

Instruction Manual for Installation and Maintenance of The Model Band Saw Machine:

S3715 NG

The Original Manual
was written
in Portuguese

serial number:

date:

Before installing or performing any operation, carefully read this Instruction Manual for the use of this machine. For further information or clarification, contact Starrett..



Starrett®



Starrett Indústria e Comércio Ltda.
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**ATTENTION! RISK OF ACCIDENTS:**

- BEFORE STARTING any kind of operation on the **S3720 E** machine, READ CAREFULLY ALL instructions contained in this instruction manual, so that the user becomes familiar with the equipment;
- OBSERVE carefully the INSTRUCTIONS FOR TRANSPORT AND STORAGE ([Chapter 7](#));
- OBSERVE carefully the INSTALLATION AND COMMISSIONING INSTRUCTIONS ([Chapter 8](#)). OBSERVE the voltage (Volts) of the machine being delivered;
- All operations of TRANSPORT, INSTALLATION, USE, MAINTENANCE, ASSEMBLY, DISASSEMBLY, and REPAIR must be carried out by QUALIFIED, TRAINED, and AUTHORIZED for these types of services;
- **Starrett** will provide all Assistance and Technical Support to the user or the company owning the machine whenever requested in writing;
- OBSERVE and UNDERSTAND all signs on the machine;
- If the standard machine, delivered to the user, is modified or its technical characteristics are changed without **Starrett's** prior knowledge and approval, in addition to the loss of all WARRANTY, civil and criminal liabilities will fall on the owner of the machine.

Starrett Indústria e Comércio Ltda.
Av. Laroy S. Starrett 1880

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1. DECLARATION CONFORMITY:

DECLARAÇÃO DE CONFORMIDADE CE EC DECLARATION CONFORMITY

**Starrett Indústria e Comércio Ltda.
Av. Laroy Starrett, 1880
13306-900 – Itu – SP – Brazil**



Declara que os produtos Máquina de Serra Fita, modelos:
Declares that the products Band Saw machine, models:

S3715 NG

estão em conformidade com os requisitos essenciais de segurança das Diretivas Europeias relevantes:
are in conformity with the essential safety requirements of the relevant European Directives:

**2006/42/EC
2014/30/EU**

**Diretiva de máquinas;
Diretiva de Compatibilidade Eletromagnética**

Pessoa que compilou o arquivo técnico estabelecido na UE:
Person that who compile technical file established within the EU:

**The L. S. Starrett Company Ltd.
Oxnam Road Industrial Estate, Jedburgh, Scotland, TD8 6LR, UK**

As instruções de montagem e conexão definidas em catálogos e arquivos técnicos de construção devem ser respeitadas pelo usuário.
Mounting and connecting instructions defined in catalogues and technical construction files must be respected by the user.

Eles são baseados nas seguintes normas técnicas:
They are based on the following technical standards:

ISO 16093:2017,
Machine tools - Safety - Sawing machines for cold metal

ISO 12100:2010,
Safety of Machinery - General principles for design / Risk Assessment and Risk reduction.

IEC 60204-1:2016,
Safety of machinery – Electrical equipment of machines, part 1 : General requirements

ISO 13849-1:2015,
Safety of machinery – Safety-related parts of control systems Part 1: General principles for design

EN 50370-1:2005,
Electromagnetic compatibility (EMC) - Product family standard for machine tools - Part 1: Emission.

EN 50370-2:2003,
Electromagnetic compatibility (EMC) - Product family standard for machine tools - Part 2: Immunity.

IEC 61000-4-2: 2009,
Electrostatic discharge (ESD)

IEC 61000-4-4: 2012,
Electrical fast transient/burst requirements (EFT/Burst)

IEC 61000-4-6: 2014,
Immunity to conducted disturbances, induced by radio-frequency fields (CS)

Itu/SP, November, 2022th. Por **Starrett / By Starrett:**

Cláudio Guarneri
Industrial Director

2. NR-12 CONFORMITY DECLARATION:

CONFORMITY DECLARATION

Starrett Indústria e Comércio Ltda.

Av. Laroy Starrett, 1880

13306-900 – Itu/SP – Brasil

CNPJ 56.994.700/0001-01

Declares, under his responsibility, that the products, Band Saw Machine, model:

S3715 NG

Which refers to this declaration, is in accordance with the applicable requirements of Brazilian Regulatory Standards:

NR-10 - Safety in Electrical Installations and Services;

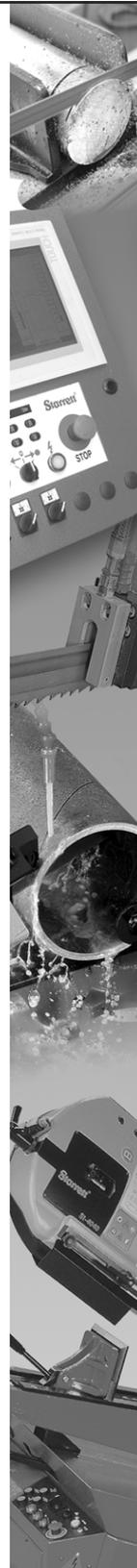
NR-12 - Machinery and Work Equipment Safety;

NR-15 – Unhealthy Activities and Operations – ANNEX I;

NR-17 – Ergonomics;

and also with the applicable requirements of the Technical Standards,

- **ISO 16093:2017**, *Machines tools - Safety - Sawing machines for cold metal*;
- **ISO 12100:2013**, *Safety of machinery - General principles for design - Risk assessment and risk reduction*;
- **ABNT NBR 13759:1997**, *Safety of machinery - General principles for design - Risk assessment and risk reduction*;
- **ISO 13849-1:2015**, *Safety of machinery – Safety-related parts of control systems Part 1: General principles for design*;
- **ISO 13857:2019**, *Safety of machinery - Safety distances to prevent hazard zones being reached by upper and lower limbs*;
- **ISO 13854:2017**, *Safety of machinery - Minimum gaps to avoid crushing of parts of the human body*;



- **ISO 14120:2015**, *Safety of machinery - Guards - General requirements for the design and construction of fixed and movable guards;*
- **ISO 14119:2013**, *Safety of machinery - Interlocking devices associated with guards - Principles for design and selection;*
- **IEC 60204-1:2016**, *Safety of machinery - Electrical equipment of machines - Part 1: General requirements;*
- **ISO/TR 14121- 2:2012**, *Safety machinery - Risk assessment - Part 2: Practical guidance and examples of methods.*

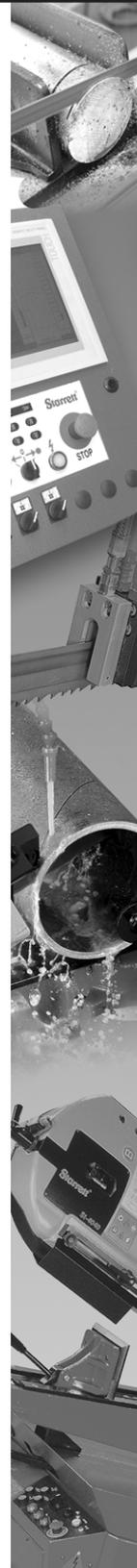
Cláudio Guarnieri

Cláudio Guarnieri

Diretor Industrial

Starrett Indústria e Comércio Ltda.

Itu/SP, November 1st / 2022.



3. MACHINE IDENTIFICATION:

All **Starrett** machines are provided with a nameplate attached to the Base or Cabinet (01). The following data as Model, serial number, Power (kW / hp), Voltage (V), Frequency (Hz) and Weight (kg), are engraved.

The figure below shows the shape of the **Starrett** name plate.

	Máquina de Serra Fita / Band Saw Machine	
	Modelo/Model	S3715 NG
STARRETT IND. E COM. LTDA.	Nº de série / Serial number	X0002-22/CH-S
Av. Laroy S. Starrett, 1880 13306-900 - ITU/SP - BRAZIL tel: 0055 11 2118-8000 fax: 0055 11 2118-8001 www.starrett.com.br CREA nº 0163046	Código/Code	S3715NG-H2
	Ano de fabricação/Manufacturing Year	2022
	Peso Líquido / Net Weight	268 kg
	Potência/Power (Lâmina/Band Saw)	1.5 / 2.2 hp / kW
	Potência/Power (Unid.Hid / Hydr. Unit)	----- hp / kW
	Potência/Power (Refrig; / Coolant)	0.1 / 0.075 hp / kW
	Tensão / Voltage	220 V 60 Hz
	Frequência / Frequency	
	Corrente / Current	5,22 / 4,2 A

(ILLUSTRATIVE DATA)

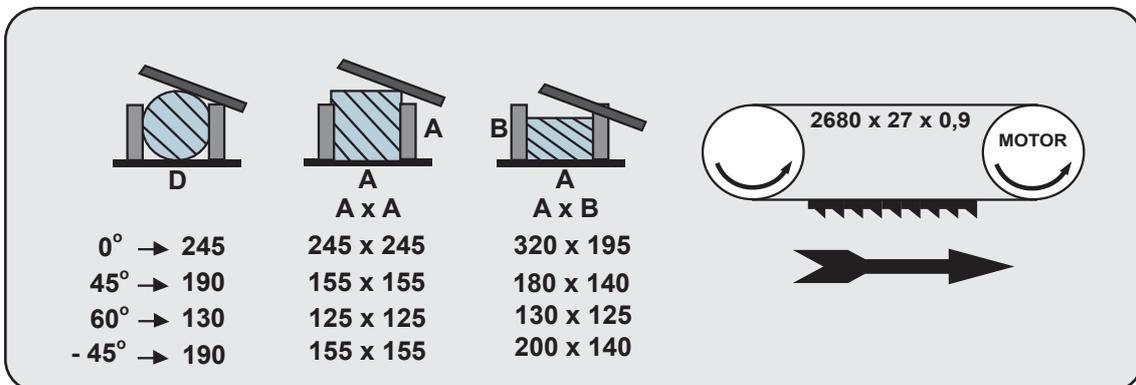
4. TECHNICAL DATA:

Starrett	S3715 NG
Net Weight (kg):	268
Dimensions (mm):	1.6 x 0.8 x 0.9 (height)
Power of Band Saw Blade Motor (hp / kW):	1.5 / 1,1
Power of Coolant Pump Motor (hp / kW):	0.1 / 0.075
Band Saw Blade Dimensions (mm):	2 680 x 27 x 0,9
Blade Speed (m/min):	82 and 41 (at 60 Hz)
Available Voltage (V) ^{(1) (2)} :	220 or 380
Operation frequency of electric system (Hz) ⁽²⁾ :	50 or 60

(1) VOLTAGE defined according to customer's request

(2) See Requirements and Conditions for Installing the machine in 10.2 of this Instruction Manual

CUTTING DIMENSION ALLOWED (mm)



Noise emitted by machine

Sound Pressure Level = 79,2 dB A

Sound Power Level = 74,2 dB A

NOISE DECLARATION: (6.3 of ISO 16093:2017):

The values quoted are emission levels and are not necessarily safe working levels. Whilst there is a correlation between the emission and exposure levels, this cannot be used reliably to determine whether or not further precautions are required. Factors that influence the actual level of exposure of the workforce include characteristics of the work room, the other sources of noise, etc. i.e. the number of machines and other adjacent processes. Also the permissible exposure level can vary from country to country. This information, however will enable the user of the machine to make a better evaluation of the hazard and risk.”

4.1. STANDARD ITEM:

Starrett Band Saw Blade

4.2. REFERENCES OF PARTS AND COMPONENTS:

POS.	PART / COMPONENT
1	CABINET
2	GENERAL SWITCH - QS1
3	EMERGENCY BUTTON - SB0
4	BOW
5	SAFETY WARNING PLATE
6	COMMAND PANEL
7	CUTTING TABLE
8	HYDRAULIC CYLINDER
9	SPRING SET
10	BAND SAW BLADE
11	BLADE MOTOR-M1
12	DRIVEN FLYWHEEL
13	MOTOR FLYWHEEL
14	GEARBOX (REDUCER)
15	TRIGGER - SWITCH
16	CUTTING VALVE

continuation:

POS.	PART / COMPONENT
17	TENSIONER
18	BACK COVER PROTECTION
19	VISE SET
20	VISE ADVANCE CRANK
21	QUICK TIGHTENING LEVER
22	VISE LOCK HANDLE
23	VISE LOCK SCREW
24	BOW SHAFT
25	FIXED GUIDE
26	MOBILE GUIDE
27	HARD METAL TABLET
28	MOBILE GUIDE SUPPORT
29	FIXED GUIDE SUPPORT
30	MOBILE GUIDE LOCK HANDLE
31	REGULATING VALVE
32	TOGGLE SWITCH
33	PILOT SIGNALING
34	START BUTTON
35	LIMIT SWITCH
36	COOLANT PUMP-M2
37	TENSIONER HANDLE
38	LIMITER PIN
39	SAFETY SWITCH
40	RESET BUTTON - SB3
41	ELECTRICAL BOARD
42	LIMIT SWITCH - SQ3
43	MOBILE GUIDE PROTECTION
44	GUIDE FIXING LOCK SCREW
45	SELECTOR SWITCH
46	ANGULAR SCALE

continuation:

POS.	PART / COMPONENT
47	INPUT ROLLER TABLE
48	OUTPUT ROLLER TABLE
49	STOP BUTTON
50	CUTTING CAPACITY PLATE
51	RESERVOIR
52	SIDE BEARINGS
53	BACKREST BEARINGS
54	COOLANT LIQUID DISPENSER
55	DISTRIBUTOR TAP
56	CRANKCASE FIXING HANDLE
57	MEASURING ROD
58	STOPPER
59	MEASURING ROD SCALE
60	STOPPER LOCK HANDLE
61	LEVER
62	VISE
63	JAW
64	SPRING SET
65	COUPLING FORK
66	PIN
67	LOCK PIN
68	LIMIT SHEET
69	STOPPER PIN
70	BOW TURN LOCK LEVER



FIGURE 4.1 - GENERAL VIEW

5. SAFETY RECOMMENDATIONS:

This machine is equipped with various safety devices to protect the user against injuries. However, all safety aspects cannot be summed by this way. Therefore, each user shall pay attention to the configuration, maintenance and repair of the machine, and **READ** and **UNDERSTAND** all parts of this Instruction Manual.



In addition, it is the duty of the user or owner of the machine to observe the conditions and contexts of risks that the equipment will operate, analyzing through the mandatory requirements of Federal Regulatory Standard of each country.

OBSERVE obligatorily:

- **ONLY QUALIFIED** and **TRAINED** persons and expressly **AUTHORIZED** may operate and maintain this machine. These people shall be trained regarding occupational safety standards of each country;
- Without express authorization, it is strictly forbidden to perform changes or modifications to machine components that may compromise user or machine safety, exposing the operator in unnecessary risk. For the changes or modification mentioned above, shall be requested, mandatorily, authorization and written approval by **Starrett Technical Support**;
- **ONLY AUTHORIZED** persons by the company that owns the machine can handle, operate, place and position the material to be cut on the Cutting Table, prepare the cut, perform maintenance, remove mobile parts, change permanent components, replace components in the periodic maintenance, for example: oil, filter, bearings, coolant liquid, etc.;
- In order to carry maintenance, modifications, repair, replacement of components in the Electric System of the machine, the responsible and authorized person by the owner company, shall be **TRAINED** and **QUALIFIED** for this purpose, according to relevant legislation. It is implicit that only **QUALIFIED** and **TRAINED** technician must connect the machine to the electric power supplier and perform any works for this purpose. In each country, for industrial electrical installations it must comply with the international technical standards IEC and ISO, in particular the **IEC 60204-1** and the relevant local legislation;
- **POSITION** the General Switch (02) in **OFF**, that is, **DISCONNECT** the power grid when there is maintenance intervention or any other work on it, is necessary. In this way, there is no risk of electric shock;

- **OBSERVE** and **ENSURE** that the responsible person for handling, to operate, to put material to be cut, to prepare the cut, to maintain, to repair, to remove mobile parts, to change permanent components, to replace the components of machine, that **DOES NOT** work under the influence of drugs, alcohol or drugs that influence the central nervous system of the user or operator;
- **DO NOT OPERATE** the machine if there is any problem or doubt regarding the operation of the machine. **CONTACT** the **Starrett Technical Support**;
- **PRESS** the EMERGENCY Button (03) quickly, in case of accident, problem or danger;
- To avoid irregularities with the operation of the machine, it is necessary that the operator is well informed and trained on the operation of the machine before start the operation;

**ATTENTION!:****RISK OF AMPUTATION OR SEVERE INJURY!**

- The use of this machine **IS NOT** authorized, under **ANY CIRCUMSTANCES**, by **CHILD(REN)** or by person(s) **NOT** trained and skilled;
- During cutting operation, **IT MUST NOT BE USED** by operator, **UNDER ANY CIRCUMSTANCES**: lab coat or shirt or any type of long-sleeved tracksuit, chain (s) or necktie or scarf, loose long hair, rings on any finger, or any other object on the body that could pull the operator against the machine;
- **OBSERVE** all the signs that are on the Bow (04) and the Cabinet (01) of the machine. It is very important that the operator is familiarized with these indications;
- **DO NOT DAMAGE** the Technical Plate (50) and the Warning Signs on the machine;
- **NEVER TOUCH** with the hands or other body part on the mobile parts of the machine when it is in operation;
- **KEEP** the machine and the close areas always clean. In this way, accidents can be avoided, for the operator and also for people who pass by the machine;
- **POSITION** the General Switch (02) in **OFF** and **PRESS** the **EMERGENCY** Button (03), before starting the cleaning of machine or its maintenance;

- ▶ • **NEVER REMOVE** the chips of material and the other residues with the machine in operation. **DO NOT ALLOW** chips and other residues to accumulate on or around the machine, as this may cause accidents or serious damage;
- **USE** lifting and transport devices to handle materials for cutting according to the weight limit and appropriate dimensions, for safe and ergonomic work. This operation must be performed by responsible and trained people;
- **DO NOT TOUCH** any part of the machine, when it is in operation; 
- **USE** always the Personal Protective Equipment (PPE), with the duly certified according to the safety legislation of each country, such as safety glasses and hearing protectors;



- **USE** Leather Gloves, only when replacement of the Band Saw Blade (10);



ONLY when replacing the Band Saw Blade

- **OBSERVE** the choice of the type of Band Saw Blade (10), such as the teeth, feed and cutting speed, suitable for the type of material to be cut, to avoid problems during the cutting operation (SEE [Chapter 9 of this Manual](#));
- **OBSERVE** the Safety Recommendations, in case of machine maintenance (SEE [Chapter 14 of this Manual](#));
- **OBSERVE** all Safety Recommendations for changing the speed of the Band Saw Blade (10);
- **USE** always new and original spare parts. Other spare parts or works not approved by the manufacturer, that present risks or cause accidents and damage are not under **Starrett** responsibility;
- **ENSURE** a sufficient free area (minimum of 1.5 m) around the machine, aiming at space for work and the passage of people;

- **DO NOT PLACE** or **LEAVE** tools or other objects on parts of the machine;
- **USE** hydraulic oils recommended in this manual. Its disposal must follow the relevant legislation.



ATTENTION NOTICE:
Risk of Accident



WARNING NOTICE:
Risk of Explosion



WARNING NOTICE:
Risk of Electric Shock



WARNING NOTICE:
Mandatory Grounding



WARNING NOTICE:
Risk of Tipping



WARNING NOTICE:
Risk of Heavy Load Falling



WARNING NOTICE:
Risk of Cut



WARNING NOTICE:
Risk of Tools or Objects Falling



MANDATORY ACTION:
READ the Instruction Manual



MANDATORY ACTION:
USE Safety Shoes



MANDATORY ACTION:
USE Safety Glasses



MANDATORY ACTION:
USE Safety Helmet



MANDATORY ACTION:
USE Safety Gloves



MANDATORY ACTION:
USE Safety Clothing



MANDATORY ACTION:
USE Ear Protector



MANDATORY ACTION:
MAKE Preventive Maintenance



FORBIDDEN ACTION:
SWITCH OFF the machine



FORBIDDEN ACTION:
DO NOT TOUCH



FORBIDDEN ACTION:
DO NOT LEAVE tools and
objects on the machine



FORBIDDEN ACTION:
DO NOT GO UP in the
machine



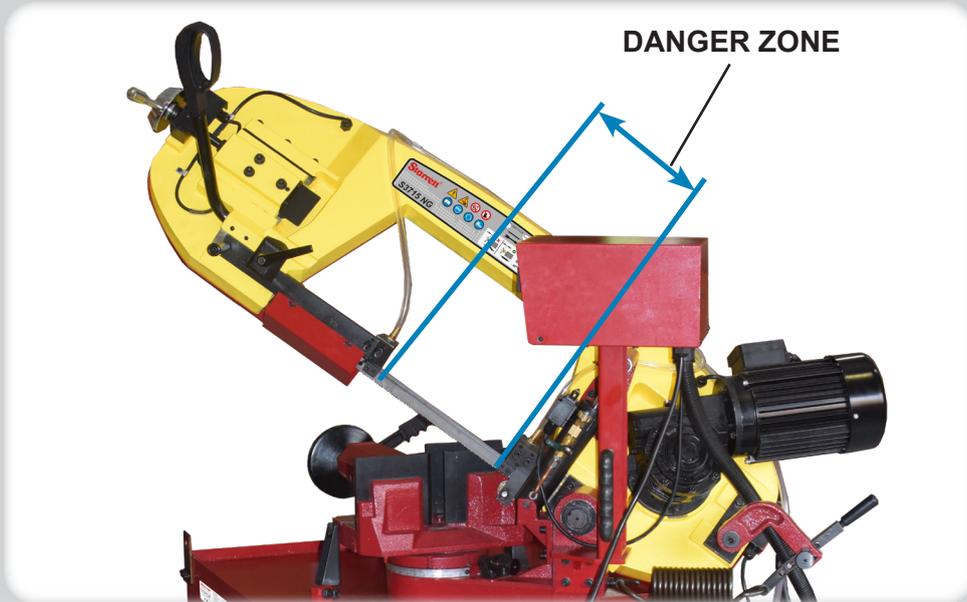
ATTENTION!:
RISK OF ACCIDENT:

DEFINITION OF THE POSITION OF THE MACHINE OPERATOR:

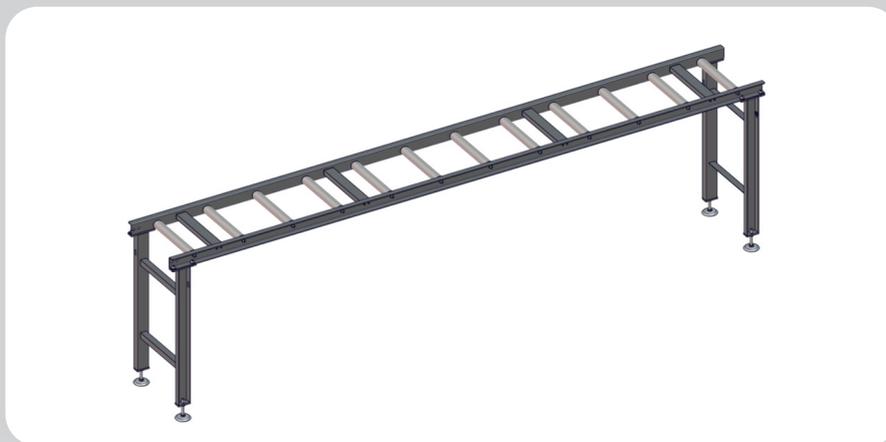
During the cutting process, the operator **MUST** be in front of the Command Panel (06), paying attention to the main cutting parameters settings, and with his free hand to immediately access the EMERGENCY Button (03).



- ▶ The Band Saw Blade (10) has an area that is not protected, called the DANGER ZONE. The machine operator must be aware of this area.

**ATTENTION!: RISK OF ACCIDENT:**

Cutting long materials that exceed the support of the material on the Cutting Table (07) of the machine, must be supported by roller tables in the machine input position:





ATTENTION!: RISK OF ACCIDENT:

SAFETY RECOMENDATIONS for Maintenance:

When any maintenance operation occurs ([SEE Chapter 14 - MAINTENANCE](#)), the user must:

- ISOLATE the area as shown below;
- IDENTIFY that the machine is being maintained by means of an WARNING PLATE (LOTO System) placed on the EMERGENCY Button (03) on the Command Panel (06) (figure [5.1](#)).



FIGURE 5.1 - WARNING PLATE (LOTO SYSTEM)

6. GENERAL DESCRIPTION:

The machine of **STARRETT HORIZONTAL BAND SAW – S3715 NG** was developed by the quality, security, modernity and technology criteria, in order to meet the needs of its user, in accordance with the technical standard **ISO 16403:2015** and others applicable, besides the regulatory norms.

This is a indicated machine to cut bars of various shapes and sizes of materials exclusively metallic, ferrous (steel and alloys) and non-ferrous (brass alloys and aluminum, etc.) The physical characteristics of these materials such as hardness, toughness and density should not pose any safety problem to the user during the cutting operation.



ATTENTION!: RISK OF ACCIDENTS:

This machine model is intended exclusively for cutting metallic materials, both ferrous and non-ferrous.

Examples:

- mechanical constructions steels;
- alloy steels;
- stainless steels;
- cast iron;
- aluminum alloys;
- carbon steels;
- copper;
- brass.

Its construction consists of an Bow (04) (figure [6.1](#)) rigid that has 2 Flywheels: being a Driven (12) (figure [6.2](#)) and the other Motor (13) (figure [6.2](#)). The Motor Flywheel (13) coupled to a NO-END type Gearbox (14) (figure [6.3](#)).

The Driven Flywheel (12) is mounted on the shaft of a dynamometric system called Tensioner (17) (figure [6.3](#)).

One Band Saw Blade (10) welded (figure [6.2](#)) is mounted on the two Flywheels (12) and (13) and conveniently stretched by the Tensioner (17) (figure [6.3](#)).

The Band Saw Blade (10) and the Flywheels (12) and (13) are protected at the rear of the Bow (04) by Back Cover (18) (figure [6.4](#)).

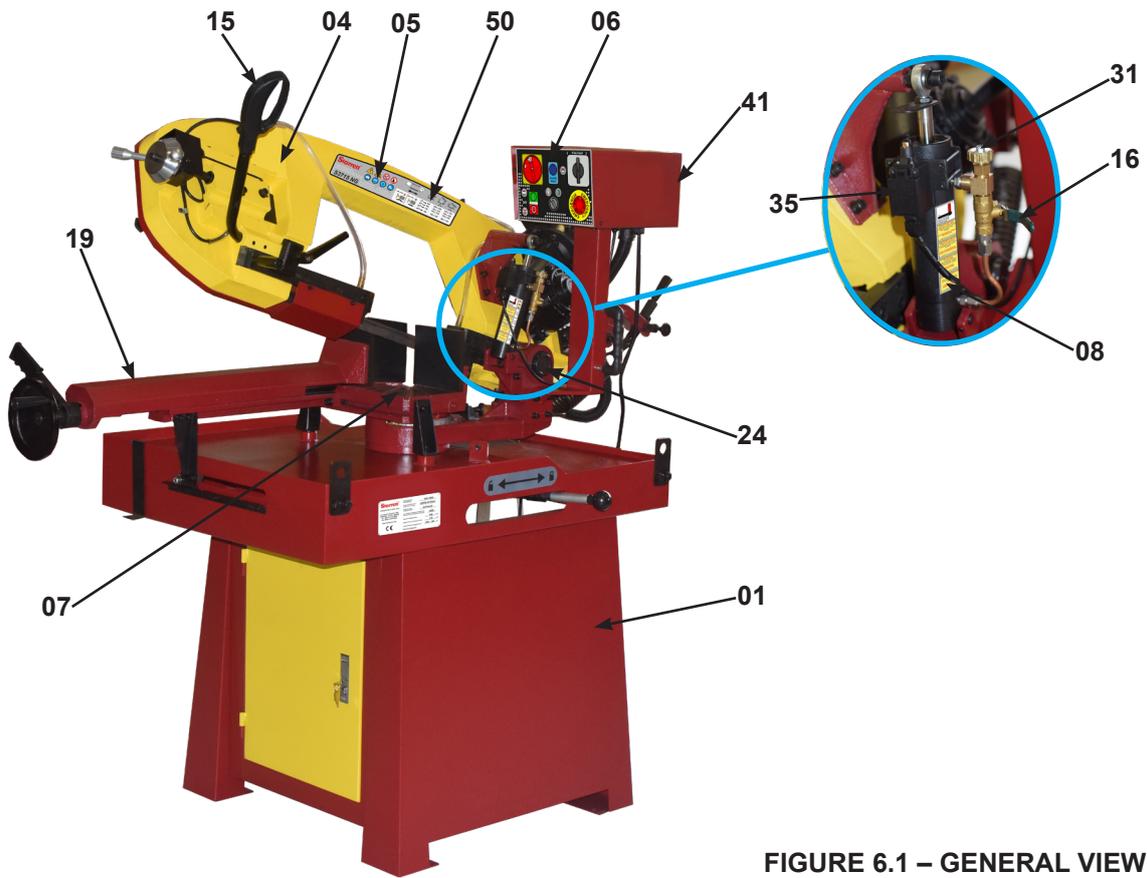


FIGURE 6.1 – GENERAL VIEW

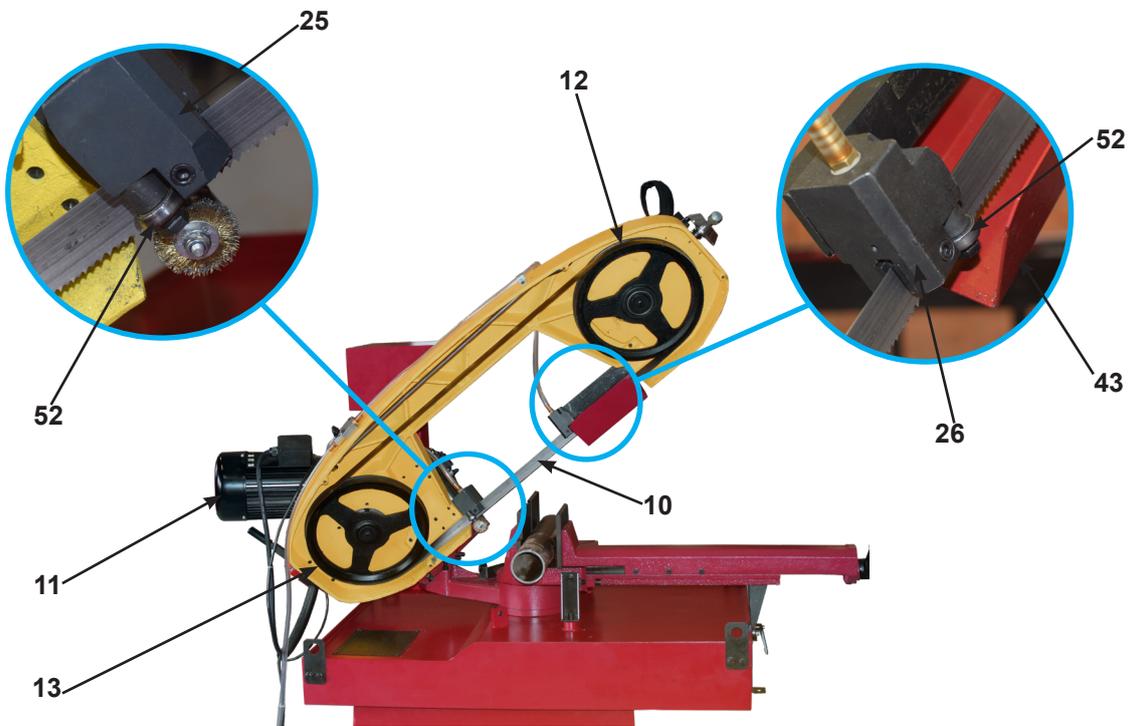


FIGURE 6.2 – FLYWHEELS ASSEMBLY

Due to the machine's constructive form, the Bow (04) can rotate on a fixed point of the Vise Set (19), called the Bow Shaft (24) (figure 6.1), that is, on an shaft perpendicular to the Cutting Table (07), to allow cutting at angles to the material to be cut.

The upper part of the machine is supported and fixed on a rigid Cabinet (01), built in steel plate and profiles. Its structure is protected by a highly weather-resistant paint. Beside the Bow (04) set is the Command Panel (06), easily accessible by the operator. (figure 6.1).

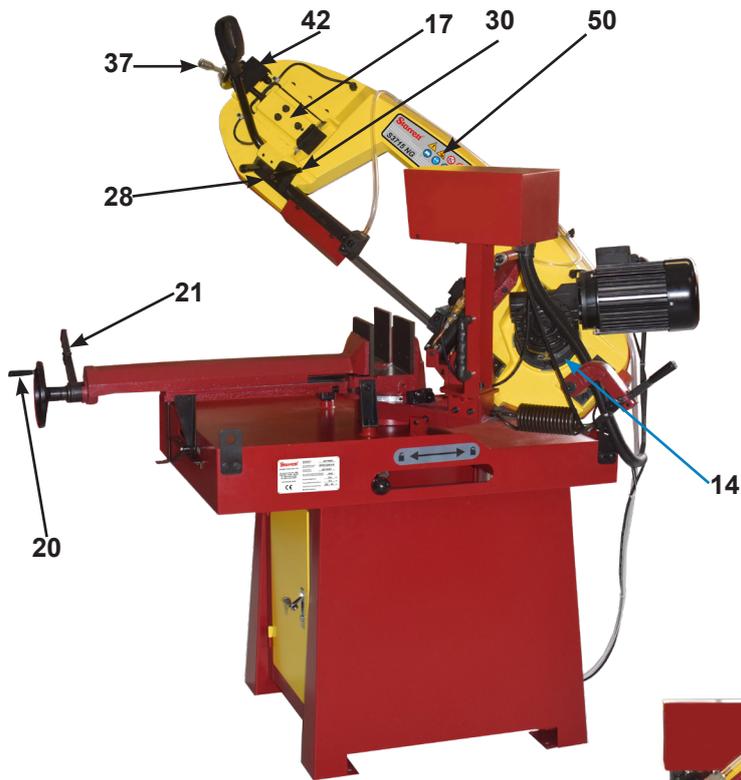


FIGURE 6.3 – VISE SET



FIGURE 6.4 – FLYWHEELS PROTECTION (BACK COVER)

The Vise Set (19) (figure 6.1) is responsible for rigidly fixing the material to be cut on the Cutting Table (07) (figure 6.1). This set has a longitudinal movement, in the direction of material clamping, controlled manually by the Crank (20) (figure 6.5). The tightening or loosening of the same on the material, is also controlled manually by the Quick Tightening Lever (21) (figure 6.5).

The second movement of the Vise Set (19) is transversal, which positions the Vise Set (19), both on the right side as in the left side of the Bow (04). To make the adjustment and lock in the desired position there is a Vise Lock Handle (22) and the two Screws of Vise Lock (23) (figure 6.5).

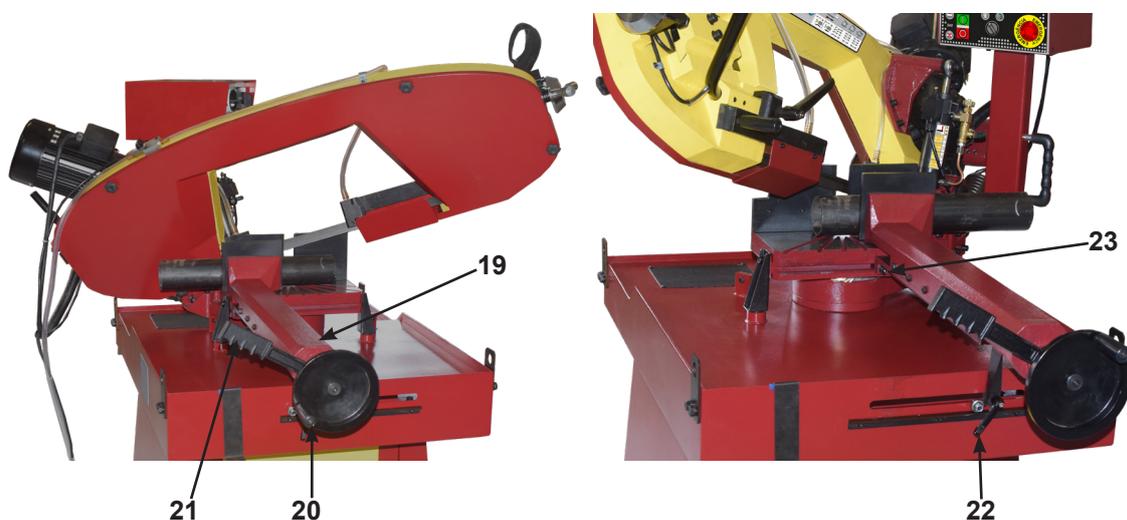


FIGURE 6.5 - TRANSVERSAL MOVEMENT OF THE VISE

The segment of the Band Saw Blade (10) that performs the cut is supported by the Fixed Guide (25) and the Mobile Guide (26) (figure 6.2). These Guides (25) and (26) have Bearings (52) (53) and Hard Metal Tablets (27) (figure 14.3), that allow the cutting tool to twist relative to the turning plane of the Flywheels (12) (13), to form the cutting plane.



OBSERVATION!:

The segment of the Band Saw Blade (10) that performs the cut (between the Guides (25) (26)), obviously, has no protection, and the machine operator must take all due care.

The Hard Metal Tablets (27) (figure [14.3](#)) have the function of aligning and not allowing the Band Saw Blade (10) (figure [6.2](#)) to turn sideways while cutting.

The Mobile Guide Support (28) (figure [6.3](#)), close to the Driven Flywheel (12), can be manually adjusted by loosening the Mobile Guide Lock Handle (30) to adjust the distance of the Guide to the material to be cut.

The tensioning of the Band Saw Blade (10) on the Flywheels (12) (13) is realized by the Tensioner Handle (37) (figure [6.3](#)).

This machine has 2 operation modes: **MANUAL** and **GRAVITATIONAL**. The operating modes are selected by the Selector Switch (45) (figure [6.6](#)).

In MANUAL mode, the operator is responsible for the forward speed and force, and for keeping the Blade Motor (11) working (figure [6.2](#)). The adjustment of this mode is described in the [Chapter 11](#).

In the GRAVITATIONAL mode, the operator simply activates the Trigger (15) (figure [6.1](#)), opens the Cutting Valve (16) (figure [6.1](#)) and starts the forward motion boosted by the weight of the Bow (04). At the end of the cutting operation the machine will stop automatically. The adjustment in this mode is described in the [Chapter 11](#).

By opening and closing the Regulating Valve (31) (figure [6.1](#)), it can control the forward speed, which is responsible for controlling the internal pressure in the Hydraulic Cylinder (08) (figure [6.1](#)). The Cutting Valve (16) (figure [6.1](#)) allows to maintain Bow (04) in any position, when it is in the CLOSED position (lever in the horizontal). The adjustment in this mode is described in the [Chapter 11](#).

To start the cutting process, the machine must be adjusted and connected to the user's electric grid. Also, the material to be cut must be properly positioned and locked on the Cutting Table (07) (figure [6.1](#)).

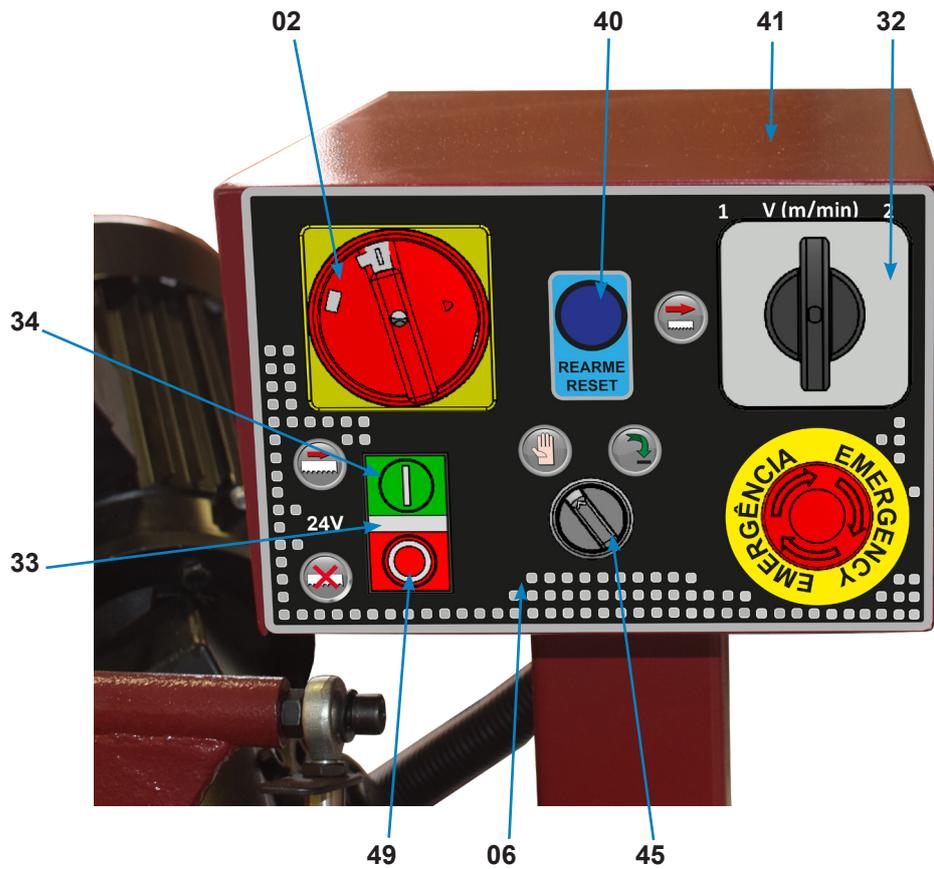


FIGURE 6.6 - COMMAND PANEL

By placing the General Switch (02) in the position **ON**, the Pilot Signaling (33) of color **WHITE** should light up, indicating that the machine is energized (figure 6.6).

By pressing the **START** Button (34) (figure 6.5), of color **GREEN**, the movement of the Band Saw Blade (10) begins.

At the end of the cut, the Limit Switch (35) (figure 6.1) is actuated, turning off the Electric Motors M1 of the Blade Motor (11) and M2 of the Coolant Pump (36) (figure 10.2).

To access the Command Panel (06) (figure 6.6), there is a General Switch (02), which protects the user in case of maintenance by completely disabling the electrical system.

This machine has 2 cutting speeds, which can be chosen by the Toggle Switch (32) (figure 6.6), located on the Command Panel (06) (figure 6.6).

Electric System was developed according to the applicable requirements of the technical standards. This system consists of 3 parts.

The first is the Power Circuit, designed to support the load of the electric motors: M1 (11) of the Band Saw Blade (10) (figure 6.2) and M2 of the Coolant Pump (36), (figure 10.2), both being protected against possible short circuits or overloads.

The M1 Motor (11) is driven by 2 Contactors KM1 and KM2, as part of the Safety System.

The second part is the machine's control circuit that operates at 24 Vac, that is, extra low voltage.

The third part makes up the device's Safety System. The monitoring function is performed by the KS1 Safety Relay, on the SB0 EMERGENCY Button (03), the SQ1 Safety Switch (39) (figure 6.4) of the Back Cover (18) (figure 6.4) and of Contactors KM1 and KM2. A SB3 RESET Button (40) is added to the Safety System to prevent any accidental actuation from occurring after removing the machine's EMERGENCY condition.

The security systems present are:

- FR1 Thermal Relay (thermal protection): Motor Protection (11). (figure 6.2) of the Band Saw Blade (10) (figure 6.2) against overload;
- EMERGENCY Button (03) SB0: Located on the Command Panel (06) (figure 6.6), for any non-normal STOP requirements. This safety function is monitored by the FS1 Safety Relay;
- Back Cover (18) (figure 6.4): It has the function of mobile protection of the interior of the Bow (04). When removed, it opens Safety Switch SQ1 (39) (figure 6.4) the machine's electrical system. This safety function is monitored by the FS1 Safety Relay;
- SB3 Reset Button (40) (BLUE COLOR): Located on the Command Panel (06) (figure 6.6), whose function is to prevent the machine from starting up unexpectedly;
- FS1 Safety Relay: Located inside the Electrical Board (41) (figure 6.6), whose function is to monitor the security devices present;
- HL1 PILOT Signaling (figure 6.6): Located in the Command Panel (06). Its function is to indicate that the commands are energized in extra low voltage (24 Vac), and the machine is ready to operate;
- SQ3 Limit Switch (42) (figure 6.3): Its function is to disable the machine's electrical system, in cases of rupture of the Band Saw Blade (10). This function is monitored by the FS Safety Relay;
- Mobile Guide Protection (43) (figure 6.4): Located and fixed on the Mobile Guide (26), which can only be removed by using a tool.

7. TRANSPORT AND STORAGE:

7.1. SPECIFIC SAFETY RECOMMENDATIONS:



ATTENTION!:

RISK OF TIPPING AND ACCIDENTS WITH SERIOUS INJURIES:



- All loading, transportation and unloading of the **Starrett** Band Saw Blade machine must be performed by specialized companies or by **TRAINED** and **AUTHORIZED** professionals.
- Before carrying out any movement of the machine, it is necessary to **CAREFULLY READ** this Instruction Manual, in order to know the specific safety instructions for this type of operation.
- USE Personal Protective Equipment - PPE in the loading and unloading phase of the Band Saw Blade machine.



- PLAN the lifting and transport of the Starrett machine, together with the staff of Occupational Health and Safety Service of the company that owns the equipment.
- AVOID abrupt movements and turns, and high speeds when transporting the machine by forklift, as there are risks of tipping over and damage to the equipment.
- ALWAYS CHECK that the forklift booms are properly seated on the pallet.



7.2. UNLOADING AND TRANSPORT:

The machine when leaving the factory is packed in a wooden crate, fixed on a pallet. This packaging allows transportation by forklift or pallet truck.

To DISCHARGE the machine onto a truck, for example, it is recommended to use a forklift, driven by a TRAINED and AUTHORIZED professional for this type of operation.

When using this means of transport and lifting, it advises NOT to REMOVE the wooden crate, leaving the removal of it in the place of installation.

Another option is to use an overhead crane to remove it from the truck and move it to the installation point. However, in this case, the wooden crate must be removed to lift it safely using steel cables, as shown in figure [7.1](#).

The cables must have and withstand a top load of 304 kg each.

LIFT the machine to the minimum necessary to move it, to avoid the risk of the machine or objects falling due to a great height.



During this operation, the specific safety conditions for this type of operation must be respected.

DO NOT USE load lifting belts around the structure or other part of the machine, as this will damage the machine, in addition to the risk of accidents.

**OBSERVATION:**

1. USE steel cables (minimum diameter = \varnothing 8 mm) with enough resistance to support 268 kgf, and pass by hook eye, as indicated in the following figure [7.1](#);
2. CHECK that the steel cable is intact, before starting hoisting;
3. MAKE sure that the 4 hooks are intact before lift the machine;
4. MAKE sure that the machine is well balanced during the lifting operation;
5. LIFT the machine the minimum required to enable moving the same;
6. DO NOT permit to shake the machine during movement of traveling crane.

**FIGURE 7.1: EXAMPLE OF LIFTING THE MACHINE**

7.3. STORAGE:

It may happen that the area intended for installation is not free or available to install the **Starrett** Band Saw machine.

However, there may be a chance that this equipment is ready and delivered to the owner in advance, without finalizing the operating location.

In this case, depending on the storage time, some necessary prior care must be observed and performed.

PROCEDURES for Storage:

1. UNLOAD the Band Saw machine in one place:

- clean;
- plan;
- with resistant floor capable of supporting the weight of the machine;
- covered to protect from:
 - rain and other sources of water and moisture;
 - of dust; and
 - air flow.
- free of passage or permanence of persons strangers to the place of storage;
- with adequate power supply, if necessary, to connect it electrically to inspect and/or perform some type of preventive maintenance during storage.



2. CHECK on the arrival of the machine, if it is in accordance with the Order or Purchase Order of the owner company;

3. CHECK also the items described in the invoice of Starrett or distributor are in accordance with the material received;

4. INSPECT if the machine is intact, without dents, deep scratches, oxidation of parts, or with damage to components or lack of them;

5. USE desiccant and dehumidifying elements, such as sachet or Silica Gel bag, if the storage time is above 10 days, leaving it on the machine.

8. INSTALLATION AND COMMISSIONING:

8.1. SPECIFIC SAFETY RECOMMENDATIONS:



ATTENTION!:

ACCIDENTS WITH SERIOUS INJURIES:



- All the installation procedures for the Band Saw Starrett machine must be performed by specialized companies or by TRAINED and AUTHORIZED professionals..
- Before executing any movement of the machine, it is necessary to **READ** this Instruction Manual **CAREFULLY**, in order to know the specific safety instructions for this type of operation.
- USE Personal Protective Equipment - PPE during loading and unloading of the Band Saw machine.



- PLAN the machine installation operation **Starrett**, together with the personnel from SESMT - Safety and Occupational Medicine Service of the company that owns the equipment.
- CERTIFY that the user's power supply network is rated to support the machine's workload, and the grounding is adequate. This operation must be carried out under the supervision of a legally HABILITATED professional.
- DO NOT INSTALL this machine in environments where there is a risk of explosions or fire. AVOID explosive environments.



8.2. INSTALLATION:

The machine must be installed in a normally lit working environment, on an industrial-type floor of sufficient strength to support the machine's own weight plus the weight of the material to be cut.

The fixation must be done by means of "anchor" bolts to the floor, as illustrated in the figure [8.1](#), especially when handling long and heavy materials. These fixings must be by the support points.

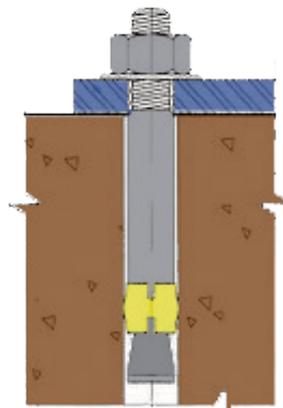


FIGURE 8.1: FIXING BY MEANS OF ANCHOR BOLTS

In cutting processes where there are long materials with large dimensions to be cut, that is, long bars, the operator must properly SUPPORT them by means of trestles stands and/or INPUT (47) and OUTPUT (48) Roller Tables, as visualized in the figures [8.2](#) and [8.3](#). For materials below 630 mm, MAIN the use of the Support Bracket as an option.

Another important detail is the alignment and leveling of the Roller Tables (47) and (48) with the Cutting Table (07), to ensure good cutting results. If these options are used, it is recommended to use a tray under the rollers to collect any leaked coolant.



ATTENTION! RISK OF CRUSHING:

USE a Roller Table system for materials to be cut long, long bars, or of various shapes..

Materials over 630 mm in length USE Roller Tables (47) and/or (48).



FIGURE 8.2: EXAMPLE OF AN INPUT ROLLER TABLE



FIGURE 8.3: EXAMPLE OF AN OUTPUT ROLLER TABLE

When the machine installation is done, the installer or whoever did the installation must CHECK:

- Whether all parts of the machine are perfectly intact, such as no dents, cracks, or any other defects;
- That the EMERGENCY Button (03), the Toggle Switch (32), Blade Motor (11), Reducer (14), Coolant Pump (36), Vise Set (19), and Vise Advance Crank (20) are intact and working;
- The status of the Cabinet (01), Mobile Guide (26) and Command Panel (06) etc;
- Whether the machine conforms to what is in the manual and in your order (options), in particular to the electronic Invoice.

**OBSERVATION:**

Should any parts NOT be intact or NOT conform to the order and/or the manual, it is the user's (installer's) responsibility to immediately notify **Starrett**, in writing, to receive clarification, also in writing, as to what should be done to resolve the problem.

However, once a problem has been found, the installer **MUST NOT** proceed with the installation until the problem is resolved and cleared up.

8.3. REQUIREMENTS AND CONDITIONS NEEDED TO INSTALL THE MACHINE:**ENVIRONMENTAL CONDITIONS:**

- working temperature: from -10 to +50 °C.;
- relative humidity: lower than 90%;
- The installation of the machine to the client's electrical network **MUST be done by professionals QUALIFIED for this type of service**;
- OBSERVE the electrical diagram, in this Manual, so that the electrical connection is made correctly;
- OBSERVE the position of the Command Panel (06) in relation to the machine's Bow (04). The Coolant Pump (36) is located inside the Cabinet (01) and is ready for operation.

Before connecting the machine to the user's mains power supply, REALIZE:

PRELIMINARY PROCEDURE:

1. VERIFY that the electrical conductor supplied with the machine is intact in its extension;
2. VERIFY that the user's main electrical network has the same voltage (Volts) and frequency (Hz) as specified on the machine.



OBSERVATION:

If the voltage and/or frequency are not compatible with the end user's main electric network, due to the buyer's mistake, immediately a **Starrett must be informed immediately. Components may be exchanged under warranty or not, at Starrett's discretion and decision.**



The user's electrical network must use cables or wires whose cross-sectional area is equal to or greater than 2.5mm² or more.

After the PRELIMINARY PROCEDURE above the integrity of the conductor cable, REALIZE the electrical connection of the machine to the mains.

This operation must be performed by a **QUALIFIED** and **AUTHORIZED** professional, under the supervision of a legally **HABILITATED** professional.

PROCEDURE OF THE ELECTRICAL CONNECTION:

1. CERTIFY that the user's power supply is OFF;
2. CONNECT the electrical conductor end of the machine to the external Circuit Breakers Board, or MOUNT a 4-pin plug, 3 of which are used for the phases **R, S, T** and the fourth pin for the **GROUND**;
3. OBSERVE the plug manufacturer's recommendations and specifications, if this option is adopted;
4. NOTE if the connection to **GROUND** is adequate;
5. CHECK all connections are properly tightened.



Once the machine has been electrically connected to the user's mains, CHECK:

PROCEDURE FOR CHECKING THE ELECTRICAL CONNECTION:

1. POSITION the General Switch (02) in the **ON** position;
2. NOTE that the (WHITE) PILOT Signaling (33) on the Command Panel (06) is lit, indicating that the machine is on;
3. TURN the speed Toggle Switch (32) to position "1" or "2";
4. PRESS momentarily the START Button (34);
5. VERIFY that the Band Saw Blade (10) is rotating in the direction indicated on Plate (50), placed in the Bow (04) (figure [6.3](#)).



ATTENTION!:



RISKS OF ACCIDENTS AND ELECTRIC SHOCK:

- CHECK if the Band Saw Blade (10) is moving in the same direction as indicated on the Plate (50), located on the Bow (04). If the direction of rotation is opposite to that indicated, swap 2 of the 3 phases (cables) in the socket that connects the machine to the user's electrical network.
- Any change in the electrical connection of the machine to the user's network must be performed by QUALIFIED and AUTHORIZED professionals.

MACHINE ELECTRIC POWER SUPPLY REQUIREMENTS (Alternating Current)

(According to 4.3 of the ISO IEC 60204-1:2020):

- **Voltage:** Voltage in permanent regime: 0.9 to 1.1 of the nominal voltage;
- **Frequency:** 0,99 to 1,01 of the nominal frequency on a permanent basis;
0,98 to 1,02 of short duration.
- **Harmonics:** Harmonic distortion of no more than 12% of the total effective voltage on energized conductors, considering the sum of the 2nd through the 30th harmonics.
- **Voltage Interruption:** Power supply interrupted or at zero voltage for no more than 3 ms in any random period of the power cycle with more than 1 s between successive interruptions.

- **Voltage sinking:** Voltage sinking not exceeding 20 % of the effective supply voltage for more than one cycle with more than 1 s between successive sinking.
- **Maximum impedance for GROUNDING:** 10 Ω



ATTENTION!:
RISK OF ELECTRIC SHOCK:



- USE the color codes or numbering, for connecting the machine cable to the electrical network:

OPTION 1	OPTION 2	Cables Function
GREEN / YELLOW	GREEN / YELLOW	Ground
BROWN	BLACK 1	R
BLUE	BLACK 2	S
BLACK	BLACK 3	T

- VERIFY that the GROUND connection conductor is well connected and has NO common connection with the NEUTRAL of the user's electrical network;
- CONNECT the machine's conductive cables to a Three-Pole Circuit Breaker 25 A independent remote and to a 40 A Three-Pole RCD with 0.3 A sensitivity on 220 V;
- The GROUNDING should be in accordance with the Technical Standard **ISO 5410**;
- CONSULT a legally HABILITATED professional for such installation..



**ATTENTION!:****RISKS OF ACCIDENTS and MACHINE DAMAGE:****IMPORTANT WARNING!**

- NEVER EXECUTE any welding operation (electrode, MIG or TIG) with the Band Saw machine **ON**, that is, connected to the mains, with the General Switch (02) turned **ON**, (WHITE) PILOT Signaling (33) lit.
- DO NOT USE the band saw machine itself as the GROUDING point of the welding equipment. Even with the Band Saw machine turned off, DO NOT DO ANY welding on it.
- NEVER WELD any type of material to be cut on the Band Saw machine under any circumstances, as this can cause irreparable electrical damage, which is NOT covered under warranty.

9. BAND SAW BLADE SELECTION:

9.1. LIMITS AND RECOMMENDATIONS:

Prior to beginning any kind of work with the machine, CHECK that the job to be carried out is within the limits specified in table and Technical Data ([SEE Chapter 4](#)). If it is out of the specified values, it's recommend that an inquiry in writing be addressed to **Starrett** on the possibility of changing some technical specification. The **Starrett** will answer in writing the appropriate solution.



ATTENTION!:

RISK OF DAMAGE TO THE BAND SAW BLADE:

Starrett takes no responsibility for injuries or damages caused to persons or material property; it is user's responsibility to carefully CHECK out the characteristics of the material to be cut in order to prevent any risk to operator and/or third parties.

If it is within the specified capabilities of the machine, selection of the band is now another important aspect for the good performance of the job to be carried out.

9.2. CRITERIA FOR BAND SAW BLADE SELECTION:

The proper selection of a saw band for a given application must consider some factors: type of material, hardness, cutting section, capability of the machine itself, etc.

Four basics variables exist in selecting the band saw blade:

1. Blade Type;
2. Teeth Shape;
3. Pitch;
4. Cutting Feeding and Blade Speeds.



Band Saw Blade
Catalog **Starrett**

9.2.1. TEETH (PITCH):

The pitch is number of teeth per inch (25.4 mm), that operator must be choose in function of material cutting section.

The normal or annealed materials require at least 3 teeth inside cross section to be cut. It is ideal between 6-12 teeth. In general, materials with thin section require a band saw blade with a larger number of teeth per inch (25.4 mm), or a band saw blade with “teeth thinner” being this opposite for materials with larger section.

9.2.2. ADVANCES AND SPEED OF CUTTING:

It’s important that the feed and cutting speed will be corrects.

Starrett can to send a table “slide chart” type, to fast and easy selection of band saw blade, with specification of feeding and cutting speed for each kind of material.

The same information are available in the **Starrett Band Saw Blade Catalog**.



OBSERVATION!:

The best conditions to cut are 3 to 12 teeth inside in the cross section to be cut, in the same time.

10. INITIAL ADJUSTMENTS:

10.1. INITIAL CHECKS:

Before starting any kind of work with the machine, CHECK:

1. The volume of coolant liquid (oil + water) in Reservoir (51) (figure [10.1](#)) is approximately 20 liters. The oil concentration in the cutting fluid mixture should follow the instructions according to the oil manufacturers' specifications;



ATTENTION!: ENVIROMENTAL RISKS:

CHECK that the coolant oil to be used is not harmful to the user, the environment and the machine itself.

Its disposal must follow the environmental regulations in effect and the product manufacturer's own.

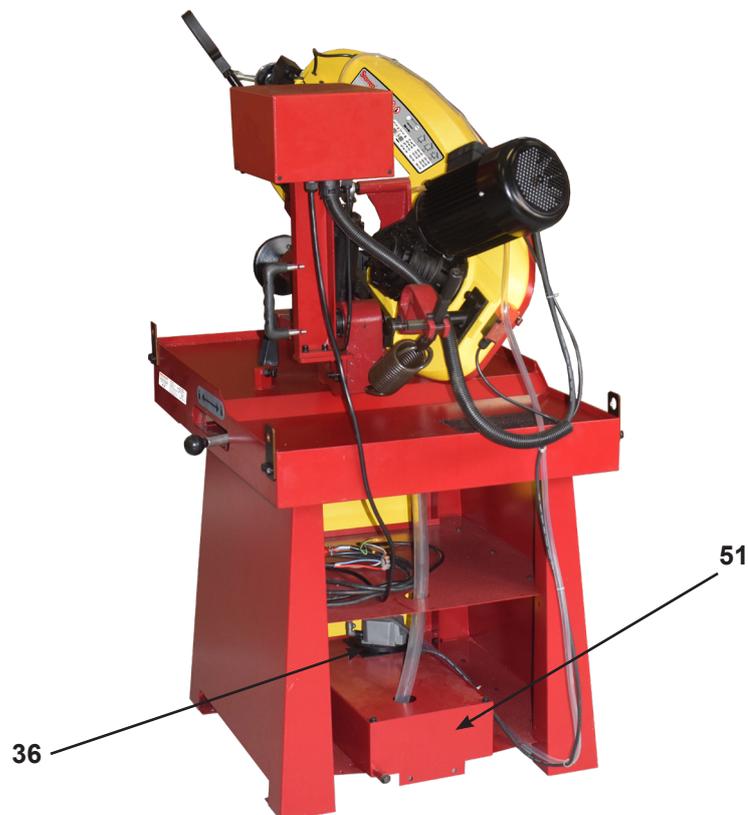
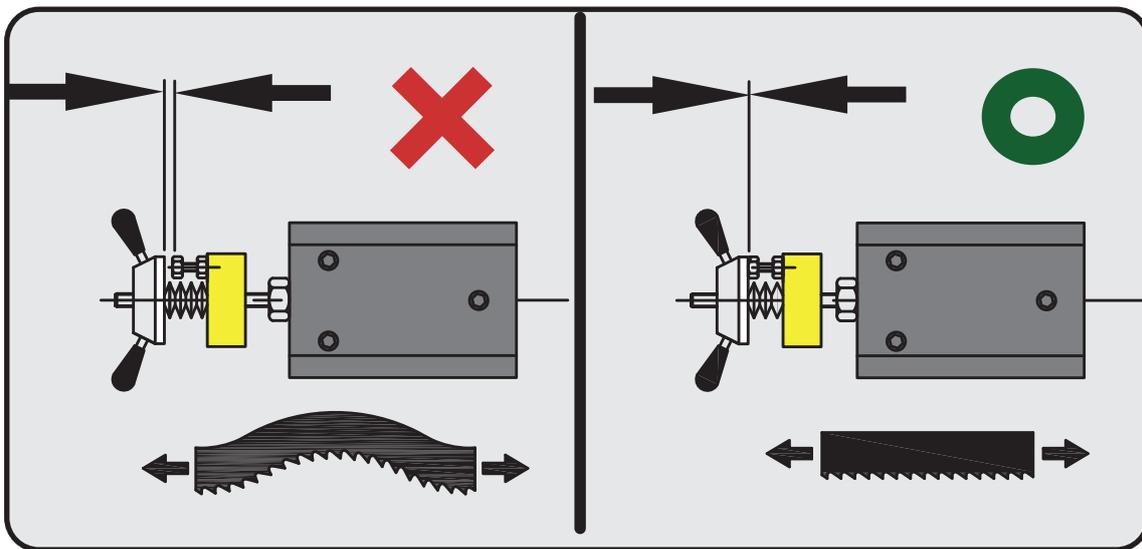


FIGURE 10.1 - RESERVOIR OF THE COOLANT LIQUID

2. CHECK the condition of the Band Saw Blade (10), as to the integrity of its teeth and body;
3. CHECK the tension of the Band Saw Blade (10) by turning the Tensioner Handle (37) until the conditions indicated on the Cutting Capacity Plate (50) located over the Bow (04) (figure [6.1](#)) are present.

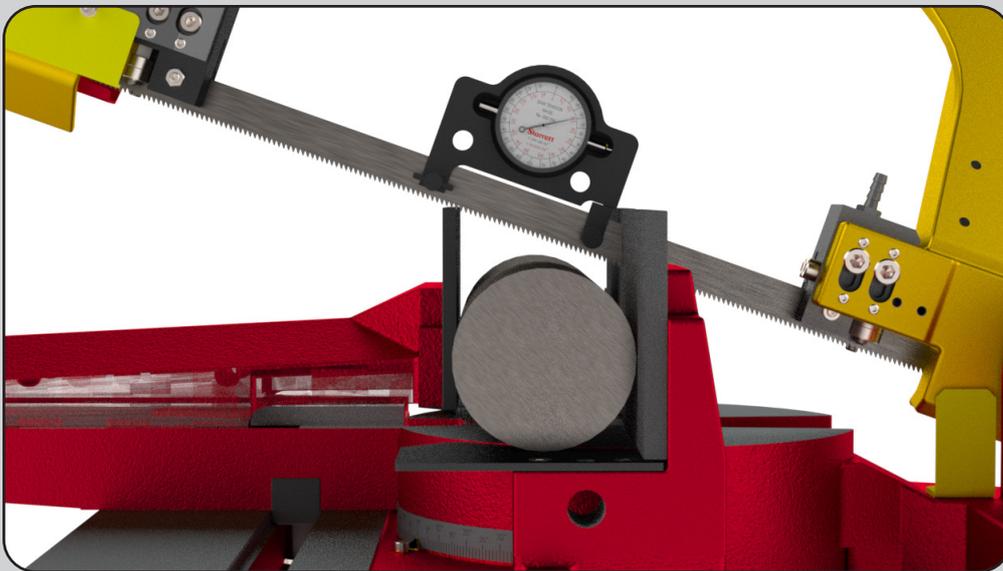




ATTENTION!:
RISK OF DAMAGE TO THE MACHINE:

The recommended limit is 20 000 lbf/pol² (20 kSI) or 1 400 Kgf/cm².

It is advisable TO USE a monthly voltage meter instrument **Starrett** 682 EMZ (EDP 57075 – SAW TENSION GAGE), conforme abaixo, a fim de verificar a ajuste de fábrica do conjunto de tensionamento.



4. CHECK that the type of teeth is the most correct for the cut being made. CHECK that the selection complies with the **Saw Blade Selection** Criteria in [Chapter 09](#). SEE [10.3](#);
5. NOTE that the cutting speed selection (m/min) is compatible with the characteristics of the material to be cut. SELECT the cutting speed via the Toggle Switch (32) (figure [6.6](#)), located on the Command Panel (06). As a guide, the Table of Cutting Recommendations can be used **Starrett**.
6. CHECK that the material to be cut is well positioned on the Cutting Table (07), that is, properly supported over the entire surface. SEE [10.4](#).

10.2. INITIAL ADJUSTMENTS:

1. ADJUST the position of the Mobile Guide (26) (figure [6.2](#)) relative to the material to be cut:
 - POSITION the Band Saw Blade (10), WITHOUT TOUCHING THE TEETH, as close as possible to the material to be cut, keeping a distance of 10 mm above it;
 - RELEASE the Mobile Guide Lock Handle (30) (figure [10.3](#));
 - SLIDE the Mobile Guide Support (28) (figure [10.3](#)), so that the distance between Guides (25) (26) is as small as possible;
 - LOCK the Mobile Guide Support (28) again by the Mobile Guide Lock Handle (30).

2. ADJUST the cutting speed, by Toggle Switch (32) (figure [12.1](#)):
 - “ 1 ” (cutting speed = 37,5 m/min) for hard materials;
 - “ 2 ” (cutting speed = 75 m/min) for soft materials.

10.3. CONSIDERATIONS ABOUT THE BAND SAW BLADE:

Some advice for maintaining the good performance of the Band Saw Blade (10):

1. TENSION the Band Saw Blade (10) correctly, as instructed in item 3 of subsection [10.1](#);
2. KNOW the physical characteristics of the material to be cut, especially its hardness and homogeneity;
3. USE a cutting speed that is compatible with the geometry, dimensions, and physical characteristics (hardness) of the material to be cut;
4. USE good quality Band Saw Blades (10) with correct and intact teeth (no broken teeth);
5. USE the recommendations for the First Cuts in the subsection [11.4](#);
6. CLEAN the Guides (25) (26) frequently - with the machine stopped USE the Micro Oil **Starrett M1**, for cleaning the Side Bearings (52) and Backrest Bearings (53);
7. CHECK the condition of the Bearings (52) (53);
8. CHECK periodically the clearances between the Bearings (52) (0.95 mm), and the distance of the back of the Band Saw Blade (10) from the Backrest Bearing (53), as illustrated in figure [14.3](#).

**OBSERVATION!:**

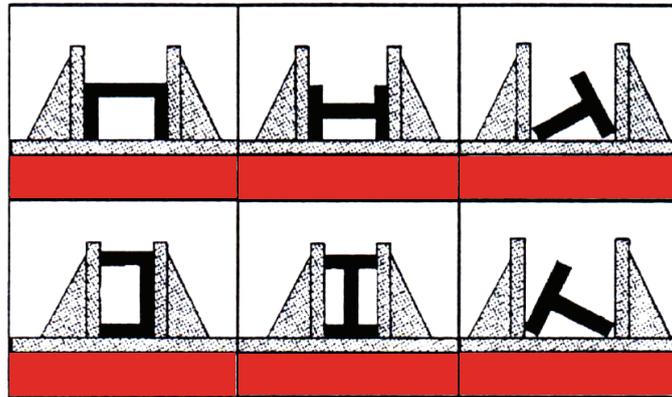
For the best use of the Band Saw Blade (10), it is recommended that it be softened while new when installed in the machine.

This softening is a practice that aims to provide an accommodation of the cutting edges of the teeth, before the saw is submitted to the full work.

Conditioning consists in making the Band Saw Blade (10) work for a period of twice the time required for cutting and at an adequate speed, according to the Table of Cutting Recommendations **Starrett**.

PREVENT THE TEETH OF THE BAND SAW BLADE FROM SLIDING OVER THE MATERIAL WITHOUT REMOVING CHIPS.

(AVOID VIBRATIONS)

10.4. RECOMMENDATIONS FOR THE BEST WAY TO FIX THE MATERIAL TO BE CUT:**OBSERVATION!:**

The cutting operation must be carried out at a forward speed and cutting speed suitable for the teeth of the Band Saw Blade (10), to the thickness of the material to be cut and to the wear of the cutting tool itself.

It is very important to try to keep the cutting conditions within the parameters set by **Starrett**. With this, the performance and the life span of the product will be longer. For a good use of the machine, it is important to keep the Guides (25) (26) always clean and make sure that both receive plenty of coolant liquid cut. To increase or decrease the cutting fluid flow simply OPEN or CLOSE the tap located on the Coolant Dispenser (54), installed on the Bow (04) (figure [10.3](#)).

10.5. BAND SAW BLADE REPLACEMENT AND ADJUSTMENT PROCEDURES:

To correctly change the Band Saw Blade (10) it is necessary to keep the Bow (04) in the highest position and at a 0°, and then:

1. POSITION the General Switch (02) in the **OFF** position, the EMERGENCY Button (03) pressed down (locked);
2. REMOVE the Back Cover (18) by releasing the Crankcase Fixing Handles (56) located at the rear of the Bow (04) (figure [10.2](#));
3. REMOVE the Mobile Guide Protection (43) from the Mobile Guide Support (28) (figure [10.3](#));
4. By removing the Back Cover (18), the Safety Switch (39) (figure [10.2](#)) installed on Bow (04) keeps the machine's electrical control system disabled, as a safety measure – **UNDER NO CIRCUMSTANCES EVER ACTIVATE THE SAFETY SWITCH (39) IN THIS SITUATION.**
5. TURN the Tensioner Handle (37) (figure [10.3](#)) in the sense of decreasing (loosening) the tension of the Band Saw Blade (10) (figure [10.3](#)), in order to decrease the distance between centers of the Flywheels (12) (13).
6. REMOVE the Band Saw Blade (10) carefully, using leather gloves only in this situation, and safety glasses;



7. Carefully clean the surface where it touches the Band Saw Blade (10), the two Flywheels (12) (13) and the inside of the Guides (25) (26), pulverizing with abundant Micro Oil M1 between the Side Bearings (52) (figure [6.2](#)) and the Backrest Bearings (53) (figure [14.3](#)), before installing a new Band Saw Blade (10);
8. MOUNT the new Band Saw Blade (10), making sure that it has full teeth and is compatible with the material to be cut, observing that the teeth are in the direction indicated on the Plate (50) (figure [6.3](#)).

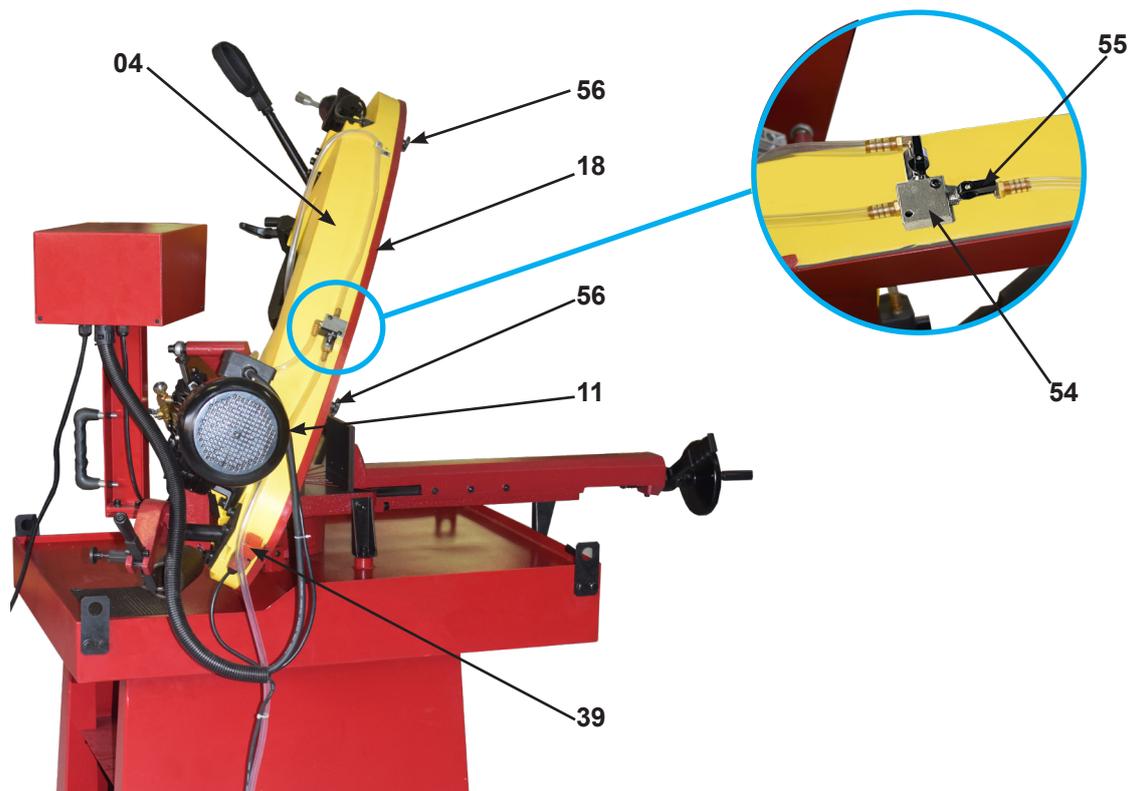


FIGURE 10.2 - BOW BACK COVER AND INNER PROTECTION OF THE MOBILE GUIDE

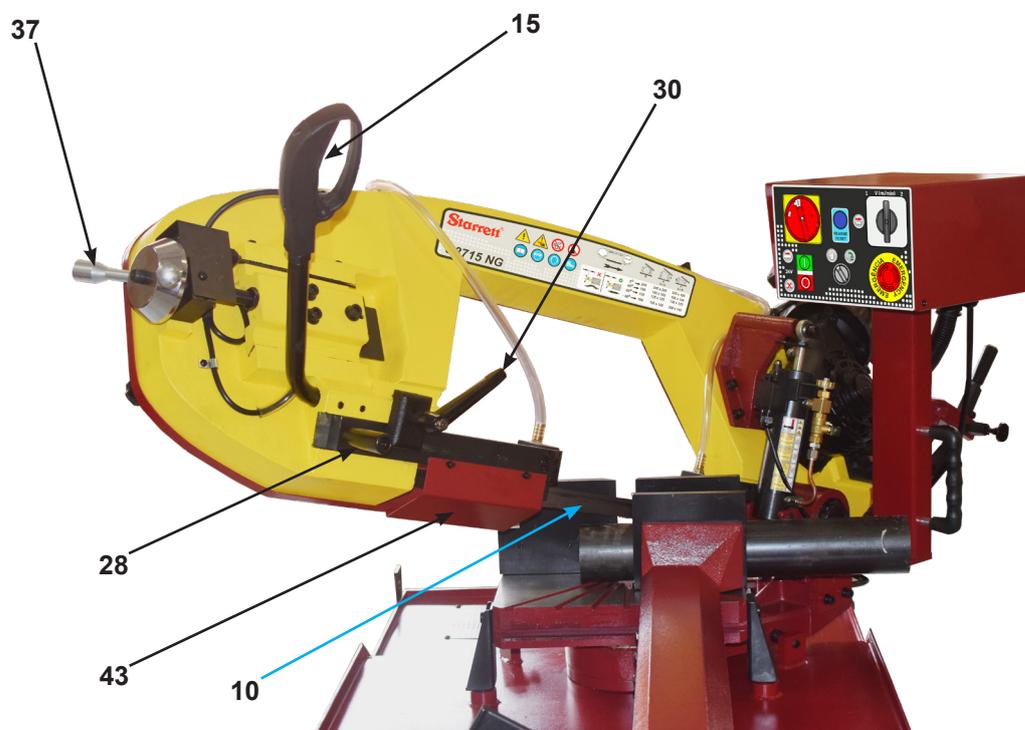


FIGURE 10.3 - MOBILE GUIDE SUPPORT

9. INSERT first in the gap of the Guides (25) (26) between the Side Bearings (52), then in the Motor Flywheel (13), and finally in the Driven Flywheel (12);
10. REALIZE the pre-stretching by turning the Tensioner Handle (37) (figure [10.3](#)) in the direction of the Band Saw Blade (10) tensioning (stretching);
11. MOUNT the Back Cover (18) (figure [10.2](#)), securing it by the Back Cover Fixing Handles (56) (figure [10.2](#));
12. INSERT properly the actuator, attached to the Back Cover (18), in the Safety Switch (39) (figure [10.2](#));
13. MOUNT the Mobile Guide Protection (43) (figure [10.3](#)) in the Mobile Guide Support (28) (figure [10.3](#)) by their respective screws;
14. SELECT one of the 2 cutting speeds via the Toggle Switch (32) (figure [12.1](#));
15. RELEASE the EMERGENCY Button (03) (figure [12.1](#));
16. POSITION the General Switch (02) (figure [12.1](#)) to **ON**;
17. POSITION the Selector Switch (45) (figure [12.1](#)) in **MANUAL** mode;
18. PRESS the Trigger (15) (figure [10.3](#)) momentarily to rotate the Blade Motor (11) (figure [10.2](#));
19. REPEAT this operation 4 to 5 times to seat the Band Saw Blade (10) on the Flywheels (12) (13) and the Guides (25) (26);
20. REALIZE the definitive tensioning the Band Saw Blade (10) by turning the Tensioner Handle (37) (figure [10.3](#)).

10.6 PROCEDURE FOR INSTALLING THE MEASURE ROD SYSTEM:

The **S3715 NG** has a standard Measuring Rod system, consisting of a 500 mm Rod (57) and a Stopper (58) (figure [10.4](#)).

USE PROCEDURE:

1. INSTALL the Stopper (58) in the Measuring Rod (57) (figure [10.4](#));
2. INSERT the Stopper (58) into the side of the Band Saw Blade (10);
3. ADJUST the ZERO dimension of the Measuring Rod Scale (59) (figure [10.4](#)) with some reference of the Stopper (58). Then, when you want to cut the material to a certain cut length, PROCEED:

4. RELEASE the Stopper Handle Lock (60) (figure [10.4](#));
5. POSITION the Stopper (58) at the desired dimension by the Measuring Rod Scale (59);
6. LOCK the Stopper Handle Lock (60);
7. PLACE the material to be cut on the edge of the Stopper (58).



FIGURE 10.4 - STOPPER ADJUSTMENT

11. NORMAL OPERATION:

11.1. SPECIFIC SAFETY RECOMMENDATIONS:



ATTENTION!: RISK OF ACCIDENTS WITH SERIOUS INJURIES:



- All cutting operation procedures on the Band Saw machine **Starrett** must be carried out by specialized companies or by TRAINED and AUTHORIZED professionals.
- Before performing any cutting operation on the machine, it is necessary **READ CAREFULLY** this Instruction Manual in order to know the specific safety instructions for this type of operation.
- USE Personal Protective Equipment - PPE during loading and unloading of the Band Saw machine.



- PLAN every cutting operation before starting it.
- CERTIFY that all safe conditions for the cutting operation are present.
- CERTIFY that all cutting parameters are set (SEE [Chapter 10](#)).
- HANDLE the materials to be cut with adequate lifting and transportation devices, for example, hoists, overhead cranes, or other devices with the same efficiency and purpose.
- USE Roller Tables for cutting long material (SEE [8.2](#) - figures [8.2](#) and [8.3](#) and [Chapter 05 - General Safety Recommendations](#))

11.2. STARTING THE MACHINE:

PROCEDURE:

1. OBSERVE if the machine is inoperative, verifying that the General Switch (02) is in the **OFF** position and the EMERGENCY Button (03) is pressed (figure [12.1](#)), before starting any operation;
2. LIFT the Bow (04) to its maximum upper position by the Lever (61) (figure [11.1](#));
3. LOCK the Cutting Valve (16) horizontally as shown in figure [11.1](#);
4. CLOSE the Regulating Valve (31), turning it clockwise, until resistance to closing is encountered. This will secure the machine before handling or adjusting it;
5. APPROXIMATE the Vise (62) (figure [11.2](#)) with the Vise Advance Crank (20) (figure [11.2](#)) to the material to be cut. ENCOST the Jaws (63) (figure [11.2](#)) on the material to be cut;
6. BACK $\frac{1}{4}$ turn on the Vise Advance Crank (20). This will provide a small enough clearance for the operator to move the part longitudinally. The tightening and loosening of the Vise Set (19) on the material will be done manually, by turning the Quick Tightening Lever (21) downwards (figure [11.2](#));
7. CERTIFY that the material is properly secured on the Vise Set (19);
8. SELECT the cutting speed with the Toggle Switch (32) (figure [12.1](#)), according to the characteristics of the material to be cut;
9. DEFINE the mode of operation: **MANUAL** or **GRAVITATIONAL** by the Selector Switch (45) (figure [12.1](#)):

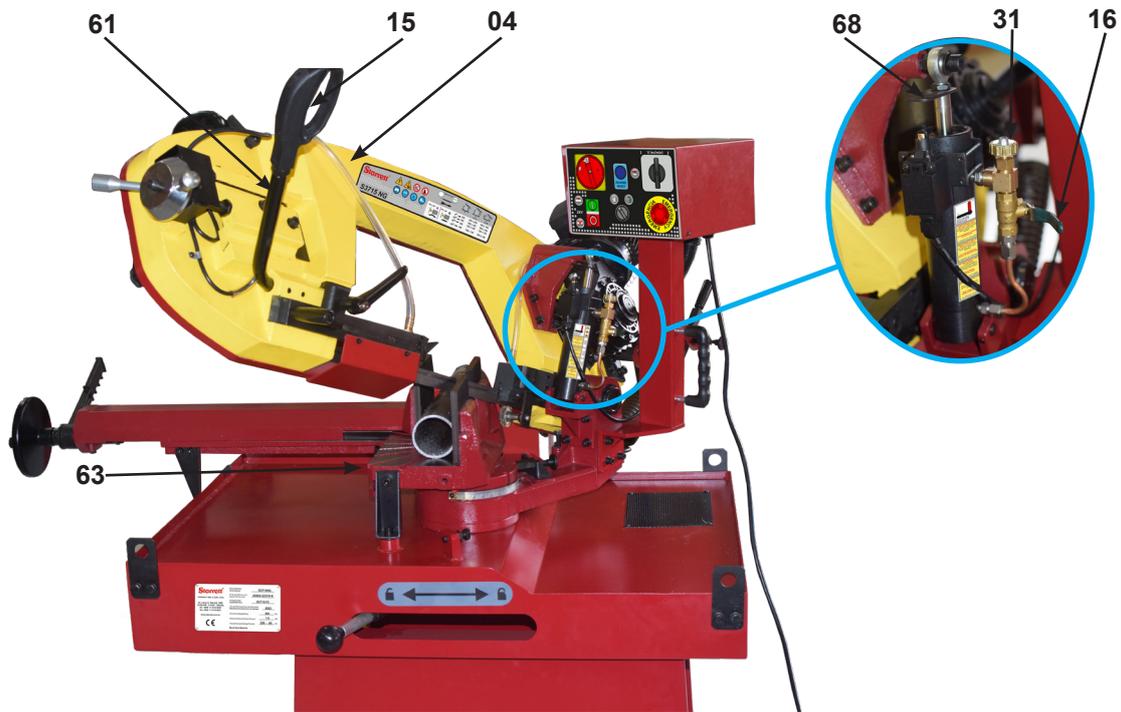


FIGURE 11.1 - ADVANCE CONTROL CYLINDER

MANUAL MODE OPERATION (FOR ADJUSTMENT OF THE CUTTING PROCESS):



(SELECTOR SWITCH (45) - to the LEFT)

In this mode of operation, the operator is responsible for exerting the advance force and controlling its speed. It is an operation that requires the operator to remain in his working position.

PROCEDURE:

1. MAINTAIN the Bow (04) (figure [11.1](#)) fully in its upper position, before starting any cutting operation;
2. TENSION the Spring Set (64) by positioning the Coupling Fork (65), until it touches the Pin (66) (figure [11.2](#)), until the Bow (04) remains in the upper position. The Coupling Fork (65) must be locked by the Lock Pin (67). The Valves (16) (31) must be OPEN during the entire cutting operation (figure [11.1](#)).
3. POSITION the General Switch (02) in the **ON** position and the EMERGENCY Button (03) unlocked;

4. VERIFY that the RESET Button (40) (BLUE) and the PILOT (33) (WHITE) Signalings are lit:
 - If not, VERIFY what is going on, because the machine is not in a safe condition to be activated.
 - If yes, PRESS the RESET Button (40) (BLUE). POSITION the Selector Switch (45) to MANUAL (LEFT);
5. OPEN the Tap (55) of the Coolant Dispenser (54) (figure [10.2](#)) of the coolant liquid, if necessary;
6. HOLD the Trigger (15) depressed, and start cutting the material by pulling the Lever (61) downwards until the end of the operation (figure [11.1](#));

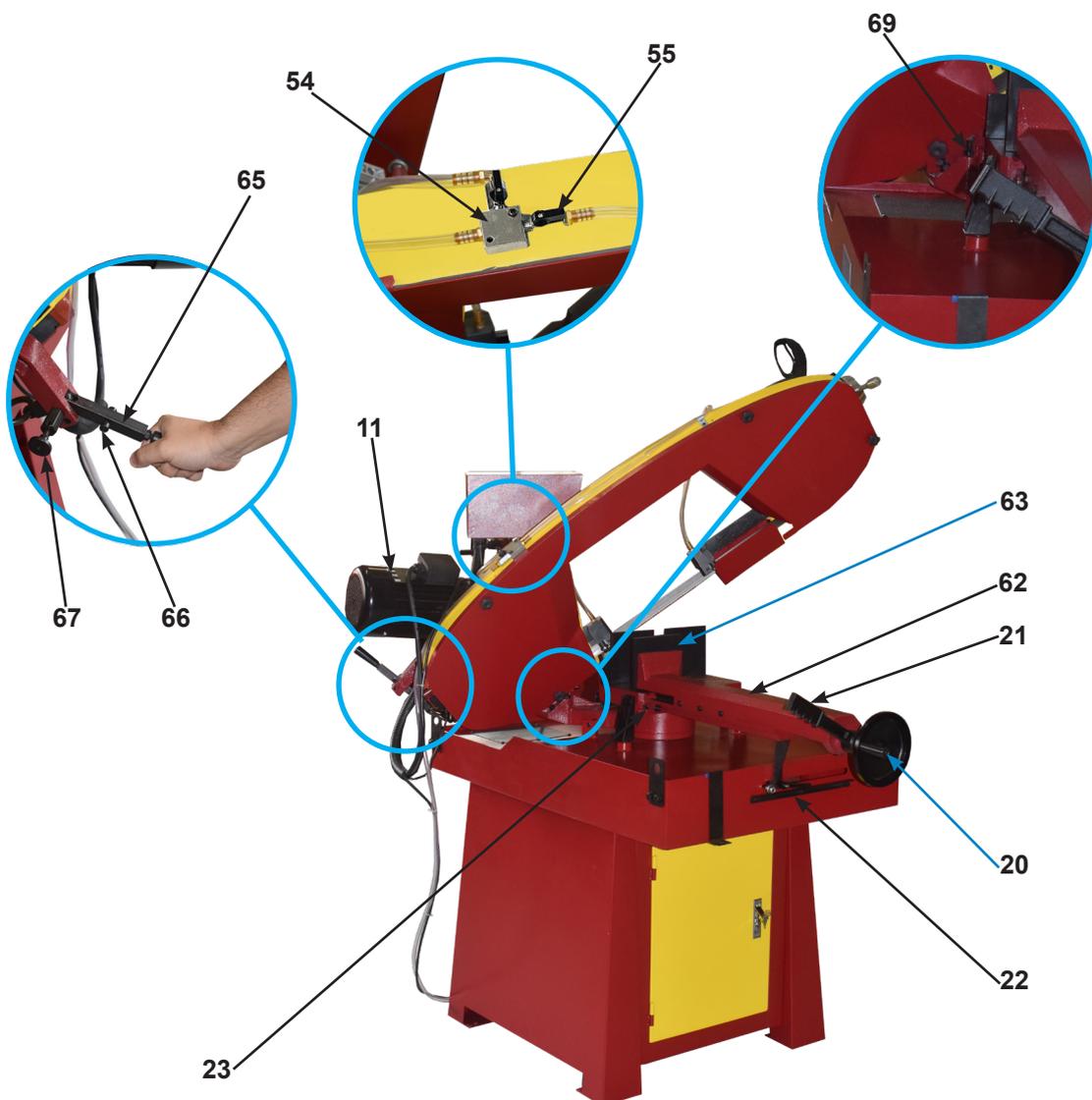


FIGURE 11.2 – VISE SET

7. RELEASE the finger of the Trigger (15) at the end of the cut (figure [11.1](#));
8. SLOWLY release the Lever (61) (figura [11.1](#));
9. OPEN the Vise Set (19) by the Quick Tightening Screw (21) pulling it upwards (figure [11.2](#));
10. REMOVE the cut material;
11. REPLACE the material to be cut for a new cut.

OPERATION IN THE GRAVITATIONAL MODE

(SELECTOR SWITCH (45) - to the RIGHT)



In this operating mode, it is the weight of the Bow (04) that exerts the advance force, with the speed controlled by the Regulating Valve (31) (figure [11.1](#)).

PROCEDURE:

1. RELIEVE the tension of the Spring Set (64) by unlocking, through the Lock Pin (67), the Coupling Fork (65) from the Pin (66) (figure [11.2](#)). The Spring Set (64) cannot exert an opposing force to the forward movement of the Bow (04);
2. HOLD the Bow (04) in the maximum upper position, by Valves (16) and (31) (figure [11.1](#)) in CLOSED positions;
3. POSITION the General Switch (02) in the **ON** position and the EMERGENCY Button (03) unlocked (figure [12.1](#));
4. VERIFY that the RESET Button (40) (BLUE) and the PILOT (33) (WHITE) Signalings are lit:
 - If not, VERIFY what is going on, because the machine is not in a safe condition to be activated;
 - If yes, PRESS the RESET Button (40) (BLUE COLOR). POSITION the Selector Switch (45) in SEMI-AUTOMATIC (RIGHT) (Gravitational Mode);
5. OPEN the Tap (55) of the Coolant Dispenser (54) (figure [11.2](#)) of the coolant liquid if necessary;
6. PRESS the Start Button (34) on the Command Panel (06) (figure [12.1](#));
7. OPEN the Cutting Valve (16) slowly and carefully (figure [11.1](#));

8. OPEN the Regulating Valve (31) slowly until a suitable cutting speed is reached (figure [11.1](#));
9. OBSERVE the cutting performance. **If there is anything or noise abnormal stop the cutting process by pressing the EMERGENCY Button (03);**

At the end of the cut, the Cylinder Fix Arm (68) (figure [11.1](#)) press the Limit Switch (35), turning off the Blade Motor (11) (figure [11.2](#)). Simultaneously the Bow (04) touches the Stopper Pin (69) (figure [11.3](#)).

10. CLOSE Valves (16) and (31) (figure [11.1](#));
11. LIFT the Bow (04) to its upper position, using the Lever (61) (figure [11.1](#));
12. OPEN the Vise (62) by the Quick Tightening Lever (21) pulling it upwards (figure [11.2](#));
13. REMOVE the cut material;
14. REPLACE the material to be cut for a new cut.



**ATTENTION!
RISK OF ACCIDENT:**

OBSERVE always the Operating Instructions for the Cylinder (08), described in the Technical Inscription beside, installed in the Bow (04), beside the Blade Motor (11).

<p>(1) (2) VALVULA DE CORTIR VALVULA DE CORTIR VALVULA DE CORTIR VALVULA DE CORTIR VALVULA DE CORTIR</p>	
<p>NECA FORÇAR O ARCO PARA CIMA ou PARA BAIXO - isto danificará o cilindro causando falhas e podendo causar acidentes.</p> <p>LER ATENTAMENTE O MANUAL DE INSTRUÇÕES</p> <p>(1) ABERTO (2) FECHADO</p>	<p>ATENÇÃO RISCO DE ACIDENTES</p>
<p>NECA FUERCE AL ARCO DE ARRIBA o BAIXO, JANDO- se isto pode danificar el cilindro, causar falhas y posiblo causar accidentes.</p> <p>LEA CUIDADOSAMENTE EL MANUAL DE INSTRUCCIONES</p> <p>(1) ABIERTA (2) CERRADA</p>	<p>ATENCIÓN RISGO DE ACCIDENTES</p>
<p>NE JAMAIS FORÇAR LA ARC O PARA ARRIBA o PARA ABAIXO - isto poderá danificar el cilindro provocando falhas e podendo causar accidentes.</p> <p>LIRE LE MANUEL D'INSTRUCTIONS</p> <p>(1) OUVERT (2) FERMEE</p>	<p>AVERTISSEMENT RISQUE D'ACCIDENT</p>
<p>NEVER FORCE THE BOW TO UP OR DOWN - this will damage the cylinder causing failure and may cause accidents.</p> <p>READ CAREFULLY THE INSTRUCTIONS MANUAL</p> <p>(1) OPEN (2) CLOSED</p>	<p>ATTENTION RISK OF ACCIDENT</p>

**ATTENTION!: RISK OF EQUIPMENT DAMAGE AND ACCIDENT:**

Before starting any cut, VERIFY the position of the Vise Set (19) in relation to the Bow (04).

ALWAYS VERIFY that the Bow (04) is locked by the Lever (61) (figure [11.1](#)).

11.3. NORMAL STOP OF THE MACHINE:

There are 2 situations in which the machine stops NORMALLY.

The first is at the end of the cut, in which the Limit Switch (35) is activated, turning off the Motors (11) (figure [11.2](#)) of the Saw Blade and Coolant Pump (36) (figure [10.1](#)).

The second case is by operator action when the Stop Button (49) (figure [12.1](#)) is activated.

11.4. RECOMMENDATIONS IN THE FIRST COURTS:

USE low advance speeds and at each operation, if necessary, increase them according to the cutting performance.

If there is any abnormal noise in the process, the operator must stop the operation and CHECK what may be occurring.

If in doubt, **Starrett** Technical Assistance can provide all the information to help.

11.5. PROCEDURE FOR ANGLE CUTTING:**11.5.1 CUT TO THE RIGHT (0° TO +60°):**

When desired to realize angled cutting ($\neq 0^\circ$), to the right side (0° to $+60^\circ$ maximum) of the operator, follow the procedure.

PROCEDURE:**ATTENTION!: RISK OF EQUIPMENT DAMAGE AND ACCIDENT:**

To perform this procedure, the Bow (04) must be in its maximum upper position. The operator must PRESS the EMERGENCY Button (03) and POSITION the General Switch (02) in the OFF position, until the adjustment of this item is completed.

CERTIFY if the Bow (04) is locked, forcing its rotation by the Lever (70) (figure [11.3](#)).

1. VERIFY that the General Switch (02) is in the OFF position and the EMERGENCY Button (03) is pressed (figure [12.1](#)), before starting any operation;
2. RELEASE the Limiter Pin (38) (figure [11.3](#)) from the 0° position (when necessary), to enable turning the Bow (04) to the right side (figure [11.4](#));
3. PUSH the Bow Turn Lock Lever (70) (figure [11.3](#)) counter-clockwise to unlock the Bow (04);
4. ROTATE the Bow (04) (figure [11.1](#)) until the desired angle shown in the Angular Scale (46) (figure [11.3](#));
5. PULL the Bow Turn Lock Lever (70) clockwise (tighten) (figure [11.3](#));
6. CERTIFY that the Bow (04) is really locked;
7. CERTIFY that the Vise Set (19) is on the right side (figure [11.4](#)) If not, PROCEED:
 - RELEASE the two Vise Lock Screws (23) (figure [11.2](#));
 - RELEASE the Vise Lock Handle (22) (figure [11.2](#));
 - MOVE the Vise (62) to the right;
 - TIGHTEN the two Vise Lock Screws (23) and the Vise Lock Handle (22).

For cuts with an angle greater than 45° (>45°), the rear of the Bow (04) can be positioned on the side of the Cabinet (01).

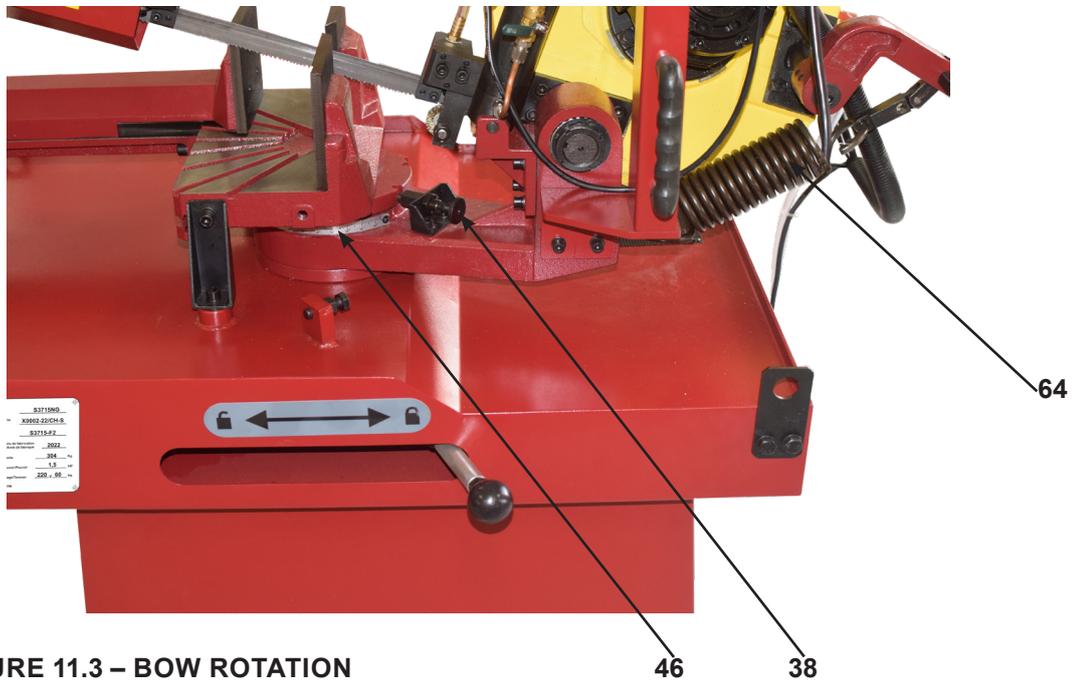


FIGURE 11.3 – BOW ROTATION

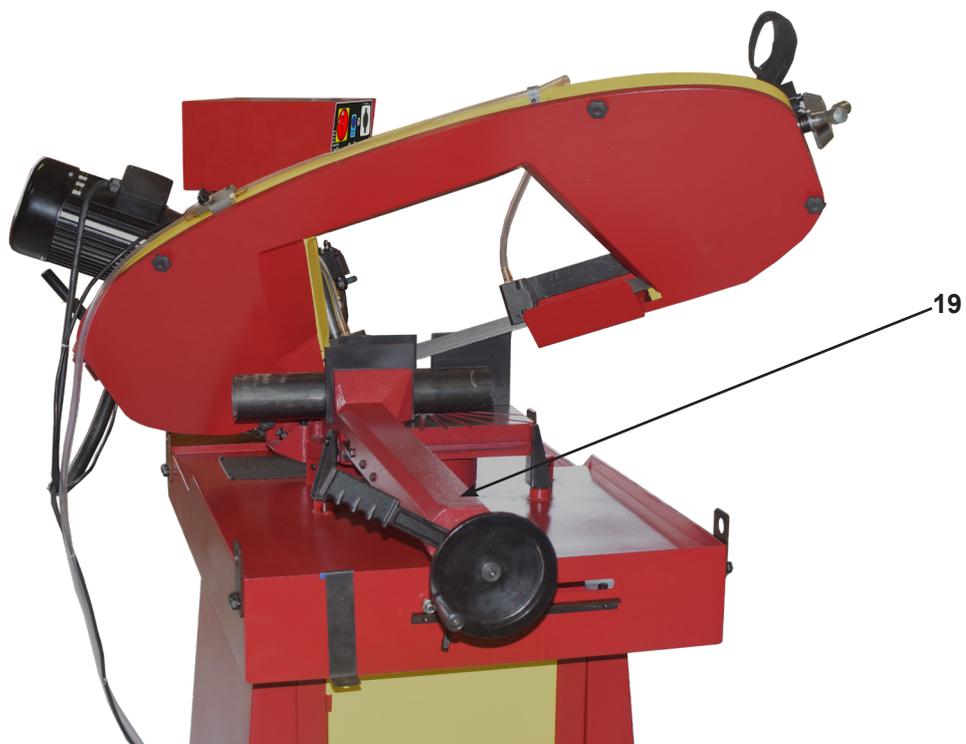


FIGURE 11.4 – VISE SET (19) TO THE RIGHT

11.5.2 CUT TO THE LEFT (0° TO -45°):

When it is desired to perform angled cutting ($\neq 0^\circ$), to the left side (0° to -45° maximum) of the operator, follow the procedure.

PROCEDURE:



ATTENTION!: RISK OF ACCIDENTS and MACHINE DAMAGE:

To perform this procedure, the Bow (04) must be in its maximum upper position. The operator must PRESS the EMERGENCY Button (03) and POSITION the General Switch (02) in the OFF position, until the adjustment of this item is completed.

CERTIFY if the Bow (04) is locked, forcing its rotation by the Lever (70) (figure [11.3](#)).

1. VERIFY that the General Switch (02) is in the OFF position and the EMERGENCY Button (03) is pressed ([figure 12.1](#)), before starting any operation;
2. RELEASE the Limiter Pin (38) (figure [11.3](#)) from the 0° position (when necessary), to enable the turning of the Bow (04) to the left side (figure [11.5](#));
3. PUSH the Bow Turn Lock Lever (70) (figure [11.3](#)) counter-clockwise to unlock the Bow (04);
4. ROTATE the Bow (04) (figure [11.1](#)) until the desired angle shown in the Angular Scale (46) (figure [11.3](#));
5. PULL the Bow Turn Lock Lever (70) clockwise (tighten) (figure [11.3](#));
6. CERTIFY that the Bow (04) is really locked;
7. CERTIFY that the Vise Set (19) is on the left side (figure [11.5](#)). If not, PROCEED:
 - RELEASE the two the Vise Lock Screws (23) (figure [11.2](#));
 - RELEASE the Vise Lock Handle (figure [11.2](#));
 - MOVE the Vise (62) to the left;
 - TIGHTEN the two Vise Lock Screws (23) and the Vise Lock Handle (22) (figure [11.2](#)).

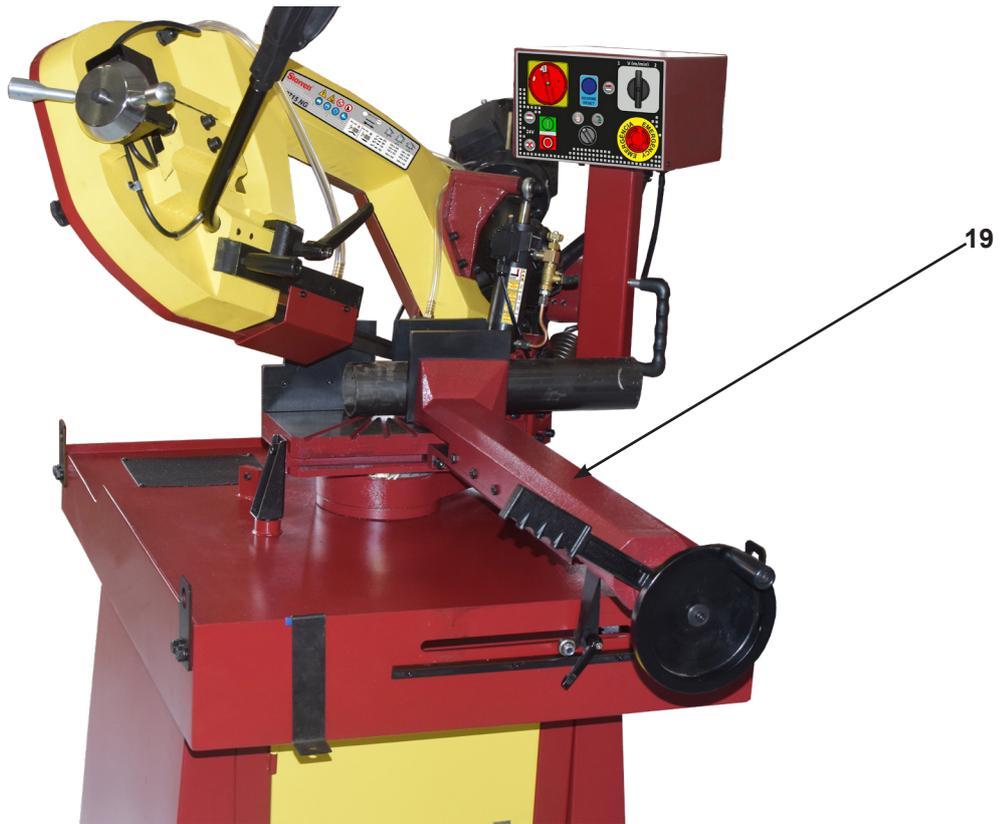


FIGURE 11.5 – VISE SET (19) TO THE LEFT

12. EMERGENCY OPERATION:

If there is an occurrence, where the EMERGENCY Button (03) on the Command Panel (06) needs to be ACTIVATED (figure [12.1](#)), the operator must follow the procedures below.



PROCEDURE:

- 1. EMERGENCY!:** PRESS the EMERGENCY Button (03) located on the Command Panel (06) (figure [12.1](#)).
- TURN OFF the machine by the General Switch (02) (figure [12.1](#)), by turning it to **OFF**;

First providence:

- STOP and CHECK what is occurring;
- REQUEST help from a SUPERVISOR or other QUALIFIED person;
- VERIFY and DEAL with the occurrence;
- 6. DO NOT START** the machine without first making sure that the reason for the EMERGENCY has been resolved;

Second providence:

- VERIFY that the material to be cut is properly secured, that the Band Saw Blade (10) is intact and in position outside the material and secure, and also that there are no other imminent risks that must be removed;
- POSITION the General Switch (02) at ON, as soon as the problem is solved and eliminating the present danger, if necessary;
- VERIFY that the WHITE Pilot Signaling (33) located on the Command Panel (06) is lit. If the WHITE Pilot Signaling (33) remains BLANK, REQUEST the help of maintenance personnel to CHECK what is going on, because there may be some problem with the electrical system that prevents the machine from starting;
- VERIFY that the BLUE signaling on the RESET Button (40) is lit (figure [12.1](#));

11. ACTIVATE the RESET Button (40). The BLUE signaling should go out (figura [12.1](#)):
 - If it does NOT go out, ask the maintenance personnel to help to CHECK what is going on, because there may be some problem with the electrical part that prevents the machine from starting;
 - If the BLUE light goes out, TURN ON the GREEN Start Button (34) to start the machine and continue the initial work.
12. START the machine and CONTINUE the initial work;
13. REPORT and REGISTER the occurrence, if necessary to a supervisor or immediate superior.

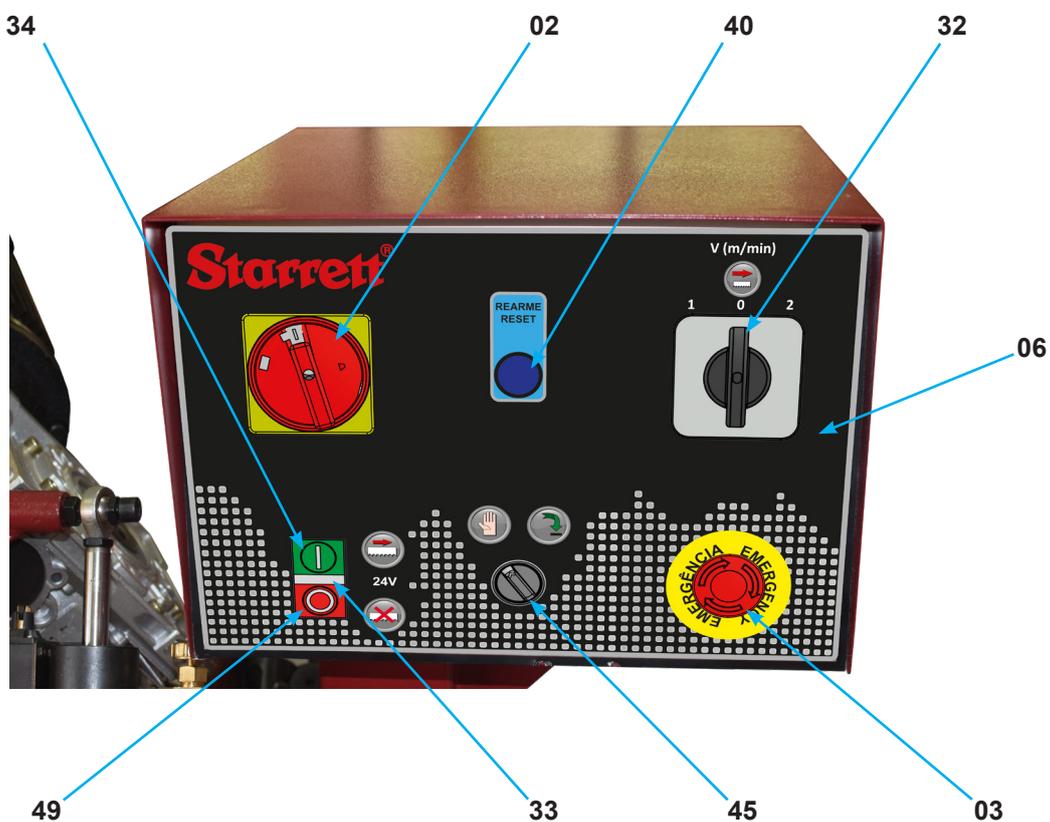


FIGURE 12.1 - COMMAND PANEL

13. SYSTEMS:

13.1. ELECTRICAL SYSTEM:

The electrical system was developed and projected in order to maintain the operator and equipment safety, being in accordance with the requirements of the norms **IEC 60204-1** and **ISO 16093**.

The standard machine was designed to operate with 2 motors, being the three-phase Motor M1 (11) that moves the Band Saw Blade (10), and the M2 Motor, single-phase, that drives the Coolant Pump (36), duly specified, according to the load capacity of each.

A General Switch QS1 (02) of the disconnecting type is installed at the circuit entrance to electrically disable the machine, when the Command Panel (06) cover is opened for maintenance.

A Contactor KM1 has the function of driving the Motors M1 (11) and M2, as soon as the Trigger SB3 (15) or the START Button SB2 (34) are activated (figure [10.3](#)). A second Contactor KM2, in series with the Contactor KM1, is part of the redundancy of the drive safety system for Motor M1 (11) SEE figure [13.1](#).

The Speed Selector Switch (32) SA1, of the 3-position type (1 - 0 - 2) has the function of changing the speed of Motor M1 (11), as chosen by the operator. In the 0 (ZERO) or neutral position the Motor (11) does not start. To switch off the machine just press the OPERATIONAL STOP Button SB4 (49).

The M1 Motor (11) is used to drive the Band Saw Blade (10), which is protected by the Overload Relay FR1. If Motor M1 (11) has a current overload above the specification, Overload Relay FR1 will open its contacts shutting down Motor M1. The Coolant Pump Motor M2 (36) is protected by Fuses FU4 and FU5.

A properly sized Transformer TR1 has the function of reducing the control voltage to 24 VAC, that is, to extra low voltage, being in compliance with the **IEC 60204-1**. This transformer is protected by 2 Fuses FU1 and FU2 at the input and 1 Fuse FU3 at the output. A Power Supply U1 is installed to supply the Safety Relay FS1.

As a safety system, one EMERGENCY Button SB1 (03) is installed in a position visible and accessible to the operator in case of abnormality. This is monitored by a Safety Relay FS1, installed on the Command Panel (06) (figure [11.2](#)) and they have redundancy by 2 contacts (2 channels).

In addition, Safety Switches SQ1, SQ2 (39) interlock the Back Cover (18). These safety components have electrical redundancy and monitoring. The interlocking function can be performed by two safety switches of the electromagnetic type, installed on the rear part of the Bow (04) (figure 10.2).

In case the Band Saw Blade (10) breaks, the Limit Switch SQ3 (42) disables the electrical system, stopping the machine completely (figure 6.3).

Also, by means of the 2-position Selector Switch SA2 (45), it has the function of selecting the machine's operation mode: **MANUAL** or **SEMIAUTO**.

An Limit Switch SQ4, installed in the Hydraulic Cylinder (08), has the function of automatically switching off the machine at the end of the cut, that is, when the Bow (04) is in the inferior position. This function is only valid when Selector Switch SA2 (45) is positioned in **SEMIAUTO**.

As established in the standard **ISO 16093**, The machine's safety functions have been defined in **CATEGORY 3**.

The cables for the motors (the "power" cables) are black and of gauge 1.25 mm². The control cables are red and have a gauge of 0.75 mm². All cables are identified according to the attached electrical schematic.

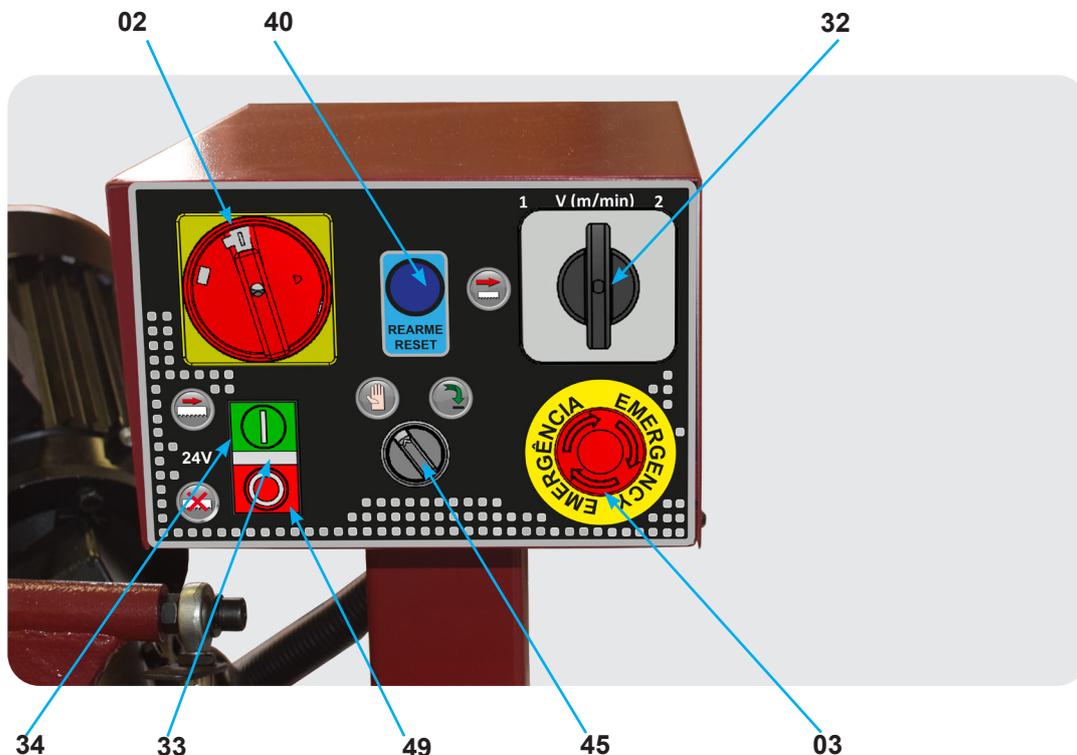
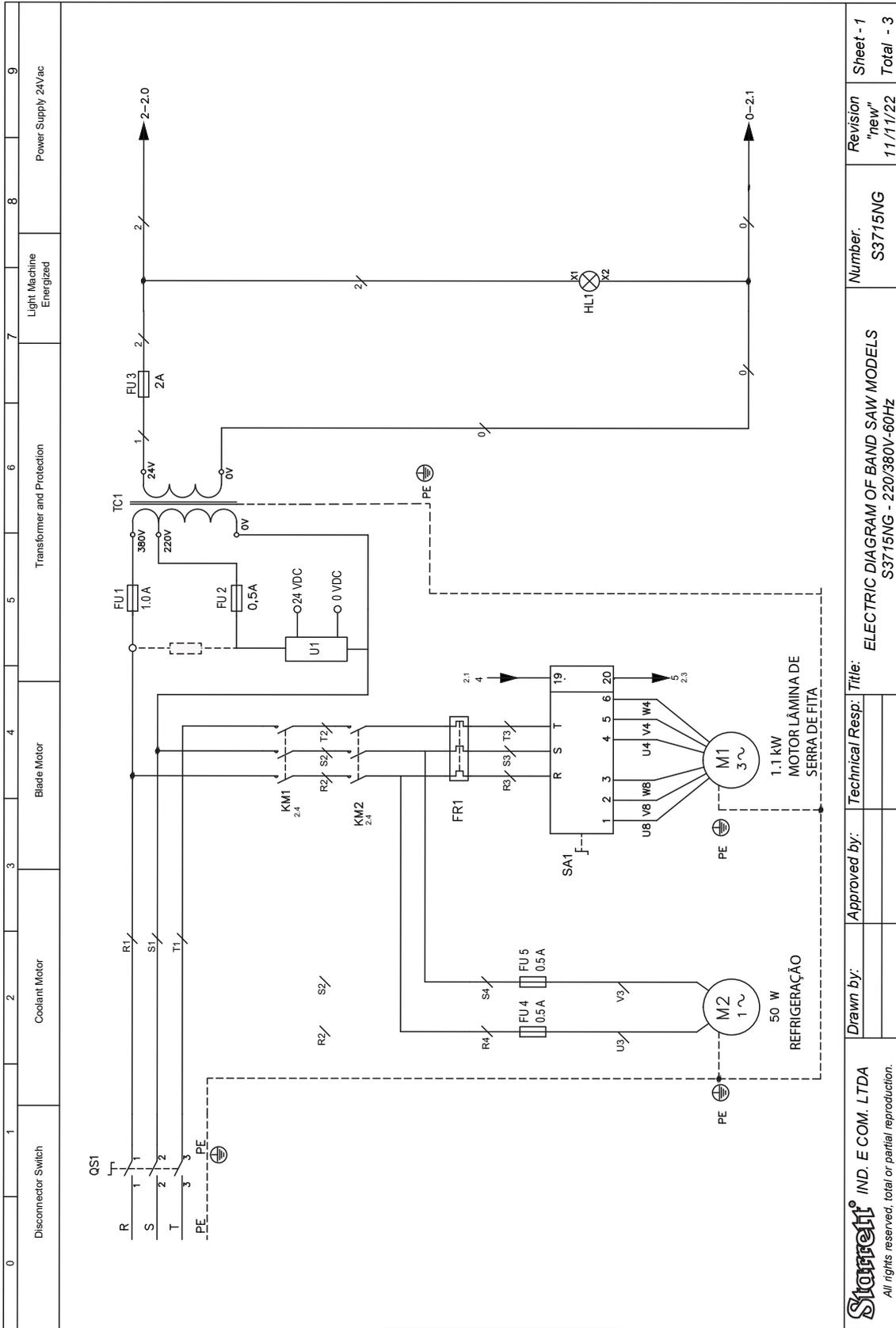


FIGURE 13.1 - COMMAND PANEL

LIST OF ELECTRICAL COMPONENTS:

SIGLA	Description	Starrett Code	Specification	Supplier:
M1	BLADE MOTOR			
M2	COOLANT MOTOR			
FU1-2	FUSE 0,5 A			
FU3	FUSE 2,0 A			
FU4-5	FUSE 1,0 A			
TC1	TRANSFORMER - 220 - 380 V / 24 V			
SQ1	BACK COVER SAFETY SWITCH			
SQ2	BACK COVER SAFETY SWITCH			
SQ3	RUPTURE BLADE LIMIT SWITCH			
SB1	EMERGENCY BUTTON			
SB2	START BUTTON			
SB3	TRIGGER BUTTON			
SB4	OPERATIONAL STOP BUTTON			
SB5	RESET BUTTON			
HL1	PILOT LIGHT 24 VAC			
HL3	BLUE LIGHT (RESET)			
SA1	SPEED SELECTOR SWITCH			
SA2	MANUAL/SEMIAUTO MODE SWITCH			
FS1	SAFETY RELAY			
QS1	GENERAL SWITCH			
KM1	POWER CONTACTOR			
KM2	POWER CONTACTOR			
KA1	AUXILIAR CONTACTOR			
FR1	OVERLOAD RELAY			
U1	POWER SUPPLY 0 -24VDC			



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Drawn by: _____
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 Technical Resp.: _____

Number: S3715NG
 Revision "new" 11/11/22

Sheet - 1
 Total - 3

0	1	2	3	4	5	6	7	8	9					
Legend with the most used symbols in this project, based on the standard IEC - 60617.														
Symbol	Code	Description	Symbol	Description	Symbol	Description	Symbol	Code	Description	Code	Symbol	Description	Code	Description
	FR	Overload Relay		Auxiliar contact of the contactor, relay, button or circuit breaker.		Pressure switch contact		S	Pressure switch contact	S		Limit Switch contact mechanical action	SQ	Limit Switch contact mechanical action
	FR	Contact (thermal drive)		Time relay timed in the disconnection		Time relay timed in the disconnection		KT	Time relay timed in the disconnection	S		Switch drive by foot	SQ	Switch drive by foot
	PE	Grounding protection		NC Contact with timed opening.		NC Contact with timed opening.		KT	NC Contact with timed opening.	S		Transformer	T	Transformer
	FU	Thermal- magnetic Tripolar Circuit Breaker		Time relay timed in the bonded		Time relay timed in the bonded		KT	Time relay timed in the bonded	S		Devices box Safety Relay, Inverter	U KS IN	Devices box Safety Relay, Inverter
	HL	Indicator lamp for sinalization,		NO Contact with timed closing.		NO Contact with timed closing.		KT	NO Contact with timed closing.	SA		Voltage converter CC Power Supply	U	Voltage converter CC Power Supply
	K	Contact coil		3 ph Motor with Grounding connection		3 ph Motor with Grounding connection		M	3 ph Motor with Grounding connection	SA		Borne Connector	X	Borne Connector
	K	Contact of power of contactor.		Motor Circuit Breaker		Motor Circuit Breaker		Q	Motor Circuit Breaker	SB		Fuse Borne	XF	Fuse Borne
	K	Reversible contact		Disconnector Switch		Disconnector Switch		QG	Disconnector Switch	SB		Solenoid Valve	Y	Solenoid Valve

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Drawn by: _____
 Approved by: _____

Technical Resp: _____
 Title: **ELECTRIC DIAGRAM OF BAND SAW MODELS**
 S3715NG - 220/380V-60Hz

Number: **S3715NG**
 Revision "new" **11/11/22**
 Sheet - 3
 Total - 3

13.2. MACHINE SAFETY SYSTEMS:

This machine is equipped with the following safety devices:

- FR1 Overload Relay (thermal protection): Protection of the Motor M1 (11) of the Band Saw Blade (10) against overload;
- EMERGENCY Button (03): Located on the Command Panel (06), for eventual needs of non-normal STOPS. This safety function is monitored by the FS1 Safety Relay;
- Back Cover Protection (18): It has the function of mobile protection of the interior of the Bow (04). When removed, it opens Safety Switch SQ1 (39) disabling the machine's Electrical System. When removed, it opens Safety Switch SQ1 (39) disabling the machine's Electrical System;
- RESET Button SB3 (40) (BLUE): Located on the Command Panel (06), its function is to prevent the unexpected start-up of the machine;
- Safety Relay FS1: Located inside the Electrical Board (41), whose function is to monitor the security devices present;
- PILOT Light HL1 (33): Located on the Command Panel (06). Its function is to indicate that the controls are energized in extra low voltage (24 Vac), making the machine ready to operate;
- Limit Switch SQ3 (35): Its function is to disable the machine's electrical system, in cases of rupture of the Band Saw Blade (10). This function is monitored by the Safety Relay FS1;
- Mobile Guide Fixed Protections (43 and 44): Located and fixed on the Mobile Guide Support (28) (figures [6.2](#) and [6.4](#)), which can only be removed by using a tool;
- Fixed Guide Protection (44): Located and attached to the Fixed Guide Support (29), which can only be removed by use of a tool.

13.3. MEASURE ROD SYSTEM:

The **S3715 NG** has a standard Measuring Rod system, consisting of a 500 mm Measuring Rod (57) and a Stopper (58) (figure 13.2), which can be locked by the Stopper Lock Handle (60).

The Measuring Rod (57) has a Scale (59) to facilitate the positioning of the Stopper (58). It is installed on the right side of the Cutting Table (07) set and can be safely used for any mode of operation.

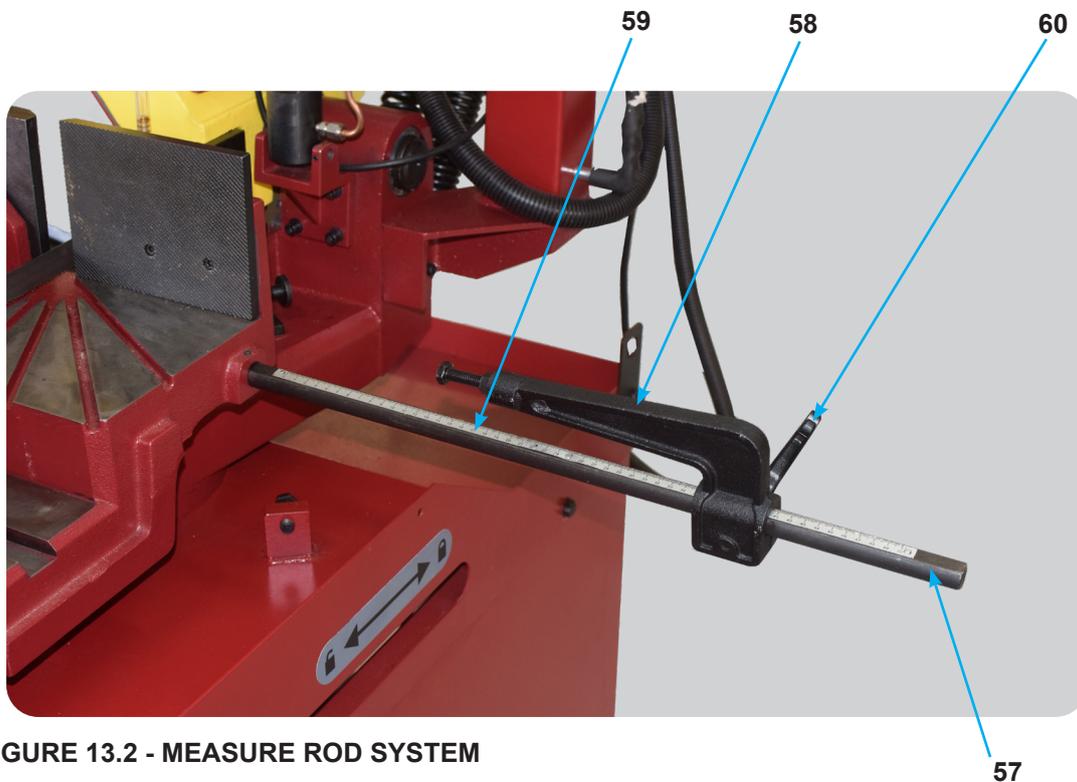


FIGURE 13.2 - MEASURE ROD SYSTEM

13.4 GEARMOTOR:

The **S3715 NG** was developed to have 2 cutting speeds in order to cut different materials. The selection of these speeds is made electrically by means of a 3-position Toggle Switch (32) (speeds “1”, “2” and “O” – off) that commands a set composed of the Gearbox (14) and the Motor (11) (figure [13.3](#)).

13.4.1. PRINCIPLE OF FUNCTIONING:

The Gearbox (14) is a WORM type, with permanent lubrication. Coupled to this, there is a 4 and 8-pole, three-phase, double speed motor, DAHLANDER type, whose voltage must be chosen by the user: 220 or 380 or 400 or 440 V, at 50 and 60 Hz frequencies.

In cases of long periods of operation, in hot environments, the worm Gearbox (14), due to its characteristics, can operate at temperatures between 60 and 80 °C. In this temperature range, its performance and that of Motor (11) is impaired. (figure [13.3](#))

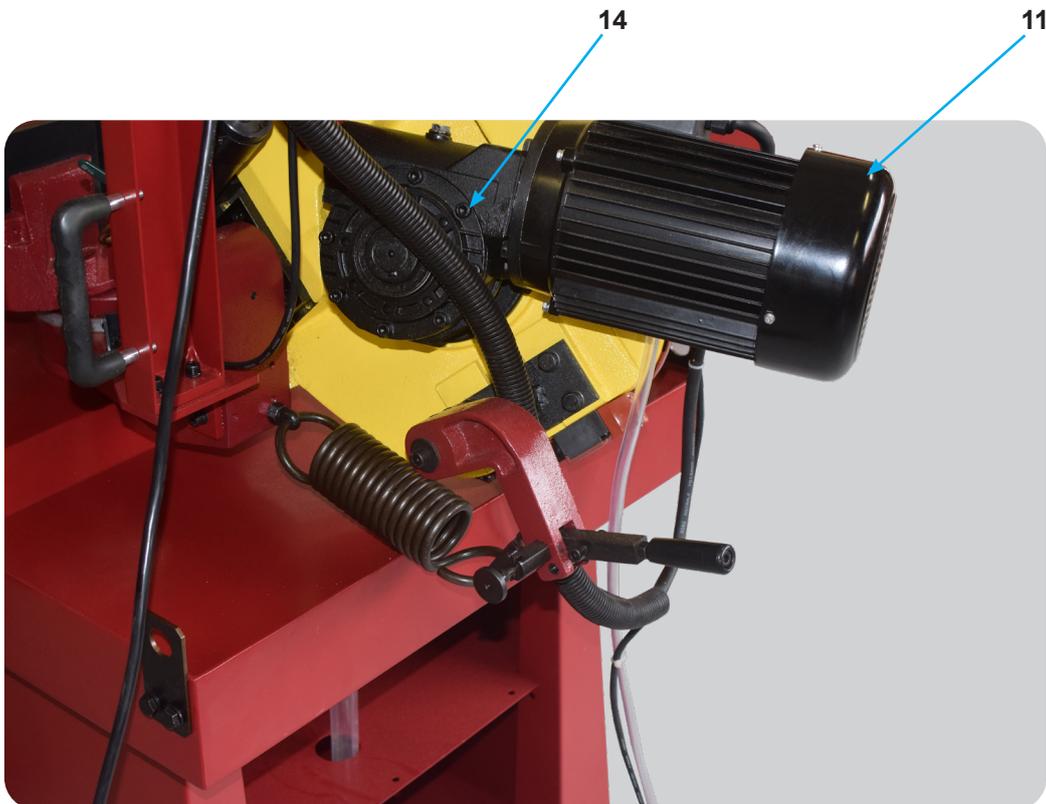


FIGURE 13.3 - GEARMOTOR SYSTEM

14. GENERAL MAINTENANCE:

14.1. SPECIFIC SAFETY RECOMMENDATIONS:



ATTENTION!:

ELECTRICAL SHOCK HAZARDS AND ACCIDENTS WITH SERIOUS INJURIES.



- Any intervention on the **Starrett** Band Saw Machine, as for maintenance, must be performed by **QUALIFIED** professionals, and **AUTHORIZED** by the owner company.
- USE Personal Protective Equipment - PPE during all maintenance phases. READ CAREFULLY the Maintenance instructions contained in this Instruction Manual.



- PLAN all maintenance, lubrication, and periodic inspection operations in advance. PREPARE all the necessary tools and materials for this operation.
- KEEP the electrical schematics handy for possible consultation during maintenance, lubrication, and inspection of the machine.

- CERTIFY that the General Switch (02) is in the **OFF** position, to avoid risk of electrical shock. If necessary, LOCK the General Switch (02) with a padlock or a locking device (figure [14.1](#)), when there are accident risks.



- USE Maintenance Warning Label (figura [14.2](#)) (TAGOUT) positioned and/or fixed on the General Switch (02) and at the locations where maintenance is taking place on the machine (LOTO procedure).

- DO NOT CLIMB, under any circumstances, on the machine. USE recommended and authorized means of access for work at height.



- ISOLATE the area around the machine to be serviced with signs and barriers, and PROVIDE suitable lifting and transport devices.



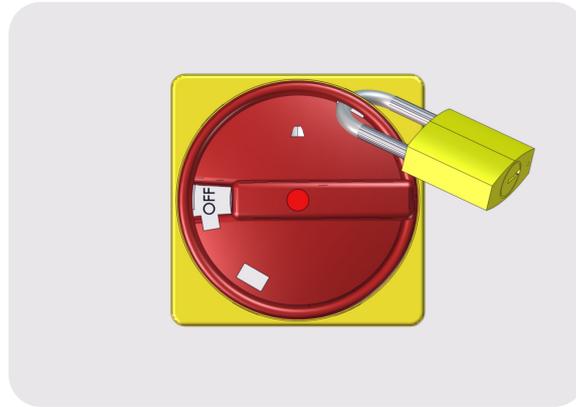


FIGURE 14.1 - GENERAL SWITCH LOCK WITH PADLOCK

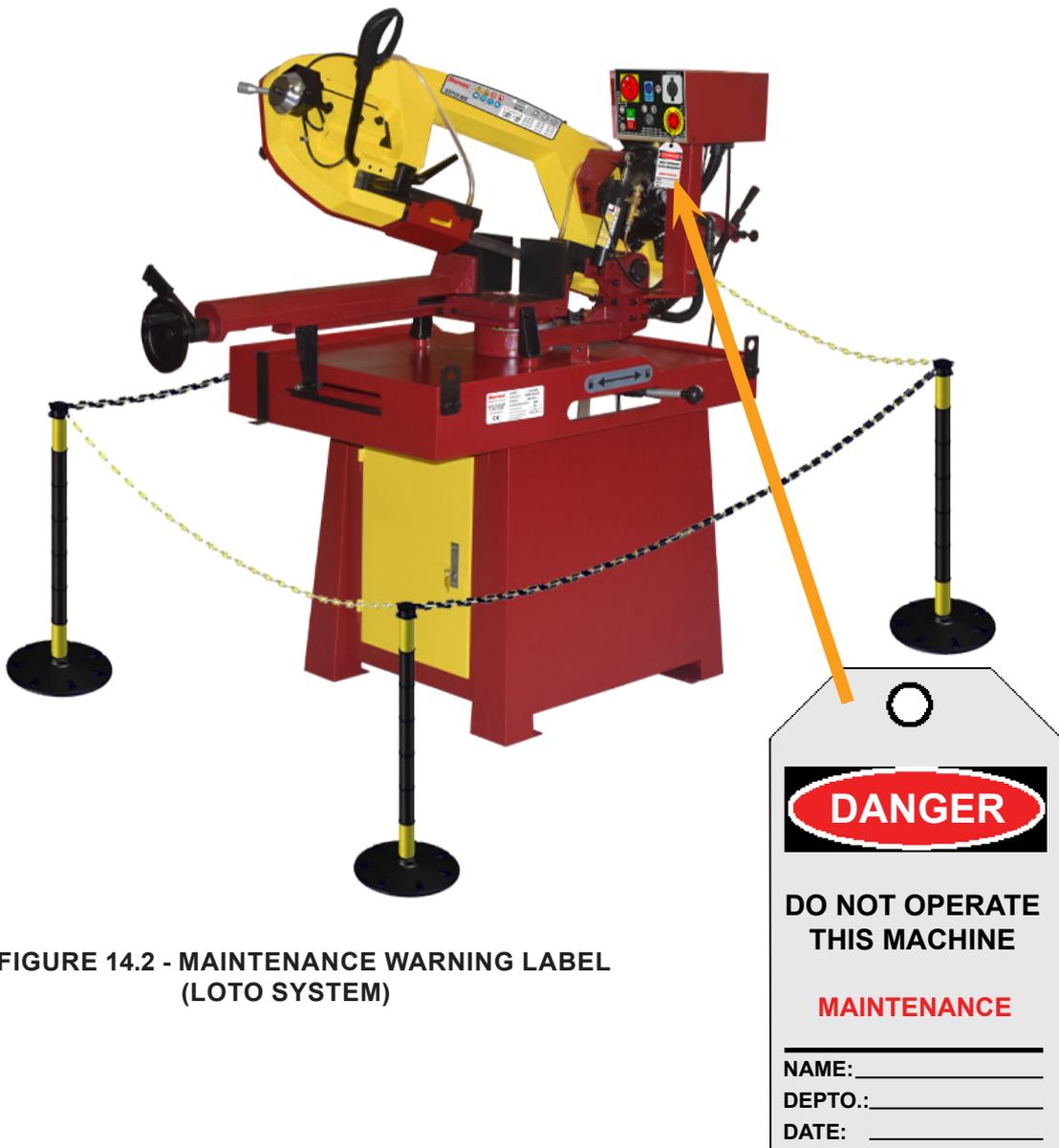


FIGURE 14.2 - MAINTENANCE WARNING LABEL (LOTO SYSTEM)

This Chapter aims to describe the main systems that compose this machine, as well as the main corrective and preventive maintenance procedures. Keeping periodic inspections up to date allows the machine to always obtain good overall performance.

14.2. CLEANING:

It is very important:

- CARRY out the cleaning and elimination of the chips from the Flywheels (12) (13) and from the Guide set (25) (26) daily;
- CLEAN the Reservoir (51) periodically (at least once a week) and FILL or REPLACE, if necessary, the coolant cutting liquid mixture in the Reservoir (51) and HOLD the level,
- REMOVE the chips from the Vise (19) and the Cabinet (01) at certain intervals during the day;
- CLEAN periodically and REALIZE a proper inspection of the conductive cables of the entire electrical system (“whips”).



ATTENTION!

RISK OF INJURY TO THE EYES:

The user, if using compressed air or equivalent systems for cleaning, must WEAR SAFETY GLASSES to avoid unnecessary accidents.



14.3. CORRECTIVE MAINTENANCE:

14.3.1. GUIDE SET ADJUSTMENTS:

The Guide Set must periodically be adjusted for optimum cutting performance.

a.) DAILY CLEANING:

1. CLEAN these 2 sets daily with its own cooling liquid (water + cutting oil), with the Bow (04) in the down position, with no material to be cut on the Cutting Table (07).

2. HOLD the machine running for 5 minutes with the Bow (04) in the down position, after all cutting operations, for cooling liquid to clean the Guides (25) (26);
3. WASH the inside of the Guide Set (25) (26) thoroughly with cooling liquid and allow it to drain with the Tap (55) fully open.

Another way to clean these sets daily is to pressure-wash them with Micro Oil M1 from **Starrett**.

b.) MONTHLY CLEANING:

1. REMOVE the Band Saw Blade (10);
2. POSITION the Bow (04) in the lower position;
3. WASH the Bearings (52) (53) under pressure with Micro Oil M1;
4. REMOVE any dirt that is on these Guide Sets (25) (26), using a clean brush.

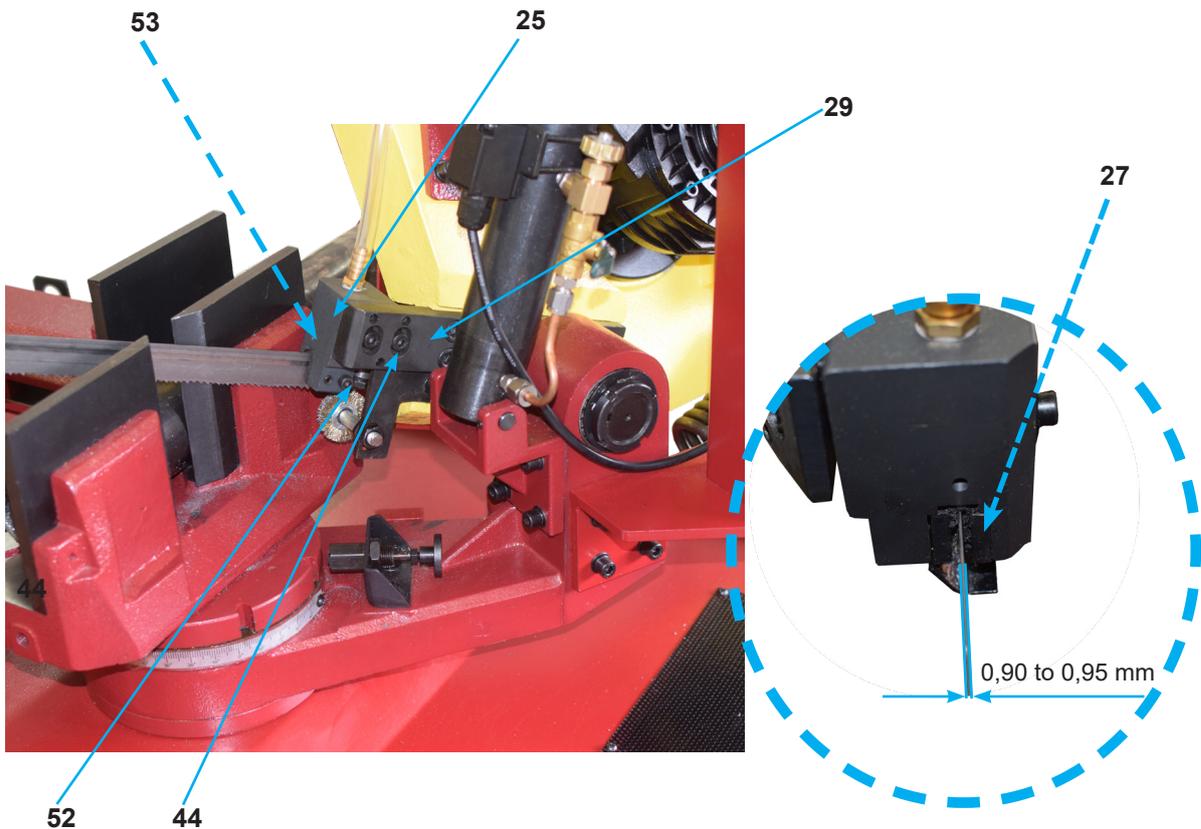


FIGURE 14.3 - SIDE BEARINGS ADJUSTMENT

c.) SIDE BEARINGS ADJUSTMENT (52): (figures [14.3](#) and [14.4](#))

PROCEDURE:

1. POSITION the Bow (04) in the upper position;
2. CLOSE the Valves (16) and (31) (figure [11.1](#));
3. RELIEVE the tension of the Band Saw Blade (10) ([SEE subsection 10.5](#));
4. CLEAN the Guides (25) (26) under pressure with plenty of Micro Oil M1, to remove all kinds of dirt;
5. LOOSE the Eccentric Shaft Fixing Screw;
6. TURN the Eccentric Shaft Adjustment Nut **ALWAYS** clockwise with the aid of a Fixed Key. The Side Bearings (52) must fully rest against the side of the Band Saw Blade (10). The gap between the Side Bearings (52) must be between 0.90 to 0.95 mm (figure [14.3](#));
7. TIGHTEN the Eccentric Shaft Fixing Screw, otherwise there may be a chance of it coming loosened and leaving the Side Bearing (52) free, which may lead to future problems.

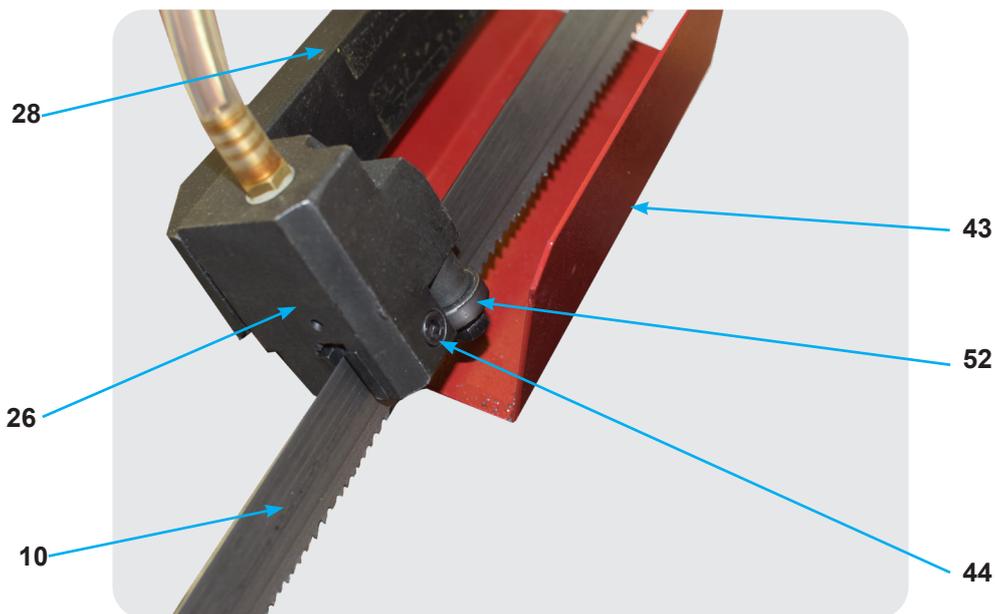


FIGURE 14.4 - SIDE BEARINGS ADJUSTMENT

The pressure of the Side Bearing (52) on the Band Saw Blade (10) must NOT be excessive, as it can cause premature wear of this component. Also, these Bearings (52) must NOT be too far from the side of the Band saw Blade (10), as this causes cutting deviations.

d.) HARD METAL TABLETS ADJUSTMENT (27):**PROCEDURE:**

1. POSITION the Bow (04) in the upper position;
2. CLOSE the Valves (16) and (31) (figura [11.1](#));
3. RELIEVE the tension of the Band Saw Blade (10);
4. CLEAN the Guides (25) (26) under pressure with plenty of Micro Oil M1, to remove all kinds of dirt;
5. LOOSE the Hard Metal Tablet Fixing Screw;
6. RELEASE the Hard Metal Fixing Nut and slowly TIGHTEN the Hard Metal Tablet (27) screw until it touches the Band Saw Blade (10);
7. TIGHTEN the Hard Metal Fixing Nut and the corresponding Fixing Screw;
8. VERIFY the tightness of the Fixing Screw.

e.) BACKREST BEARING ADJUSTMENT (53):

DAILY OBSERVE the position of the Backrest Bearing (53) (figure [14.3](#)) to the back of the Band Saw Blade (10). The distance should be between 0.5 to 1.0 mm of clearance.

If the Band Saw Blade (10) is out of bounds, FOLLOW the instructions:

PROCEDURE:

1. LOOSE the Screws (44) of the Guides (25) (26) (figures [14.3](#) and [14.4](#));
2. MOVE up or down the Guide Set (25) or (26), installed in the Guides Support (28) and (29) respectively.
3. VERIFY that the Mobile Guide (26) (SEE figure [14.4](#)) is not touching the teeth of the Band Saw Blade (10). If it is, ADJUST the position of the Protection (43) away from the teeth of the Band Saw Blade (10) to avoid damaging it.

14.3.2. DRIVEN FLYWHEEL CAMBER ADJUSTMENT (12):

The service life of a Band Saw Blade (10) depends on the adjustment with the Driven Flywheel (12) and the Motor Flywheel (13).

The Band Saw Blade (10) when rotating on the Driven Flywheel (12) and Motor (13) must lightly touch the shoulder of these Flywheels (figura [14.5](#)).

When ADJUSTING the Driven Flywheel (12) camber can relieve the pressure of the Band Saw Blade (10) on the REBOUND.

PROCEDURE:

1. POSITION the Bow (04) in the upper maximum position;
2. CLOSE the Valves (16) and (31);
3. VERIFY that the General Switch (02) is in the **OFF** position and the EMERGENCY Button (03) is pressed;
4. LOOSE (TIGHTEN) the Screws A, B and C, without removing them from the Tensioner System (Cart) (17), with an Allen Hex Key (figure [14.5](#));
5. TURN Screw D, to adjust (camber) the Driven Flywheel (12) (figure [14.5](#)), as follows:
 - clockwise the back of the Band Saw Blade (10) touches the REBOUND;
 - counter-clockwise the back of the Band Saw Blade (10) pulls away from the the REBOUND.
6. The turning intensity of the D screw should be small, around 1/4 to 1/3 turn for each adjustment, until the ideal condition is reached, that is, the back of the Band Saw Blade (10). The gap must be between 0.2 to 0.5 mm from the REBOUND of the Flywheels (12) (13). MEASURE this gap with a gap gauge;
7. TIGHTEN the Screws **A, B** and **C**;
8. POSITION the Toggle Switch (32) (figure [13.1](#)) in speed **1** and the Selector Switch (45) (figure [13.1](#)) in MANUAL mode;
9. START the machine by turning the General Switch (02) to **ON**;
10. UNLOCK the EMERGENCY Button (03);
11. VERIFY that the tensioning of the Band Saw Blade (10) is correct;



12. PRESS the Trigger (15) (figure [14.5](#)) lightly to rotate the Motor (11) of the Band Saw Blade (10);
13. REMOVE the Back Cover (18) from the Bow (04);

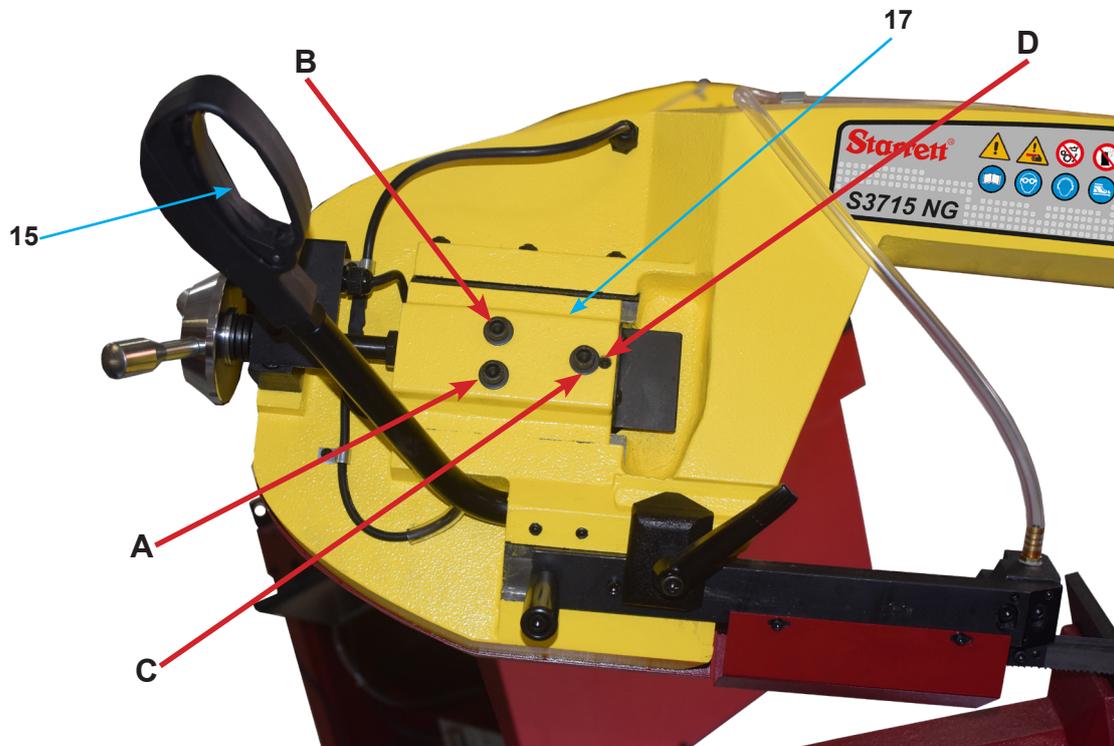


FIGURE 14.5 - POSITIONING OF THE CAMBER ADJUSTMENT SCREWS

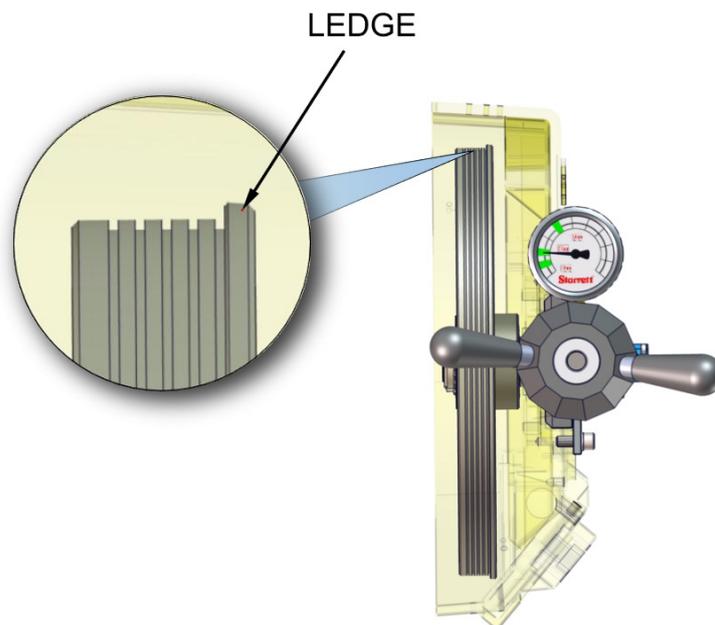


FIGURE 14.6 - FLYWHEELS REBOUND

14. VERIFY the position of the back of the Band Saw Blade (10) in relation to the projections of the Flywheels (12) (13). As a reference measurement the back of the Band Saw Blade (10) should be 0.2 to 0.5 mm from the projections of the Flywheels (12) (13);
15. INSTALL the Back Cover (18) again and REPEAT the procedure from item 1 to 13, if it persists outside these measures;
16. INSTALL the Back Cover (18) definitively, if the measurement complies with the parameters in item 13;
17. ENABLE the machine electrically and make it AVAILABLE for use;
18. REALIZE this procedure MONTHLY or when there is a problem with the Band Saw Blade (10) breaking or wear of the Flywheel (12) (13) rebound (figure [14.6](#)).

14.3.3. REMOVAL OF THE HYDRAULIC CYLINDER FROM THE BOW:

To change or repair the Hydraulic Cylinder (08), some safety measures are required to avoid any risk to the user during its removal.

PROCEDURE:

1. VERIFY that the General Switch (02) is in the **OFF** position and the EMERGENCY Button (03) is pressed;
2. POSITION the Bow (04) in the lower position;
3. WITHDRAW the Cylinder (08) rod completely;
4. REMOVE the Cylinder (08) by its respective fixing screws;
5. REPLACE the Cylinder (08) with a new one, if necessary;
6. NEVER attempt to work with the machine without the Cylinder (08) properly installed, as this can generate risks and damage to the operator and the equipment;
7. START the machine, by turning the General Switch (02) to **ON**;
8. UNLOCK the EMERGENCY Button (03);
9. TEST the machine and VERIFY that performance is adequate.



14.3.4. REMOVAL OF THE SPRING SET (09):

To change and repair the Spring Set (09), some safety measures are required to avoid any risk to the user during its removal.

PROCEDURE:

1. VERIFY that the General Switch (02) is in the OFF position and the EMERGENCY Button (03) is pressed;
2. POSITION the Bow (04) to its maximum upper position;
3. CLOSE the Valves (16) and (31) (figure [11.1](#));
4. PLACE a wooden wedge to **sustain** the Fixed Guide Support (29) on the Cutting Table (07), in order to keep the Bow (04) in this maximum upper position, in a safe way;
5. CERTIFY that the Bow (04) and the wooden wedge are secure and firm in this position;
6. RELIEVE the tension of the Spring Set (09) by the Coupling Fork (65);
7. REMOVE the Spring Set (09) and REPLACE the necessary item(s);
8. RE-ASSEMBLY the Spring Set (09);
9. CERTIFY that the assembly is correct;
10. REMOVE the wooden wedge under the Fixed Guide Support (29);
11. TENSION the Spring Set (09) to initial conditions;
12. OPEN the Valves (16) and (31);
13. START the machine by turning the General Switch (02) to **ON**;
14. UNLOCK the EMERGENCY Button (03);
15. TEST the machine and VERIFY that performance is adequate.



14.3.5. GEARMOTOR REPAIR AND REPLACEMENT:

Assembly and Disassembly of the Gearmotor.

To assemble and disassemble the Gearmotor, follow these instructions (figure [14.7](#)).

PROCEDURE:

1. POSITION the Bow (04) in the lower position;
2. DISCONNECT the Motor (11) power cable;
3. BLOCK the General Switch (02) with Padlock (figure [14.1](#));
4. IDENTIFY with Maintenance Warning Label, as shown in figure [14.2](#);
5. NOTE down the wiring diagram on a piece of paper, to avoid assembly errors later;
6. LOOSE the screws that fix the Motor (11) to the Gearbox (14);
7. REMOVE the Motor Flywheel (13) by removing the central screw, through the inner side of the Bow (04);
8. LOOSE the screws that secure the Reducer (14);
9. REMOVE the Reducer (14) from the Bow (04), carefully;
10. REALIZE the necessary maintenance;
11. DRAIN the oil contained in the gearbox;

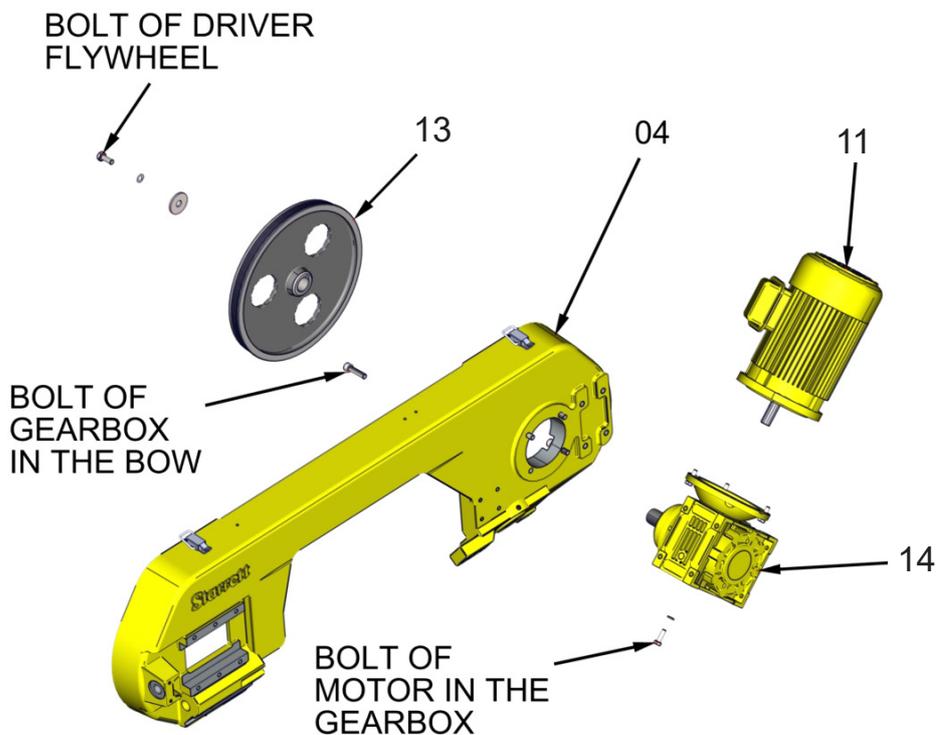


FIGURE 14.7 - GEARMOTOR SET

12. DO NOT DROP the oil from the Reducer (14) into the environment;
13. REALIZE the necessary maintenance on the Reducer (14);
14. RESTORE the assembly of the Reducer (14), following the reverse steps of disassembly;
15. MOUNT the Motor Flywheel (13) on the shaft end of the Reducer (14);
16. CERTIFY the tightening of the screw that fixes the Driven Flywheel (12);
17. MOUNT the Motor (11) on the Reducer (14), making sure to tighten the respective screws;
18. REDO the original electrical connection;
19. TURN the Motor (11) in both directions, approximately 20 times, by the Fan, avoiding excessive strain on the shafts;
20. START the machine, turning the General Switch (02) to ON;
21. UNLOCK the EMERGENCY Button (03);
22. VERIFY that the Gearbox Set [(11) + (14)] is working without any strange noise. If it occurs, [CONTACT Starrett's Technical Assistance](#).

14.4. PREVENTIVE MAINTENANCE:

POS	DESCRIPTION	FREQUENCY	ACTION
25 and 26	Cleaning the Guide (Backrest and Side Bearings)	Daily	Clean with Micro-Oil M1, or Cooling Liquid, and/or Compressed Air
52 and 53	Bearing wear verification (clearances)	Monthly	Measuring with clearance gauge
14	Gearbox Verification	Biannually	REPAIR if necessary

continuation:

POS	DESCRIPTION	FREQUENCY	ACTION
51	Verification of cooling liquid level in the Reservoir	Daily	COMPLETE
12 and 13	Cleaning the Back Cove and Flywheels	Daily Weekly	CLEAN, LUBRICATE the flywheel shafts, injecting grease through the grease fittings
11 and 17	Verification of Band Saw Blade tensioning	Daily	ADJUST
07 and 62	Surface cleaning of the Cutting Table, Vise and other machine surfaces	Daily	CLEAN
17	Tensioner System	Monthly	REPLACE, if necessary
10	Band Saw Blade	Daily	REPLACE, if necessary



ATTENTION! RISK OF ACCIDENTS:

All periodic and corrective maintenance must be carried out by QUALIFIED and TRAINED professionals.

The owner of machine must check all safety laws and standards of each country.

14.5. PROBLEMS - CAUSES AND SOLUTIONS:

PROBLEM	CAUSES AND SOLUTIONS
WHITE PILOT Signaling (33) is off	<ul style="list-style-type: none"> • VERIFY that the General Switch (02) is in the OFF position;
Band Saw Blade (10) does not turn	<ul style="list-style-type: none"> • VERIFY that the Safety Switch (39) of the Back Cover (18) is disabling the electrical system. INSERT the Back Cover (18) actuator key correctly into the Safety Switch (39); • VERIFY that the Toogle Switch (32) speed is in position 1 or 2; • VERIFY whether the EMERGENCY Button (03) is pressed or defective; • VERIFY that the WHITE PILOT Signaling (33) is off.
The rotation of Bow (04), between angles 0° to 60°, is hard	<ul style="list-style-type: none"> • VERIFY the Lubrication of the Rotatory Support. REPLACE the cutting oil, as it may be dissolving or removing lubrication from the Rotatory Support and moving parts; • VERIFY for excessive chips and/or dirt on the machine. REMOVE the chips and/or dirt.
The Band Saw Blade (10) does not tension	<ul style="list-style-type: none"> • VERIFY the length of the Band Saw Blade (10). It should be $2\ 680 \pm 2$ mm.
The Band Saw Blade (10) comes out of the Flywheel	<ul style="list-style-type: none"> • VERIFY the tensioning of the Band Saw Blade (10). TENSION according to 10.1, item 3; • VERIFY the clearance in the Bearings of the Flywheels (12) (13). ADJUST and REGULATE the Flywheels (12) (13) and/or REPLACE the respective Bearings; • VERIFY the conicity of the Driven Flywheel (12) (must be 0.5°). REMOVE and SEND to Maintenance for recovery. CONTACT Starrett's Technical Assistance before executing any kind of machining service.

continuation:

PROBLEM	CAUSES AND SOLUTIONS
Coolant liquid does not reach the Band Saw Blade (10)	<ul style="list-style-type: none"> • VERIFY if there is coolant liquid in the Reservoir (51). DISPOSE the old coolant liquid, CLEAN the inside of the Reservoir (51) and FILL with new coolant liquid; • VERIFY whether the Tap (55) is closed or open. OPEN the Tap (55) if it is closed; • VERIFY that coolant liquid is circulating through the Coolant Pump (36) and Tap (55) hoses. DISOBSSTRUCT or REPLACE the hoses, if they are clogged.
Band Saw Blade (10) tooth breakage	<ul style="list-style-type: none"> • VERIFY if the tooth pressure is excessive on the material to be cut. REDUCE feed rate by adjusting Regulating Valve (31); • VERIFY that the teeth of the Band Saw Blade (10) are correct. CONSULT Chapter 9 and/or the Starrett Technical Assistance, if necessary; • VERIFY the conditions of the Side Bearings. VERIFY whether they are broken or not. REPLACE the Bearings (52) and ADJUST as item 14.3.1 c.; • VERIFY if the cutting speed is lower than recommended. INCREASE the speed by the Toggle Switch (32);
Early wear of the Saw Blade Teeth (10)	<ul style="list-style-type: none"> • VERIFY that the Band Saw Blade (10) is suitable for the material to be cut. REPLACE with a Band Saw Blade (10) recommended to Starrett's specification. CONTACT Starrett's Technical Assistance if necessary; • VERIFY if the cutting speed is high relative to what is recommended. REDUCE the speed by Toggle Switch (32);

continuation:

PROBLEM	CAUSES AND SOLUTIONS
Breakage of the Band Saw Blade (10) at the weld	<ul style="list-style-type: none"> • VERIFY if the forward speed is lower than recommended. INCREASE the advance speed by adjusting the Regulating Valve (31); • VERIFY the weld of the Band Saw Blade (10) for defects. REPLACE the Band Saw Blade (10) with a new one;
Band Saw Blade (10) breaks away from the weld	<ul style="list-style-type: none"> • VERIFY if this problem occurs within a few hours of use. REALIZE machine maintenance and ADJUST the Guides (25) (26) according to 14.3.1; • VERIFY if this problem occurs with many hours of use. Wear and natural material fatigue of the Band Saw Blade (10);
Crooked cut	<ul style="list-style-type: none"> • VERIFY the condition of the Bearings (52) in the Guide (25) (26) set. ADJUST or REPLACE the Bearings (52); • VERIFY the adjustment of the Side Bearings (52) (clearance should be 0.95 mm). ADJUST according to item 14.3.1 c.; • VERIFY the position of the Mobile Guide Support (28), if it is too far back in relation to the dimension of the material to be cut. POSITION the Mobile Guide Support (28) as close as possible to the material to be cut; • VERIFY that the material to be cut is not so uneven as to cause crooked cuts. REDUCE advance speed, and USE new or good condition Band Saw Blades (10); • VERIFY that the cutting speed and coolant liquid are appropriate for the type of material being cut. VERIFY the hardness of the material. CHOOSE: Band Saw Blade (10), cutting and advance speed, and coolant oil according to the type of material. CONTACT Starrett's Technical Assistance; if necessary.

continuation:

PROBLEM	CAUSES AND SOLUTIONS
Crooked cut (continuation)	<ul style="list-style-type: none">• ADJUST the tension of the Band Saw Blade (10) according to item 3 of 10.1.• VERIFY if roller support brackets are misaligned with the Cutting Table (07) surface. ADJUST the support brackets;• VERIFY the advance speed of the Bow (04). REDUCE advance speed by adjusting Regulating Valve (31).

15. DISASSEMBLY AND DEACTIVATION:

15.1. SPECIFIC SAFETY RECOMMENDATIONS:



ATTENTION!: RISK OF ACCIDENTS

WITH SERIOUS INJURIES:



- All Disassembly and Deactivation procedures for the **Starrett** Band Saw machine shall be performed by specialized companies or by **QUALIFIED, TRAINED** and **AUTHORIZED** professionals.
- Before carrying out any movement of the machine, it is necessary to **READ CAREFULLY** this Instruction Manual, in order to know the specific safety instructions for this type of operation.
- USE Personal Protective Equipment - PPE in the loading and unloading phase of the band saw machine.



- PLAN the machine Disassembly and Deactivation operation **Starrett**, together with the staff of Occupational Health and Safety Service of the company that owns the equipment.
- CERTIFY that the machine is completely **DISCONNECTED** from the user's power supply.



15.2. DISASSEMBLY AND DEACTIVATION OF THE MACHINE:

15.2.1. DISASSEMBLY:

In the case, if it's necessary to disassembly the machine for some reason, some cares shall be taken:

1. REMOVE and DISASSEMBLE the machine are tasks that shall be carried out by a person duly **QUALIFIED** and **AUTHORIZED** to do it and having experience and expertise to do that job;

2. DISCONNECT correctly it from user's power grid in a safe way, making sure that the machine is totally powered off;
3. CLEAN the machine completely, removing the coolant liquid (oil + water) from the Cooling System contained in the Reservoir (51) and about the Cabinet (01). DRAIN all the liquid avoiding throwing it in the environment;
4. REMOVE the chip contained in the Reservoir (51) and over the Cabinet (01);
5. GREASE with oil to protect all the parts subject to oxidation and which are exposed to bad weather for a long time;
6. For the phase of moving the machine and/or its parts, OBSERVE the instructions contained in [Chapter 7 - TRANSPORT AND STORAGE](#);
7. When disassembling the machine or part of it, FOLLOW a sequence that allows, later, to assemble it correctly. To do this, MAKE notes in this manual the operations performed;
8. STORE machine parts as instructed in [Chapter 7 - TRANSPORT AND STORAGE](#);
9. If has the need to DISPOSE of machine parts, OBSERVE environmental conditions, avoiding products harmful to environment. FOLLOW the relevant legislation for proper disposal in depending on the type of material discarded.

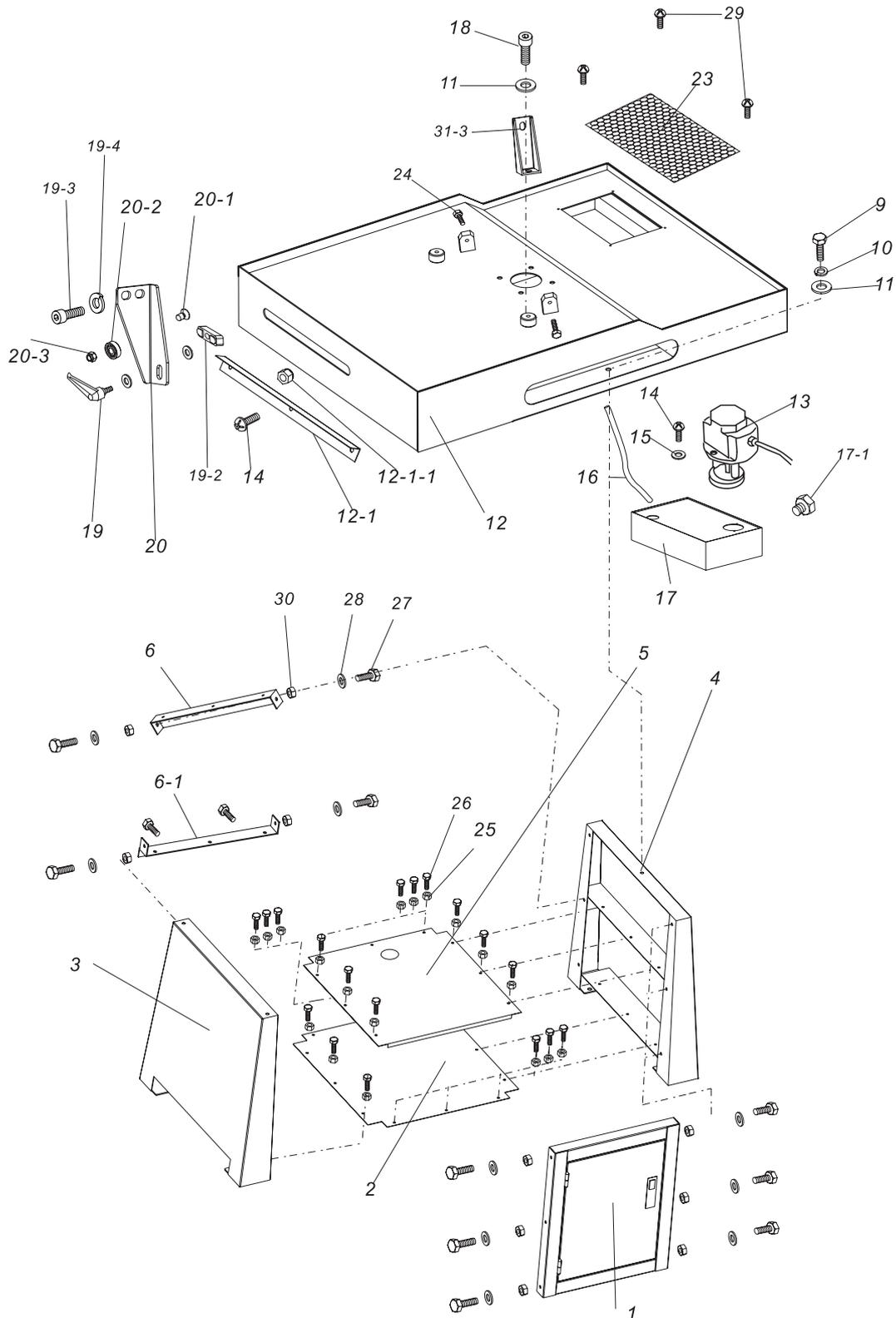
15.2.2. DEACTIVATION:

There may be a need to disable the machine for some reason, some precautions must be taken:

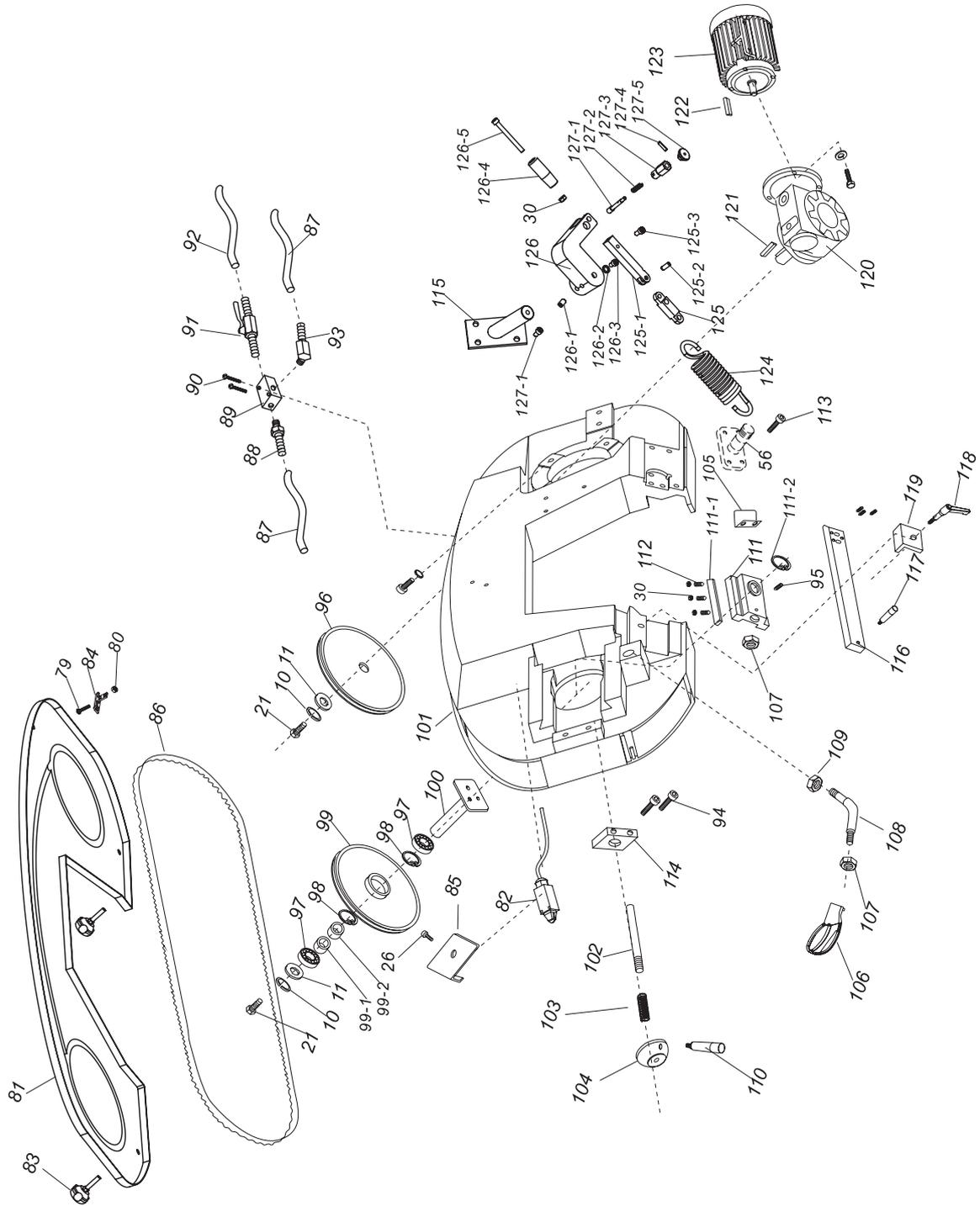
1. REMOVE and DISASSEMBLE the machine shall be the tasks of suitably SKILLED and AUTHORIZED people for this purpose, and who have experience and competence for this work;
2. DISCONNECT completely and correctly from the user's power grid, safely, making sure that the machine is totally powered off;
3. CLEAN the machine completely, removing the cutting liquid (oil + water) from the Cooling System contained in the Reservoir (51). DRAIN all the liquid avoiding throwing it in the environment;
4. REMOVE the chip contained in the Reservoir (51) and over the Cabinet (01);
5. GREASE with oil to protect all the parts subject to oxidation and which are exposed to bad weather for a long time;
6. STORE the machine following the instructions in [Chapter 7 - TRANSPORT AND STORAGE](#).

16. SPARE PARTS:

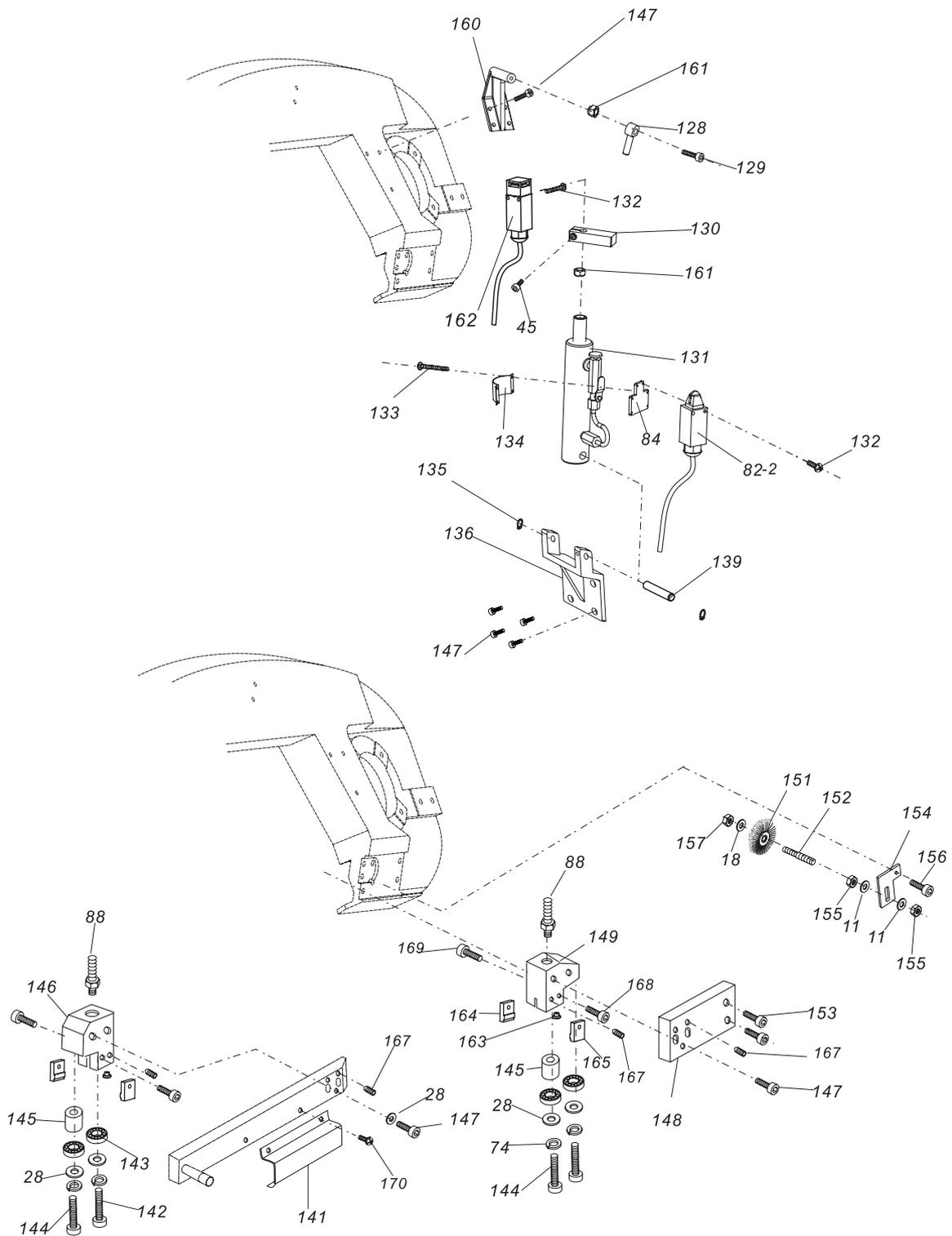
16.1. CABINET SET, COOLANT SYSTEM:



16.3. Bow SET:



16.4. GUIDES SET:



TABLES:

POS	DESCRIPTION
1	FRONT PANEL W/DOOR
2	BOTTOM SHELF
3	LEFT SIDE PANEL
4	RIGHT SIDE PANEL
5	UPPER SHELF
6	REAR BRACKRT A
6-1	REAR BRACKET B
9	HEX SCREW M10X25
10	SPRING WASHER 10mm
11	WASHER 10mm
12	BASE
12-1	BRACKET
12-1-1	LOCK NUT M6
13	COOLANT PUMP
14	PAN HEAD SCREW M6X15
15	WASHER 5mm
16	COOLANT HOSE
17	COOLANT CONTAINER
17-1	CONTAINER PLUG M12X10
18	HEX HEAD SCREW M10X16
19	RATCHET LEVER
19-2	BOLT GUIDE
19-3	ALLEN SCREW M8X16
19-4	SPRING WASHER 8 mm
20	VICE SUPPORT
20-1	SUNK HEAD SCREW M8X20
20-2	BEARING 608
20-3	LOCK NUT M8
23	FILTER
24	HEX HEAD SCREW M12X60
25	HEX NUT M6
26	HEX HEAD SCREW M6X12
27	HEX HEAD SCREW M8X20
28	WASHER 8mm
29	PAN HEAD SCREW M6X10
30	HEX NUT M8
31	FIXED JAW, VISE
31-1	SEGMENT, FIXED JAW
31-2	SWING DISC
31-3	SUPPORT, VISE

POS	DESCRIPTION
32	SLIDE PLATE
33	PIVOT SHAFT
34	KEY
35	SPRING
36	ADJUSTABLE JAW, VISE
37	THIN NUT M8
38	SET SCREW M8X25
39	SPACER
40	QICK LOCK LEVER
41	BEARING AXK2035
42	COVER, BEARING
43	COLLAR
44	WISE HANDWHEEL
45	SET SCREW M6X10
46	SAW ARM LOCK LEVER
47	SET SCREW M10X12
48	ALLEN SCREW M10X35
49	LOCK THREAD
50	ROLL PIN
51	WISE AMOUNT BASE
52	ALLEN SCREW M8X30
53	WISE TOTATE BASE
53-1	ROLL PIN 2.5x22
53-2	THIN NUT M16X1.5
53-3	WASHER 8mm
53-4	WASHER 8mm
53-5	ALLEN SCREW M8X16
53-6	SPRING
53-7	HEX TUBE
53-0	SPINDLE ROD
54-1	KNURLED LEVER
54-2	ALLEN SCREW M10X20
54-3	SPRING LOWER HOLDER
54-4	HEX NUT M12
55-1	SPRING WASHER 6mm
55-2	SLIDE GUIDE
55-3	ALLEN SCREW M10X40
55-4	SPRING WASHER M10
55-5	SCREW GUIDE M10
55-6	ALLEN SCREW M6X20

POS	DESCRIPTION
55-7	WASHER 8mm
55-8	ALLEN SCREW M8X16
56	ROTATE SHAFT, SAW BOW
57	BEARING 32006
58	"U" HADBLE
59	BEARING SEAT
60	ROUND NUT M30
61	ALLEN SCREW M8X20
62	BRACKET, CONTROL BOX
63	SUPPORT, CONTROL BOX
64	CONTROL BOX
65	ALLEN SCREWM M6X12
66	STOP, WORKPIECE
67	STAR TYPE SCREW
68	BAR-STOP
69	FIXED JAW PLATE
69-1	FIXED JAW PLATE
70	BRACKET
71	ADJUSTABLE JAW PLATE
72	COLLAR
73	CAP, BEARING
74	SPRING WASHER 8mm
75	SUNK HEAD SCREW M8X16
76	ALLEN SCREW M10X20
79	PANHEAD SCREW M4X10
80	HEX NUT M4
81	BLADE GUARD
82	MICRO-SWITCH
82-2	MICRO-SWITCH
83	GUARD LOCK (STAR-TYPE SCREW)
84	KEY, MICRO-SWITCH
85	GUARD, MICRO-SWITCH
86	BLADE
87	HOSE, COOLANT WATER
88	HOSE FITTING
89	3-WAY FITTING
90	PAN HEAD SCREW M5X30
91	VALVE
92	SUPPLY HOSE
93	HOSE FITTING

POS	DESCRIPTION
94	ALLEN SCREW M10X55
95	ALLEN SCREW M8X12
96	DRIVE WHEEL
97	BEARING 6007
98	CIRCLE RING 55mm
99	IDLER WHEEL
99-1	SPACER 1
99-2	SPACER 2
100	SHAFT, IDLER WHEEL
101	SAW BOW
102	TENSION BAR
103	SPRING, TENSION
104	TENSION AJUDST HAND-WHEEL
105	SAFETY GUARD PLATE
106	HANDGRIP
107	HEX NUT M16
108	ROD-HANDGRIP
109	THIN NUT M20X2
110	HANDLE
111	SLIDE, IDLER WHEEL
111-1	ADJUSTING WEDGE
111-2	CIRCLE RING 30mm
112	SET SCREW M8X25
113	ALLEN SCREW M10X20
114	BRACKET, HANDLE
115	HOLDER, AR, STROKE SPRING
116	BAR, ADJUSTABLE GUARD
117	HANDLE, BAR
118	LOCK LEVER
119	LOCK PLATE
120	GEAR BOX
121	FLAT KEY, GEAR BOX
122	FLAT JEY, MOTOR
123	MOTOR
124	SPRING, SAW BOW
125	SPRING ROD
125-1	SPRING ROD
125-2	ROLL PIN 8X18
125-3	ALLEN SCREW M8X12
126	CONNECTOR

POS	DESCRIPTION
126-1	SET SCREW M10X16
126-2	SPRING WASHER 10mm
126-3	ALLEN SCREW M10X25
126-4	HANDLE
126-5	ALLEN SCREW M8X80
127-1	ROD M10X30
127-2	SPRING
127-3	HEX TUBE
127-4	ROLL PIN 2.5x22
127-5	KNURLED LEVER
128	JOINTER
129	ALLEN SCREW M10X40
130	LIMITED BLOCK
131	HYDRAULIC CYLINDER
132	PAN HEAD SCREW M4X25
133	PAN HEAD SCREW M4X40
134	SUPPORT, MICRO SWITCH
135	CIRCLE RING 12mm
136	LOWER SUPPORT, HYDRAULIC CYLINDER
139	ROLL PIN
141	BLADE SAFETY GUARD
142	HEX HEAD SCREW M8X25
143	BEARING 608-2Z
144	HEX HEAD SCREW M8X35
145	SPACER, GUIDE
146	GUIDE MOBILE
147	ALLEN SCREW M8X25
148	BRACKET, FIXED GUIDE
149	FIXED BLADE GUIDE
151	CHIP BRUSH
152	BRUSH ROD
153	ALLEN SCREW M10X20
154	BRUSH SUPPORT
155	THIN HEX NUT M10
156	ALLEN SCREW M10X16
157	HEX NUT M6
160	UPPER SUPPORT, HYDRAULIC CYLINDER
161	HEX NUT M10
162	MICRO SWITCH (LIMIT SWITCH)
163	UPPER TEETH
164	FIXED TEETH

POS	DESCRIPTION
165	ADJUSTABLE TEETH
167	SET SCREW M612
168	ALLEN SCREW M6X20
169	ALLEN SCREW M6X10
170	PAN HEAD SCREW M4X10

17. WARRANTY:



[Starrett Indústria e Comércio Ltda.](#)

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GARANTIA STARRETT

WARRANTY CERTIFICATE:

The machines manufactured and marketed by **Starrett Indústria e Comércio Ltda.** are covered by 12 months warranty from the issuance of invoice, regardless of the use of equipment.

During the warranty period, the Technical Support of Starrett provided will lose its free characteristic if the defect allegation is unfounded.

The replacement of parts or components, which are proven to have factory defects, shall be free of charge. It's not included the labor required.

There is NO Warranty for parts that suffer natural wear and tear caused by use, such as bearings, seals, lamps, carbide inserts, band saw blade etc.

There will be no Warranty coverage when:

- Inappropriate and / or improper handling for the purposes for which the product is intended;
- Transport, falls, collisions, shocks, or improper storage;
- Supply or usage of improper electric power;
- Nature agents (lightning, floods, fires, etc.);
- Lack of observance of the instruction manual;
- Interventions performed by third parties without **Starrett Indústria e Comércio Ltda.**;
- Extended lack of product usage.

They are NOT included in these Terms of the Warranty regular machine maintenance, such as adjustment, cleaning, change of saw blades tapes.

Parts or equipment, eventually replaced during the performance of this Warranty, will be the property of Starrett Indústria e Comércio Ltda.

Starrett Indústria e Comércio Ltda.

18. TECHNICAL STANDARDS REFERENCES:

European Parliament and of the Council:

Directive 2006/42/CE - Machines;

Directive 2014/30/UE - Eletromagnetic Compatibility;

Directive 2014/35/UE - Electrical equipment designed for use within certain voltage limits.

-

INTERNATIONAL TECHNICAL STANDARDS:

ISO 16093:2017 -

Machine Tools - Safety - Sawing machines for cold metal;

ISO 12100:2010 -

Safety of machinery - General principles for design - Risk assessment and risk reduction;

IEC 60204-1:2016 -

Safety of machinery - Electrical Equipment of Machines - General Requirements;

ISO 13857:2008 -

Safety Distances to Prevent Danger Zones being reached by Upper and Lower Limbs;

IEC 61000-4-2: 2009 -

Electrostatic discharge (ESD);

IEC 61000-4-4: 2012-

Electrical fast transient/burst requirements (EFT/Burst);

IEC 61000-4-6: 2014-

Immunity to conducted disturbances, induced by radio-frequency fields (CS);

ISO/TR 14121-2:2012 -

Safety of machinery - Risk assessment - Part 2: Practical guidance and examples of methods;

Starrett®