SAWING MACHINES

Instruction manual

CARIF 260 BSA

SEMI-AUTOMATIC HYDRAULIC MACHINE

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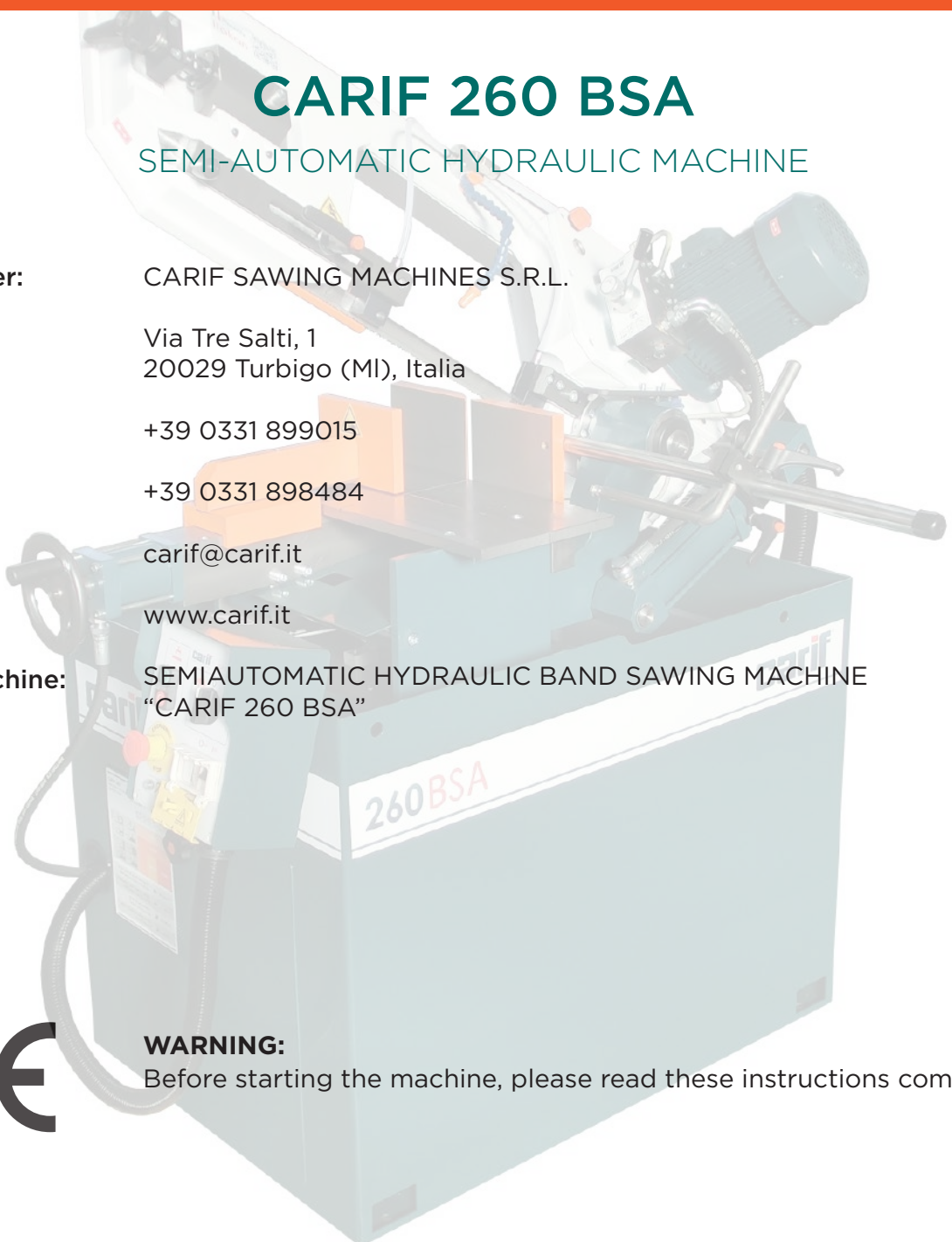
Type of machine: SEMIAUTOMATIC HYDRAULIC BAND SAWING MACHINE
"CARIF 260 BSA"



CE

WARNING:
Before starting the machine, please read these instructions completely.

carif
260BSA

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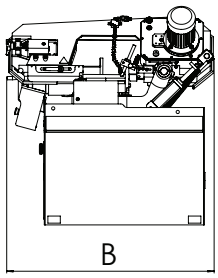
0. Machine specifications

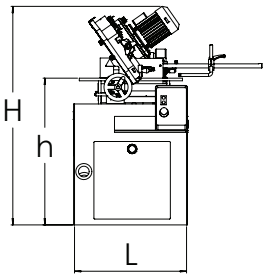
CARIF 260 BSA is a completely hydraulic band-saw designed of small dimensions, high robustness and for practical working operations.

TECHNICAL FEATURES

mm	KW	*Optional*	m/1'	*Optional*	mm	*Optional*	Kg
2450x27x0,9	1,4-0,09	2,2	33-66	15÷100	260	300	340

B	L	H	h
1170	640	1300	830





CUTTING CAPACITY

90°	-45°	+45°	+60°	+90°	-45°	+45°	+60°	+90° *	-45°	+45°	+60°	90° opt.
220	130	150	90	220	100	150	60	260 x 150h	120 x 100h	150 x 150h	90 x 60h	260 x 150h

THE IMPORTANCE TO CHOOSE A FULLY HYDRAULIC BAND SAW

All CARIF models 260/320/450 are completely Hydraulic:
closure of the vice, bow feed and pressure. The Carif hydraulic patented system has been designed with 2 commands: **BOW FEED** and **CUTTING PRESSURE**.
Thanks to this system the blade regularly descends, with a constant auto-regulation for every material type, section and thickness.

ADVANTAGES with Hydraulic Bandsaw:

+ Increased productivity: no operator during cutting cycle
+ Always straight cut: auto-regulation based on material hardness and section
+ Longer blade life: no blade stress when worn out
+ Easy to use: fast setting operation
+ Fast operation time: no idle time, more efficiency

1. Introduction

The instruction manual is a very important item of your equipment. It states all the rules and guides to efficiently operate the machine.
It is kindly suggested to familiarize with the main functions reading carefully this manual.

All the instruction in this manual must be followed in any moments during the usage and maintenance of the machine.
CARIF reserves itself from eventual bad situations caused to people or damages caused to the machine without following this instruction manual.

1.1 General safety and mandatory instruction

CARIF machines are equipped with safety devices.
It is however important that the operator runs the machine carefully to avoid any dangers.

Each person who will installing, operating, servicing or repairing at the customer's facility must have read and understood the instruction manual.

1.2 Safety Devices

The machine is equipped with the following safety devices: and symbols. These must be always cleaned and to be substituted when detached.

SAFETY DEVICES	FUNCTION
EMERGENCY STOP switch	All functions of the band saw are stopped immediately.
Electrical overload protection	Motors are turn off in case of overload.
Electrical locking	If bow carter is open the saw blade will stop.
Saw blade covers	The saw blade is cover completely, only the cutting area accessible.

Operating the machine without using the provided safety devices may lead to serious injuries. It is essential for the operator to run the machine carefully to avoid any risks.

In spite of all safety devices all the machines are potentially dangerous. Further dangers must be carefully controlled.

- The clamping may cause serious injuries if obstructed on their way
- The saw blade may cause serious injuries if obstructed during the cutting
- The saw frame may cause serious injuries during its down stroke
- The saw band may cause injuries during replacement

To reduce to minimum this risk please read the following general rules:

- Only authorized personnel should operate the installation.
- Machines repairs or any changes to the machine or installation without specific instruction are prohibited.
- The operator must take care that nobody gets near to the moving parts of the machine during cutting.
- Only when machine is turned off should any adjustments or set-up operation be performed.
- Wearing gloves when replacing the saw band.
- Wearing gloves when cleaning the machine especially if using air/water flushing guns.
- If maintenance work or repairs need to be performed turn off the main switch. Before opening any Hydraulic or Electrical lines be sure the system is without pressure and electricity.

ATTENTION!

Operating the machine without paying attention to the safety rules may lead to very severe injuries. It is essential for the operator to run the machine carefully to avoid any risks.

1.3 Sound level

The data relating to the noise level emitted by this machine during the work process depends on the material type, diameter and type of tool used. Since the data are relative measurements, the risk of hearing damage are in operation at the time of exposure of the operator to the noise.
The operator must wear ear protection if the noise exceeds 85 dB sound pressure at the workplace.
Sound pressure continuous level weighted workplace: LpA = 64 dB (A). Sound power level: LWA = 76 dB (A).
The calculation of the sound power was made taking into account such factors as: the reflection of the place
test, noise absorption and another reason that may interfere with the measurements.
This estimate allows to state that the values obtained have a degree of error of approximately 3 dB (A).
The specified values are emission levels and are not levels that can work safely.
Although there are correlations between the emission levels and exposure, it can not be used reliably to determine if precautions are necessary.
The parameters that influence the actual exposure levels are the characteristics of the laboratory, other noise sources, the number of machines and of neighboring production processes.
Moreover, the permissible exposure levels can vary from country to country.
However, this information allows the user of a better risk assessment.

1.4 Safety symbols

The machine is equipped with the following safety symbols. These must be always cleaned and to be substituted when detached:

SYMBOL	MEANING	DANGER
	Wear gloves mandatory	The saw band may cause injuries during replacement
	Wear protection glasses mandatory	
	Read instruction before start the machine mandatory	
	Entrapment injury	The clamping may cause serious injuries if obstructed on their way
	Cutting blade	The saw blade may cause serious injuries if obstructed during the cutting
	Rotation direction	Blade motor can run in the wrong direction cause not connected correctly

2. Machine Description

2.1 Main Carachteristics

1 Basement
The basement made in steel of 4mm thickness. The wide structure helps the cleaning operations.

2 Turning Support
The support is assembled on the basement shaft with n.2 conical bearings for an easy turning of the frame (+60°/-45°).

3 Frame Cyclinder
The frame cylinder is connected to hydraulic pump and permits the hydraulic feed to perform the cutting operation.

4 Measuring Device
A measusing device of L=500 mm is standard with the machine.

5 Hydraulic pump
The hydraulic pump takes the rotation directly from the motor gear box and thanks to the BOW FEED and PRESSURE regulations can cut all types of material with different thickness and hardness.

6 Blade motor
2 speed blade motor of Kw 1,1/1,4.

7 Safety switch
A safety switch fixed to the frame cover stops the saw drive in case of opening.

8 Tap for oil refiling
Hydraulic Oil can be refilled through this tap.

9 Oil level detection
An oil level indicator to visualize the oil presence.

10 Coolant tap
The coolant tap can open and close the coolant flow.

11 Blade stretcher
Blade stretcher through springs system.

12 Frame
Carif frame made in aluminum casting with hardening process.

13 Frame cover
Frame cover is fixed on the frame by knobs.

14 Blade guides
n.2 adjustable blade guide equipped with interchangeable hard metal plates.

15 Plan for piece support
The wide plans are designed to have a comfortable and practical cutting area. The plans can be used on double face.

16 Vice Cylinder
The vice cylinder is connected to the hydraulic pump and permits the hydraulic stroke of the vice to fix the material to cut.

17 Vice handle
The vice handle can be adjusted manually near the material to cut. The last 5 mm stroke is hydraulic.

18 Electrical cabinet
The Front cabinet can be moved easily for the best ergonomic.

19 Basement casing
Inside the basement is placed a coolant tank 50Lt with electropump 0,1Kw. For coolant filing follow par. 3.5.

2.2 Technical Data

CARIF 260 BSA

Weight	Ca. 320 Kg
Dimensions	1200 x 700 x 1300h mm

Sawband

Dimensions	2450 x 27 x 0,9 mm
Cutting speed	33÷66 m/min

Working Height 830 mm

Electrical data

Blade motor	1,4 Kw
Coolant pump motor	0,1 Kw

Operating range:

			
90°	220	260x150	220
-45°	130	120x100	100
+45°	150	150x150	150
+60°	90	90x60	60

3. Installation

3.1 Storage and transportation

The machine must be transported horizontally.

In case you have to store the machine, take the following cares:

- Place the machine in a close environment;
- Avoid humid places;
- The storing temperature must not fall under 5° C;
- To avoid that the machine might become rusty, apply the special prevention liquid where it's needed.

Usually, the machine is delivered bolted on a pallet and covered with a cardboard packing. On this cardboard you can find machine model references, weight and manufacturer's references.
To transport the packed machine you need a common fork lift.

Before moving the machine from the pallet to the installation point you need to:

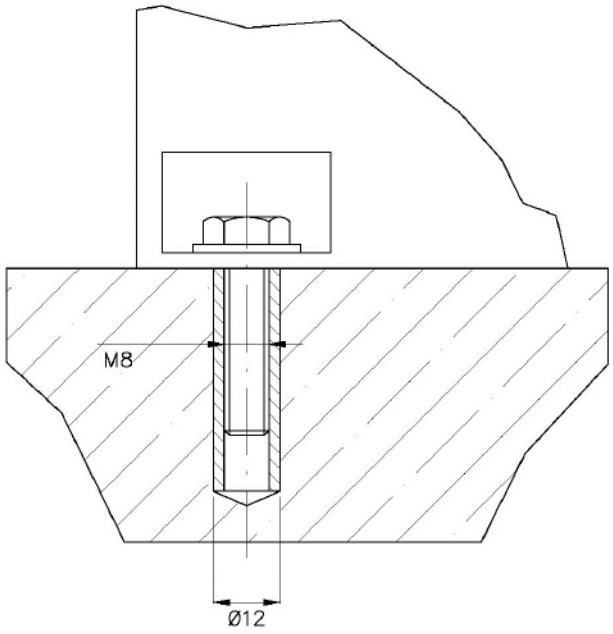
- verify the weight of the machine (Kg 320);
- verify the overall dimensions;
- verify the lifting points.

About lifting of the machine, in the basement there are 4 holes, aimed for the application of shackles (not standard equipment), in order to make the grip safer.

While laying and maintenance operating, you need to plan the safest transport of all the parts of the machine. You need to use suitable equipment, maneuvered by a skilled staff, in order to avoid to damage the sawing machine and to cause accidents to the staff.
Use shackles only for the purpose they have been made for.

3.2 Installation Plan

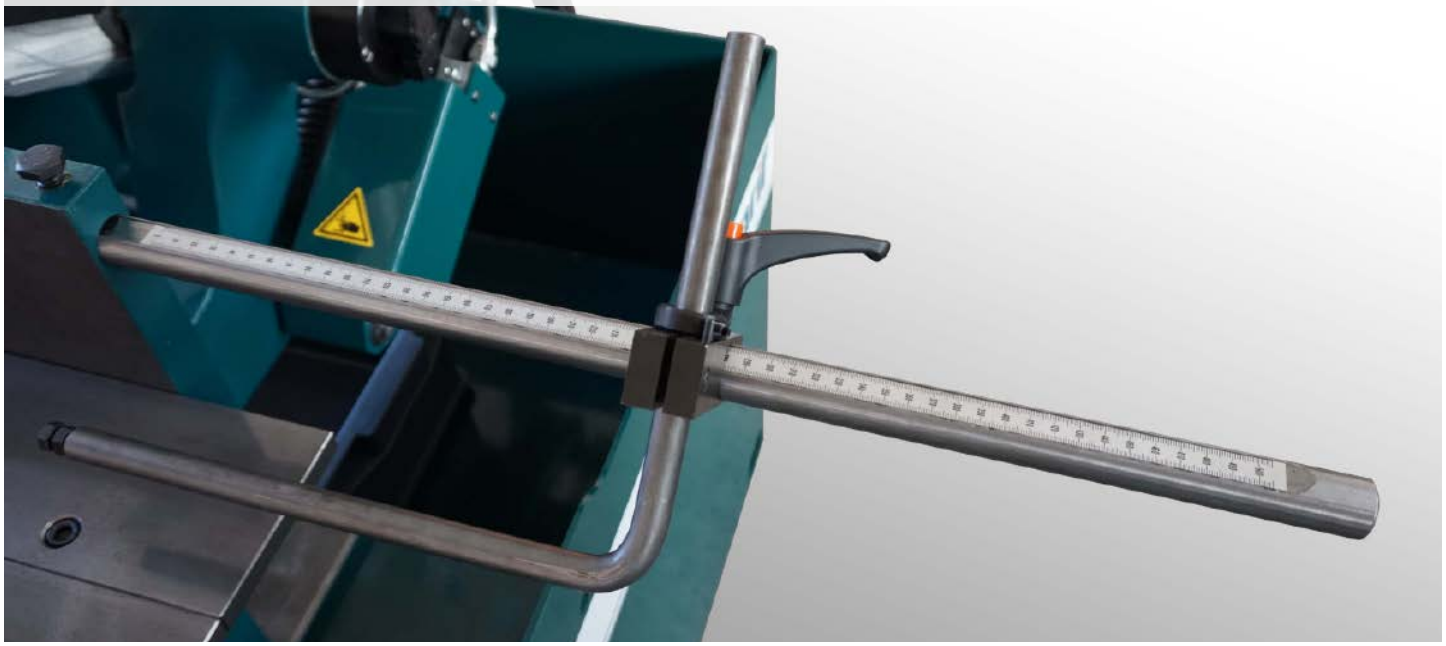
- Please be sure that power supply tension is conformed to the characteristics of the machine.
- Environment Temperature between -10°C and + 50°C.
- Humidity not more than 90%.
- Ensure to have a working space sufficient to allow the entire safety of the machine.
- Keep the back of the machine at least 800mm from the wall.
- Place the machine on a leveled and straight floor.
- Leveled the machine and eventually make the foundation in the 4 points of the basement, as picture below.



3.3 Assembly devices

The machine is delivered already assembled. You have only to set up the standard accessories and, eventually the optional ones (roller units).

The standard measuring device L = 500mm to the rear jaw with the proper Screw. (see picture)



3.4 Electrical connection

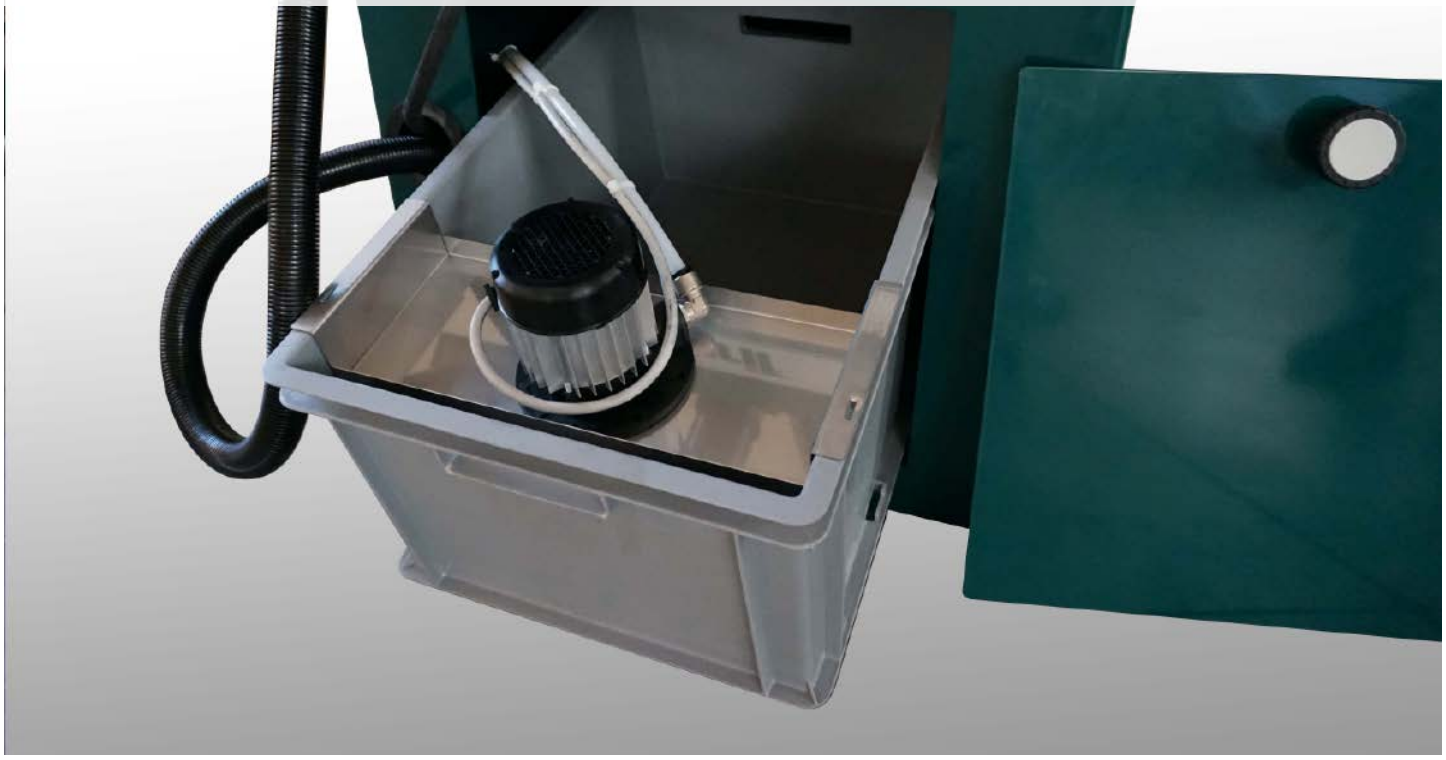
The Electrical connection must be carried out only by qualified personnel or Electricians.

Check if main voltage corresponds to the main voltage on the name plate.
Check rotating direction (arrow on blade motor or frame). If rotating in the wrong direction, exchange connection L1 and L2.

3.5 Coolant filing

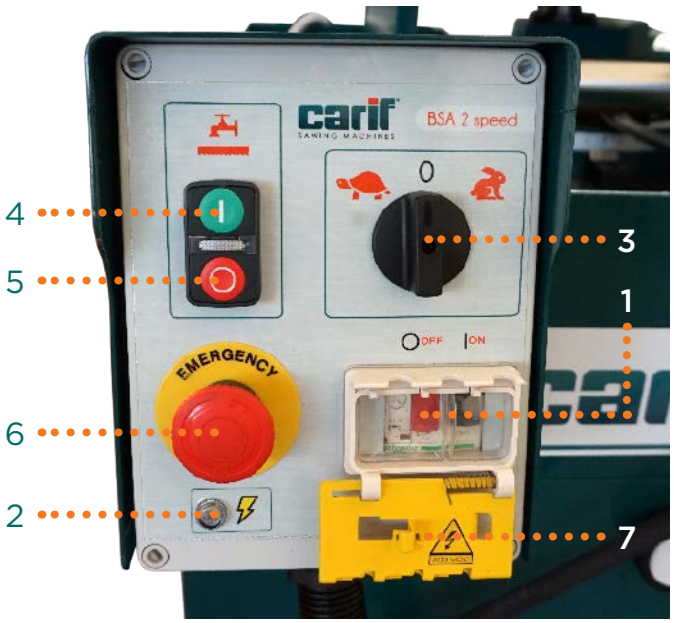
We suggest to use a good quality not toxic cooling liquid, 10% diluted. The cooling liquid is not supplied with the machine.

- Be sure that the coolant tank (part.125) is placed correctly inside the basement.
- Introduce the coolant liquid (water and oil 10%) directly from the back of the machine.
- Capacity 50 Lt.



4. Operation

4.1 Cutting Operation



Before starting the machine, verify that installation has been performed correctly.

To start and perform a cut follow these points:

a) Tension the machine , by button “1” verify tension presence trhough light “2”

b) Select the cutting angle (90°/45°/60°) acting on the rotating support through the service key.

c) Select cutting speed (33-66 m/1’) through button “3”.

d) Activate the blade rotation by button “4”.

e) The bow feed can be set through the handle **“A” (BOW FEED)** on the Hydraulic pump.

f) The pressure can be set through the knurl knob **“B” (CUTTING PRESSURE)** on the Hydraulic pump.

A PICTURE ON THE HYDR. PUMP PLATE GIVES GENERAL INSTRUCTION ON HOW TO REGULATE THE 2 COMMANDS.
FOR MORE INFORMATION FOLLOW PAR. 4.2.

An emergency device “6”, is placed on the front part of the machine and can be activate in any case of emergency.

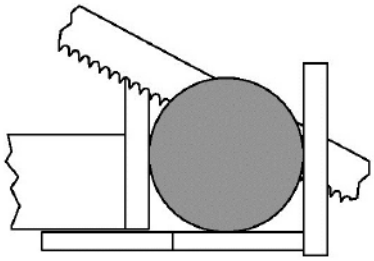
4.2 Hydraulic Pump

During the cutting operation of all types of material, it is very important to maintain constant the pressure of the blade on the piece to cut. This guarantees always straight cut, avoiding any blade deforming and increase blade-life.
On CARIF models 260/320/450 BSA is mounted a patented hydraulic gear pump that allows the fine regulation of the down stroke speed "BOW FEED" (A) and the "CUTTING PRESSURE" (B).

Thanks to these 2 hydraulic commands it is possible to cut optimally every material section.

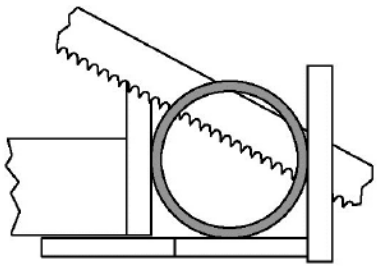
- "BOW FEED" (A) permitting sensible regulation for cutting of all types of profiles and tubes having tin thickness, also 1mm (.04").
- "CUTTING PRESSURE" (B) for cutting of all types of materials of every resistance and hardness. This pressure auto-regulate itself on the base of: blade stress, material section and blade wear.

In case the frame comes down irregularly, perform some idle strokes to expel possible air in the frame cylinder.



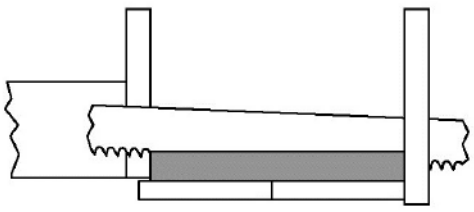
(A) BOW FEED=medium
(B) CUTTING PRESSURE= medium/high

In case of cutting full bars, the blade encounters different kind of surfaces during its cutting path.
Thanks to the "CUTTING PRESSURE" (auto-regulation of the hydraulic oil passage) it can maintain constant the adjusted pressure of the blade to obtain a longer blade life and better cutting quality.



(A) BOW FEED=low
(B) CUTTING PRESSURE=medium

In case of cutting tubes of profiles, it is advised to adjust a low feeding (BOW FEED) and a medium pressure (CUTTING PRESSURE), thus to obtain a constant feeding of the blade in the material also in the point when it encounters less material (auto-regulation of the hydraulic oil passage).



(A) BOW FEED=medium
(B) CUTTING PRESSURE=high

In case of difficult cuts, with a wide cutting surface, thanks to the possibility of having the 2 regulations: feeding (BOW FEED) and pressure (CUTTING PRESSURE), the machine can perform the cut without any problem. Mind to choose a blade type with large teeth per inch (example T=3/4 or T=2/3) and refrigerate well the blade.

4.3 Saw Blades

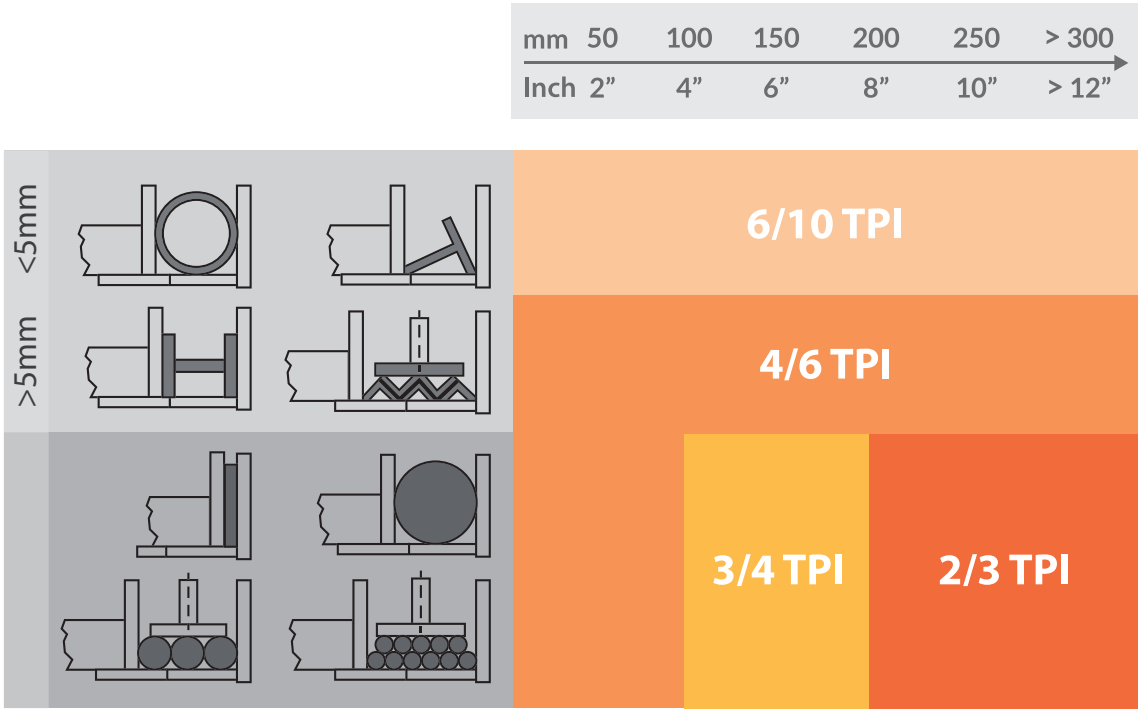
The table below can advise to choose the right blade tpi (teeth per inch) to use for different material sections:

Teeth per Inch (variable) 	Tubes or Profiles (thickness) 	Full Material 
6/10 tpi	2 ÷ 4 mm	5 ÷ 30 mm
4/6 tpi	4 ÷ 12 mm	30 ÷ 100 mm
3/4 tpi	> 12 mm	> 80 mm

To obtain the best performance in terms of durability and cutting precision, it is suggested to perform the first cuts with low pressure and slightly increase to reach the optimum value for the material to cut.

4.4 How to Position the material in the vice

For a better holding of the material in the vice, thus an much better blade life and cutting quality, it is suggested to fix the different material sections as pictures below:

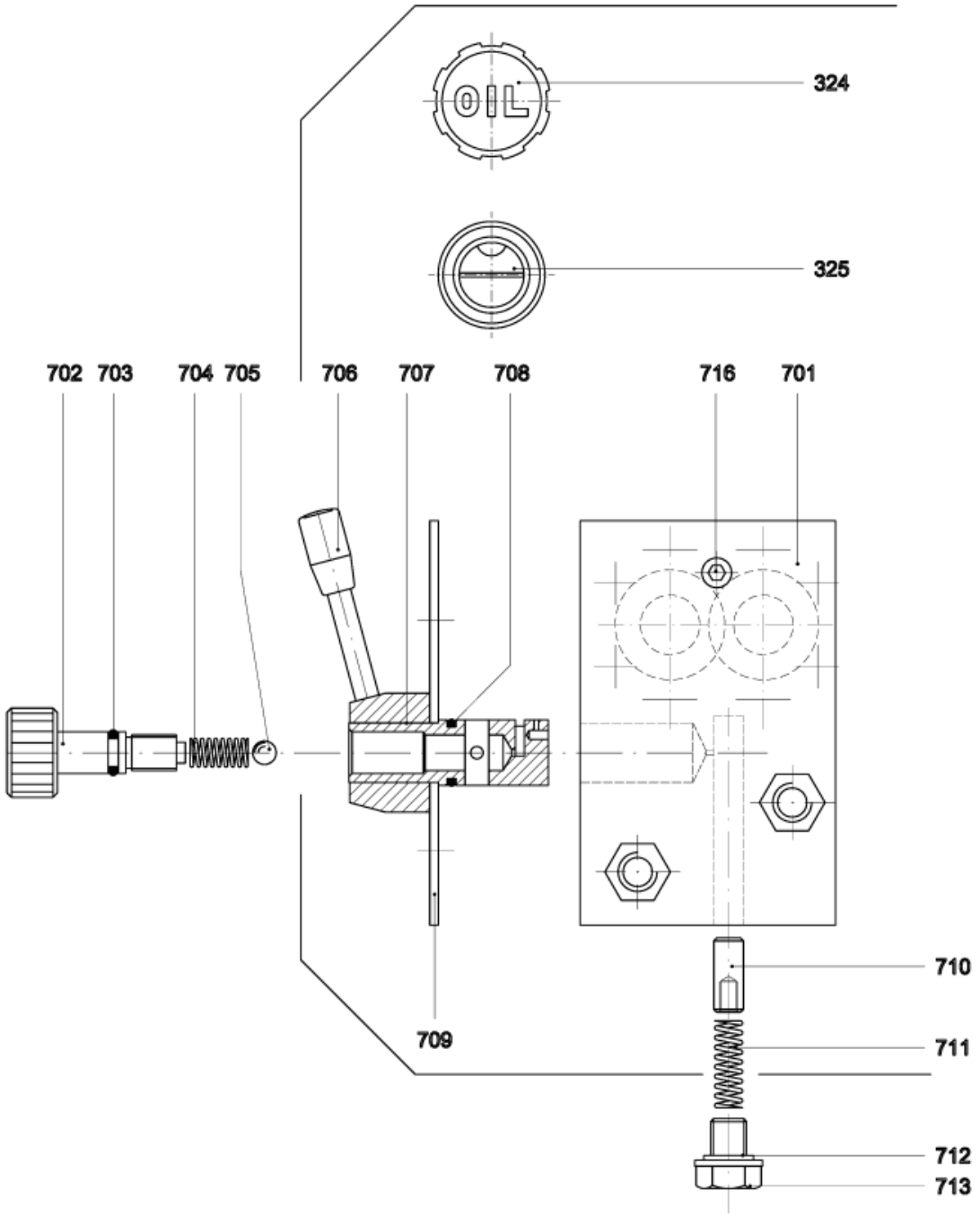


4.5 Cutting Speed

X 15 CrNiSi 25 20; X5 CrNi 18 10; 100 CrMn 6; X 210 Cr 12; 65 Si 7	20 ÷ 40 m/1'
21 NiCrMo 2; 100 Cr Mn 6; C 125W; 56 Ni CrMoV 7; GG 30; CuAl 8	40 ÷ 60 m/1'
St 50 - 2; C45; 40 Mn 4; Cu Sn 6; 36 NiCr 6; C10	60 ÷ 80 m/1'
KE-Cu; Cu Zn 10; CuSn 6; Al 99.5; G-AlSi 5 Mg; PVC	> 80 m/1'

5. Malfuctioning, causes and actions

TYPE OF ERROR	REASONS	ACTIONS
• Bow descends irregularly. • Bow delays to descend.	Air in the hydraulic system.	The machine is new and needs some days of running in. Then, the problem disappears by itself.
		Make the frame lift completely sometimes, in order to eliminate the air bubbles in the hydraulic system.
Bow doesn't descend.	Deficiency of oil.	Check the oil level (325) and, if it's needed, add oil from the plug (324).
	Impurities in the control devices.	Unscrew the cutting pressure regulator (702). Remove the spring (704) and the sphere (705) and clean the oil hole. Reassemble.
Bow doesn't lift.	The spring (711) is broken or the small piston (710) is seized.	Remove the screw (713), extract the spring (711) and the small piston (710), by a M6 screw l = 60 mm approx. Verify if the spring (711) is broken, and the small piston surface (710). Replace what's damaged.

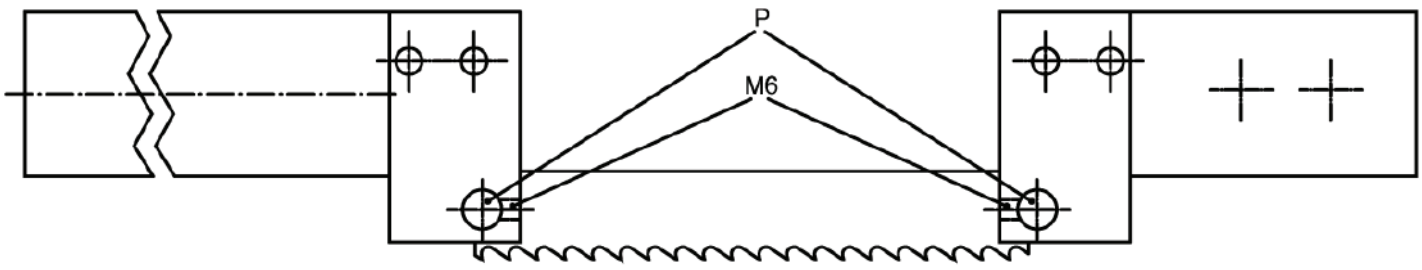


IMPORTANT: Gear pump substitution and oil replacement.

Before to start the machine:

- Remove the screw (716) and verify that the oil leaks out (to avoid gear pump seizure).
- Close the screw (716) and lock it (to avoid air suction).

TYPE OF ERROR	REASONS	ACTIONS
The cut is not perpendicular.	Condition of the hard metal tips.	Check their setting as it follows: loosen the grub screw (M6), push by a tool on the pin (P), in order to eliminate every clearance between the blade and the tips. Lock the grub screw.
		Check the wearing condition of the tips and the bearings. Eventually replace them.



6. Maintenance

6.1 Blade replacement

While you are replacing the blade, wear protective gloves and glasses.

- Switch off the machine.
- Turn the fixing screws out and remove the casing and the blade guard.

While the casing has been removed, a microswitch forbids the machine to start.

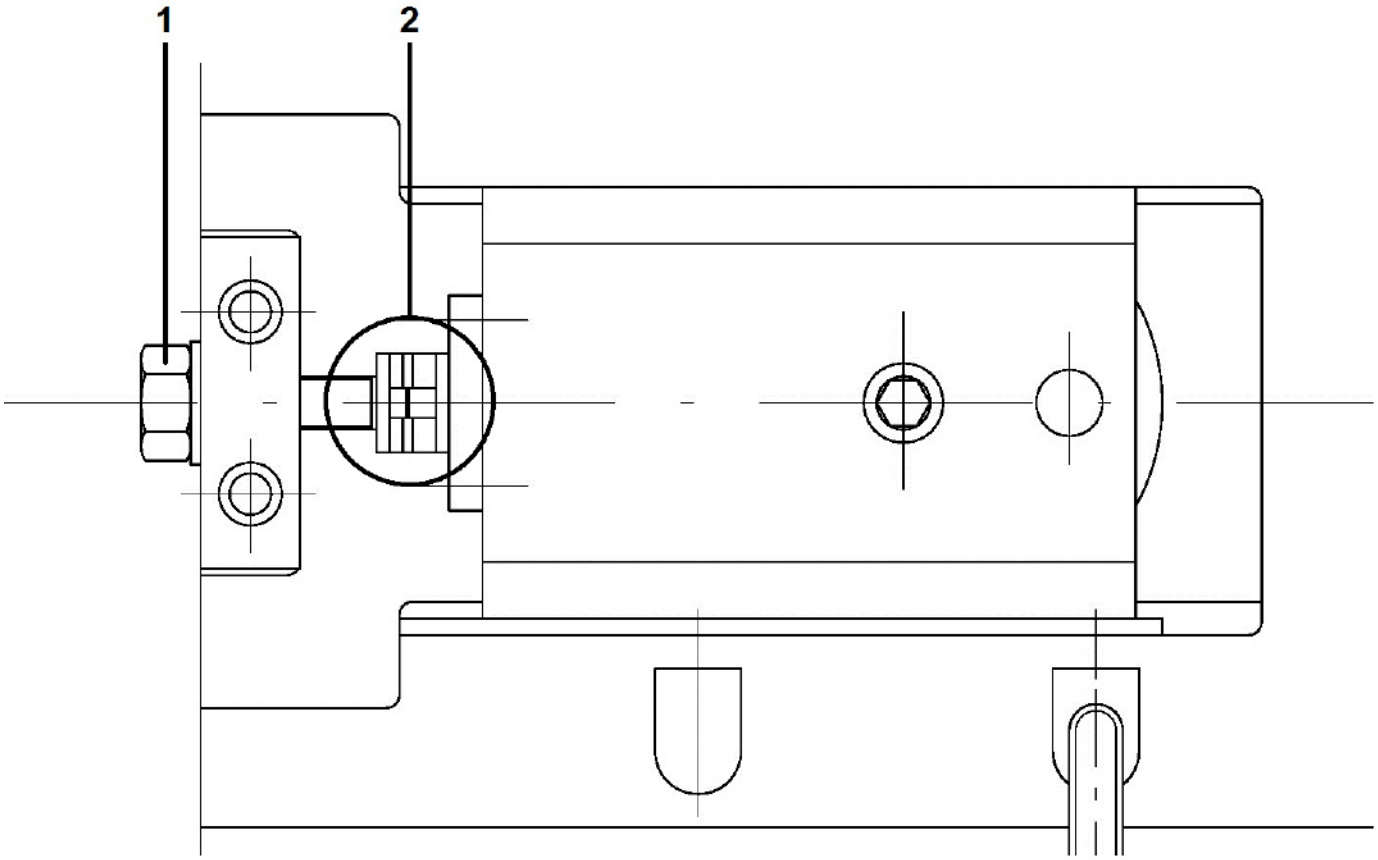
- Release the blade tension.
- Put the blade out of its seat, be careful, do not touch with hands the blade teeth.
- Free the blade from its ways.

When the blade has been released, some stops avoid that the blade might fall against the operator. Never remove these stops while extracting the blade.

6.1.1 Blade Tension

Before fitting a new blade, clean pulleys and blade ways, then, repeat the said operations, in the opposite order, and regulate the blade tension:

Turn the bolt "1" (or the handle for 260 BSA) until the sign reaches the centre of the white area "2" on the flange, like shown in the picture.



6.2 Scheduled maintenance

Before performing any maintenance activity on the machine remove tension and verify that on the machine thare are no pieces from cutting operations.

For a optimum performance of angle reading and to prevent any risk of not functioning, please always clean the magnetic tape and sensor positioned on the graduated scale.

Daily Manitenance

- Clean the machine from the chips after working.
- Check if the blade has worn or has broken teeth.
- Check if all the emergency buttons work normally.

Weekly Maintenance

- Clean carefully the machine and the basement hole for the passage of cooling water.
- Clean the blade-guide from the chips.
- Remove the frame carter, clean the pulleys and the blade path from the chips.

Monthly Maintenance

- Remove the electro-pump and clean the filter.
- Check and re-fill the cooling water if necessary.
- Clean and lubricate all the mechanical parts
- Change completely the cooling water.

Yearly Maintenance

- Check the widia inserts and turn them or replace them if worn .
- Check the frame springs and eventually substitute them.
- Check the oil level of the reduction box e when necessary refill the oil until the indicated level. Type of oils suggested:
  AGIP OSO 46
  BP HPL 46
  ESSO NUTO H46
  SHELL TELLUS OIL ST46

6.3 Spare Parts

To order spare parts it is necessary to indicate:

- Machine Serial Number
- Item code and / or position of the part on the drawing (Pos.)
- Quantity

Pos.	Pezzo	Cod.	Avail.
201	Piastra basamento Basement plate Platte fuer grundsestell Plate du bâti	0027	
202	Cuscinetto a rulli conici 32008 Roller bearing 32008 Kegelrollenlager 32008 Roulement conique 32008	0396	

7. Optional

7.1 Roller Units

On request are available some roller units type “A” or type “B” used separately from the machine. It’s possible to connect the roller units to the machine also by the connecting plan “C”.
See picture below.

Roller Units TYPE “A”

Roller Units TYPE “B”

Plan TYPE “C”

7.2 Air/oil lubrication system

Attention: the minimal air/oil lubrication system is already tested and adjusted for cutting of steel and cast-iron.
To activate the air-oil system put selector on upper position. The air-oil system is active only when blade is rotating. When installing the machine, mount the air-oil system by fixing it on the baement as shown in the picture.

7.2.1 Oil for metal cutting

Pour into oil-tank 3lt of oil:
- BECHEM Berucut MQL A20
- IRMCO 980 103-20
- BLASER SWISSLUBE – Vascomill 35
- FUCHS – Plantocut micro plus 27

7.2.2 Pneumatic connections

Connect the air entrance to “push-in” using nylon pipe of 6mm | 8mm dia.
Air pressure in entrance 5 ÷ 7 bar.

7.2.3 Regulation of oil distribution

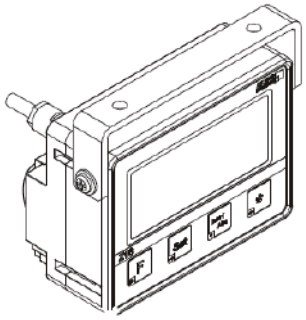
The oil-distribution of the 2 pumps is adjusted for cutting steel and cast-iron.
Act on the black cap to establish the oil-distribution:
for cutting aluminum, brass and titanium alloy, increase the oil-distribution turning anti-clock-wise 1 – 2 turns the black cap.
To have a continuous and constant lubrication is necessary to set carefully the air output through the small brass screw (see figure on parag. 5 on Air/Oil Manual attached).
How to proceed for setting the Air/Oil distribution on the blade:

- Disconnect the 2 black tubes Ø4 from the red nozzle on the blade.
- Close completely the Air output through the brass screws.
- Open completely the two black Oil regulation.
- Open slightly step by step the Air output through the brass screws and wait about a minute the oil pass throughout the black tubes. In case the oil does not come out, increase the air output.

It is suggested to do not open entirely the Air output otherwise the Oil will not come out.

CARIF suggest to use the air/oil Lubrication System only for cutting profiles, tubes and solid bars of small dimensions (=< Ø 50 mm).

7.3 Digital angle (ELGO IZ16E)



7.3.1 Technical data

LCD-Display	7 decades (digit height14mm). With sign, battery status and measurement units.
Power supply	1.5 V or 3.0 V (+24V on request)
Battery life	1...3 years (depending on the battery-type)
Operating temperature	0 °C ... + 50 °C
Power consumption (with measuring system)	< 1 mA with 1.5V
Housing dimensions	W x H = 96 x 72 mm

7.3.2 Settings

To calibrate the magnetic sensor at “0”, align the blade with the rear jaw, using a square of 90° and press simultaneously the button “F” and “SET”.

7.3.3 Battery

When the battery indicator on the front display is low, please provide a new battery Model LR20, D Mono alkaline ; 1,5 Volt. The battery life is usually 2/3 years.

For a optimum performance and to prevent any risk of not functioning, please always clean the magnetic tape and sensor positioned on the graduated scale.

7.4 Laser device

The machine is equipped with a laser device (Z-laser Z5 M18 B-635-lg90) installed on the top of the bow with a bracket.
The laser line is shipped not mounted.
To mount it correctly align the two red arrows as indicated on the device and the bracket.

7.4.1 Technical data

Supply Voltage	5-30 VDC
Dimension	92mm x Ø 20mm
Storage temperature	-10°C up to +80°C
Connection	M12 plug, 4-pin

7.4.2 Settings

To switch on/off the laser line position the selector on upper position. The liser line remains always active until selector is positioned off.
For a fine regulation of the laser line use the two ex socket screws on the laser bracket.

7.4.3 Safety precaution

Avoid direct eye exposure with the laser line.