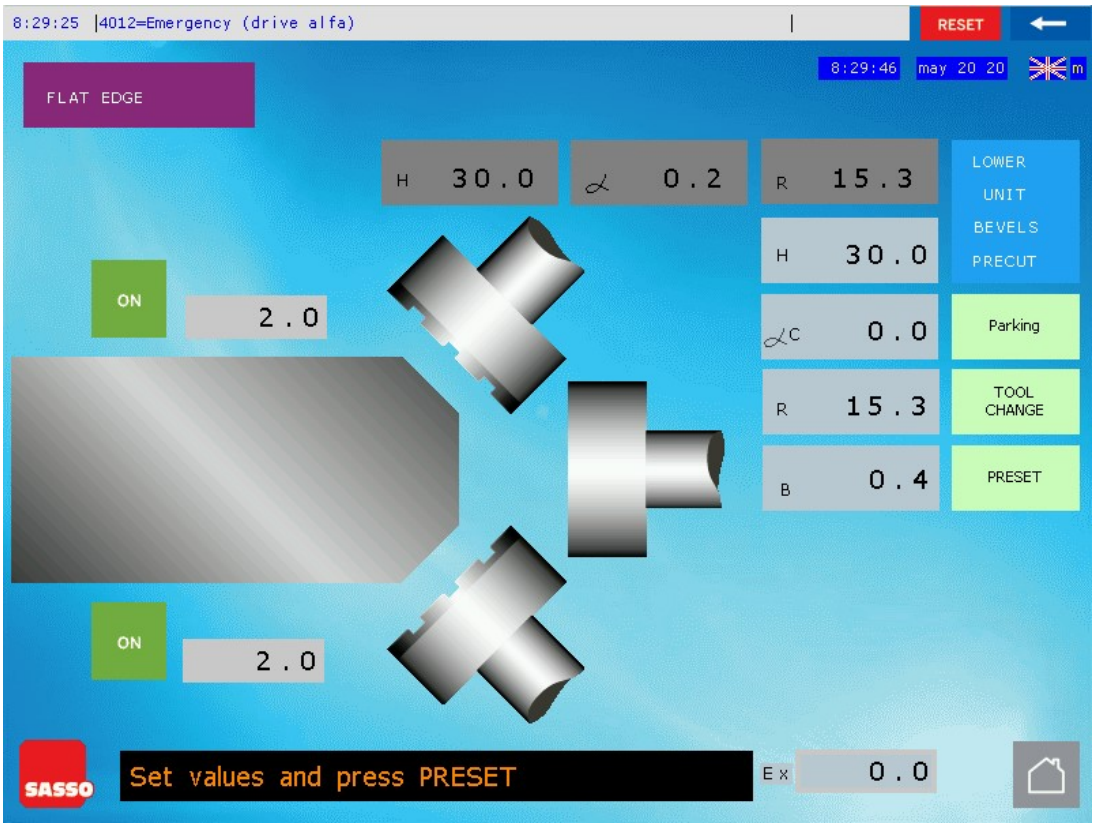


Figure 7-9

The dark grey icons at the top of the screen are view only and refer to the values currently set for H (piece height), α (angle at which the oscillating bar is positioned), R (radius at which the swinging bar is positioned).
The **PARKING** button is used to move the oscillating bar to the rest position
The **TOOL CHANGE** button to move the oscillating bar to a position in which the abrasives can be easily changed.
As shown in ***Figure 7-9***, the values of the bevels to be obtained with the upper and lower pre-cuts can be entered. This option can be disabled, as shown in ***Figure 7-5*** for the half bullnose, by pressing the relevant button. The upper and lower pre-cuts can now be used as bevels with abrasive. It will be necessary to enable the related spindles on the HOME screen, and equip the relevant unit with abrasive (see ***Figure 7-20***).
The light grey icons, instead, can be edited and are used to enter the values desired for the machining in question.

H = Thickness of the material to be machined
R = Radius value (half the thickness)
α^C = Flat edge angle
B = Swinging angle

Enter the thickness of the material to be machined and confirm. It is important to enter the exact thickness of the material being machined, as it is considered a calculation basis for positioning the upper pre-cut and the presser bar.
Enter the radius to be performed (half the thickness of the piece to be machined) and confirm.
Enter the flat edge angle (typically 0°)
Enter the swinging angle and confirm.
If the **PRESET** button is pressed now, the machine will make the necessary positioning for machining.
At this point, turn the key to **SET** (see ***Figure 5-16***), press the **RESET** button (see ***Figure 5-16***), go to the back of the machine, open the closing panel and make sure that the forming wheel is in the retracted position.
Once the protection panel has been closed, machining can be started by turning the key back to the **AUT** position (see ***Figure 5-16***) and pressing the **PRESET** button again (because the machine went into emergency due to the opening of the guard); then, upon request, press the green "**START**" button on the machine's control panel.
At this point, go back to the HOME screen and the set machining will be highlighted in green, as shown in ***Figure 7-10*** for the BULLNOSE.
N.B. Perform this machining without using a forming diamond and, therefore, disable the machining of the oscillating bar's first spindle by pressing the relevant icon on the HOME page, making sure it turns grey (see *Figure 7-1*), or equip the first head of the oscillating unit with abrasive (see *Figure 7-14*).

7.1.7 START WORKING

Once the desired machining has been set, go back to the **HOME** screen (***Figure 7-10***) and, as shown, the set machining is highlighted in green.
Bear in mind that, if no machining by the oscillating bar is required, the spindles of the other units to be used (calibrator, water drip, fixed edge unit, etc.) can be easily enabled directly from the **HOME** page.

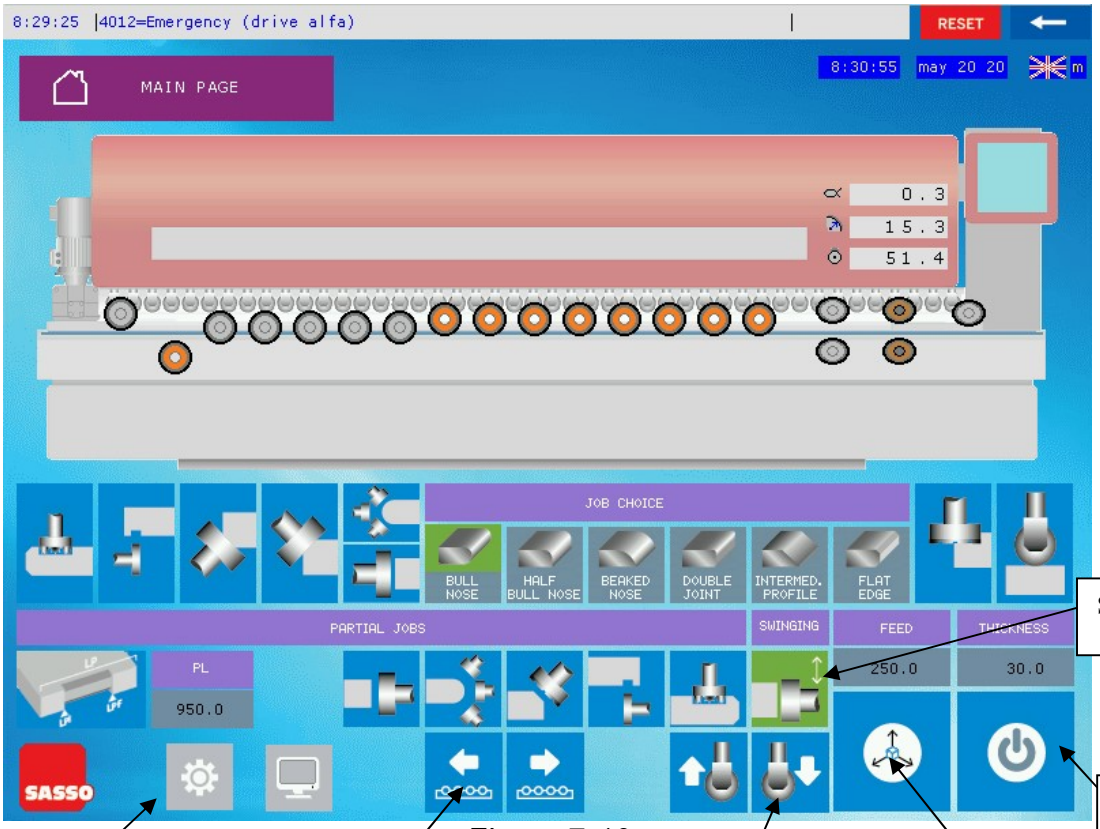


Figure 7-10

Press the **SPEED** icon and enter the desired value to edit the belt speed.
If a motorised support bar is installed on the machine, use the **SUPPORT BAR MOVEMENT** icons to open the bar to the desired position.
Also, there are two icons to manually move the presser bar.
If the machine is equipped with a standalone FLAT EDGE unit, there is a **SWING** icon as shown in ***Figure 7-10***. The latter turns green if enabled and is used for the unit to perform a swinging movement during machining.
Press **THICKNESS** and enter the desired value to edit the thickness of the material to be machined. **This value must, however, always match the ACTUAL piece thickness and, therefore, the value set in the machining pages** (for example see BULLNOSE machining in ***Figure 7-2***.) The option of determining the piece height also from the **HOME** screen has

been added for the presser bar and any other automated units to be positioned directly from the main page, if no machining needs to be performed with the oscillating bar.
If **THICKNESS** is set from the **HOME** screen, press the **PRESET** icon shown in ***Figure 7-10*** to position the presser bar at the correct height. Once it has been positioned, press the **START** icon to enable the belt and start the machining cycle.
In all cases where, instead, machining should also be performed with the oscillating bar, the piece height is to be defined on the **MACHINING SELECTION** page (BULLNOSE, HALF BULLNOSE, ETC.).

7.2 CONFIGURATION OF WORK UNITS AND OPERATING TESTS

From the home page you may enter the screens relative to each work unit in order to properly configure processing of the various components of the machine or to test their operation.

7.2.1 PRESSERS:

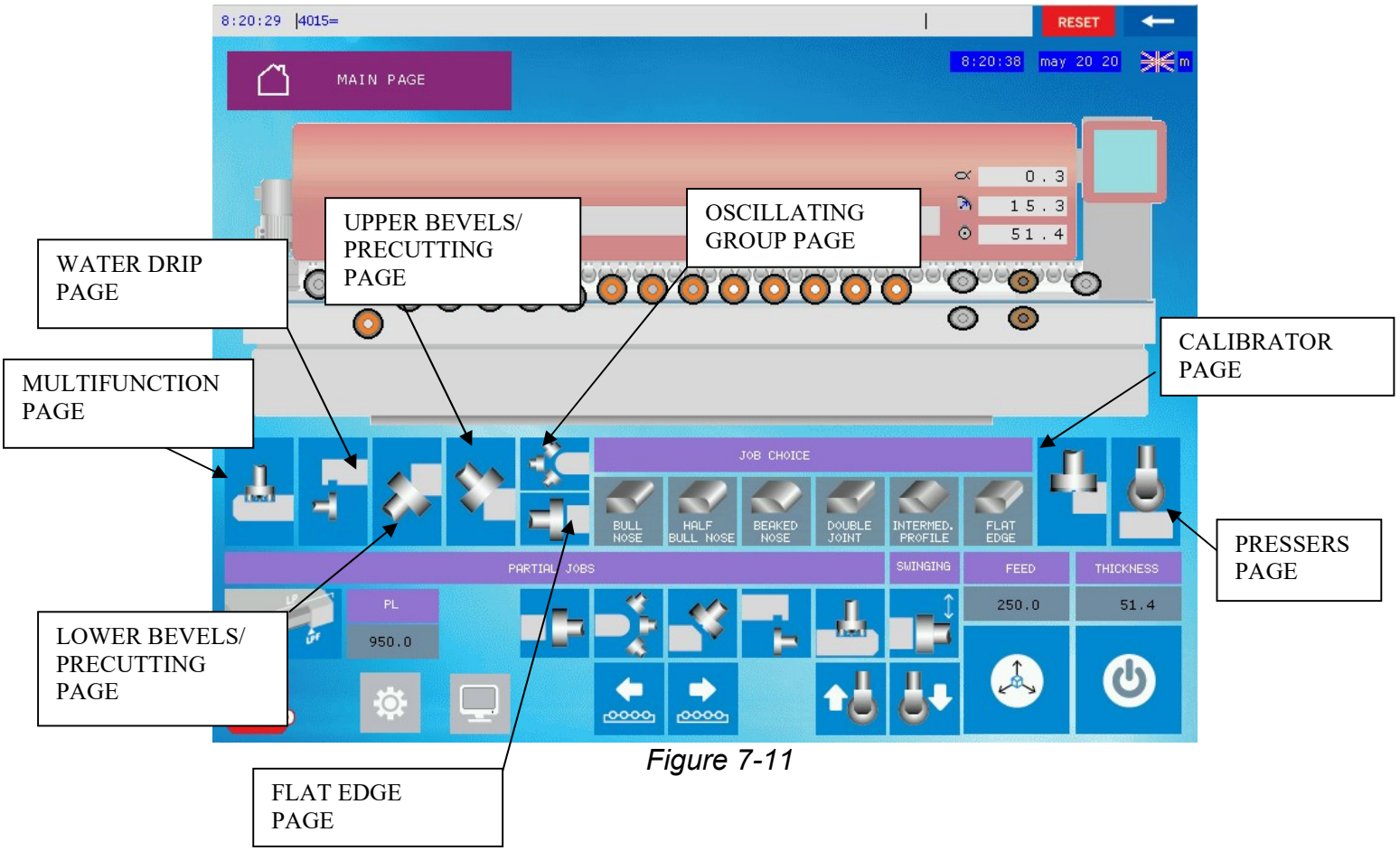


Figure 7-11

Pressing the **PRESSER PAGE** icon shown in ***Figure 7-11***, grants access to the following screen:

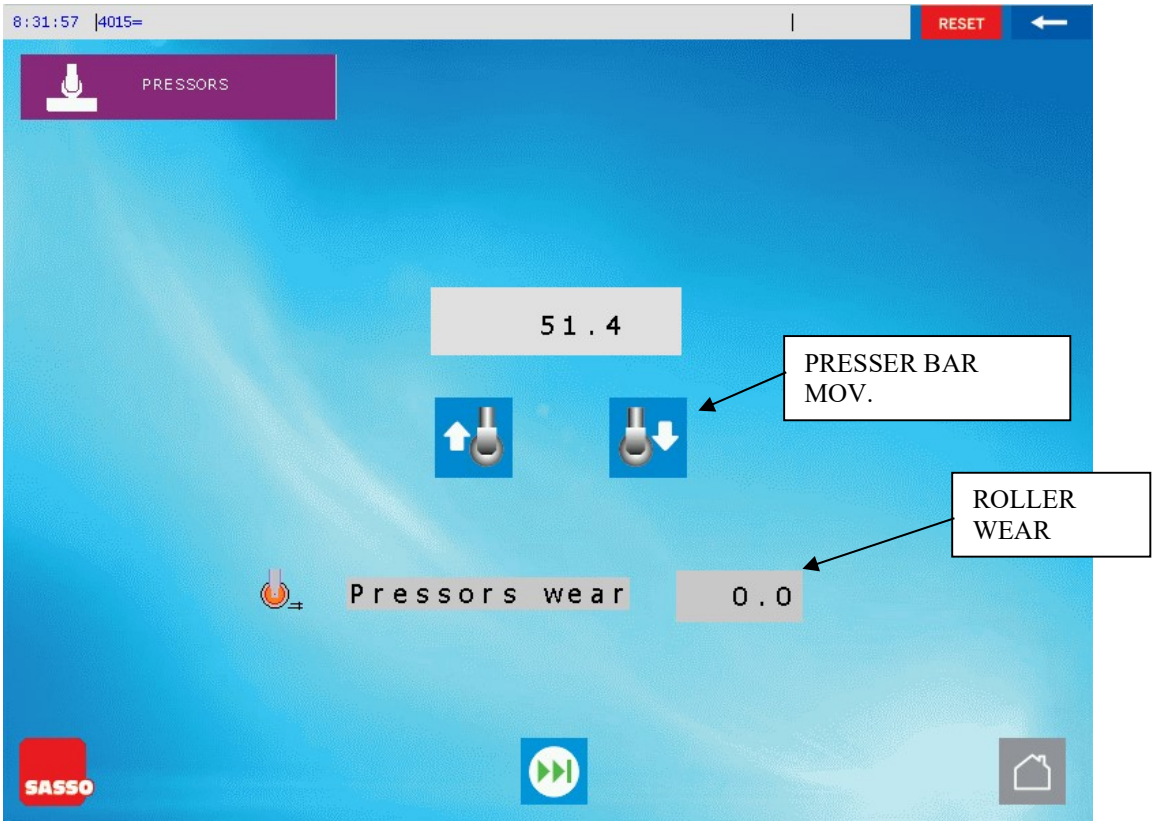


Figure 7-12

From the page shown in ***Figure 7-12***, you may enter the wear value of the rubber roller to take it into account when positioning the presser bar.
You may also manually move the presser bar with the specific arrows.
To go back to the home page, simply press the home icon at the bottom.

7.2.2 CALIBRATOR (OPTIONAL)

Pressing the **CALIBRATOR** icon shown in ***Figure 7-11*** , grants access to the screen relative to the unit.

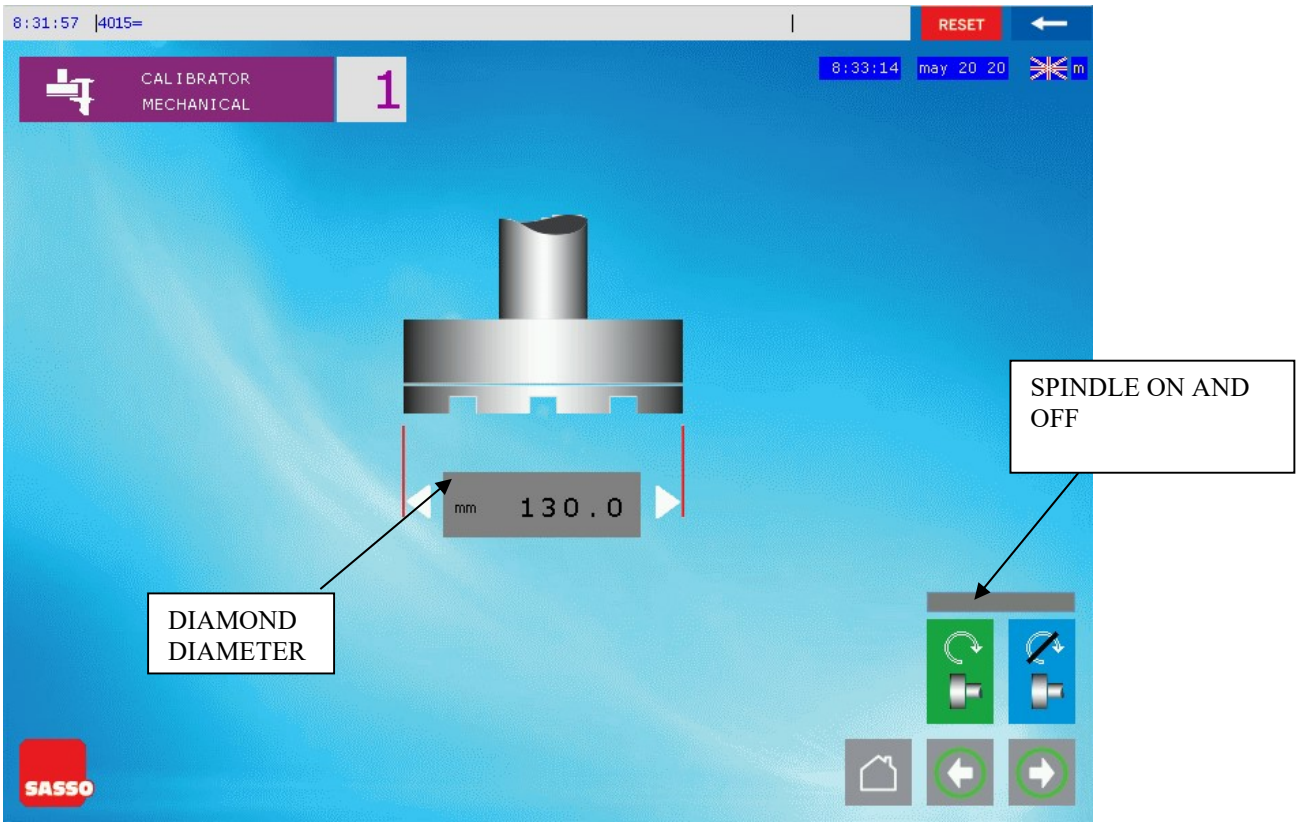


Figure 7-13

To modify the diameter of the tool, simply press the specific icon on the touch screen and enter the desired value.
The previous screen also allows you to test the operation of the unit's spindle by pressing the green icon at the bottom right, while the blue icon allows you to stop rotation of the spindle itself.
To go back to the home page, simply press the home icon at the bottom.

7.2.3 FLAT EDGE GROUP (OPTIONAL)

Pressing the **FLAT EDGE PAGE** icon shown in ***Figure 7-11***, grants access to the screen relative to the unit.

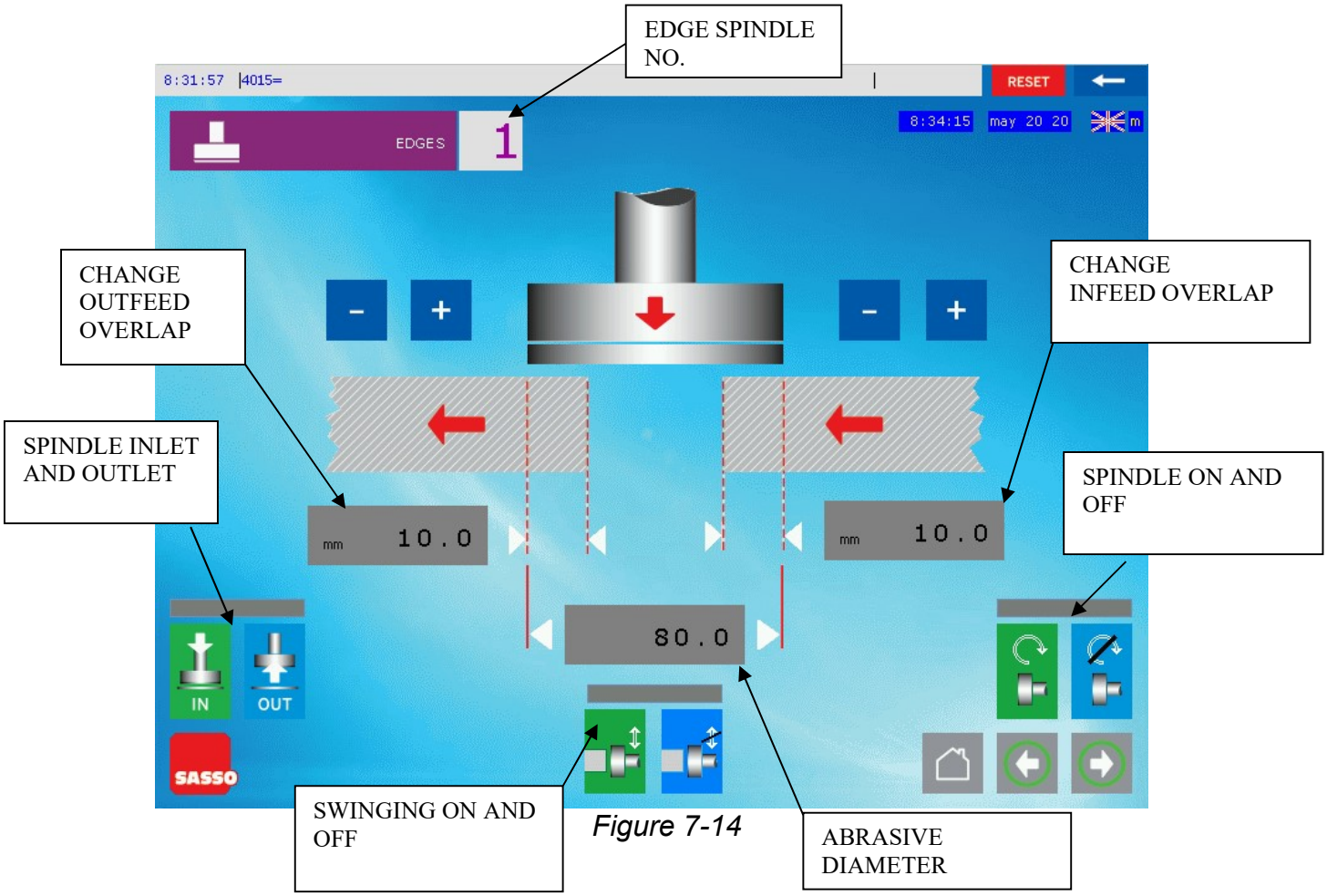


Figure 7-14

From this screen you may modify the diameter of the abrasive by pressing the value on the touch screen and entering the required value.
Then you may modify the infeed and outfeed overlaps of the various heads with respect to the edge of the material being processed.
To do so, simply press the value shown on the touch screen and enter the desired value.
As shown in ***Figure 7-14***, you can also verify the correct rotation of the spindles using the buttons at the bottom right, the correct inlet and outlet using the keys at the bottom left and correct operation of swinging with the keys at the bottom centre (as with all other cases, the activation key is green and the stop key blue).
To change the spindle being configured, simply press the number on the **EDGES** icon and enter the number relative to the desired spindle.
To change the page, press the arrows at the bottom right
To go back to the home page, simply press the home icon at the bottom.

7.2.4 OSCILLATING GROUP

Press the **OSCILLATING UNIT HEAD PAGE** icon shown in ***Figure 7-11*** to access the unit's screen.

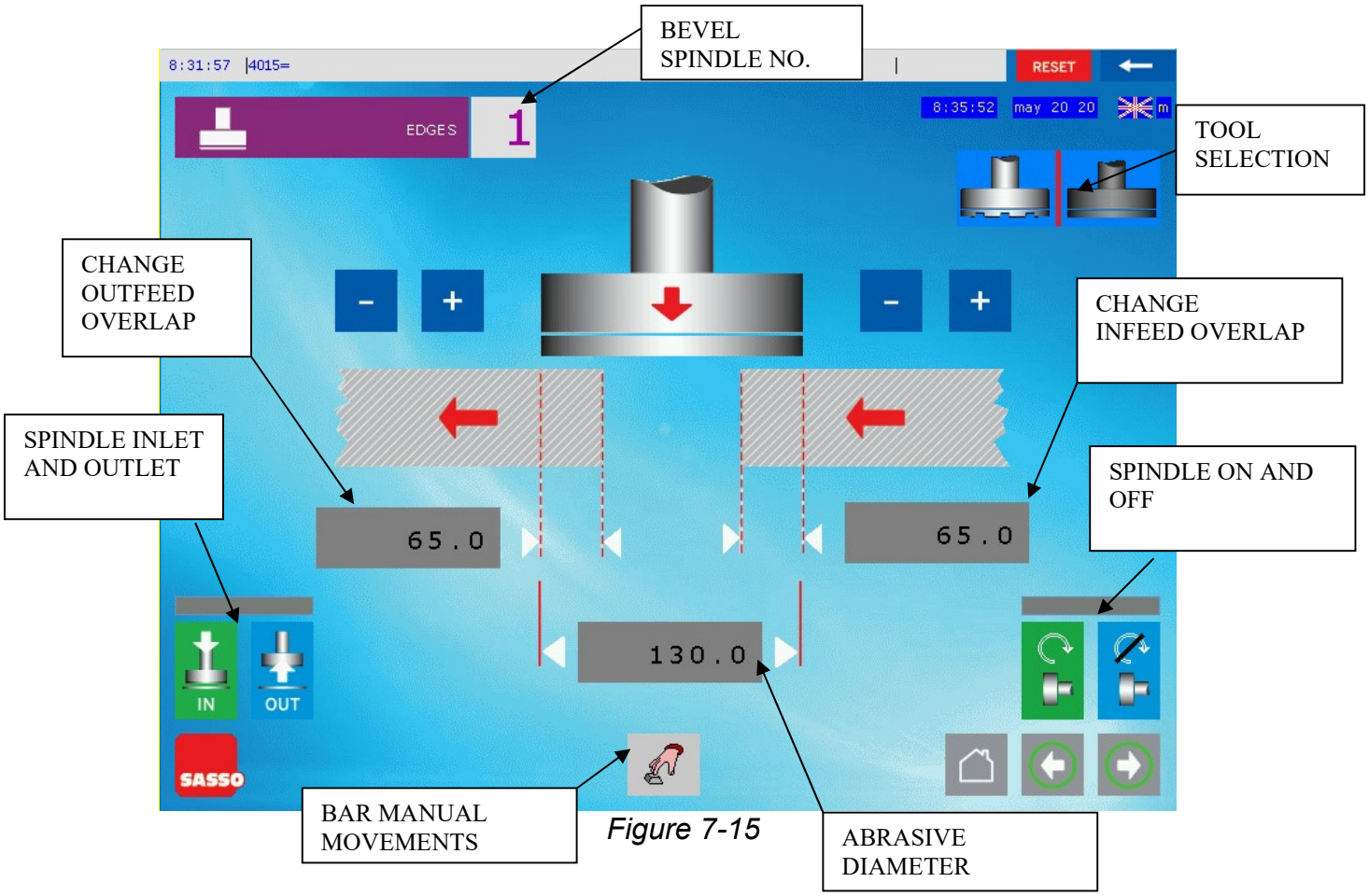


Figure 7-15

On this screen you may modify the infeed and outfeed overlaps of the various heads with respect to the edge of the material being processed.
To do so, simply press the value shown on the touch screen and enter the desired value.
As shown in ***Figure 7-15***, you can also verify the correct rotation of the spindles using the buttons at the bottom right and the correct inlet and outlet using the keys at the bottom left (as with all other cases, the activation key is green and the stop key blue).
To change the spindle to be configured, simply press the number on the **EDGES** icon and enter the number for the desired spindle or, alternatively, use the bottom right arrows to change page.
To go back to the home page, simply press the home icon at the bottom.
For the first head and, optionally, also for the second, the tool to be fitted can be defined; as a matter of fact, pressing the **TOOL SELECTION** icon opens the window shown in ***Figure 7-16***.

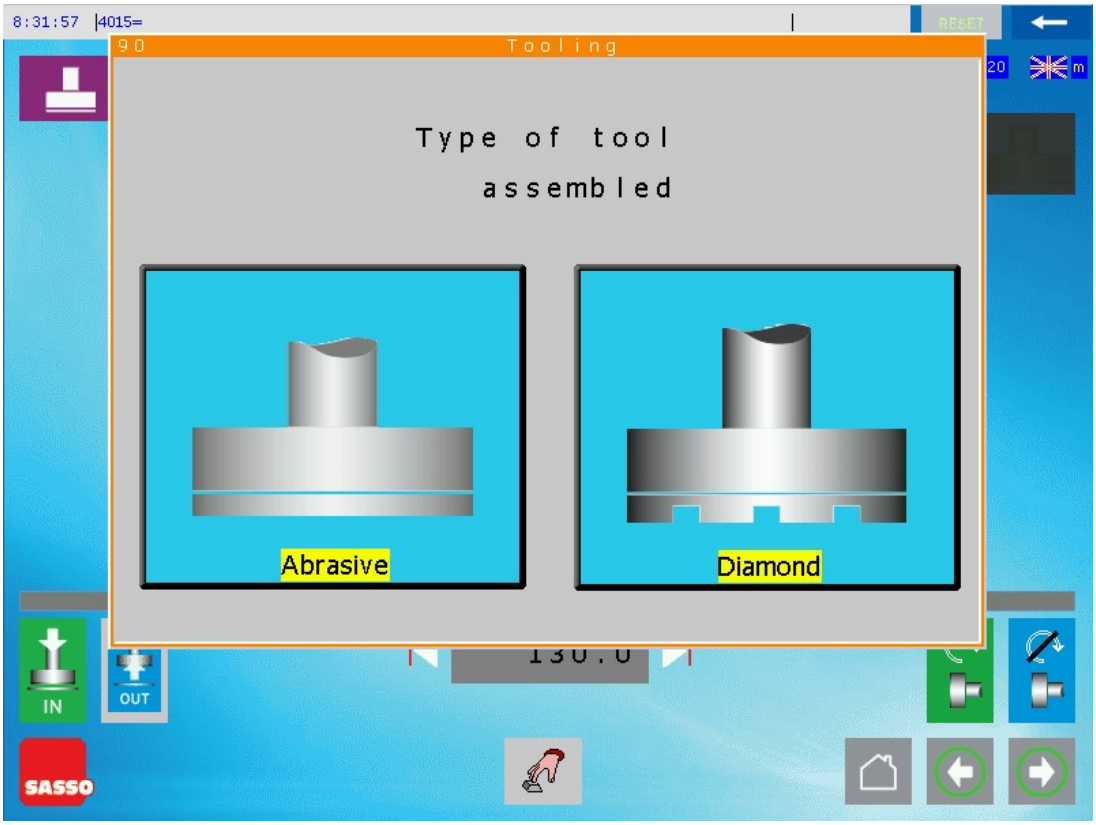


Figure 7-16

If “abrasive tool” is selected, the screen in ***Figure 7-15*** will appear, whereas if “diamond” is selected", you will get the following screen:

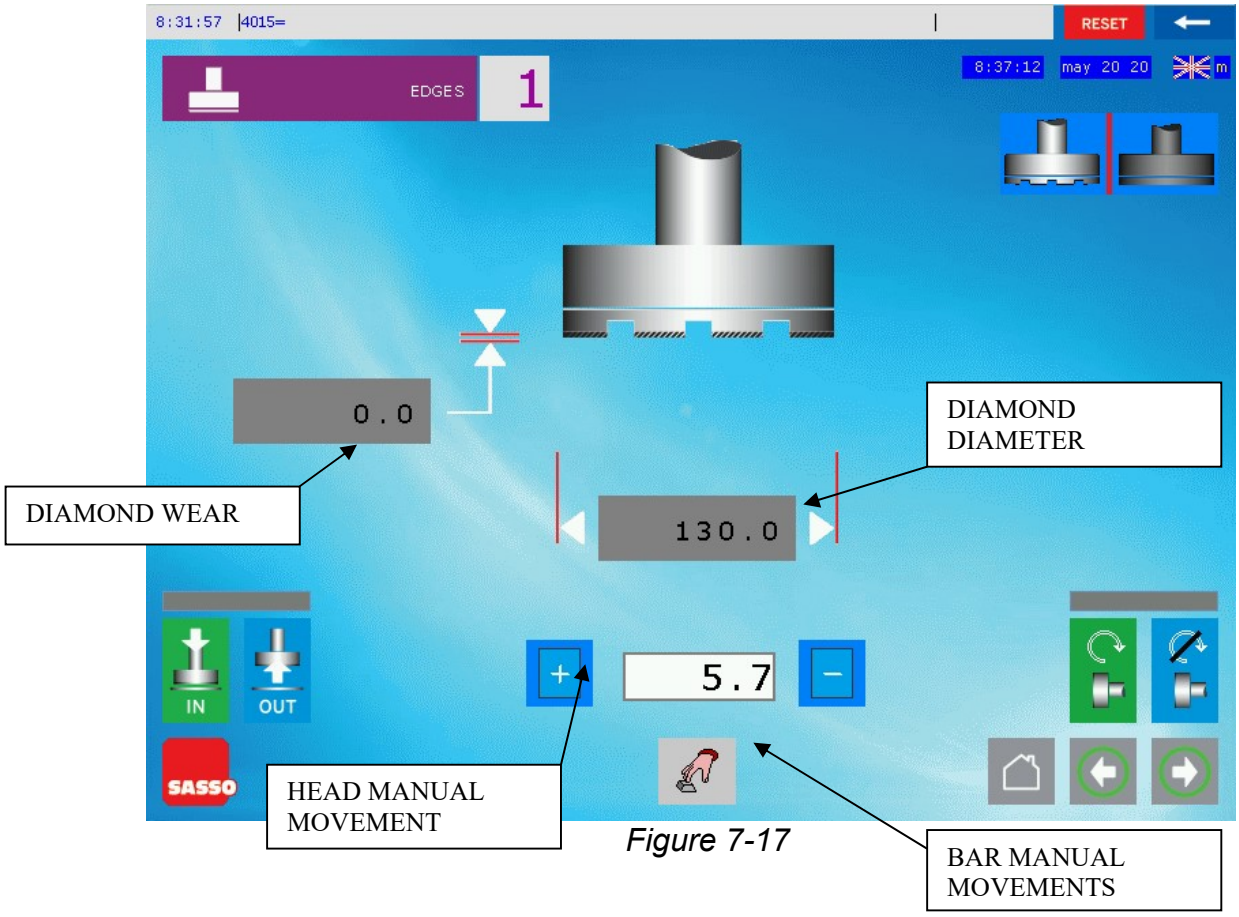


Figure 7-17

In addition to all the features already shown in ***Figure 7-15***, diamond wear must be selected for a diamond tool, as shown in ***Figure 7-17,*** , for the head positioning to be correctly calculated, if the head can be automatically positioned.
Moreover, buttons are available also to manually move heads that can be automatically positioned.
Finally, as shown in both ***Figure 7-15*** and ***Figure 7-16Figure 7-17***, the **MANUAL BAR MOVEMENTS** button is also available. If pressed, the following screen will be displayed:

Figure 7-18

As shown in ***Figure 7-18***, three types of manual movements can be performed for the alpha axis of the oscillator:

- Use the + and – buttons to increase and decrease the value of the alpha axis at which the bar is located;
- Enter the alpha axis value you want to obtain, and press the **START 1** button for the bar to position at the desired angle;
- Enter the maximum and minimum values of the alpha axis you want to obtain, and press the **START 2** button for the bar to start oscillating.

Pressing the **STOP** button will stop the movement of the bar.
For the oscillator radius, however, two types of manual movements can be performed:

- Use the + and – buttons to increase and decrease the value of the radius at which the bar is positioned;
- Enter the radius value you want to obtain, and press the **START 1** button for the bar to position at the desired angle.

Pressing the **STOP** button will stop the movement of the bar.
To go back to the home page, simply press the home icon at the bottom.

7.2.5 UPPER BEVELS / PRECUTTING

Pressing the **UPPER BEVELS/ PRECUTTING PAGE**, icon shown in ***Figure 7-11***, grants access to the screen relative to the unit.

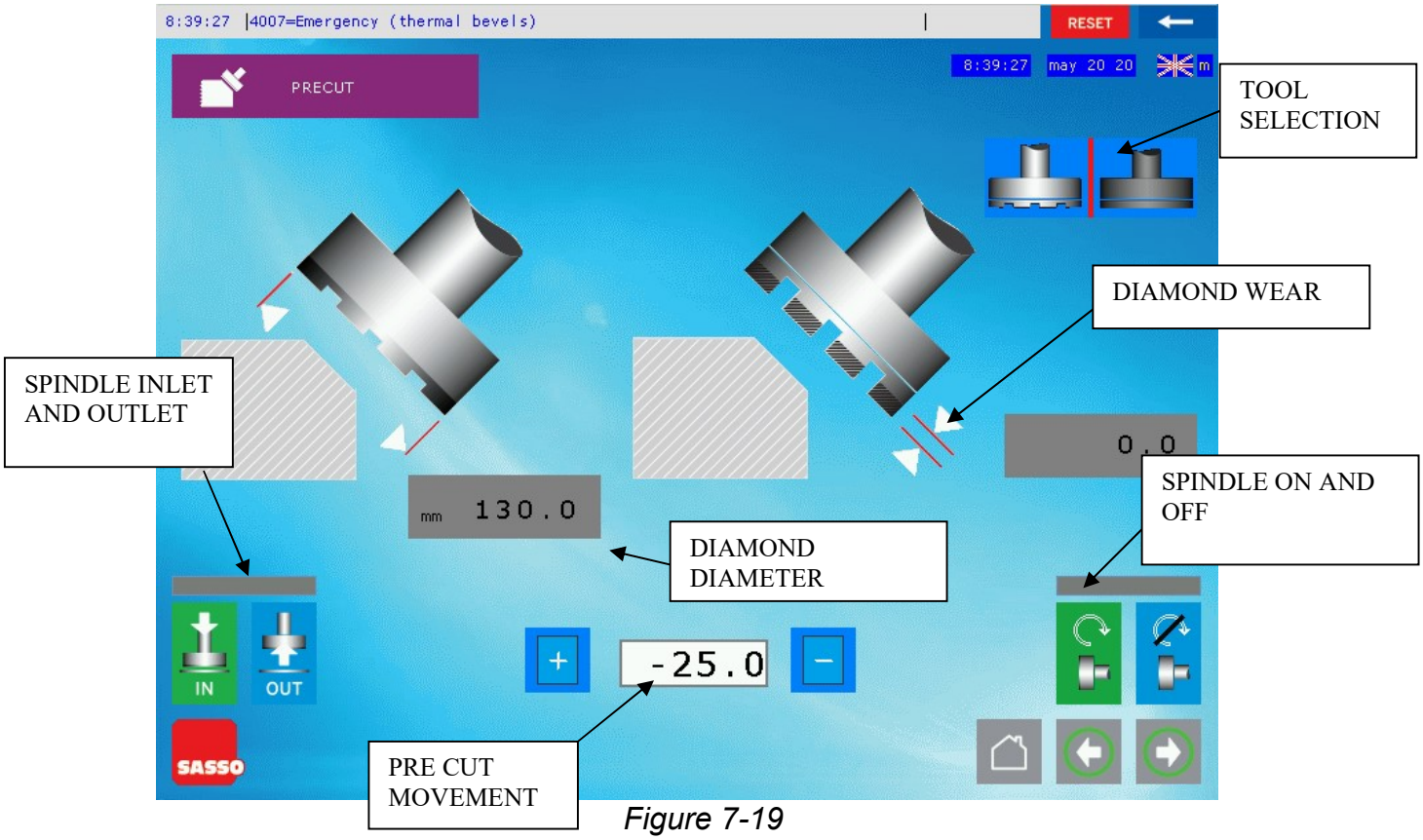


Figure 7-19

From this screen you may modify the diameter of the abrasive of the upper pre-cut diamond by pressing the value on the touch screen and entering the required value.
In addition, a diamond wear value can be entered for the pre-cut positioning to be correctly calculated.
As shown in ***Figure 7-19***, you can also verify the correct rotation of the spindles using the buttons at the bottom right and the correct inlet and outlet using the keys at the bottom left (as with all other cases, the activation key is green and the stop key blue).
Also, there are buttons to manually move the head in question.
For the pre-cut, the tool to be fitted can be defined; as a matter of fact, pressing the **TOOL SELECTION** icon opens the window shown in ***Figure 7-16***.
You can then choose the type of tool you wish to mount; if you select “diamond”, you will go back to the screen in ***Figure 7-19***, whereas if “abrasive tool” is selected, you will get the following screen:

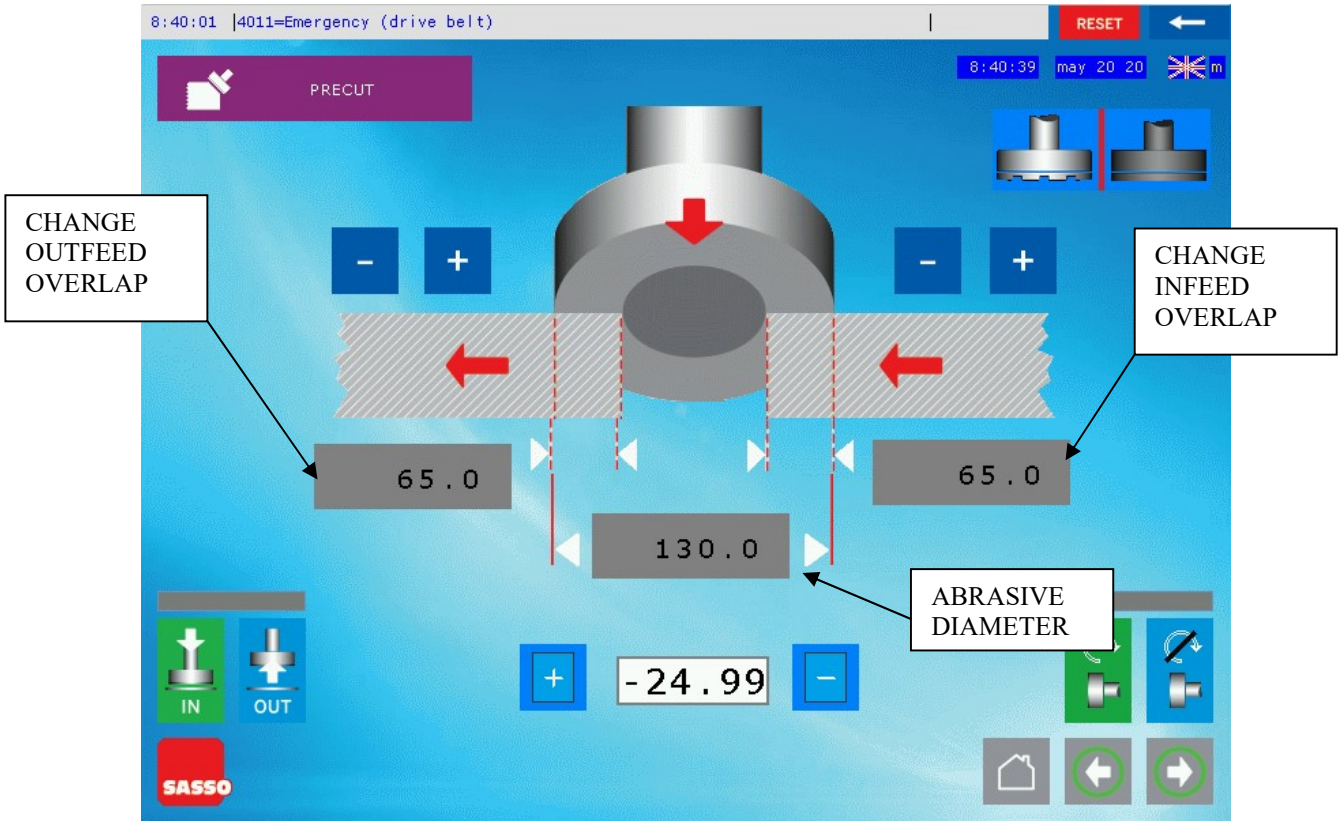


Figure 7-20

In addition to all the features already shown in ***Figure 7-19***, use this screen to change the diameter of the spindle's abrasive and the infeed and outfeed overlaps of the head, with respect to the edge of the material being machined.
When the pre-cut is equipped with abrasive, it operates as a normal bevel.
Use the arrows at the bottom right to change page and enter the upper bevel setup screen as shown in ***Figure 7-21***.

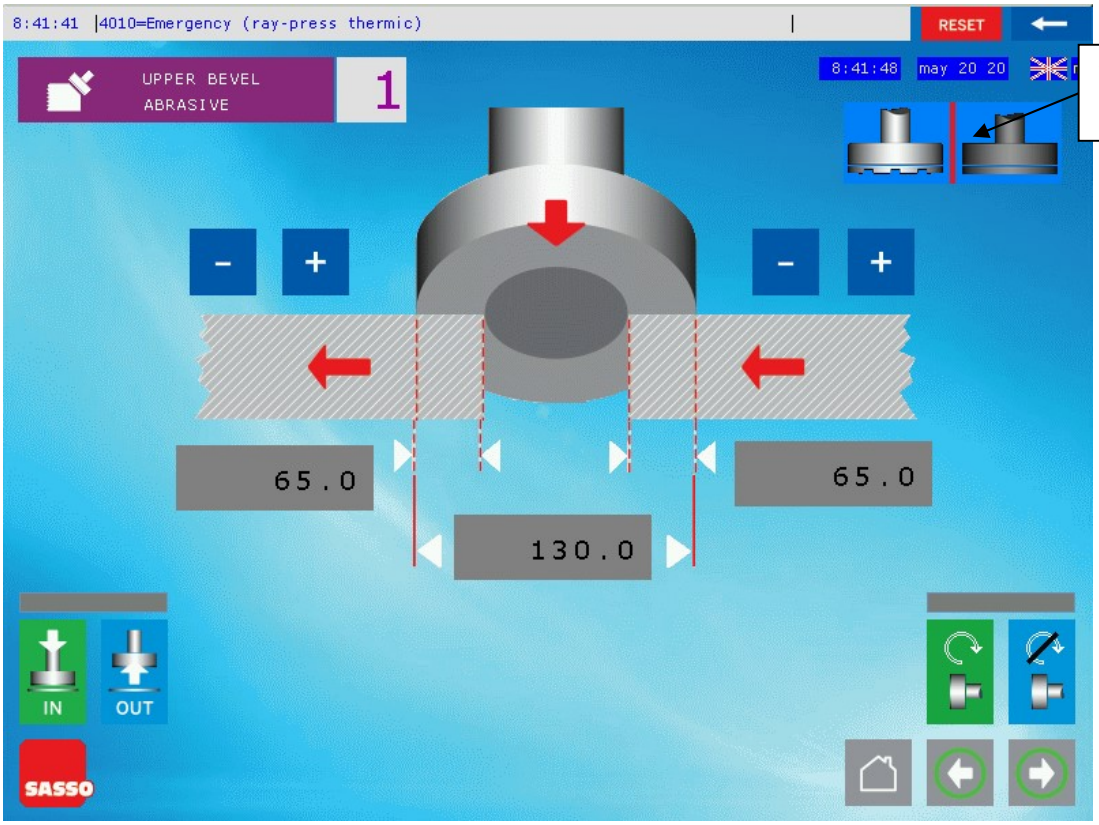


Figure 7-21

This screen is completely similar to that of the pre-cut equipped with abrasive (***Figure 7-20***). If your machine is configured with an upper bevel located before the oscillating bar, the unit can also be equipped with the diamond by pressing the **TOOL SELECTION** icon. In the latter case, the upper bevel can be used as a second pre-cut.
To go back to the home page, simply press the home icon at the bottom.

7.2.6 LOWER BEVELS / PRECUTTING

Pressing the **LOWER BEVELS/ PRECUTTING PAGE**, icon shown in ***Figure 7-11***, grants access to the screen relative to the unit.

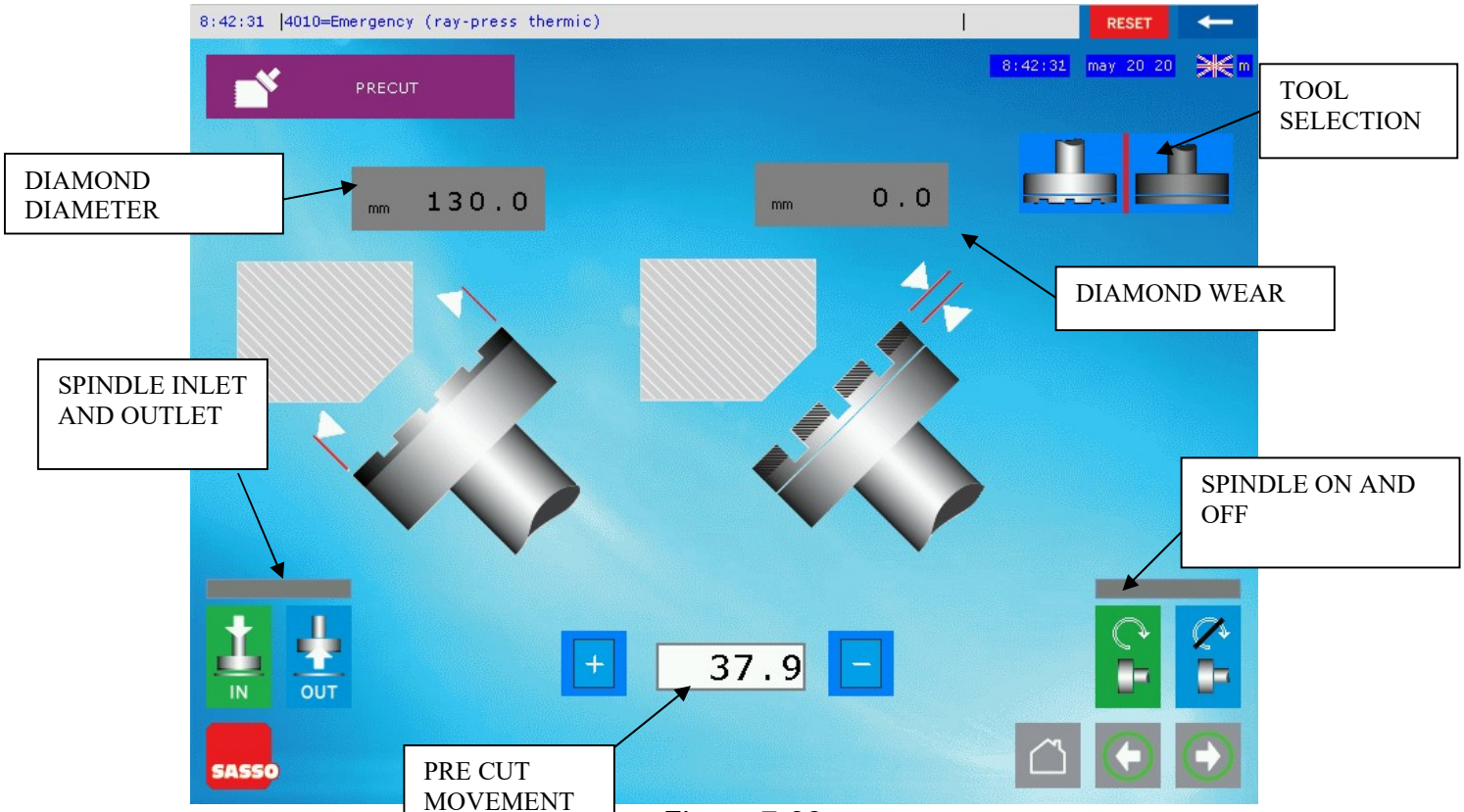


Figure 7-22

From this screen you may modify the diameter of the abrasive of the lower bevels by pressing the value on the touch screen and entering the required value.
In addition, a diamond wear value can be entered for the pre-cut positioning to be correctly calculated.
As shown in ***Figure 7-22***, you can also verify the correct rotation of the spindles using the buttons at the bottom right and the correct inlet and outlet using the keys at the bottom left (as with all other cases, the activation key is green and the stop key blue).
Also, there are buttons to manually move the head in question.
For the pre-cut, the tool to be fitted can be defined; as a matter of fact, pressing the **TOOL SELECTION** icon opens the window shown in ***Figure 7-16***.
You can then choose the type of tool you wish to mount; if you select “diamond”, you will go back to the screen in ***Figure 7-22***, whereas if “abrasive tool” is selected, you will get the following screen:

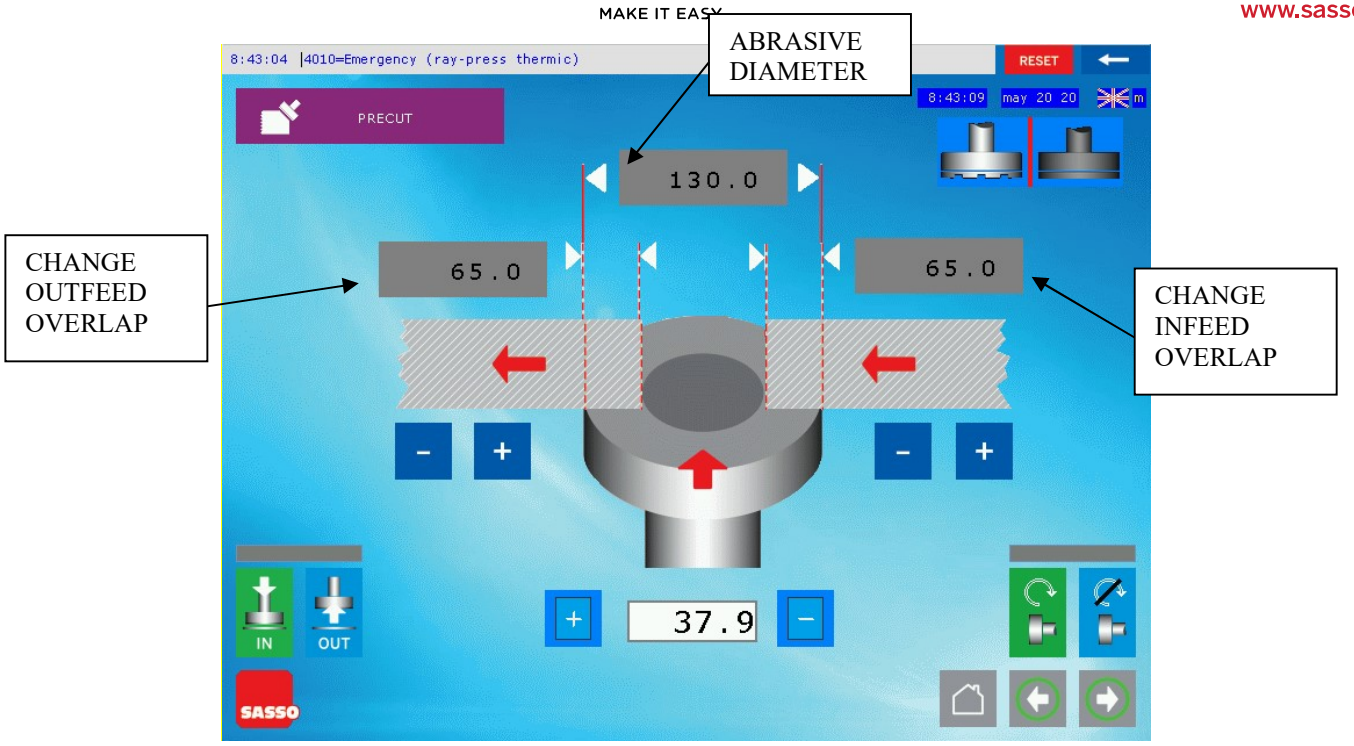


Figure 7-23

In addition to all the features already shown in ***Figure 7-22***, use this screen to change the diameter of the spindle's abrasive and the infeed and outfeed overlaps of the head, with respect to the edge of the material being machined.
When the pre-cut is equipped with abrasive, it operates as a normal bevel.
Use the arrows at the bottom right to change page and enter the lower bevel setup screen as shown in ***Figure 7-24***.

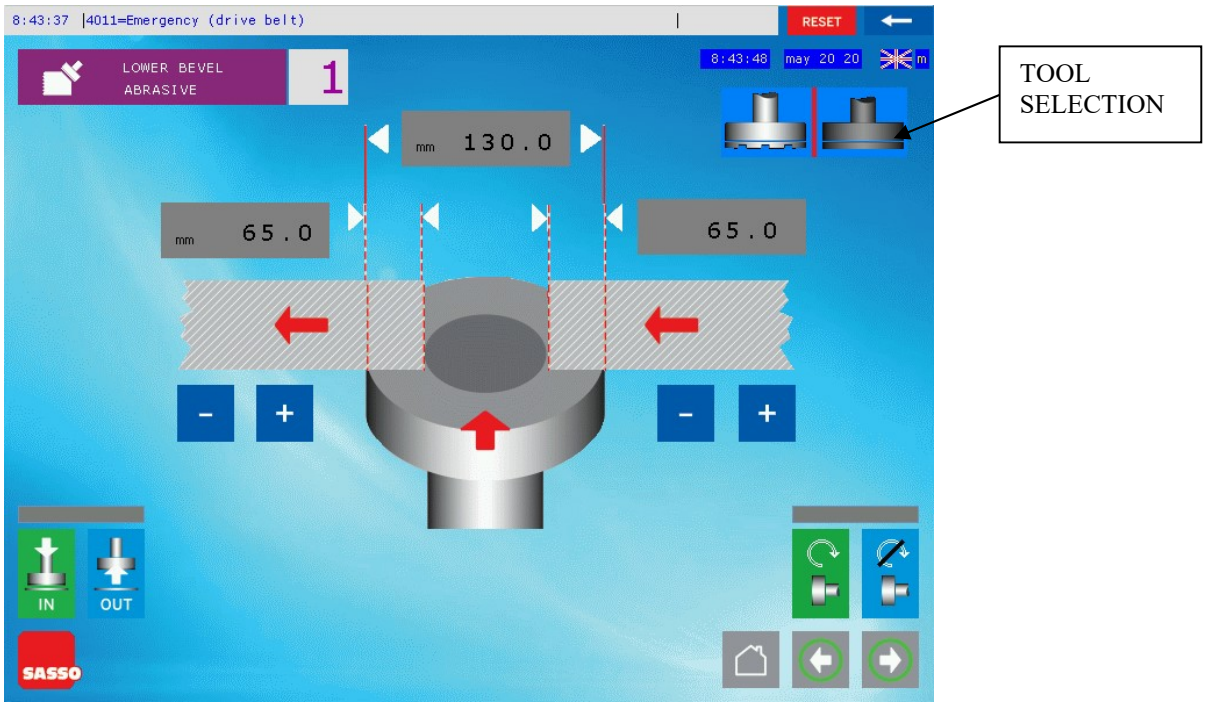


Figure 7-24

This screen is completely similar to that of the pre-cut equipped with abrasive (***Figure 7-23***). If your machine is configured with a lower bevel located before the oscillating bar, the unit can also be equipped with the diamond by pressing the **TOOL SELECTION** icon. In the latter case, the lower bevel can be used as a second pre-cut.
To go back to the home page, simply press the home icon at the bottom.

7.2.7 MULTIFUNCTION (OPTIONAL)

Pressing the multi function icon shown in ***Figure 7-11***, grants access to the screen relative to the unit.

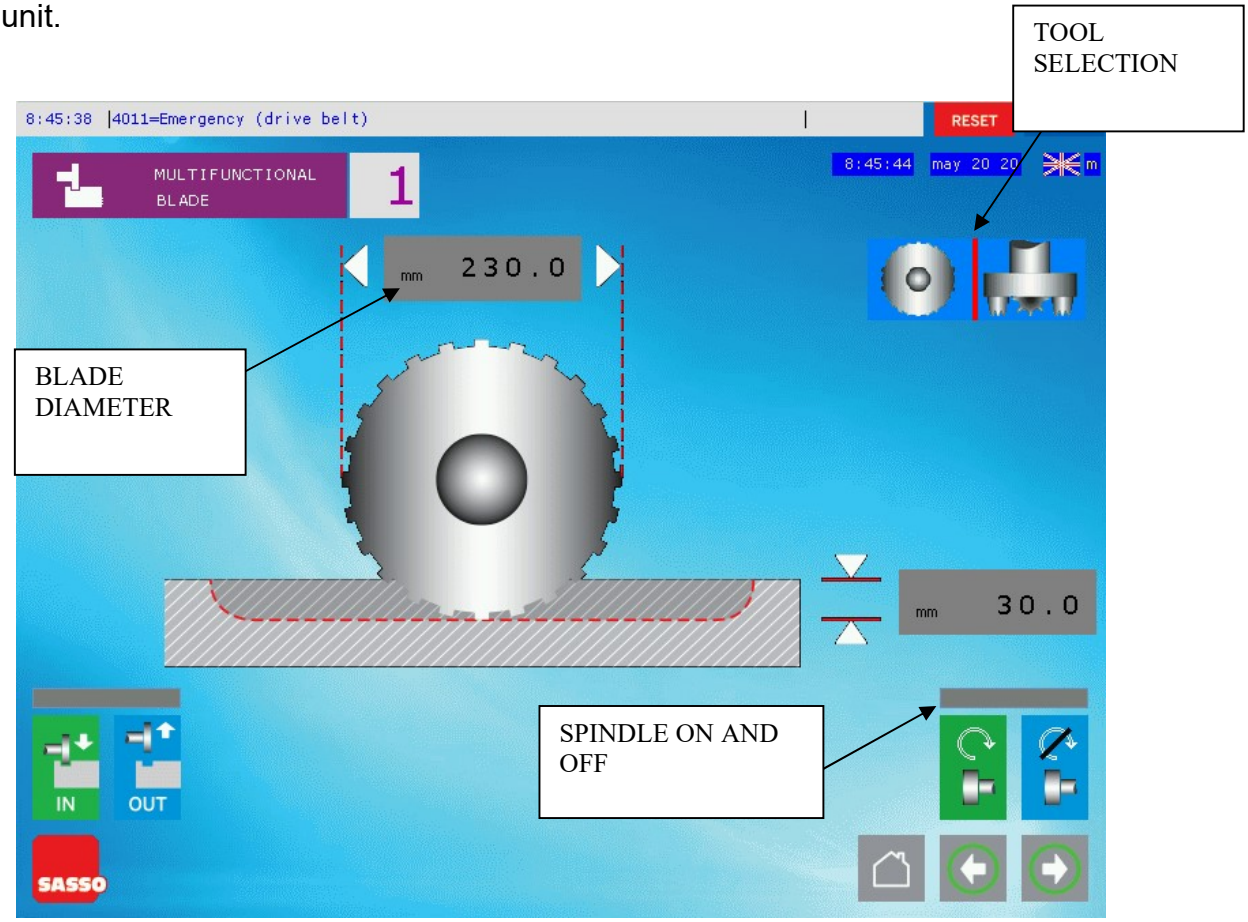


Figure 7-25

Pressing the **TOOL SELECTION** icon shown in ***Figure 7-25***, allows you to select the type of installed tool: BLADE or BUSH HAMMER as shown in the image below.

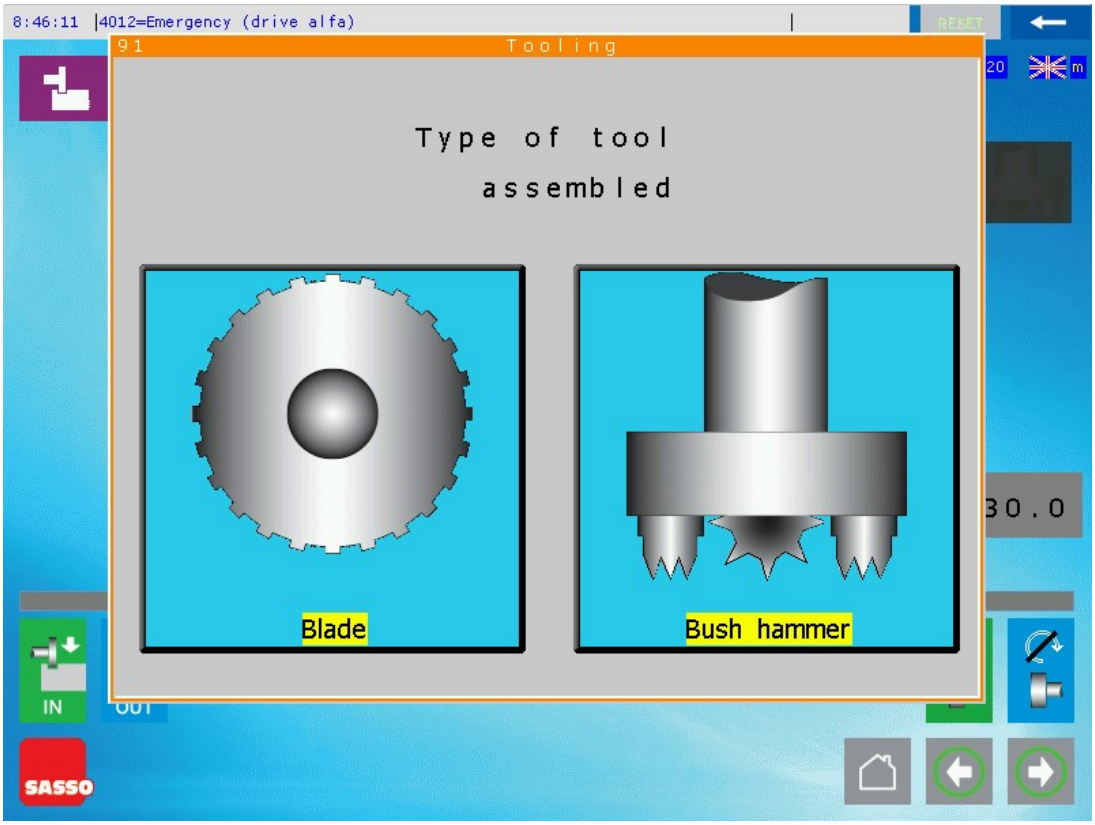


Figure 7-26

If the BLADE tool is chosen, the screen is the one shown in ***Figure 7-25***; here you may set the blade diameter by selecting the icon shown in the figure and entering the desired value. As shown in ***Figure 7-25***, you might also verify the correct rotation of the spindle using the buttons at the bottom right (as with all other cases, the activation key is green and the stop key blue).
To change the page, press the arrows at the bottom right.
To go back to the home page, simply press the home icon at the bottom.
If you select the BUSH HAMMER tool, the screen is the one shown in ***Figure 7-27***.

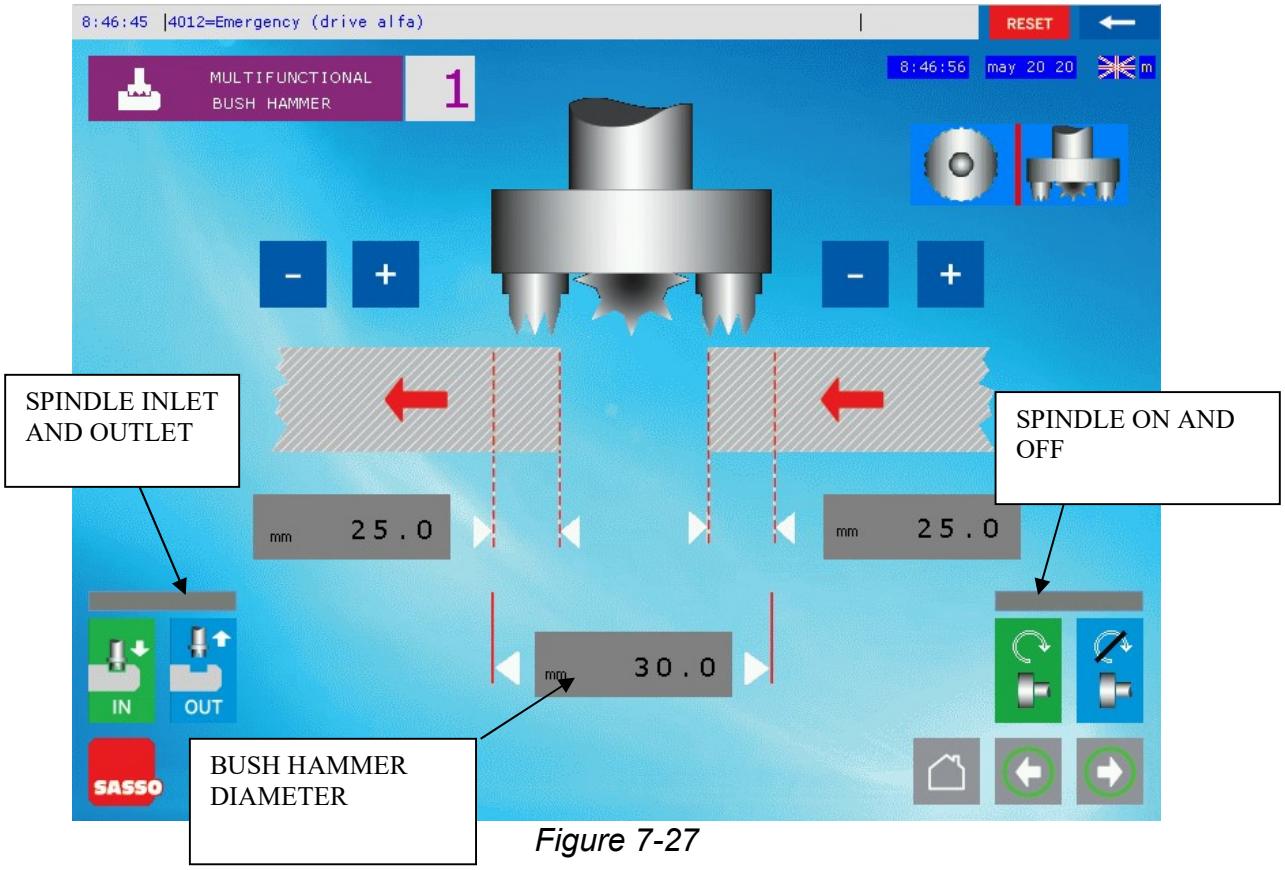


Figure 7-27

Here you may set the diameter of the installed bush hammer tool by selecting the icon shown in the figure and entering the desired value.
Then you may modify the infeed and outfeed overlaps of the head with respect to the edge of the material being processed.
As shown in ***Figure 7-27***, , you can also verify the correct rotation of the spindles using the buttons at the bottom right and the correct inlet and outlet using the keys at the bottom left (as with all other cases, the activation key is green and the stop key blue).
To change the page, press the arrows at the bottom right.
To go back to the home page, simply press the home icon at the bottom.

7.2.8 WATER DRIP (OPTIONAL)

Pressing the **WATER DRIP** icon shown in ***Figure 7-11***, grants access to the screen relative to the unit.

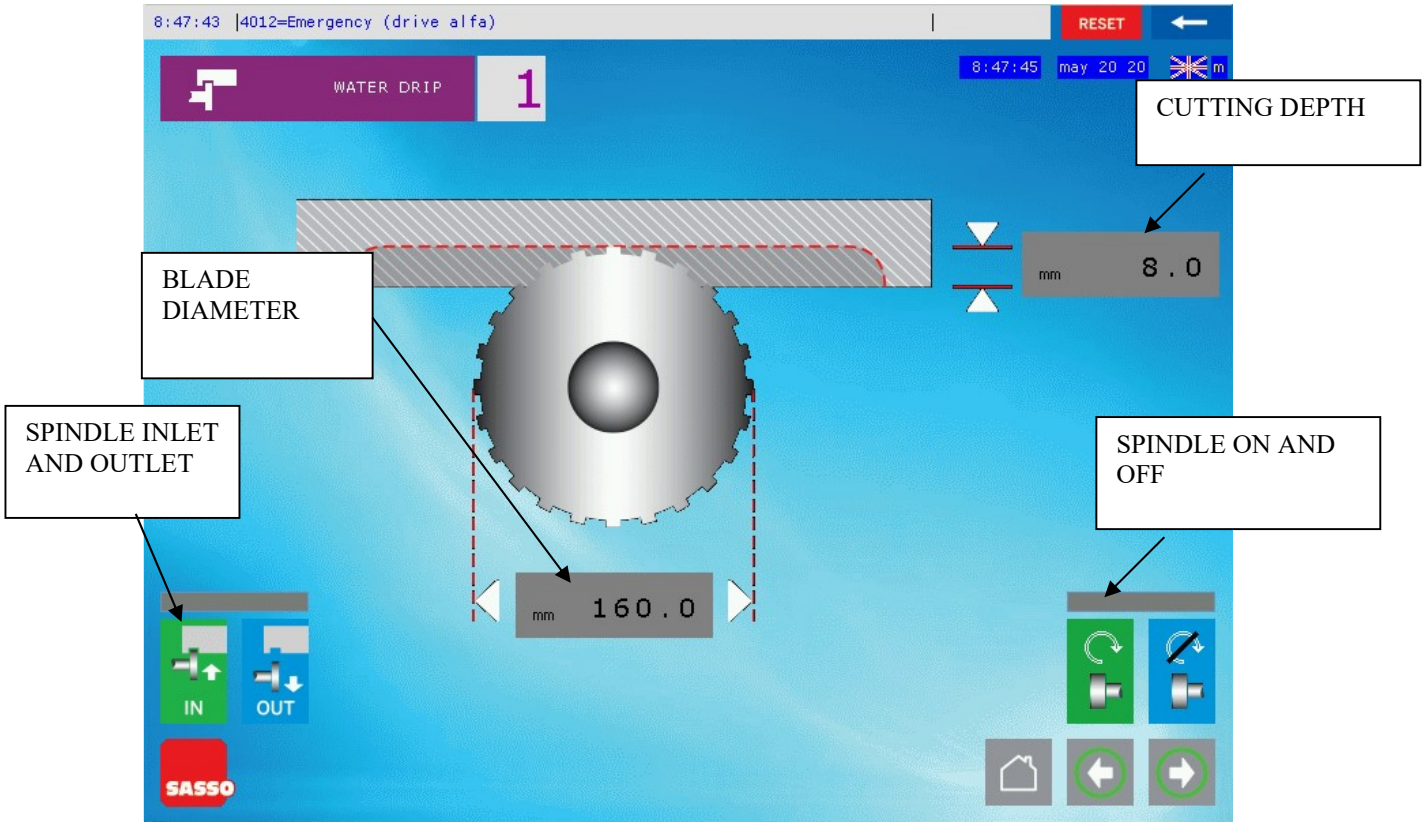


Figure 7-28

Here you may set the diameter of the installed tool by selecting the icon shown in the figure and entering the desired value.
In addition, the exact cutting depth must be defined for the correct calculation of the beginning of the cut (this is especially important for partial jobs).
As shown in ***Figure 7-28***, you can also verify the correct rotation of the spindles using the buttons at the bottom right and the correct inlet and outlet using the keys at the bottom left (as with all other cases, the activation key is green and the stop key blue).
To change the page, press the arrows at the bottom right.
To go back to the home page, simply press the home icon at the bottom.

7.3 PARTIAL JOB

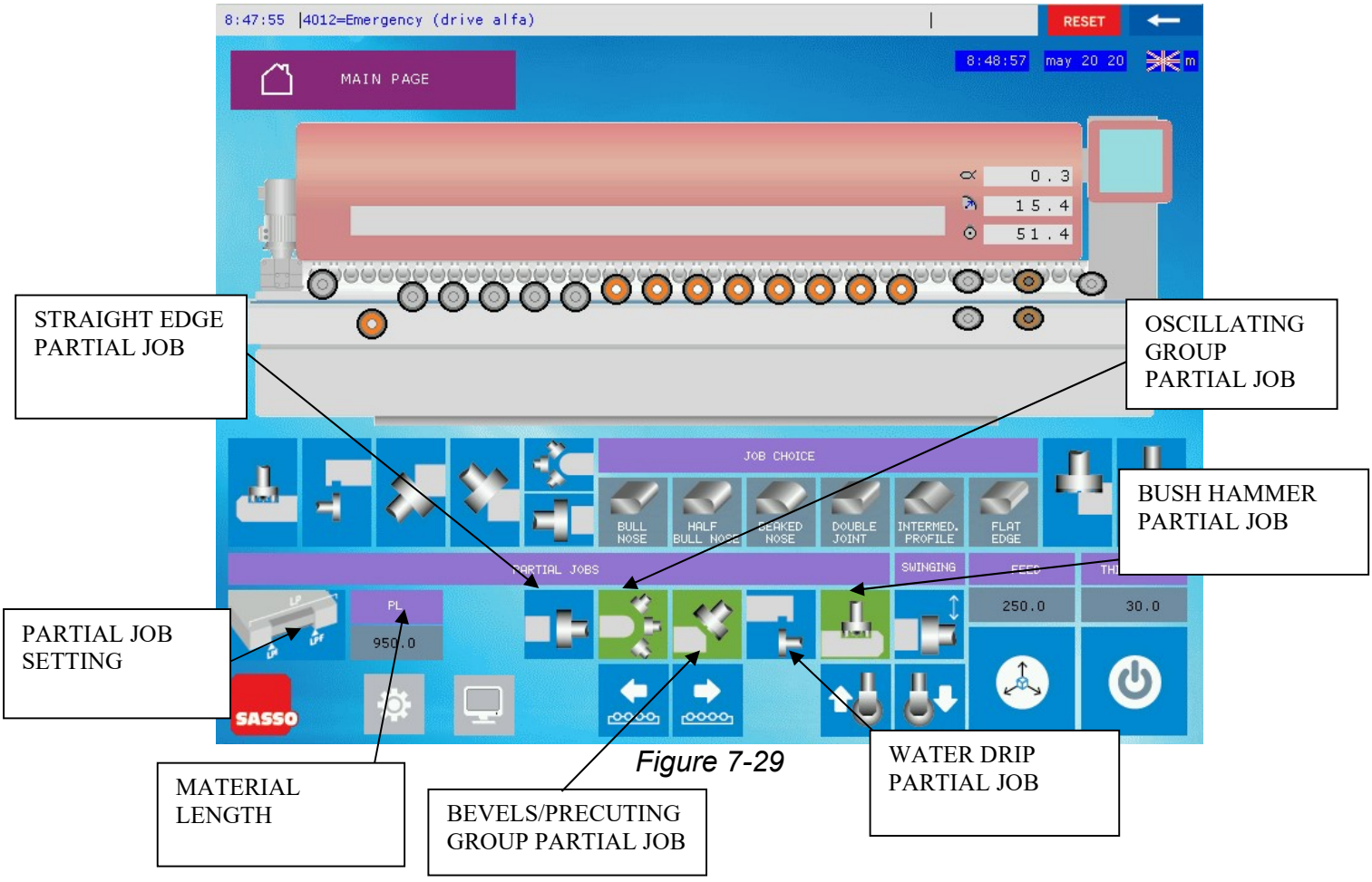


Figure 7-29

From the **HOME** page (***Figure 7-29***) you may select the units which shall perform partial processing.
When you have selected the desired units, they will turn green.
You may now set the material length by pressing the value on the screen and entering the desired value. You do not need to enter the material length for each job: if it is necessary, a warning will appear directly on the touch screen.
Pressing the **PARTIAL JOB SETTING** icon brings you to the following page:

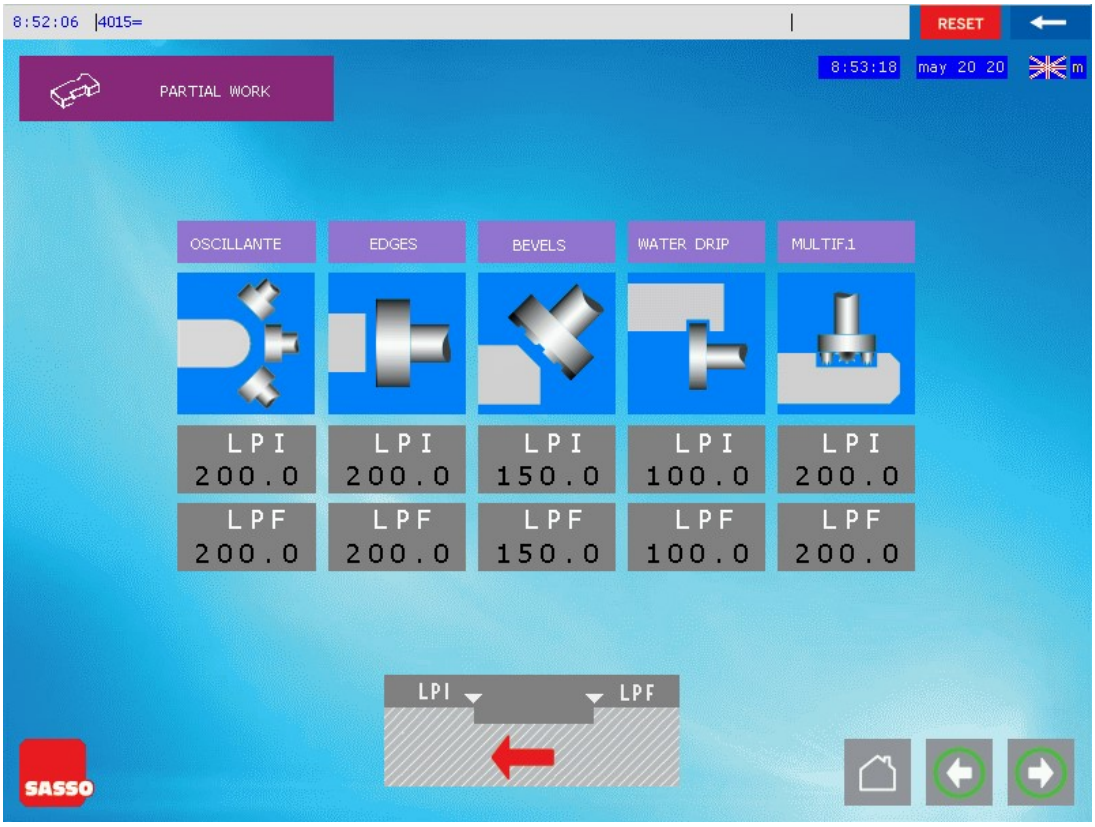


Figure 7-30

From the screen displayed in ***Figure 7-30*** for each unit (oscillating group, flat edge, bevels, water drip and bush hammer), you may enter the distance at the start of work with respect to the infeed edge of the material and the distance at the end of work with respect to the outfeed edge of the material.
To go back to the home page, simply press the home icon at the bottom.

8 MAINTENANCE

8.1 SAFETY INSTRUCTIONS DURING MAINTENANCE OPERATIONS

MAINTENANCE MUST BE CARRIED OUT WITH THE MACHINE OFF AND DISCONNECTED FROM THE POWER SUPPLIES

- The efficiency, performance and lifetime of the machine depend on several factors: improper use, routine maintenance not performed regularly, use of products which do not comply with manufacturer specifications.
- have maintenance performed by qualified personnel appropriately trained on the requirements set forth in this manual.
- apply warning signs for maintenance in progress in a clearly visible position.
- All maintenance, repairs, adjustments and lubrication must be carried out with the machine and all of its systems off. All energy sources (electrical, water, compressed air) must be disconnected to ensure that the equipment does not start up unexpectedly.
- Block the energy sources to prevent accidental start-up by third parties. Also make sure that no part can move accidentally or due to gravity.
- Check that all the safety signs and plates are in good conditions: if any defects are noticed, switch the machine off and have them replaced.
- On a daily basis check that all visual indicators are working properly: in case of malfunctioning, switch the machine off and have them repaired.
- On a daily basis check that all guards and protections are in place and working: in case of malfunctioning, switch the machine off and make the repairs.
- the machine can only be inspected and cleaned after:

  - pressure in any pneumatic devices has been discharged.
  - The spindle has been put out of service by pressing the normal stop button or the emergency stop button
  - the disc has stopped spinning
  - all energy sources (electrical, pneumatic) have been disconnected

  If it is necessary to clean the machine, the protections can be removed with the machine off and disconnected from all energy sources.
- After having commanded the machine to stop, wait at least 5 minutes before operating it again.
- When it restarts, the operator must not be inside the danger zone
- for machine troubleshooting, take all suitable precautions described in the manual to prevent any personal harm or property damage.
- remember to tighten every screw, bolt or ring nut of each mechanical element subject to adjustments or fine-tuning.
- If several maintenance teams (mechanics, electricians, etc.) need to work on the same machine or in a confined area, those in charge of the different teams must agree in advance so as to eliminate risks of interference.

- precautions to be taken when treating the lubricants:
  - avoid prolonged, excessive or repeated contact of skin with lubricating products and inhaling their vapours or fumes
  - protect the skin by wearing suitable protective clothing and equipment (overalls, goggles, gloves)
  - in case of contact, wash the skin with plenty of soap and water
  - do not keep cloths, clothing or shoes soaked with grease on you

- New and spent lubricants can contaminate the ground and water: do not pour lubricants into the ground, into watercourses or into the sewer system. Comply with relevant standards in force to dispose of them.
- carefully recover spent lubricants, separating mineral-based products from synthetic-based ones.
- When this type of maintenance is finished, the department manager or the person in charge must:

  - Make sure that all the protections, guards, casings, acoustic and luminous indicators are working
  - Check that no one remains near the machine, that all maintenance personnel have cleared the area and that there are no more danger conditions.
  - Remove all caution and/or warning signs applied in advance for maintenance
  - When starting, make sure there is no one in the danger zone

8.2 INSTRUCTIONS ON ELECTRICAL MAINTENANCE

FAILURE TO COMPLY WITH THESE GUIDELINES CAN CAUSE ELECTROCUTION, SERIOUS INJURY OR DEATH.

- Before removing any guard/protection and starting maintenance on the electrical part of the machine, personnel must:

  - Disconnect power
  - Use a specific instrument to make sure that there is actually no phase-to-phase or line-to earth voltage.
  - Follow the insulation and tagging procedure as specified in current standards.

- Always use tools with an insulated grip and in good conditions, rubber gloves, rubber matts.
- Do not perform measurements using metal tape measures.
- Before working on any circuit connected to capacitors or other capacitive elements, discharge the capacitors and the capacitive elements to their earth connections, even after having disconnected the power to the circuit.
- Before replacing fuses or indicator lights, make sure the circuit is powered off: do not replace blown fuses with copper wires or wires of other material.
- Do not use water or foam to put out fires on electrical material or in the vicinity of electrical wires, electrical machines and devices: only use powder, carbon dioxide or Halon.

8.3 ROUTINE MAINTENANCE

MAINTENANCE MUST BE CARRIED OUT WITH THE MACHINE OFF AND DISCONNECTED FROM THE POWER SUPPLIES

Machine repairs must be assigned to specialised technicians only.

It is recommended to always keep the machine properly clean, removing any filth.

Perform the following routine maintenance program:

frequency	*operation*
before starting work	• CLEAN the machine with compressed air • CHECK correct operation of the emergency buttons • CHECK the efficiency of the safety systems installed: perform the machine starting test with the guards open. Test opening of the guards with the machine running. • CHECK the state and correct installation of the fixed guards • CHECK the correct efficiency of the visual indicators
every 30 days	• check the lubricant level
every YEAR	• ELECTRICAL CHECKS: using the specific instruments, check the continuity of the earth circuit and insulation of the live parts of the machine.
number of working hours (or years) depending on the cycle times	• REPLACE the safety components fitted on the machine (emergency button, light curtains, compressed air valves, safety module) when the LIFE EXPECTANCY of the component has been reached, as indicated by the manufacturer.
whenever electrical components or safety components are replaced	• perform the ELECTRICAL TESTS AND VERIFICATIONS as set forth in Chapter 18 of standard IEC EN 60204-1 with instrument, compliant with EN 61557, for safety verifications on machinery and electric switchgear, as required by standard EN 60204-1 in chapter 18.7 RETESTING: *"Where a portion of the machine and its associated equipment is changed or modified, that portion shall be re-verified and re-tested, as appropriate (see 18.1). Particular attention should be given to the possible adverse effects that retesting can have on the equipment (for example overstressing of insulation, disconnection/reconnection of devices)."* • Repeat the functional testing of the machine and test the installed safety components
every 200 hours of work	• lubricate the moving parts of the machine • check that there is no corrosion on any of the parts making up the machine frame and all of the structural parts
every 6000 hours of work	• OVERHAUL of the machine by the manufacturer

- Any damage to the protections or anomalies found during operation or during inspection of the machine must be immediately repaired by personnel qualified for that type of operation.
- Before each use check that the protections and safeties are perfectly efficient and at the end of the work process perform general cleaning of the machine.

– Regularly check the process water for contaminants.

8.4 REPLACING SPARE PARTS

The replacement of spare parts subject to normal wear and tear, such as abrasive inserts, lubricating oil, can be done by qualified personnel trained on use of the machine.
The replacement of parts for extraordinary maintenance must be performed by qualified personnel, expert on maintenance of machine tools, appropriately instructed and trained by the manufacturer.

8.5 GREASING

8.5.1 GREASING THE BELT ROLLERS

The bearings of the belt rollers need to be greased regularly.
The hard-to-reach units are located towards the outside of the machine, as shown in figure

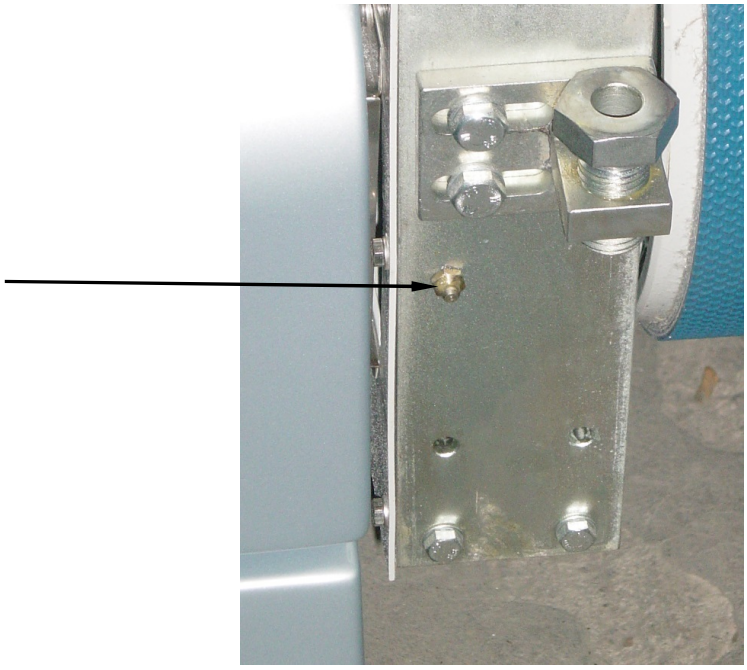


Figure 8-1

Use IP ATHESIA GREASE EP2 or equivalent

It is strictly forbidden to perform presser carrier bar greasing before disconnecting the power supply or placing the machine in emergency mode.

8.5.2 GREASING OF LIFTING SYSTEM

Figure 8-2

The lifting system is composed of two screw liftings and needs periodical lubrication in the points identified by the photos.

Use IP ATHESIA GREASE EP2 or equivalent

It is strictly forbidden to perform presser carrier bar greasing before disconnecting the power supply or placing the machine in emergency mode.

8.5.3 GREASING THE SPINDLES

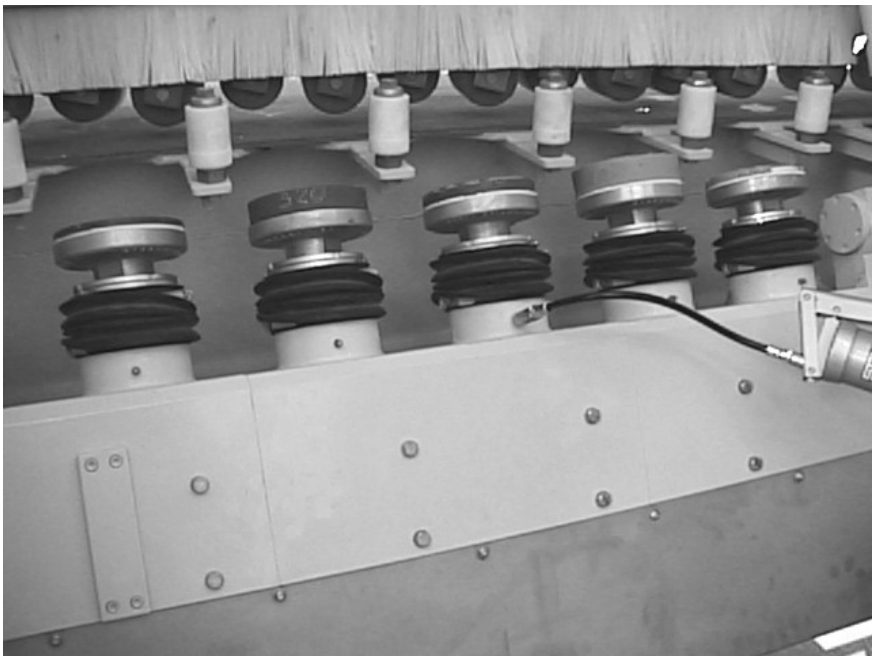


Figure 8-3

The figure above shows the grease points of the bull-nose spindles.
We recommend greasing of each spindle every 100 hours of work.

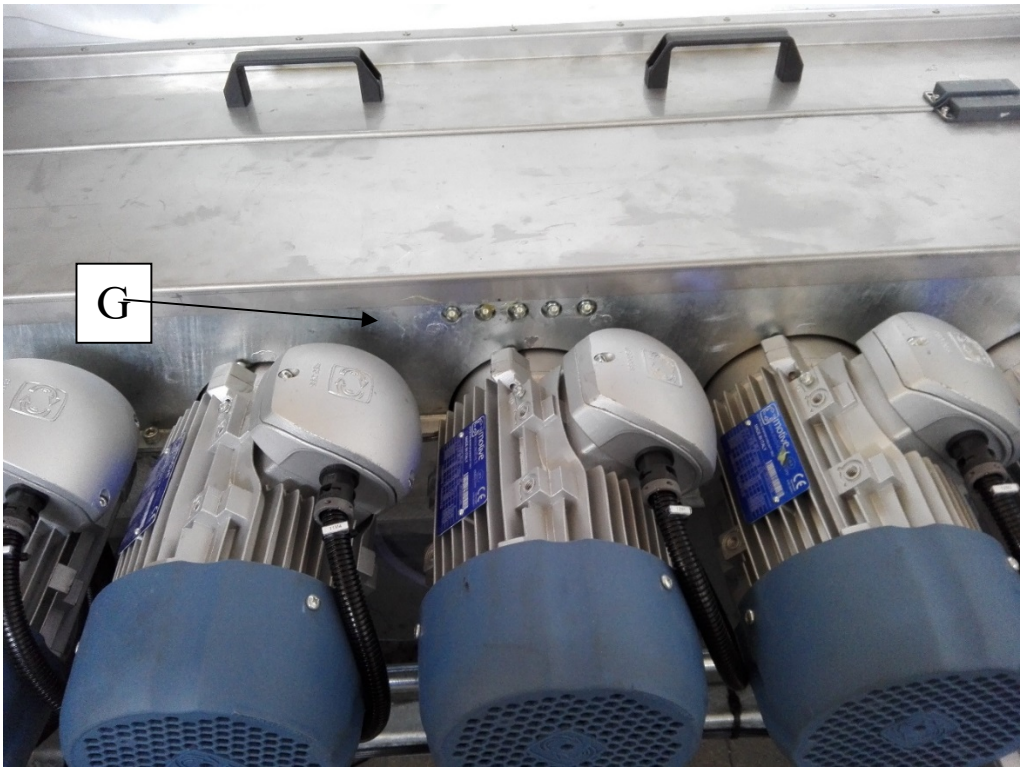


Figure 8-4

The figure above shows the grease points of the flat edge spindles .
We recommend greasing every 100 hours of work.

Use IP ATHESIA GREASE EP2 or equivalent

It is strictly forbidden to perform presser carrier bar greasing before disconnecting the power supply or placing the machine in emergency mode.

8.5.4 GREASING THE PRESSER BAR

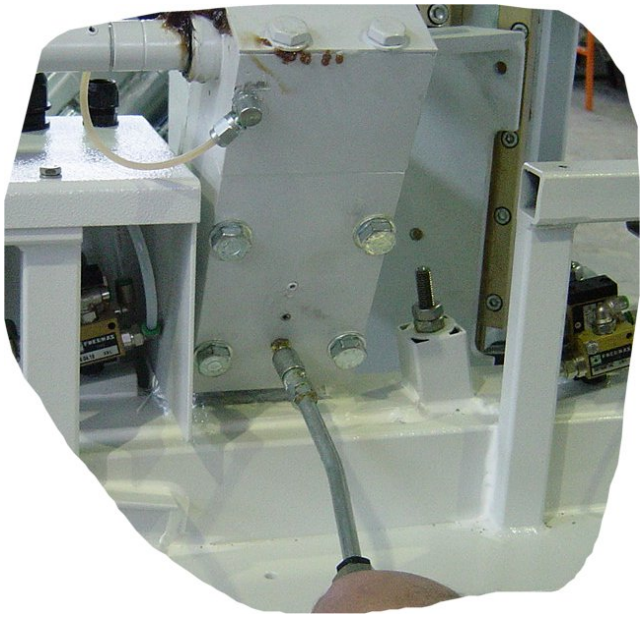


Figure 8-5

The bar of the presser rollers is equipped with a vertical movement system built on sleeves and driven by a gearmotor.

The system needs to be greased regularly to maintain its vertical sliding capacities.

Use IP ATHESIA GREASE EP2 or equivalent

It is strictly forbidden to perform presser carrier bar greasing before disconnecting the power supply or placing the machine in emergency mode.

8.5.1 GREASING THE SWINGING SYSTEM

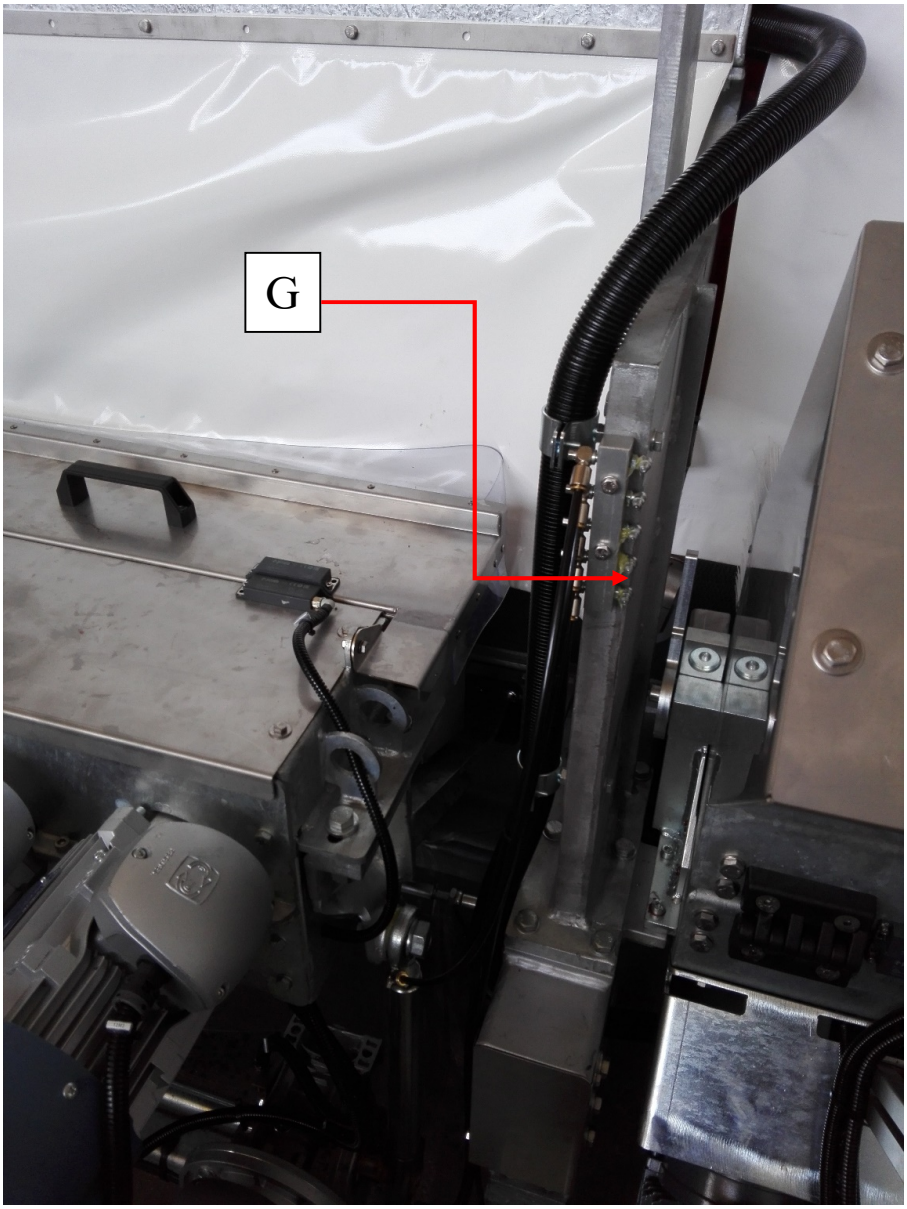


Figure 8-6

The figure above shows the greasing points of the Swinging system.

It is recommended to grease each spindle every 100 hours of work
Use IP ATHESIA GREASE EP2 or equivalent

It is strictly forbidden to perform presser carrier bar greasing before disconnecting the power supply or placing the machine in emergency mode.

8.6 BELT ADJUSTMENT

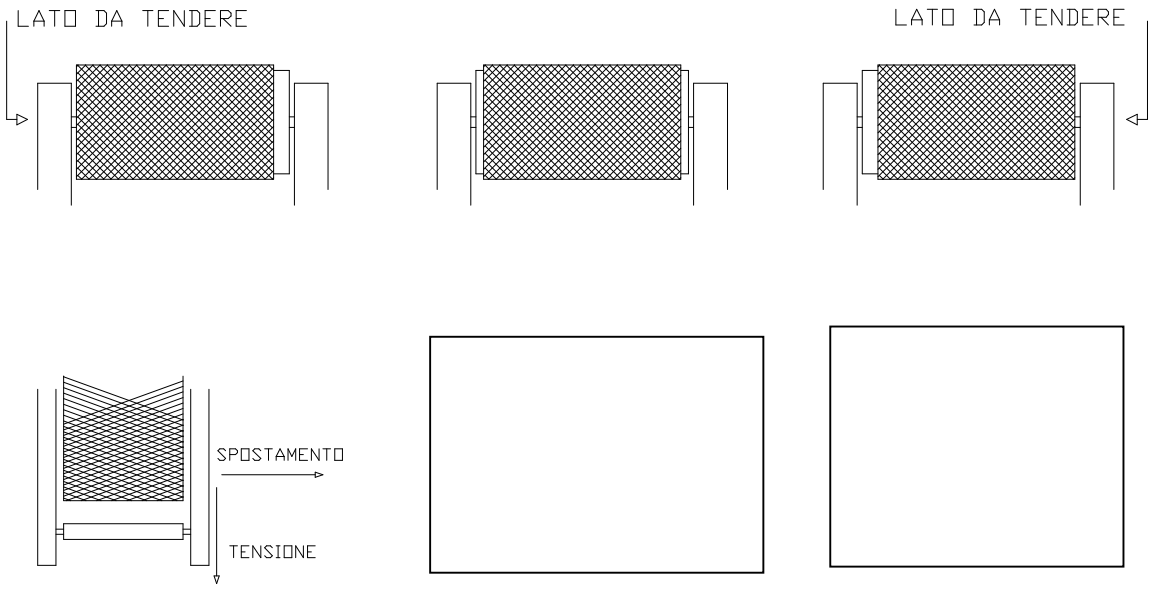


Figure 8-7

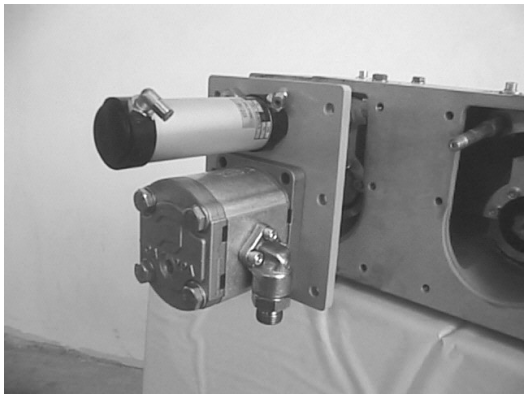
The belt must always be well-tensioned and parallel to the edge support roller line.

If the belt tends to move, you must intervene immediately as follows:
a) remove the material being processed
b) have the belt run no-load for a few revolutions
c) if shifting persists, stretch the belt on the side it has shifted to by turning the adjusting screw, as shown in the figure.

This adjustment must be made gradually, by 1/4 of a turn at a time, and waiting for a complete revolution of the belt before adjusting again.

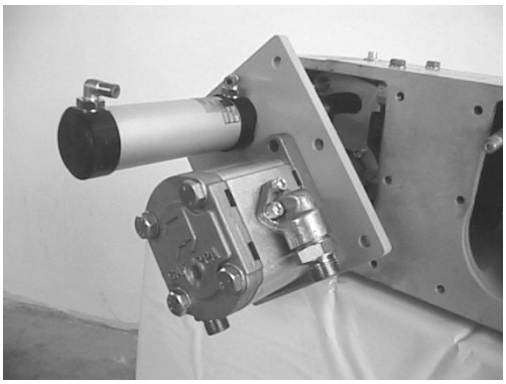
CAUTION: Always carry out this operation by running the belt in no-load conditions

8.7 MANTEINENCE OF THE EDGE SPINDLES



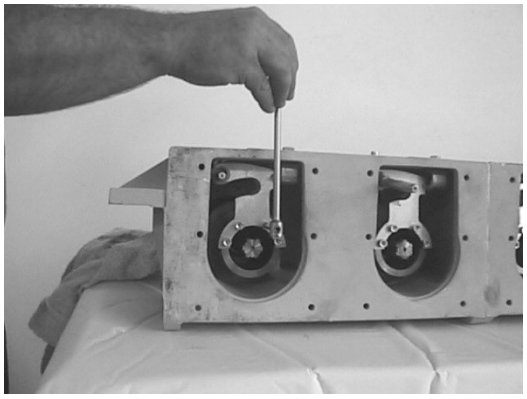
After loosening the screws that hold the motor flange, pull out the block as in the figure.

Figure 8-8



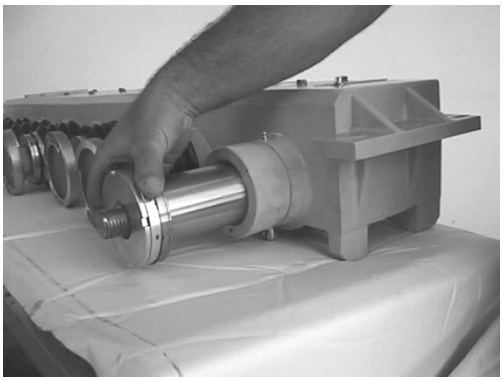
Turn the whole block to the left to free the pneumatic cylinder of the spindle.

Figure 8-9



Loosen the screws of the flange connecting the pneumatic cylinder and the spindle.

Figure 8-10



Pull the spindle out completely.

Figure 8-11

It is absolutely forbidden to proceed with the maintenance of the spindle before disconnecting the electricity supply or placing the machine in the emergency condition.

8.8 HYDRAULIC CENTRAL

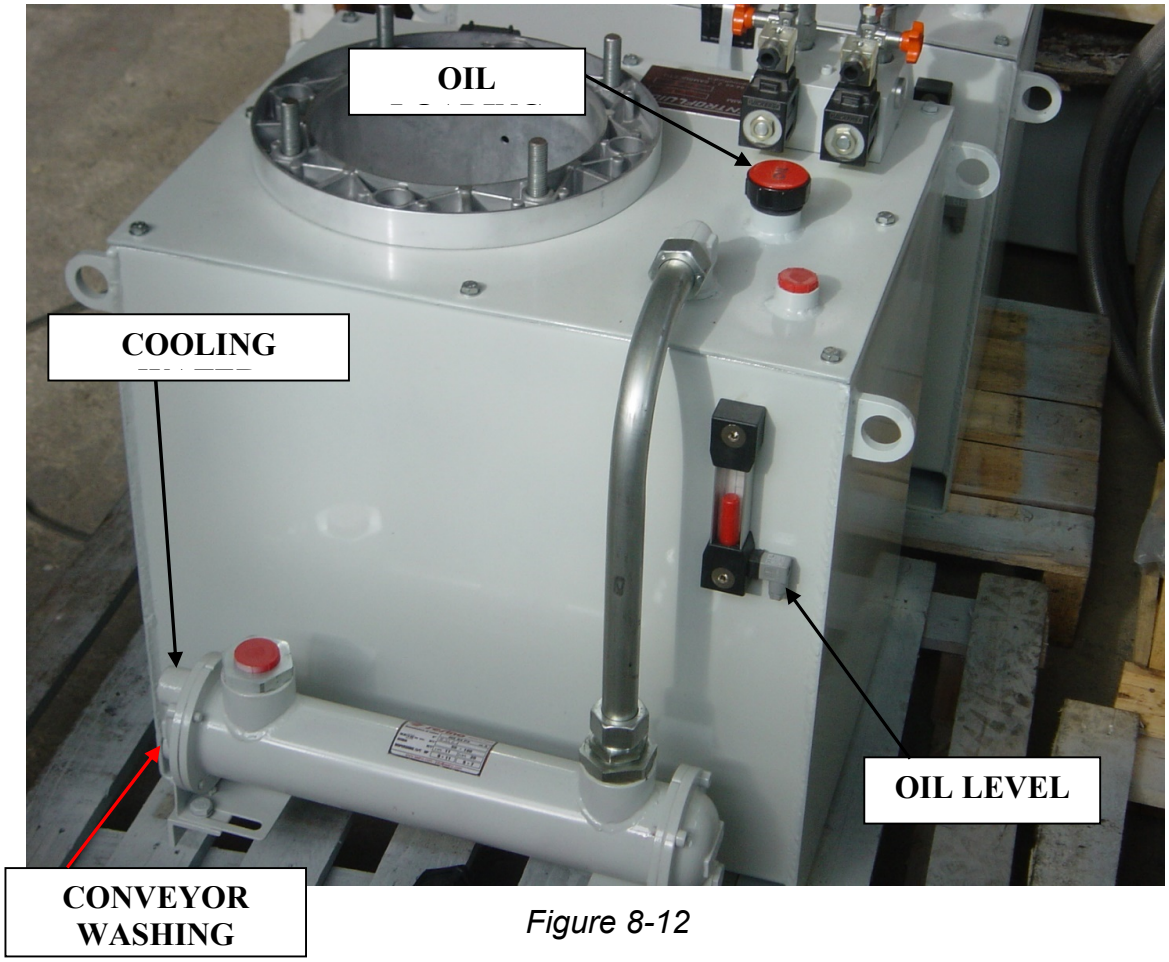


Figure 8-12

The hydraulic central is located at the extremity of the machine corresponding to the exit zone of the pieces to be worked. The movement is done through hydraulic motors, to the spindles delegated to the working of straight edges and bull headed edges.
The heating of the oil must always be contained through water current cooling down as seen in the photo; the water introduced, after having cooled down the oil, comes placed on the conveyor to complete the clean up, it is recommended to always hold the tap from which the water comes from.
The oil level must be kept under control and must always be resbull-nosed in case it goes down; therefore, if the oil level is too low for the normal consumption or for eventual oil loss, the machine will automatically go in state of emergency.

USE OIL TYPE **IP HIDRUS OIL HI 68** or its equivalent.

It is absolutely forbidden to control the oil level of the central before having disconnected the electric power or before having set the machine in state of emergency.

8.9 DISMANTLING AND SCRAPPING

The end of the life of the machine entails disassembling and transport operations or dismantling and transport of parts, scrapping and disposal. In the different situations, you must proceed as follows:

- Disassembly or transport of parts must be carried out according to the explanations in the chapters of this manual relative to transport and installation, proceeding in reverse order.
- dismantling and scrapping operations are the responsibility of the user

8.10 TREATMENT AND DISPOSAL OF WASTE

The machine is made up of steel, aluminium and metal parts in general as well as mixed components, such as wiring, electronic material.
Separate and divide parts by type before delivering them.

ATTENTION

WASTE DISPOSAL MUST BE CARRIED OUT BY DELIVERING THE ENTIRE MACHINE OR ITS PARTS TO A SPECIALISED AND AUTHORISED COMPANY, ACCORDING TO LAWS IN FORCE IN THE COUNTRY WHERE THE WASTE IS PRODUCED. IT IS POSSIBLE TO RECOVER OIL AND TO CLEAN THE GREASE ON THE MACHINE WITH RAGS, PLACING BOTH IN SPECIFIC SEALED CONTAINERS, BEFORE TRANSPORTING THE MACHINE AND/OR ITS PARTS FOR SCRAPPING AND WITHOUT PACKAGING.

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9 POLISHING PROBLEMS

9.1 USE OF ABRASIVES

To achieve the best performance, you must understand that the real work is carried out by the tools and the perfect execution of polishing depends on them.
The machine was built to use these tools at its best, but it is these that guarantee the final result.
Therefore the tools must be well-built, with the declared particle sizes and not excessively cured.
It is also fundamental that the grain sequences be correct since each abrasive must smooth the roughness left by the previous one and must prepare the surface for the following one.
An incorrect grain sequence makes any machine ineffective.
We therefore recommend being assisted by abrasive suppliers who know how to select the most suitable types for the specific processing requirements in relation to the types of material most commonly used, also considering the particular circumstances set out above, such as the cooling water.

9.2 CHECKING THE SURFACES

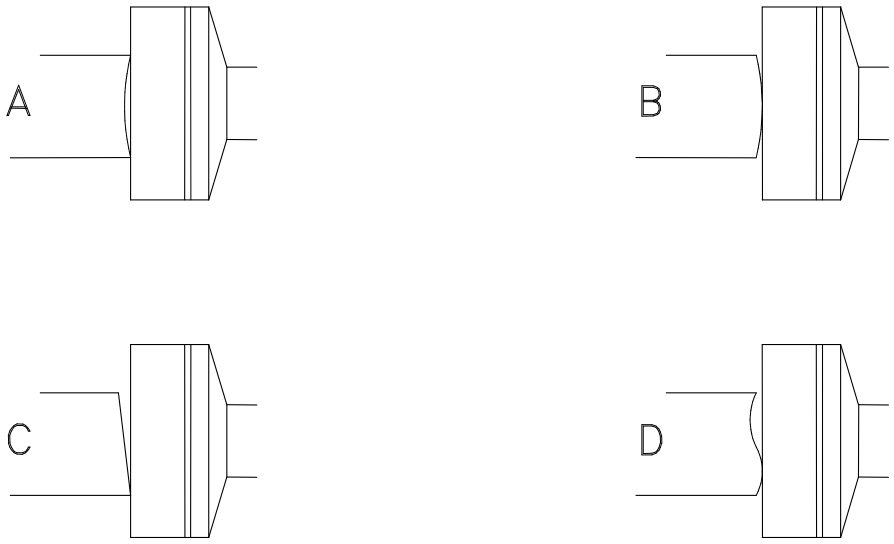

Figure 9-1

When dealing with issues of non-uniform polishing, we must start from the assumption that the abrasive, during its rotary movement, grinds the contact surface until it becomes perfectly flat.
The same cannot be said of the surface of the material being processed as it is affected by several cutting-related factors such as imperfect alignment of the disc, excessive cutting speed, deviations of the disc, etc.

Therefore the surface of the abrasive might not be perfectly adherent to the surface being processed resulting in some parts of the material being polished while others are matte by the end of the job.
This fault is not attributable to misalignment of the spindles, as one would think, but to imperfect linearity of the material.
This issue normally occurs with hard materials (such as granite) and is due to the impossibility of the abrasive of completely smoothing the surface.
Therefore profile A will be polished on the edges and matte in the middle, profile B will be polished in the middle and matte on the edges, profile C will be polished at the bottom and matte at the top, just like profile D.
Obviously it is possible that a piece can have the initial part with profile A and the final part with profile C, or other combinations, with the final result being a first part polished on the edges and a second part polished only at the bottom.
There are an endless amount of possible combinations, but the pieces can only be perfectly polished after perfect smoothing carried out by the first roughing grinding wheels.

10 DIAGRAMS