

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

# S3720 E

**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. EC CONFORMITY DECLARATION:

### 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:*

**S3720 E**

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 Machinery Directive;**  
**2014/30/EU Electromagnetic Compatibility Directive**

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, Scofand, 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, 2022<sup>th</sup>. Pela **Starrett / By Starrett:**

*Cláudio Guarnieri*  
**Industrial Director**



## 2. NR-12 CONFORMITY DECLARATION:

### CONFORMITY DECLARATION

#### **Starrett Indústria e Comércio Ltda.**

Av. Laroy Starrett, 1880

13306-900 – Itu/SP – Brazil

CNPJ 56.994.700/0001-01

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

**S3720 E**

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 - Minimim 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.*

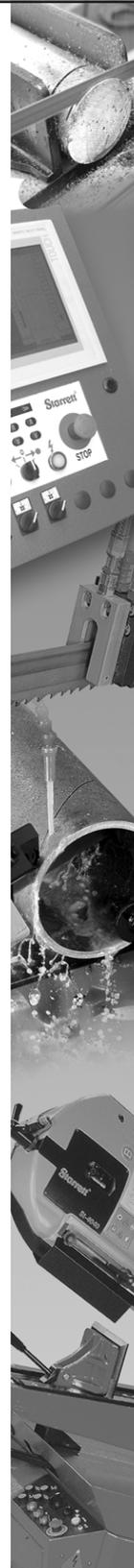
*Cláudio Guarnieri*

**Cláudio Guarnieri**

Industrial Director

Starrett Indústria e Comércio Ltda.

Itu/SP, November, 1<sup>st</sup> / 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.

 <b>STARRETT IND. E COM. LTDA.</b>  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  	<b>Máquina de Serra Fita / Band Saw Machine</b>	
	Modelo/Model	<b>S3720 E</b>
	Nº de série / Serial number	<b>X0001-22/CH-S</b>
	Código/Code	<b>S3720E-F2</b>
	Ano de fabricação/Manufacturing Year	<b>2022</b>
	Peso Líquido / Net Weight	<b>411</b> kg
	Potência/Power (Lâmina/Band Saw)	<b>1,0 / 0,75</b> hp / kW
	Potência/Power (Unid.Hid / Hydr. Unit)	----- hp / kW
	Potência/Power (Refrig; / Coolant)	<b>0,1 / 0,075</b> hp / kW
	Tensão / Voltage	<b>220</b> v <b>60</b> Hz
Frequência / Frequency		
Corrente / Current	<b>3,5</b> A	

(ILLUSTRATIVE DATA)



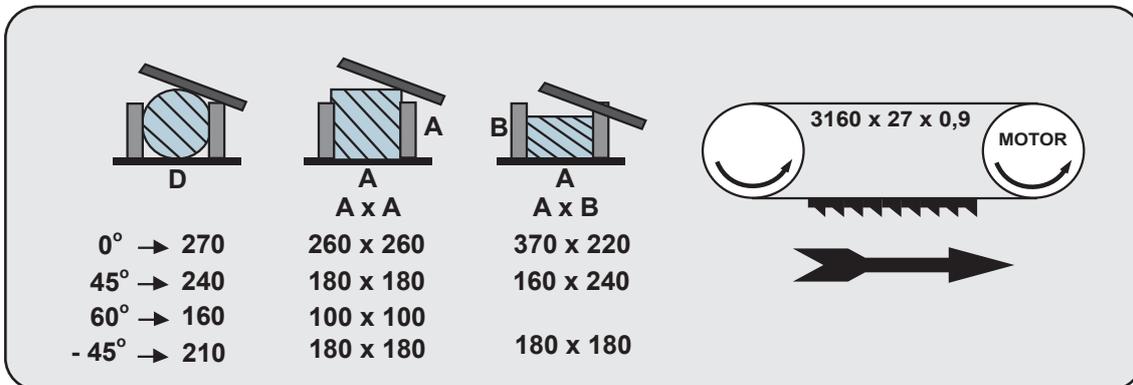
## 4. TECHNICAL DATA:

Starrett	S3720 E
Net Weight (kg):	411
Dimensions (mm):	1.2 x 0.6 x 1.5 (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):	3 160 x 27 x 0.9
Blade Speed (m/min):	82 and 41 (at 60 Hz)
Available Voltage (V) <sup>(1) (2)</sup> :	220 or 380
Operation frequency of electric system (Hz) <sup>(2)</sup> :	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 REFERENCE OF PARTS AND COMPONENTS:**

POS.	PART / COMPONENT
01	CABINET
02	GENERAL SWITCH - QS1
03	EMERGENCY BUTTON - SB0
04	BOW
05	SAFETY WARNING PLATE
06	COMMAND PANEL
07	CUTTING TABLE
08	HYDRAULIC CYLINDER
09	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 SYSTEM (CART)
18	BACK COVER
19	WISE SET
20	WISE ADVANCE CRANK
21	QUICK TIGHTENING LEVER
22	WISE LOCK HANDLE
23	WISE LOCK LEVER
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 SCREW
31	REGULATING VALVE
32	TOGGLE SWITCH
33	PILOT SIGNALING
34	START BUTTON
35	LIMIT SWITCH - SQ2
36	COOLANT PUMP-M2
37	TENSIONER HANDLE
38	MANOMETER
39	SAFETY SWITCH
40	RESET BUTTON - SB3
41	ELECTRICAL BOARD
42	LIMIT SWITCH - SQ3
43	MOBILE GUIDE PROTECTION
44	FIXED GUIDE PROTECTION
45	SELECTOR SWITCH
46	EMERGENCY BUTTON - IN CABINET

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 OF BEARINGS
54	COOLANT LIQUID DISPENSER
55	DISTRIBUTOR TAP
56	CRANKCASE FIXING HANDLES
57	MEASURING ROD
58	STOPPER
59	MEASURING ROD SCALE
60	STOPPER LOCKING LEVER
61	LEVER
62	WISE
63	JAWS
64	SPRING SET
65	COUPLING FORK
66	PIN
67	LOCK PIN
68	CYLINDER FIX ARM
69	STOPPER PIN
70	BOW TURN LOCK LEVER
71	ANGULAR SCALE
72	SIDE DRIPPER
73	REAR DRIPPER
74	GUIDES FIX SCREW
75	LEVEL DISPLAY
76	LIMITER PIN



**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**;
- All problems with the machine must be immediately reported to the **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(EN)** 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 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 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



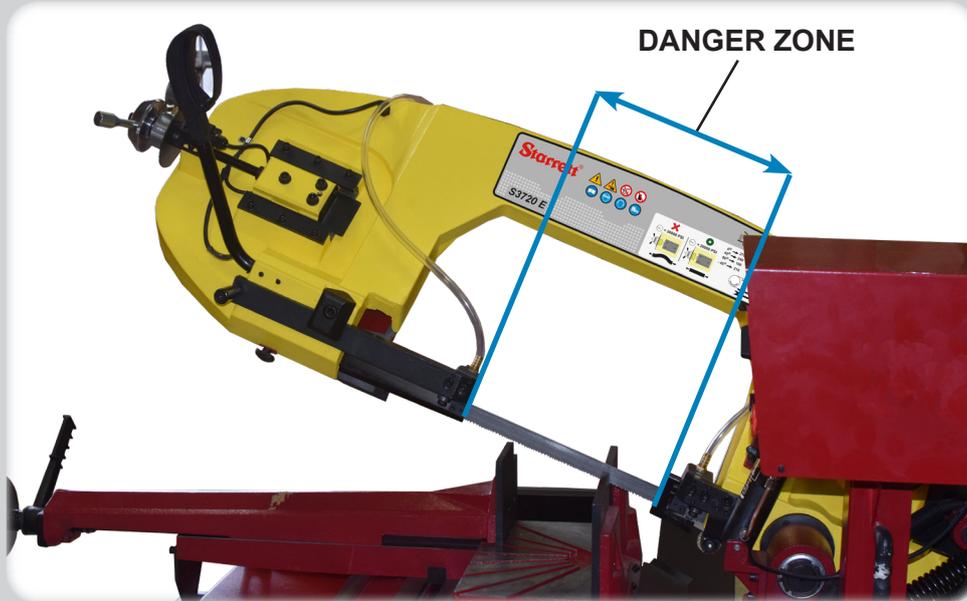
**ATTENTION!:**  
**RISK OF ACCIDENT:**

### 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).

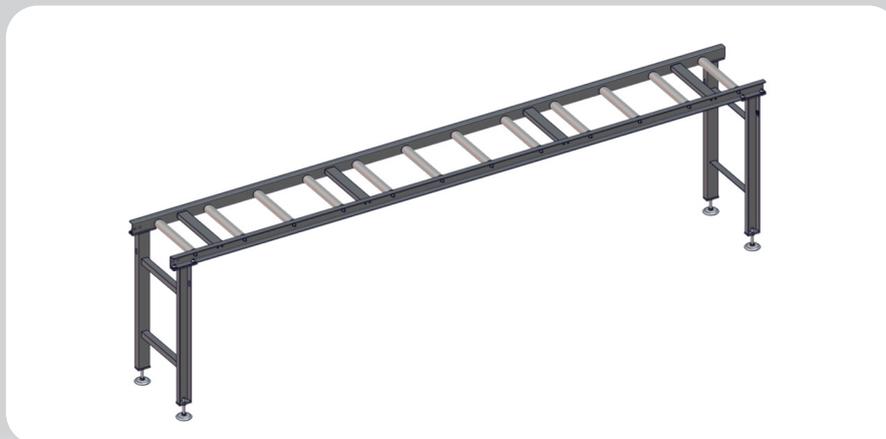


- ▶ The Band Saw Blade (10) has an area that is not protected, called the DANGER ZONE. The machine operator must be aware of this area.



**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 – S3720E** 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 construction 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 [6.1](#)).

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

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

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

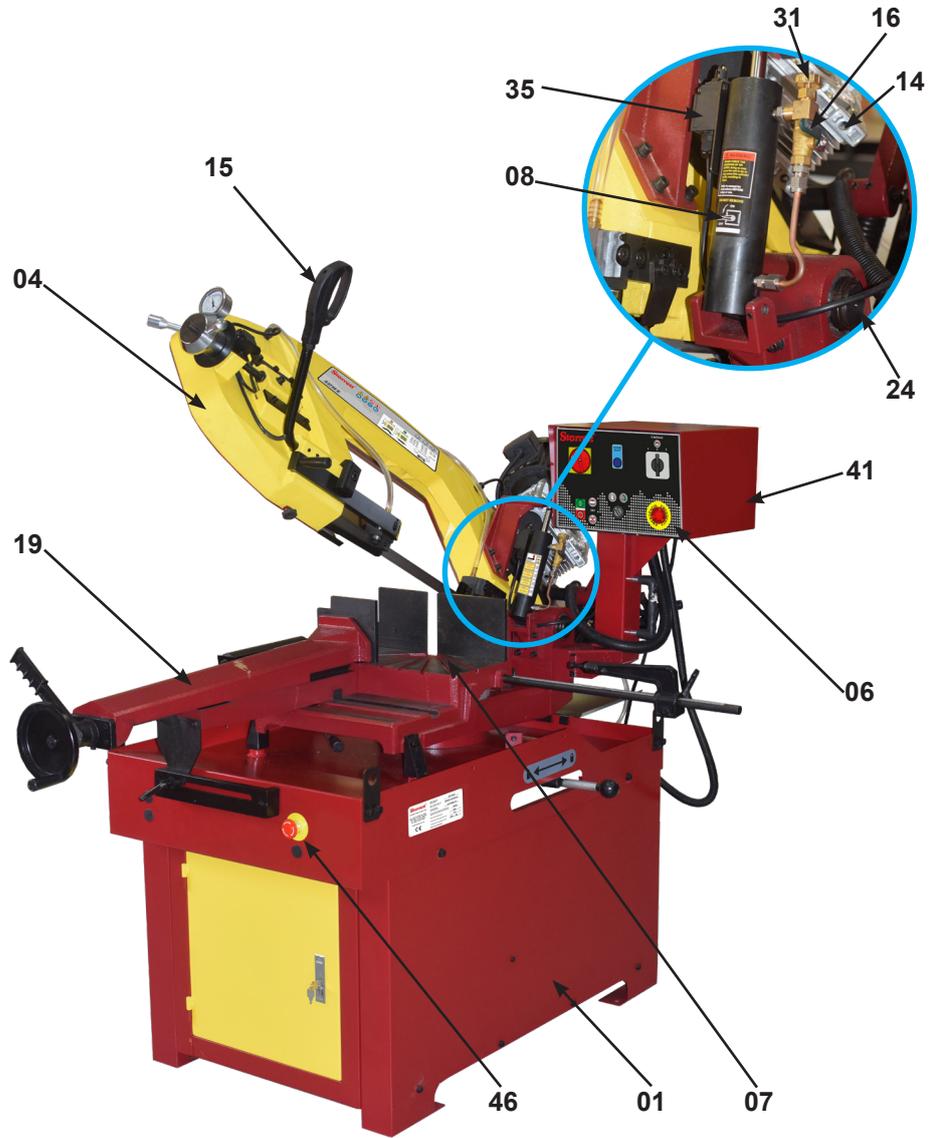
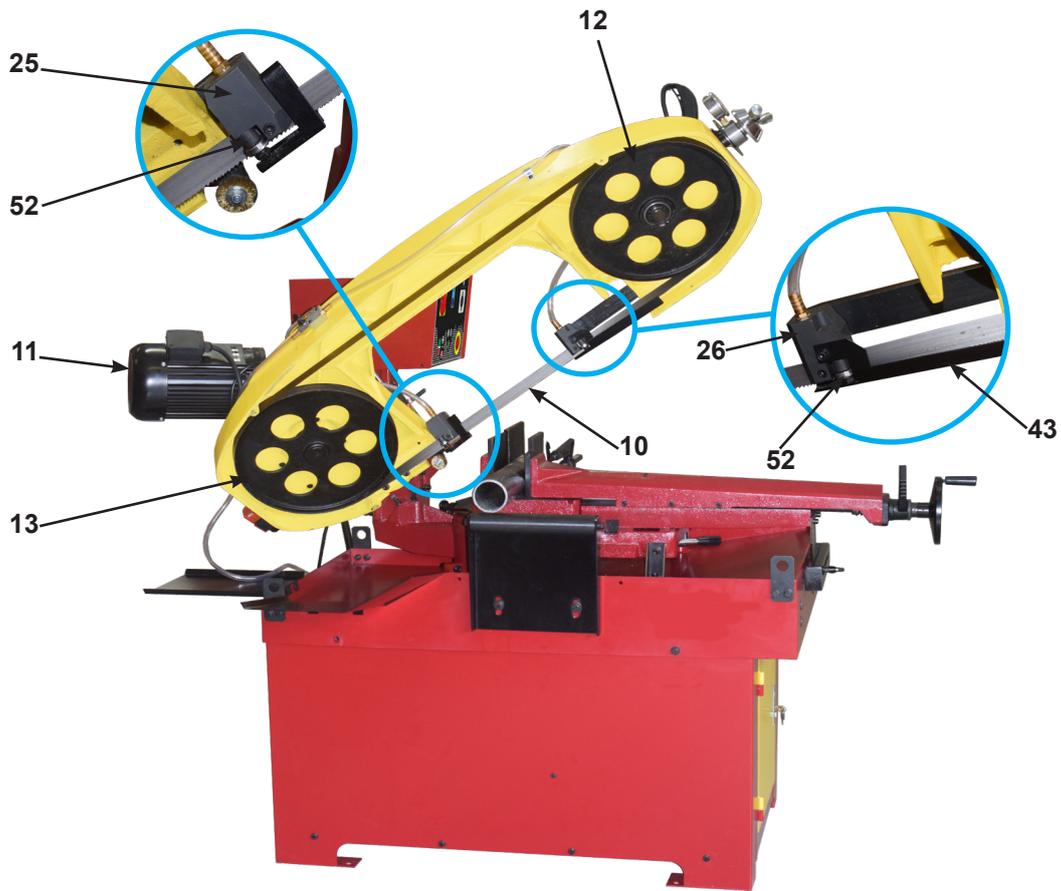


FIGURE 6.1 - GENERAL VIEW



**FIGURE 6.2 - FLYWHEELS ASSEMBLY**

By construction of machine, the Bow (04) can rotate about a fixed point of the Vise Set (19), called Bow Shaft (24) (figure [6.1](#)), that is, on the perpendicular axis of the Cutting Table (07), to allow miter cuttings on the material to be cut.

The upper part of the machine is supported and fixed on a rigid Cabinet (01), made of sheet and steel profiles. Its structure is protected by a highly weather resistant paint. Next to the Bow (04) set is the Command Panel (06), easily accessible by the operator (figure [6.1](#)).

FIGURE 6.3 - VISE SET

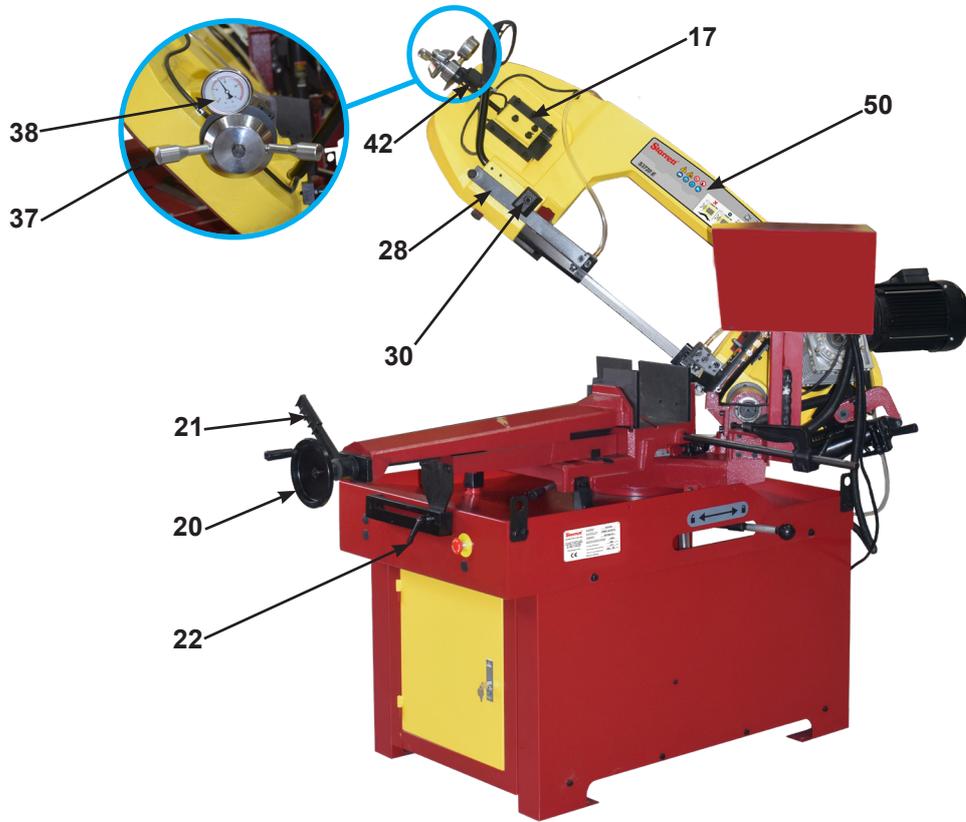
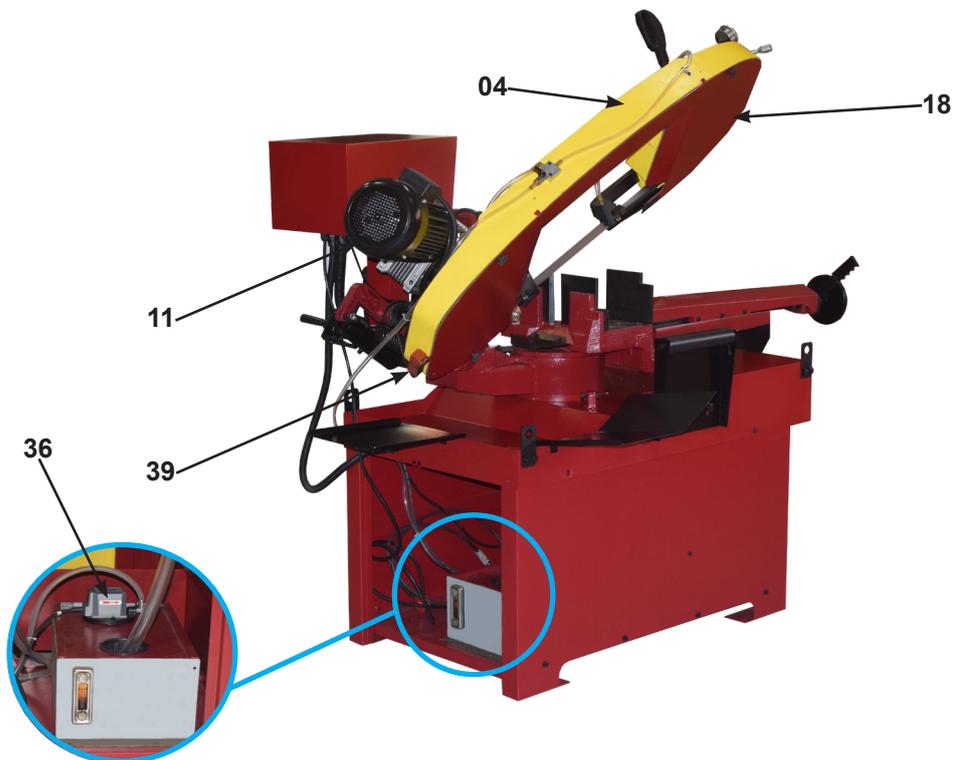


FIGURE 6.4 - FLYWHEELS PROTECTION (BACK COVER)



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 6.3). The tightening or loosening of the same on the material, is also controlled manually by the Quick Tightening Lever (21) (figure 6.3).

The second movement of the Vise Set (19) is transversal, which positions the Vise Set (19), both on the right side (figure 6.5) as in the left side of the Bow (04) (figure 6.5). To make the adjustment and lock in the desired position there is a Vise Lock Handle (22) and Vise Lock Lever (23) (figure 6.3).



Vise Set on the Left



Vise Set on the Right

**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) (26) have Bearings (52) (53) and Hard Metal Tablets (27) (figure [14.3](#) and [14.4](#)), 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.

In the Cabinet (01), on the right side is installed the EMERGENCY Button (46), whose purpose is to stop the machine in case of abnormalities (figure [6.1](#)).

The Hard Metal Tablets (27) are intended to align and to prevent the Band Saw Blade (10) from rotating sideways during cutting (figures [14.3](#) and [14.4](#)).

The Mobile Guide Support (28) (figure [6.3](#)), close to the Driven Flywheel (12), can be manually adjusted by loosening the Guide Lock Screw (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](#)). By visualization in the Manometer (38) (figure [6.3](#)) it can adjust the tension of the Band Saw Blade correctly (10) (figure [6.2](#)).

This machine has 2 operation modes: **MANUAL** and **GRAVITATIONAL**. The operating modes are selected by the Selector Switch (45) (figure [6.5](#)).

In MANUAL mode, the operator is responsible for the forward speed and force, and for keeping the Blade Motor (11) (figure [6.2](#)) working. 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](#).



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) and M2 of the Coolant Pump (36), both being protected against possible short circuits or overloads (figure [6.4](#)).

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

The second part is the Command circuit of the machine that operates in 24 Vac, that is, in extra low voltage.

The third part, makes up the equipment's Safety System. The function of monitoring is performed by the Safety Relay KS1, over the EMERGENCY Button SB0 (03), the Safety Switch SQ1 (39) of the Back Cover (18) (figure [6.4](#)) and of the Contactors KM1 and KM2. The 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 safety systems presents are:

- FR1 Overload Relay (thermal protection): Protection of the Motor M1 (11) (figure [6.4](#)) of the Band Saw Blade (10) (figure [6.2](#)) against overload;
- EMERGENCY Button (03): Located on the Command Panel (06) (figure [12.1](#)), for eventual needs of non-normal STOPS. This safety function is monitored by the KS1 Safety Relay;
- Back Cover Protection (18) (figura [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](#)) disabling the machine's Electrical System. This safety function is monitored by the FS1 Safety Relay;
- RESET Button SB3 (40) (BLUE): Located on the Command Panel (06) (figure [12.1](#)), its function is to prevent the unexpected start-up of the machine;
- FS1 Safety Relay: Located inside the Electrical Board (41) (figure [12.1](#)), 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 (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 FS1 Safety Relay;

- Mobile Guide Protection (43) (figure [6.2](#)): Located and fixed on the Mobile Guide (26), which can only be removed by using a tool;
- Fixed Guide Protection (44) (figure [6.2](#)): Located and fixed on the Fixed Guide (25) block, 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.



- PLANNING 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 support a load of more than 300 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 300 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.



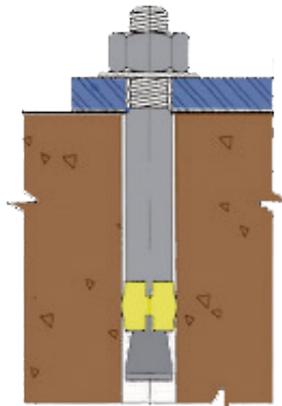
- PLAN the machine installation operation **Starrett**, together with the personnel from SESMT - Safety and Occupational Medicine Service of the company that owns the equipment.
- CERTIFY that the user's power supply network is rated to support the machine's workload, and the grounding is adequate. This 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. INSTALATION:

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), Gearbox (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**, **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 2.5 mm<sup>2</sup> 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 [10.4](#)).



**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!:**

**RISK 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.



#### **WARNING! 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.

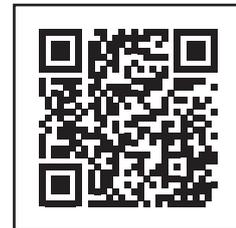
If it is within the specified capabilities of the machine, selection of the band is now another important aspect for the good performance of the job to be carried out.

### 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 basic variables exist in selecting the band saw blade:

- 1- Blade Type;
- 2- Tooth 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 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 fluid (oil + water) in Reservoir (51) is approximately 20 liters. The oil concentration in the cutting fluid mixture should follow the instructions according to the oil manufacturers' specifications (figures [10.1](#) and [10.2](#));



### **ATTENTION!: ENVIRONMENTAL 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.

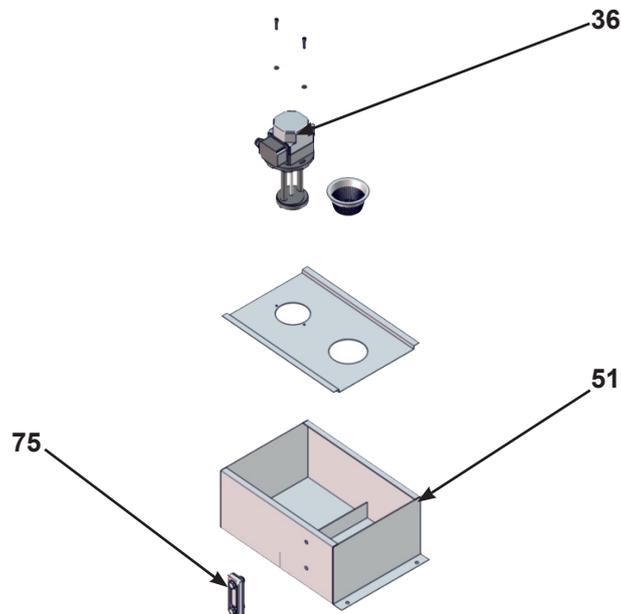
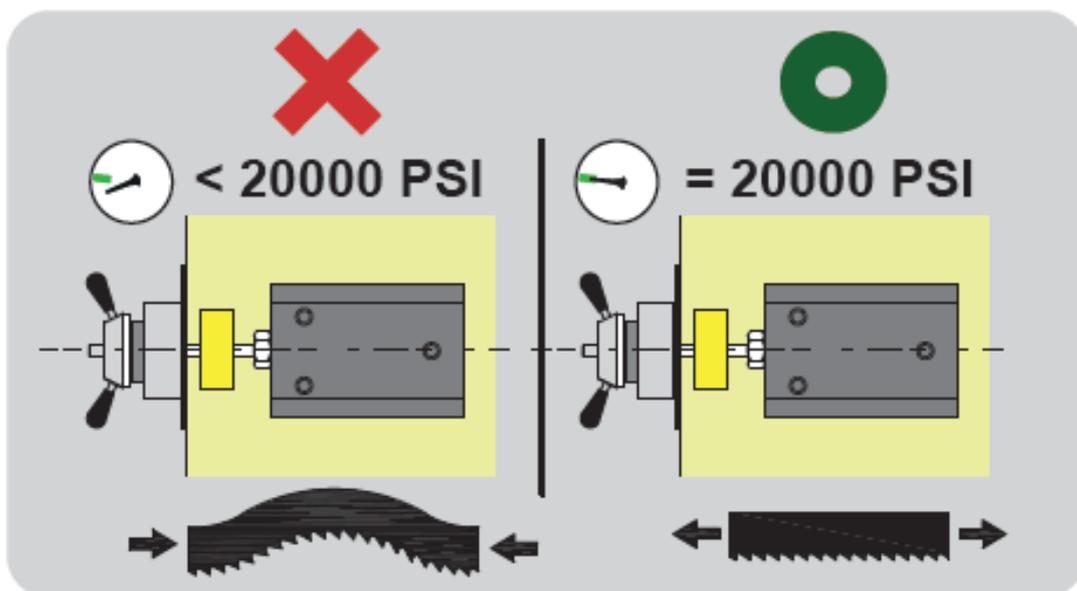


FIGURE 10.1 - RESERVOIR OF THE COOLANT FLUID



FIGURE 10.2 - RESERVOIR OF THE COOLANT FLUID

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 10.4) are present. ROTATE the Tensioner Handle (37) until the pointer of the Manometer (38) reaches the GREEN range, as shown in the figure below.

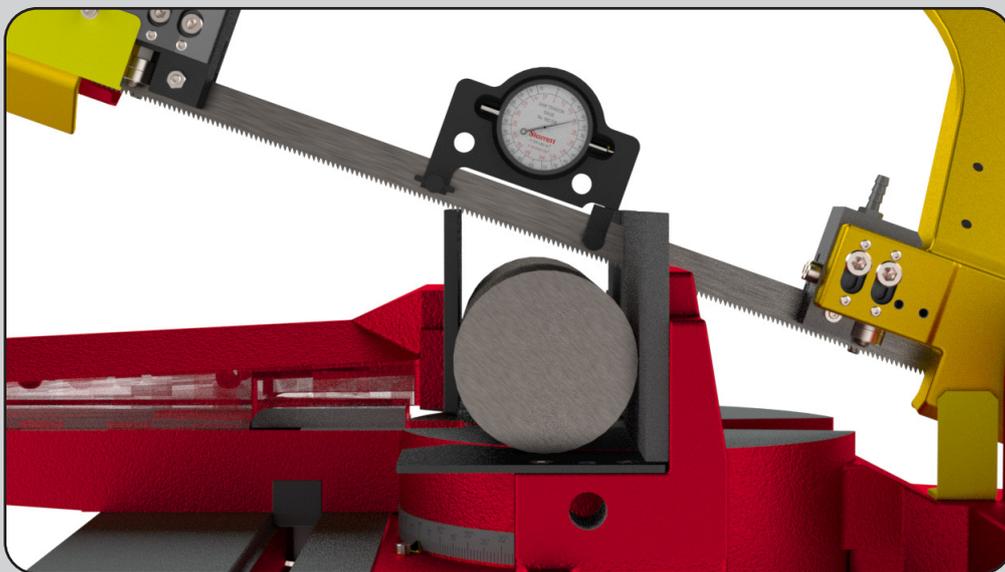




**ATTENTION!:**  
**RISK OF DAMAGE TO THE MACHINE:**

The recommended limit is 20 000 psi (20 kSI) or 1 400 Kgf/cm<sup>2</sup>.

It is advisable TO USE a monthly voltage meter instrument **Starrett** 682 EMZ (**EDP 57075 – SAW TENSION GAGE**), as below, in order to verify the factory adjustment of the tensioning assembly.



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), 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) 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 Screw (30) (figure [6.3](#));
  - SLIDE the Mobile Guide Support (28) (figure [6.3](#)), 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 Screw (30).
  
2. ADJUST the cutting speed, by Toggle Switch (32) (figure [6.6](#)):
  - “ 1 ” (cutting speed = 34 m/min) for hard materials;
  - “ 2 ” (cutting speed = 68 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.

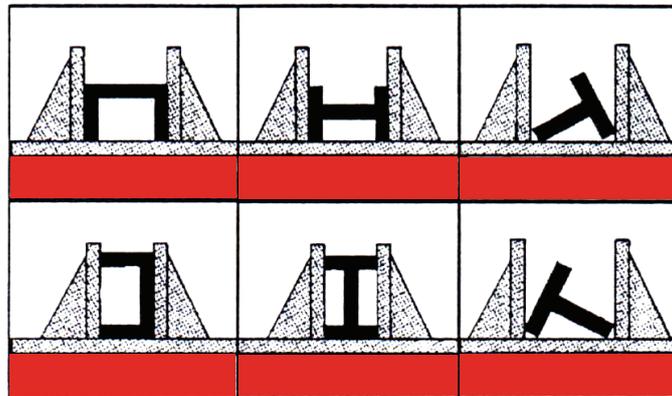
This softening is a practice that aims to provide an accommodation of the cutting edges of the teeth, before the saw is submitted to the full work.

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 fluid 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](#)).

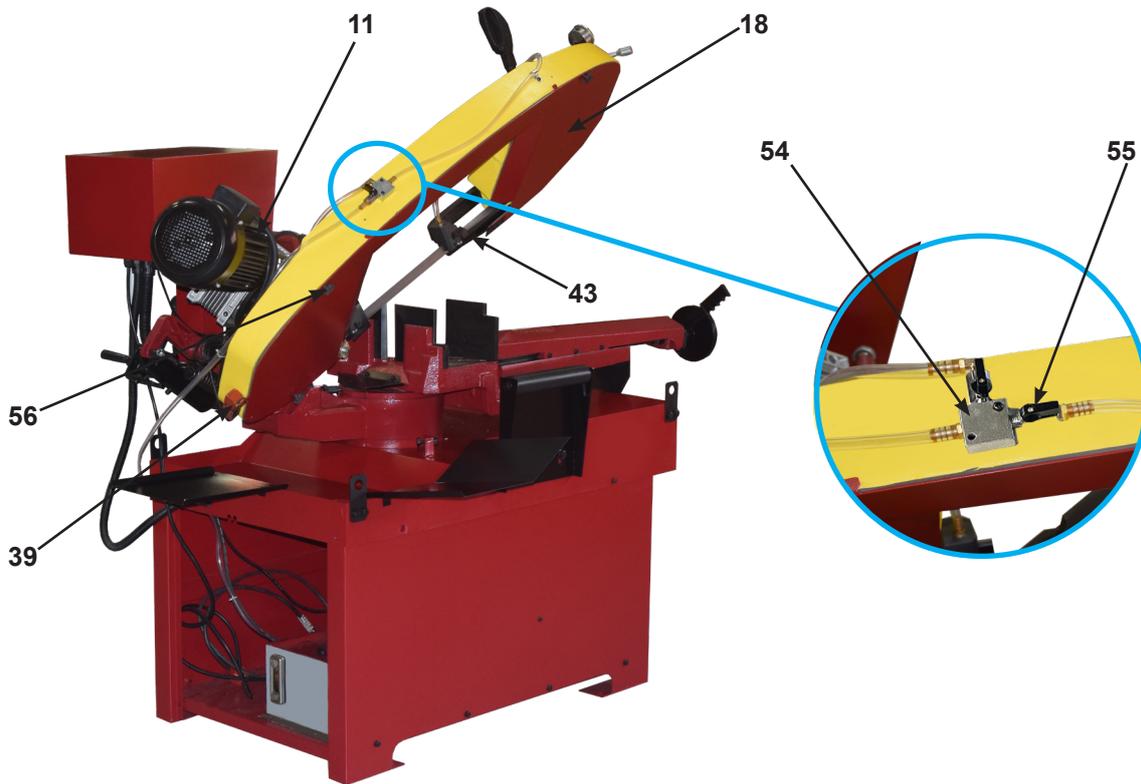
## 10.5. BAND SAW BLADE REPLACEMENT AND ADJUSTMENT PROCEDURES:

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

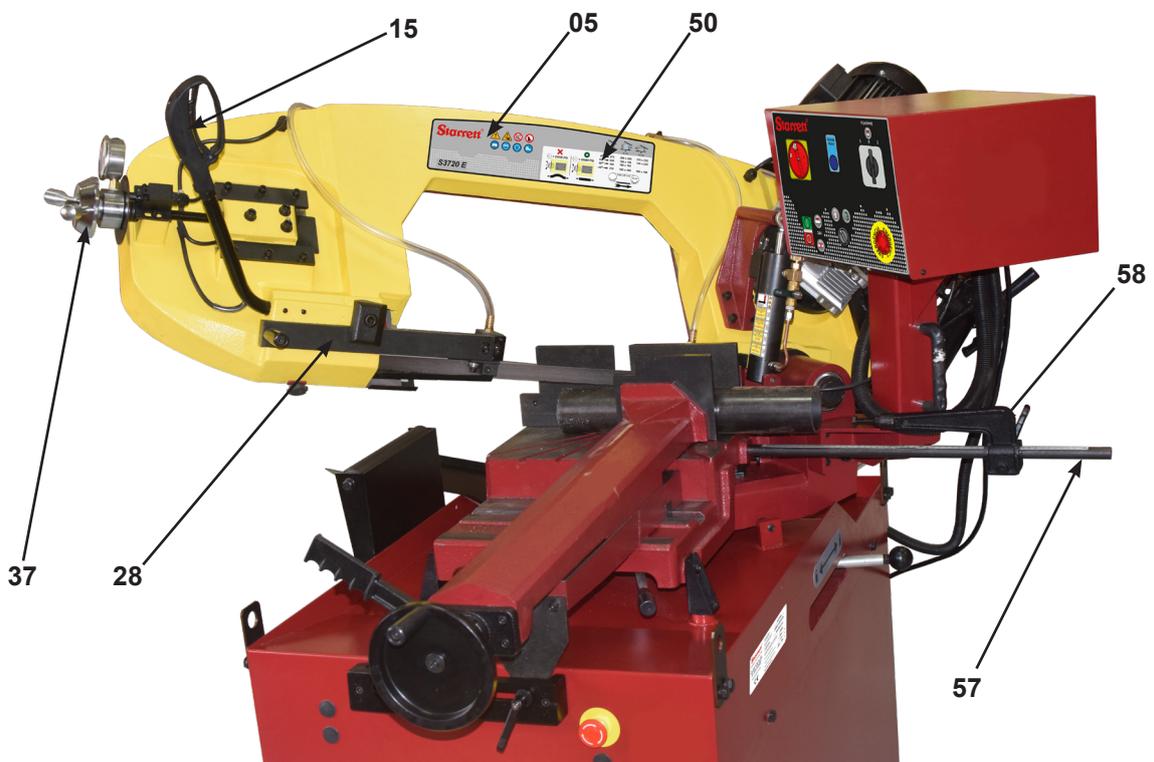
1. POSITION the General Switch (02) in the OFF position, the EMERGENCY Button (03) pressed down (locked);
2. REMOVE the Back Cover (18) by releasing the Crankcase Fixing Handles (56) located at the rear of the Bow (04) (figure [10.3](#));
3. REMOVE the Mobile Guide Protection (43) from the Mobile Guide Support (28) (figures [10.3](#) and [10.4](#));
4. By removing the Back Cover (18), the Safety Switch (39) 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** (figure [10.3](#));
5. TURN the Tensioner Handle (37) (figure [10.4](#)) in the sense of decreasing (loosening) the tension of the Band Saw Blade (10), 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) and the Backrest Bearings (53) (figures [14.3](#) and [14.4](#)), 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 10.3 - BOW BACK COVER AND INNER PROTECTION OF THE MOBILE GUIDE**



**FIGURE 10.4 - 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) in the direction of the Band Saw Blade (10) tensioning (stretching);
11. MOUNT the Back Cover (18), securing it by the Crankcase Fixing Handles (56) (figure [10.3](#));
12. INSERT properly the actuator, attached to the Back Cover (18), in the Safety Switch (39) (figure [10.3](#));
13. MOUNT the Mobile Guide Protection (43) (figure [10.3](#)) in the Mobile Guide Support (28) (figure [10.4](#)) by their respective screws;
14. SELECT one of the 2 cutting speeds via the Toggle Switch (32);
15. RELEASE the EMERGENCY Button (03);
16. POSITION the General Switch (02) to **ON**;
17. POSITION the Selector Switch (45) (figure [6.6](#)) in **MANUAL** mode;
18. PRESS the Trigger (15) (figure [10.4](#)) momentarily to rotate the Blade Motor (11) (figure [10.3](#));
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 [10.4](#)).

## 10.6 PROCEDURE FOR INSTALLING THE MEASURE ROD SYSTEM:

The **S3720 E** 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);
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) 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 Lever Lock (60);

5. POSITION the Stopper (58) at the desired dimension by the Measuring Rod Scale (59);
6. LOCK the Stopper Lock Lever (60);
7. Place the material to be cut on the edge of the Stopper (58).



**FIGURE 10.5 - 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.

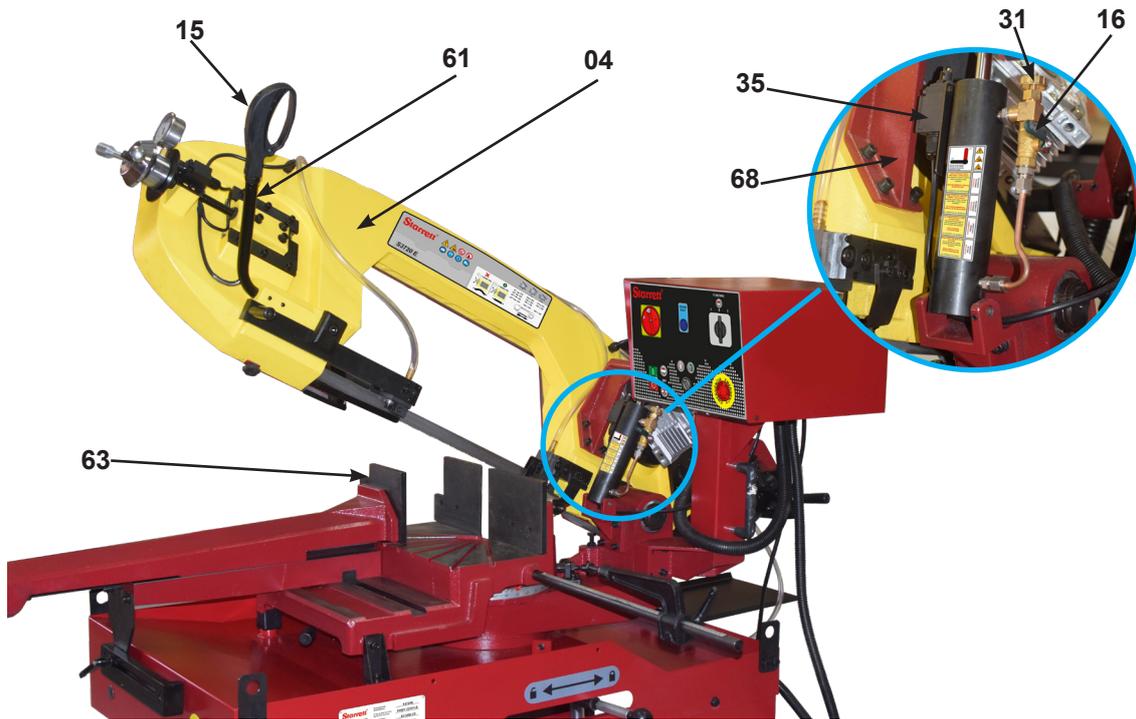


- PLAN every cutting operation before starting it.
- CERTIFY that all safe conditions for the cutting operation are present.
- CERTIFY that all cutting parameters are set (SEE [Chapter 10](#)).
- HANDLE the materials to be cut with adequate lifting and transportation devices, for example, hoists, overhead 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 [6.6](#)), before starting any operation;
2. LIFT the Bow (04) to its maximum upper position by the Lever (61) (figure [11.3](#));
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 [11.1](#)) 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), 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 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 11.2), 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);

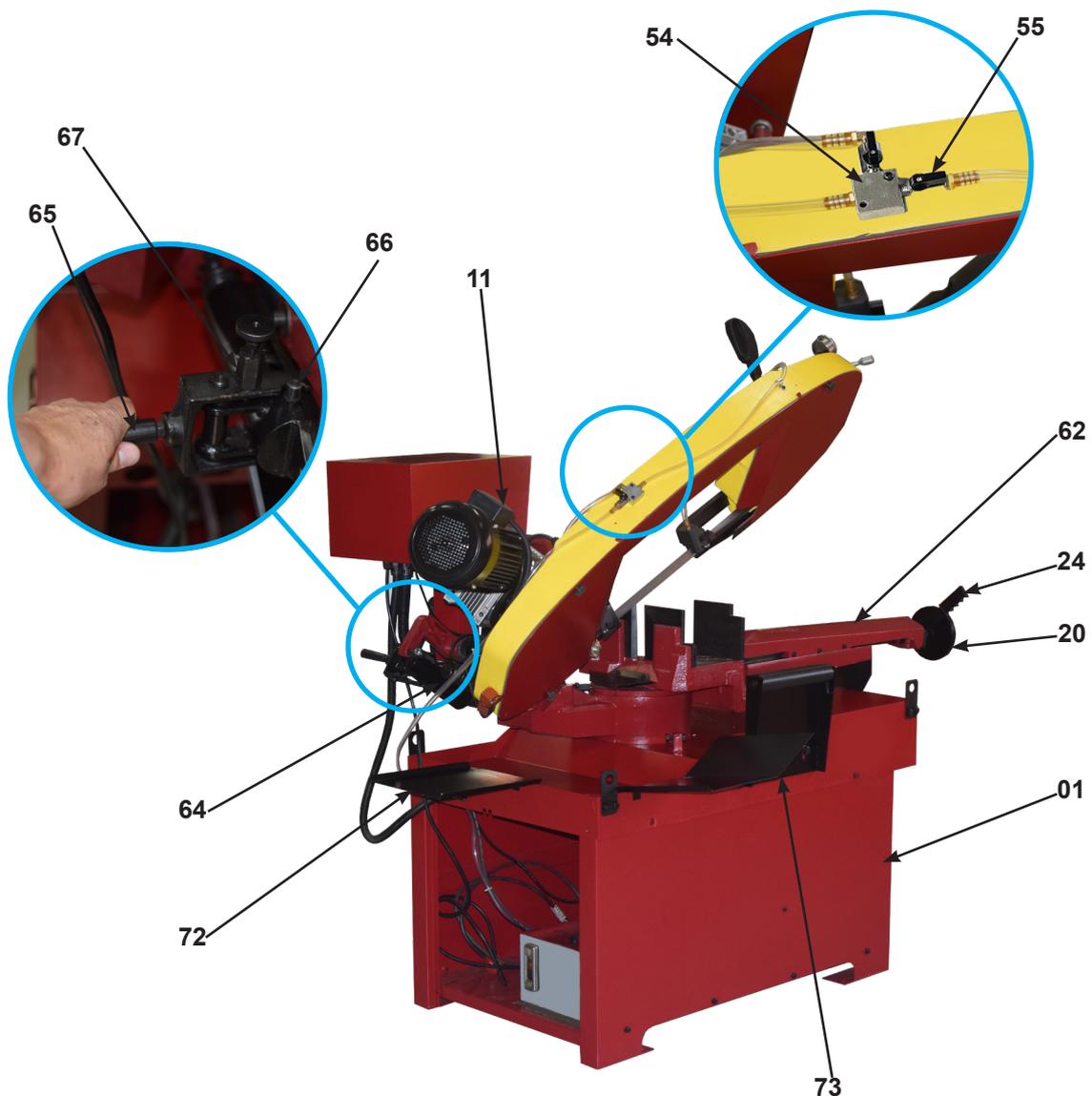


FIGURE 11.2 – VISE SET

7. RELEASE the finger of the Trigger (15) at the end of the cut (figure [11.1](#));
8. Slowly release the Lever (61) (figure [11.1](#));
9. OPEN the Vise Set (19) by the Quick Tightening Lever (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;
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) in SEMI-AUTOMATIC (RIGHT) (Gravitational Mode);
5. OPEN the Tap (55) of the Coolant Dispenser (54) (figure [11.2](#)) of the coolant fluid if necessary;
6. PRESS the Start Button (34) on the Command Panel (06) (figure [6.6](#));
7. OPEN the Cutting Valve (16) slowly and carefully;
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 11.3) 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>VÁLVULA DE CORTE VALVULA DE CORTE VANNE DE COUPURE SHUTOFF VALVE</p>	
<p>NUNCA 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 ACCIDENTES</p>
<p>NUNCA FUERCE AL ARCO DE ARRIBA o HACIA ABAJO - pues esto puede dañar el cilindro, causar falhas y puede causar accidentes.</p> <p>LEA CUIDADOSAMENTE EL MANUAL DE INSTRUCCIONES</p> <p>(1) ABIERTA (2) CERRADA</p>	<p>ATENCIÓN! RISCO DE ACCIDENTES</p>
<p>NE JAMAIS FORCER LA ARC UP AND DOWN - cela pourrait endommager le cylindre provoquant l'échec et peut provoquer des accidents.</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 [11.1](#)) of the Saw Blade and Coolant Pump (36) (figure [6.4](#)).

The second case is by operator action when the Stop Button (49) (figure [6.6](#)) is activated.

The second case is by operator action when the Stop Button (49) is pressed.

**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 ( $0^\circ$  to  $+60^\circ$  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 [6.6](#)), before starting any operation;
2. RELEASE the Limiter Pin (76) (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 (71) (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 Vise Lock Lever (23) (figure [11.2](#));
  - RELEASE the Vise Lock Handle (22) (figure [11.2](#));
  - MOVE the Vise (62) to the right;
  - TIGHTEN the Vise Lock Lever (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).

To avoid oil leakage outside this limit, a Side Dripper (72) and a Rear Dripper (73) can be attached, to collect the coolant fluid, as indicated in the figure [11.2](#).

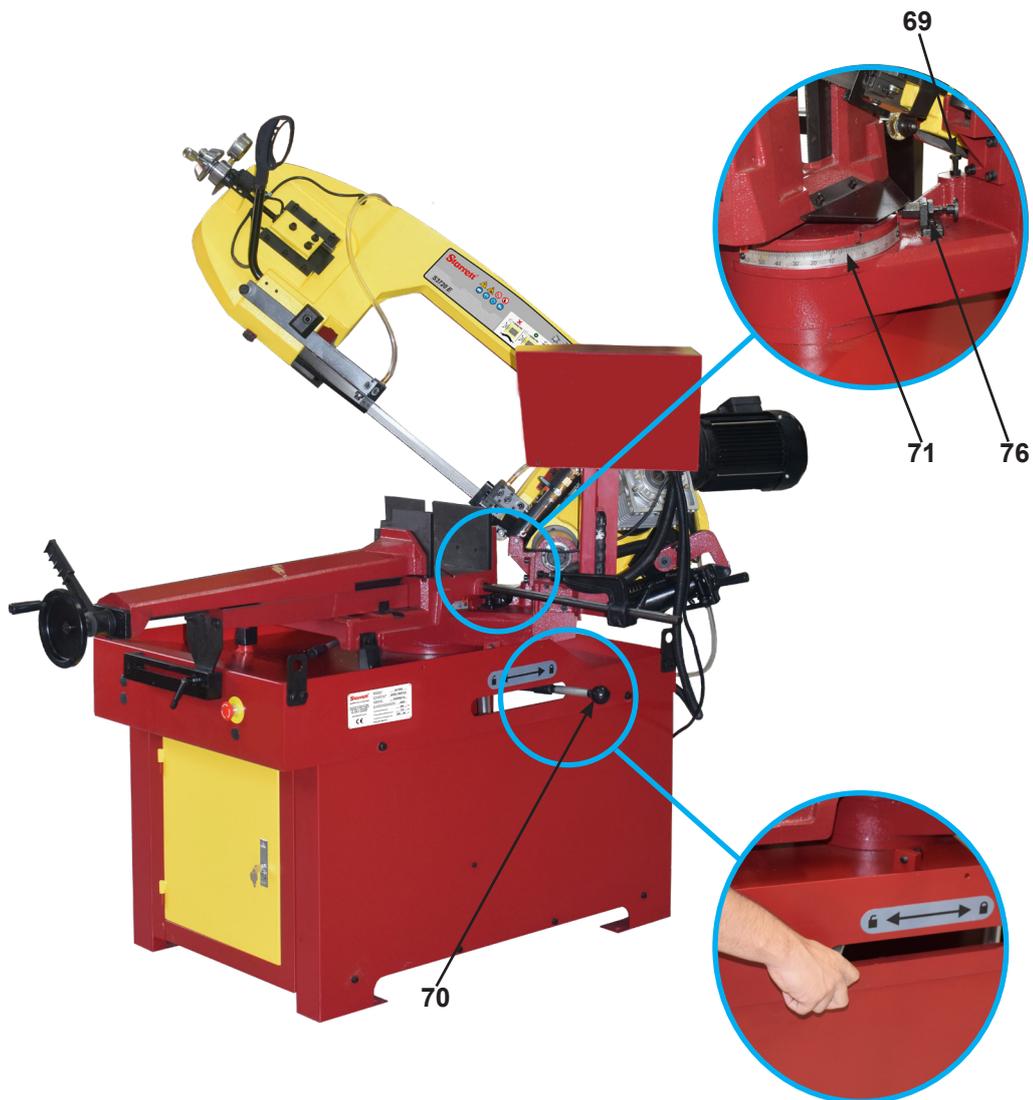


FIGURE 11.3 – BOW ROTATION



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 ( $0^\circ$  to  $-45^\circ$  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 [6.6](#)), before starting any operation;
2. RELEASE the Limiter Pin (76) (figure [11.3](#)) from the  $0^\circ$  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 (71) (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 Vise Lock Lever (23) (figure [11.2](#));
  - RELEASE the Vise Lock Handle (22) (figure [11.2](#));
  - MOVE the Vise (62) to the left (figure [11.5](#));
  - TIGHTEN the Vise Lock Lever (23) and the Vise Lock Handle (22).



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](#));
2. TURN OFF the machine by the General Switch (02) (figure [12.1](#)), by turning it to **OFF**;

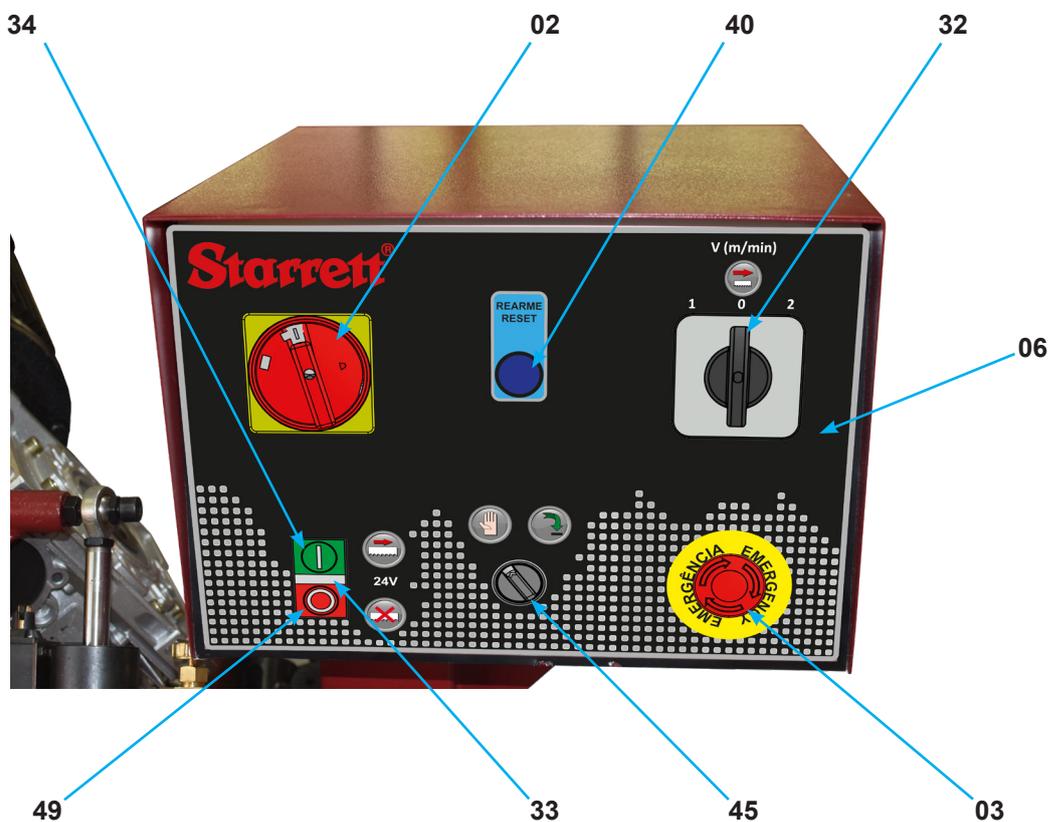
### First providence:

3. STOP and CHECK what is occurring;
4. REQUEST help from a SUPERVISOR or other QUALIFIED person;
5. 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:

7. 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;
8. POSITION the General Switch (02) at **ON**, as soon as the problem is solved and eliminating the present danger, if necessary;
9. 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;
10. 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 (figure 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, two EMERGENCY Buttons SB1 (03) and SB1-2 (46) are installed in position visible and accessible to the operator in case of abnormality. These are monitored by a Safety Relay FS1, installed on the Command Panel (06) (figure [13.1](#)) and in the Cabinet (01 ) (figure 6.1) 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 6.4).

In case the Band Saw Blade (10) breaks, the Limit Switch SQ3 (42) disables the electrical system, stopping the machine completely (figura 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 mm<sup>2</sup>. The control cables are red and have a gauge of 0.75 mm<sup>2</sup>. All cables are identified according to the attached electrical schematic.

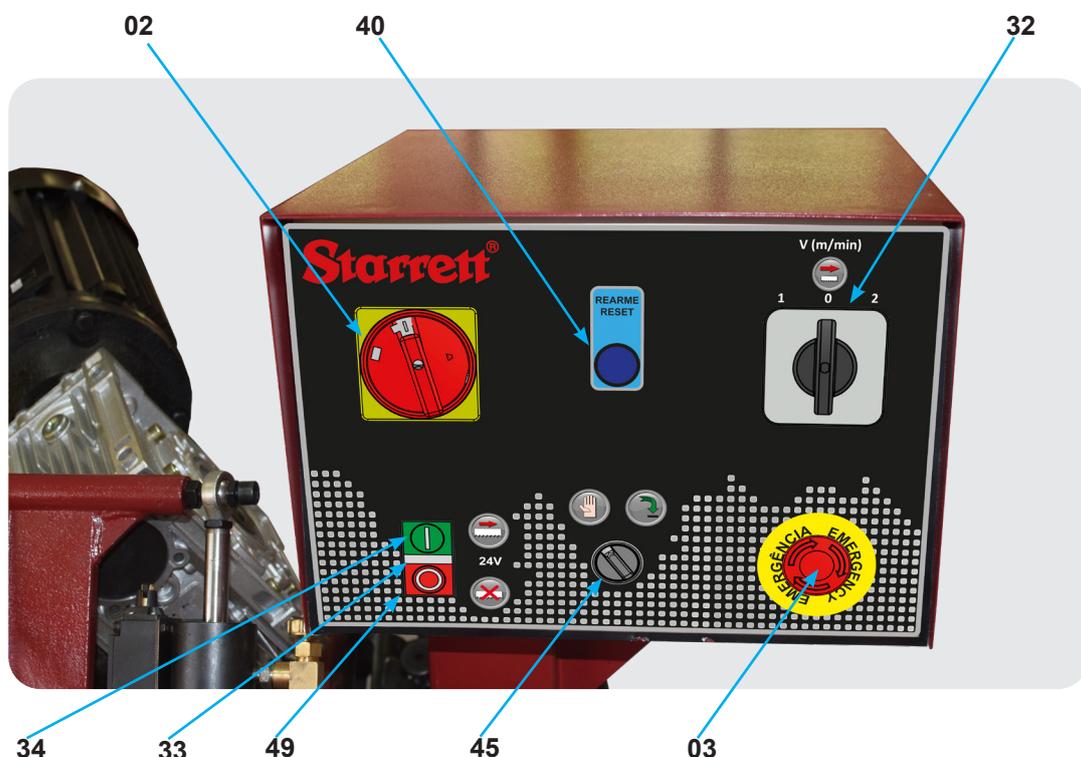
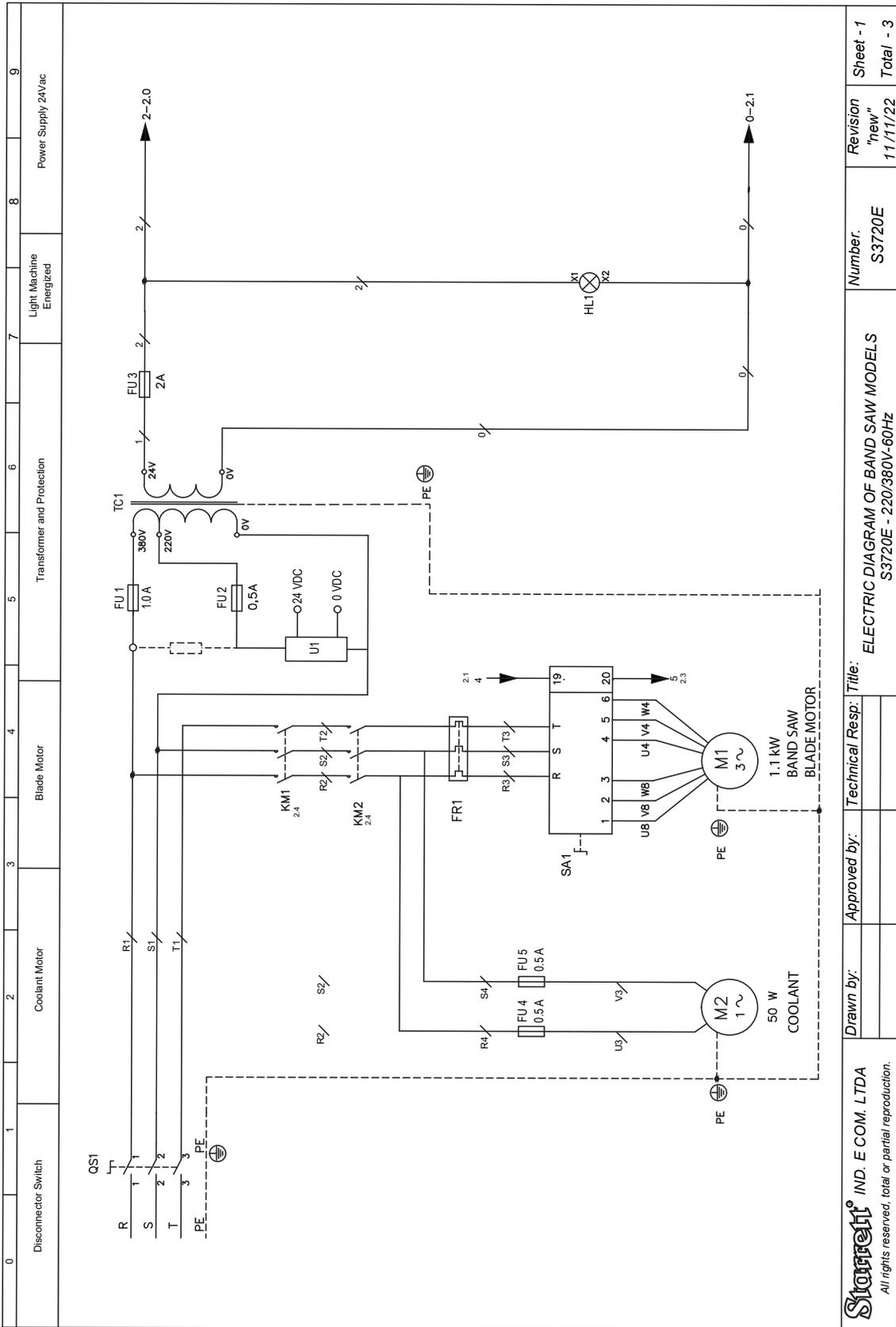


FIGURE 13.1 - COMMAND PANEL

**LIST OF ELECTRICAL COMPONENTS:**

<b>SIGLA</b>	<b>Description</b>	<b>Starrett Code</b>	<b>Specification</b>	<b>Supplier:</b>
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			
SB1-1	EMERGENCY BUTTON			
SB1-2	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			

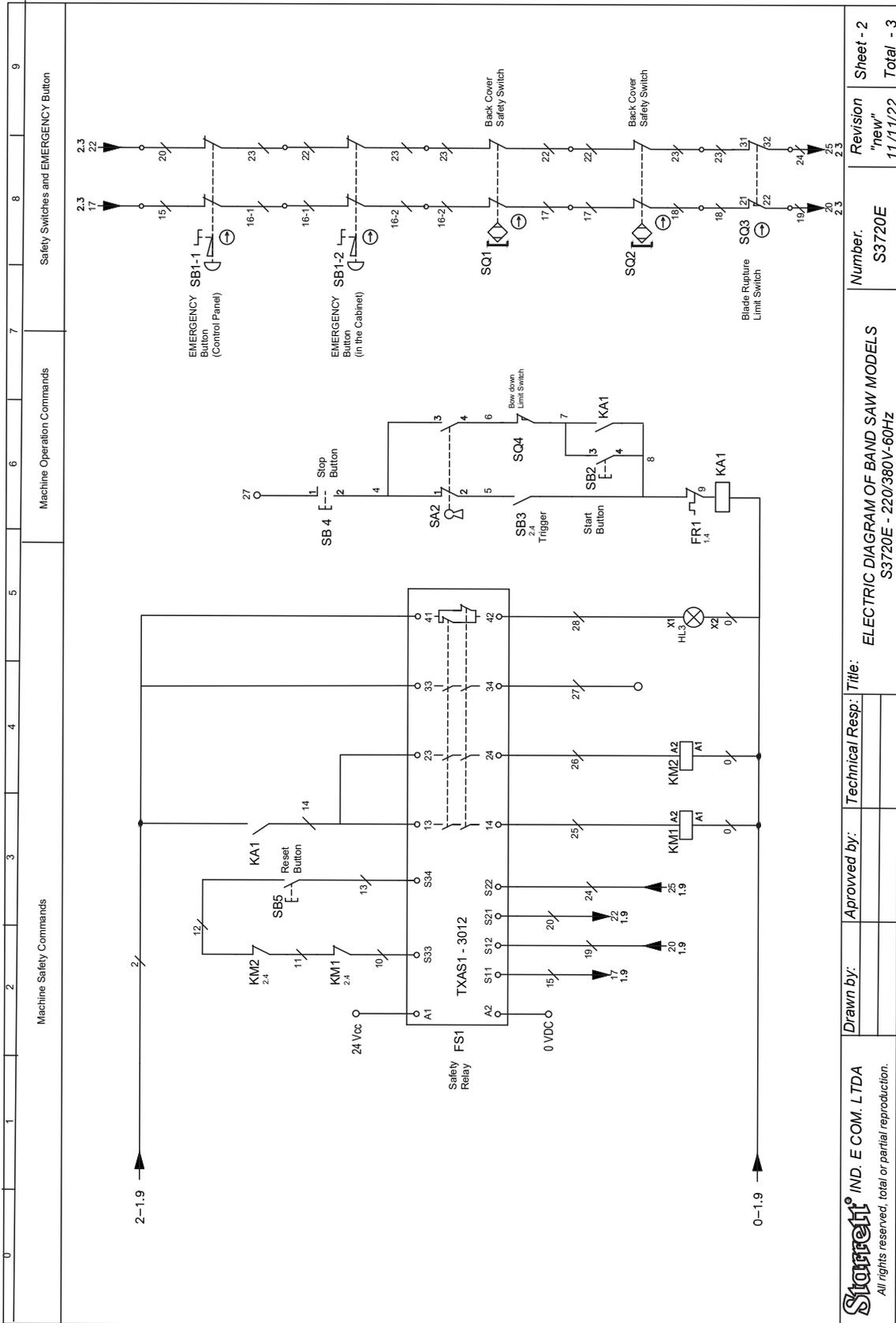


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Drawn by: \_\_\_\_\_  
 Approved by: \_\_\_\_\_  
 Technical Resp: \_\_\_\_\_  
 Title: ELECTRIC DIAGRAM OF BAND SAW MODELS S3720E - 220/380V-60Hz

Number: S3720E

Revision "new" 11/11/22  
 Sheet - 1  
 Total - 3



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0	1	2	3	4	5	6	7	8	9				
<b>Legend with the most used symbols in this project, based on the standard IEC - 60617.</b>													
Symbol	Code	Description	Symbol	Code	Description	Symbol	Code	Description	Symbol	Code	Description		
	FR	Overload Relay		K KA	Auxiliar contact of the contactor, relay, button or circuit breaker.		S	Pressure switch contact		SQ	Limit Switch contact mechanical action		
	FR	Contact (thermal drive)		KT	Time relay timed in the disconnection		S	Self reflective Optical sensor.		SQ	Switch drive by foot		
	PE	Grounding protection		KT	NC Contact with timed opening.		S	Inductive action sensor.		T	Transformer		
	FU	Thermal- magnetic Tripolar Circuit Breaker		KT	Time relay timed in the bonded		S	Contact drive by magnetic actuator		U KS IN	Devices box Safety Relay, Inverter		
	HL	Indicator lamp for sinalization,		KT	NO Contact with timed closing.		SA	Buton with restraint		U	Voltage converter CC Power Supply		
	K	Contact coil		M	3 ph Motor with Grounding connection		SA	Control Switch with 3 position.		X	Borne Connector		
	K	Contact of power of contactor.		Q	Motor Circuit Breaker		SB	Push button		XF	Fuse Borne		
	K	Reversible contact		QG	Disconnector Switch		SB	EMERGENCY Button punch type, turn to unlock and with NC contact of positive break		Y	Solenoid Valve		
<b>Starrett®</b>		IND. E COM. LTDA		Approved by:		Technical Resp. Title:		ELECTRIC DIAGRAM OF BAND SAW MODELS S3720E - 220/380V-60Hz		Revision "new" 11/11/22		Sheet - 3 Total - 3	
								Number. S3720E					

## 13.2. MACHINE SAFETY SYSTEMS:

This machine is equipped with the following safety devices:

- FS1 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 KS1 Safety Relay;
- EMERGENCY Button (46): Located in the Cabinet (01), 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 and SQ2 (39) disabling the machine's Electrical System. This safety function is monitored by the FS1 Safety Relay;
- RESET Button SB5 (40) (BLUE COLOR): 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 **S3720 E** 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 Lever (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.

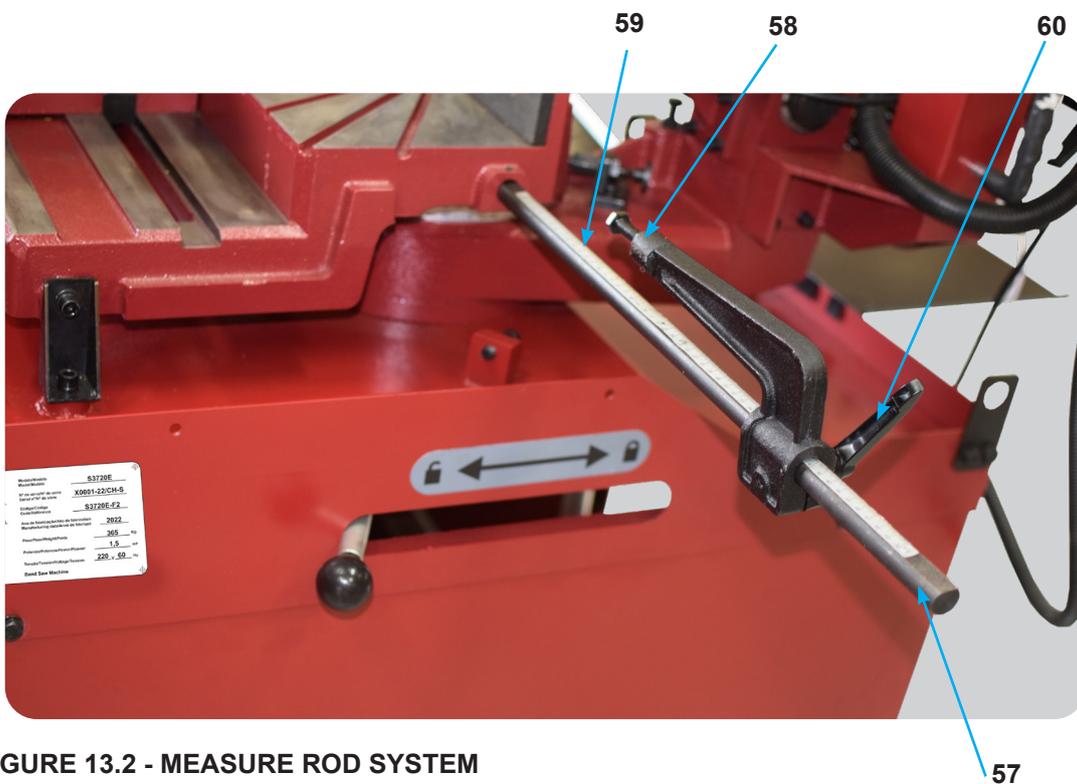


FIGURE 13.2 - MEASURE ROD SYSTEM

## 13.4 GEARMOTOR:

The **S3720 E** 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 NO-END 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.

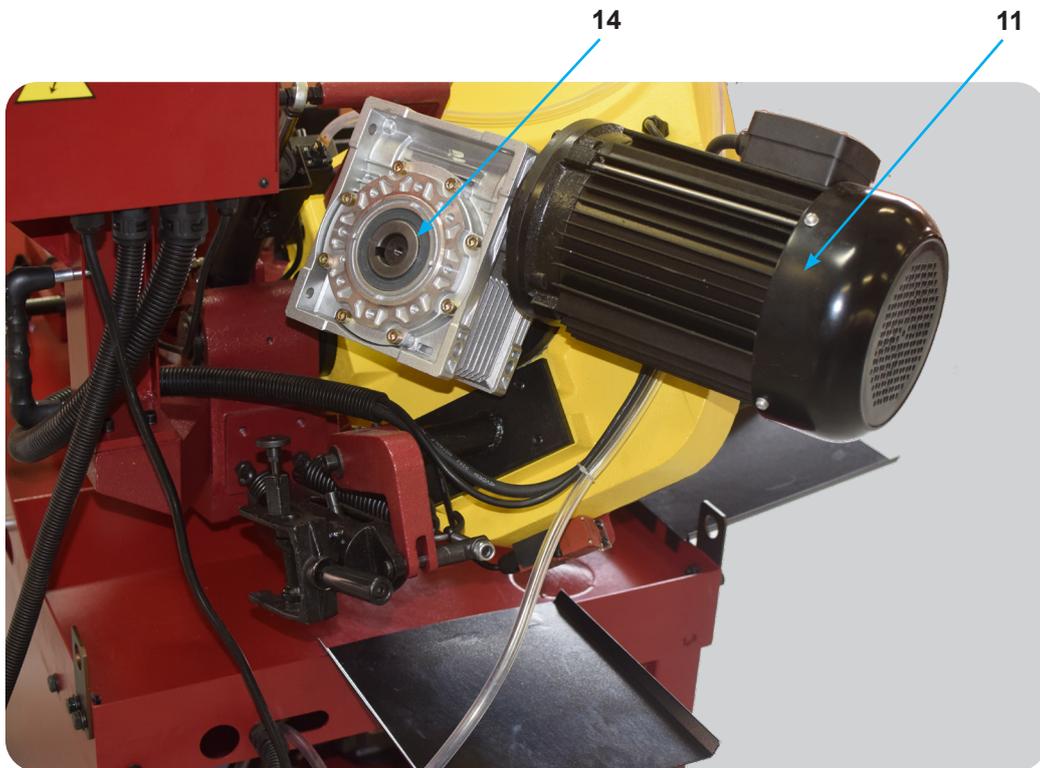


FIGURE 13.3 - GEARMOTOR SYSTEM



## 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 (figure [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.



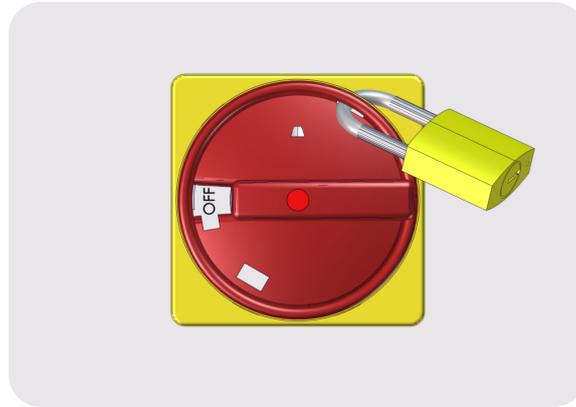


FIGURE 14.1 - GENERAL SWITCH LOCK WITH PADLOCK



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, observed at the Level Display (75);
- 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:

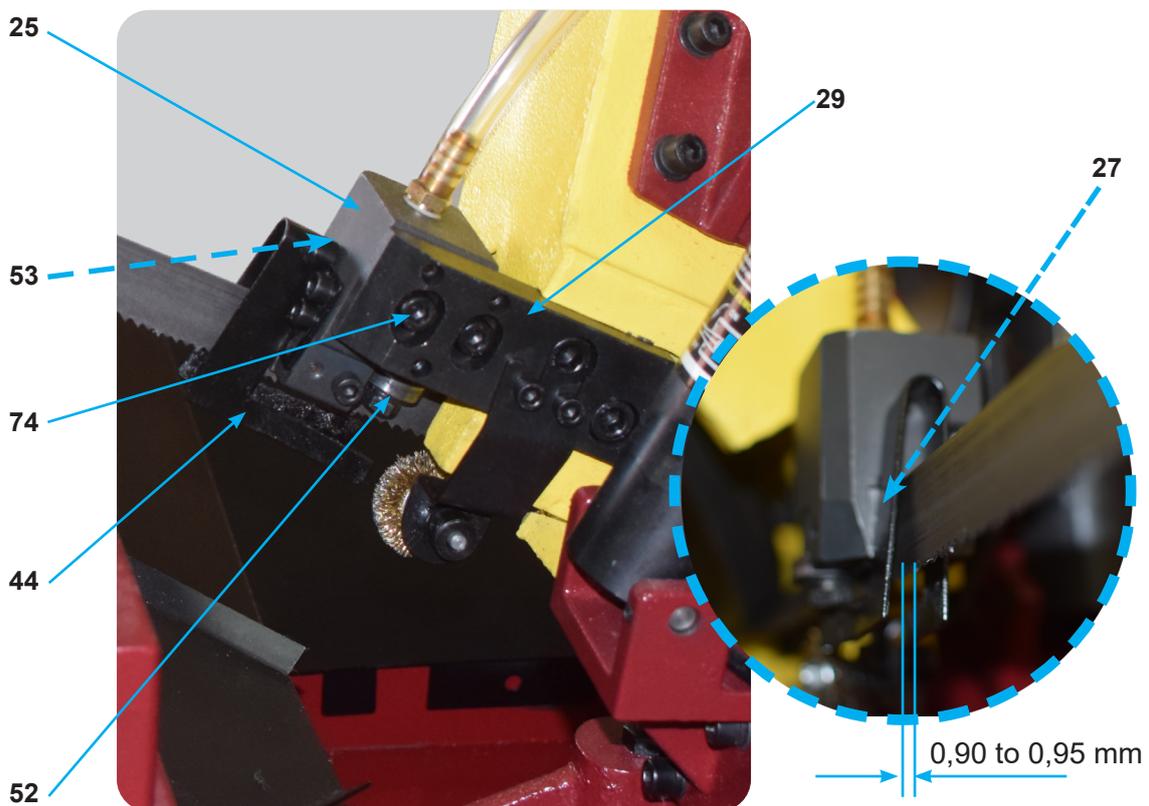
1. CLEAN these 2 sets daily with its own cooling liquid (water + cutting oil), with the Bow (04) in the down position, with no material to be cut on the Cutting Table (07).

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.

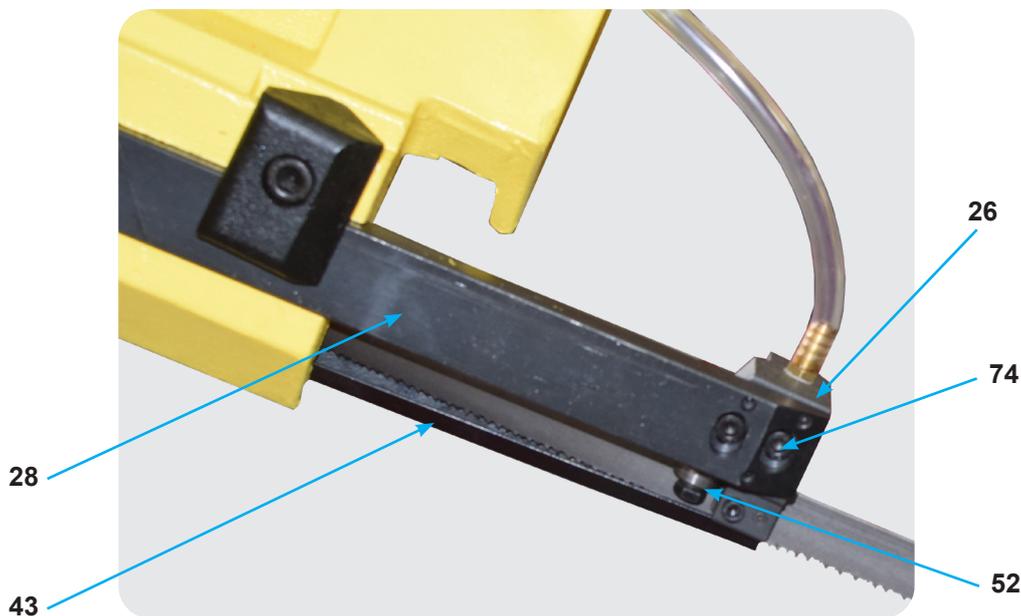


**FIGURE 14.3 - SIDE BEARINGS ADJUSTMENT**

## 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) (figure [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 [14.4](#)) 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 (74) 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 Guide Support (28) and (29) respectively.
3. VERIFY the height of the Protection (44) of the Fixed Guide (25) in relation to the teeth of the Band Saw Blade (10), that is, the guard must cover (hide) the teeth by 2 mm (minimum), so that they are not exposed. SEE figure [14.3](#);
4. 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 (figure [14.5](#)).

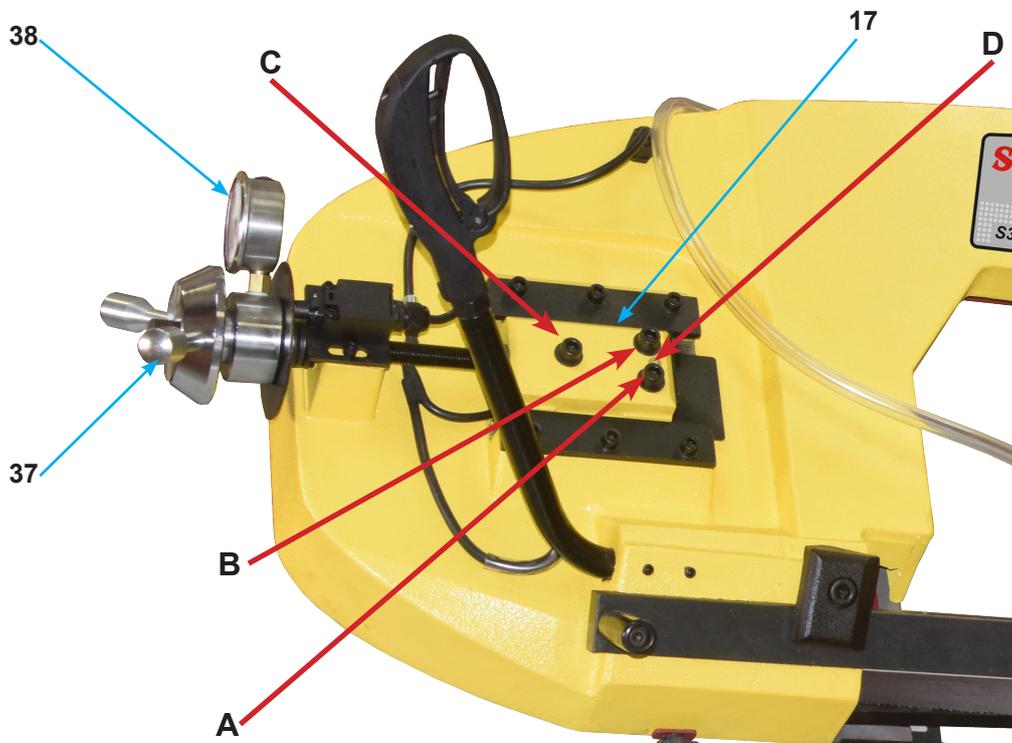
When ADJUSTING the Driven Flywheel (12) camber can relieve the pressure of the Band Saw Blade (10) on the REBOUND.

### PROCEDURE:

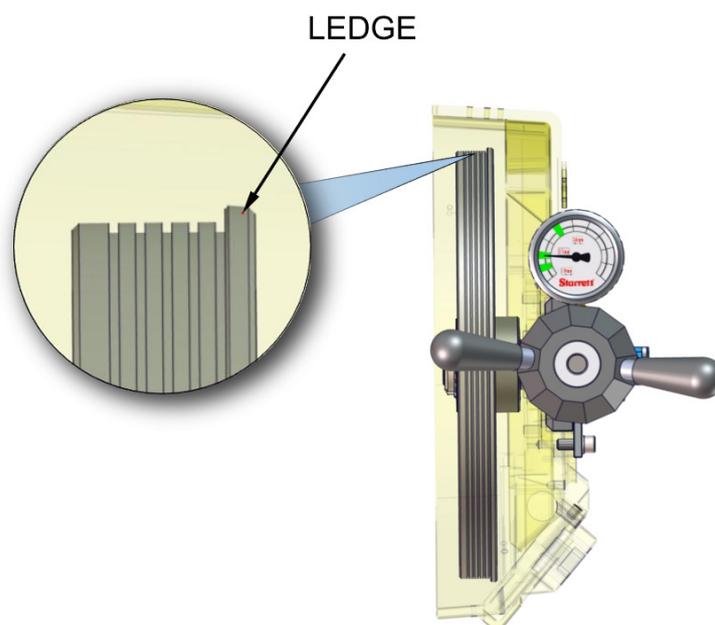
1. POSITION the Bow (04) in the upper maximum position;
2. CLOSE the Valves (16) and (31);
3. VERIFY that the General Switch (02) is in the **OFF** position and the EMERGENCY Button (03) is pressed;
4. LOOSE (TIGHTEN) the Screws A, B and C, without removing them from the Tensioner System (Cart) (17), with an Allen Hex Key (figure [14.6](#));
5. TURN Screw D, to adjust (camber) the Driven Flywheel (12), 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** again;
8. POSITION the Toggle Switch (32) in speed 1 and the Selector Switch (45) 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) 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.

#### **14.3.3. REMOVAL OF THE HYDRAULIC CYLINDER (08) 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. LOCK 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 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;

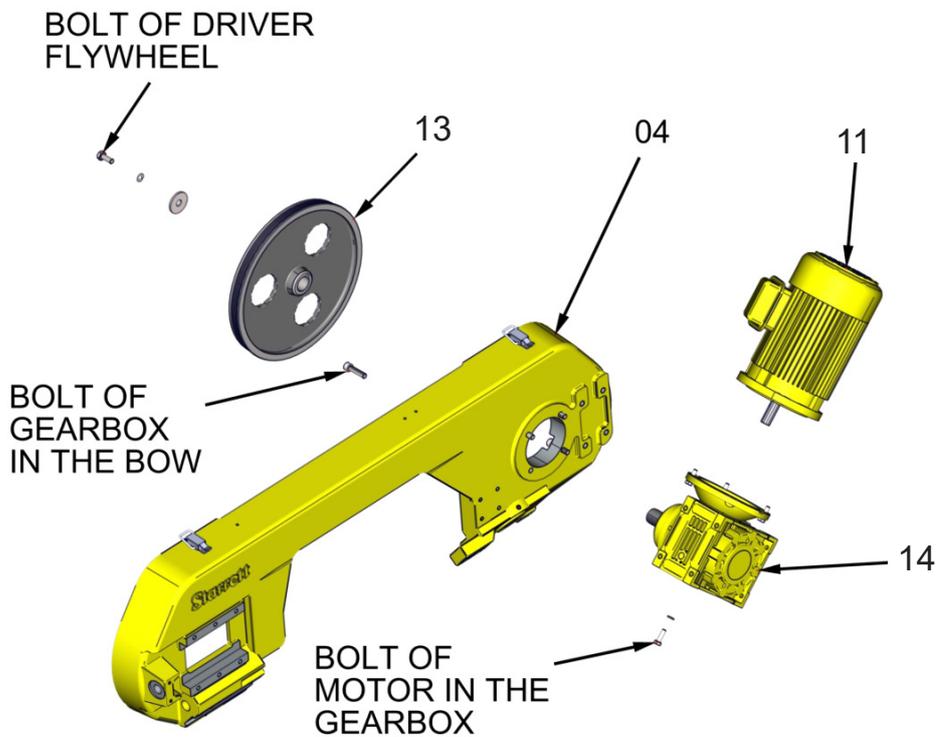


FIGURE 14.7 - GEARMOTOR SET

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 Crankcase 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 INJURIES:

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"> <li>• VERIFY that the General Switch (02) is in the <b>OFF</b> position;</li> </ul>
Band Saw Blade (10) does not turn	<ul style="list-style-type: none"> <li>• 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);</li> <li>• VERIFY that the Toggle Switch (32) speed is in position 1 or 2;</li> <li>• VERIFY whether the EMERGENCY Button (03) is pressed or defective;</li> <li>• VERIFY that the WHITE PILOT Signaling (33) is off.</li> </ul>
The rotation of Bow (04), between angles 0° to 60°, is hard	<ul style="list-style-type: none"> <li>• 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;</li> <li>• VERIFY for excessive chips and/or dirt on the machine. REMOVE the chips and/or dirt.</li> </ul>
The Band Saw Blade (10) does not tension	<ul style="list-style-type: none"> <li>• VERIFY the length of the Band Saw Blade (10). It should be <math>2\ 710 \pm 2</math> mm.</li> </ul>
The Band Saw Blade (10) comes out of the Flywheel	<ul style="list-style-type: none"> <li>• VERIFY the tensioning of the Band Saw Blade (10). TENSION according to <a href="#">10.1, item 3</a>;</li> <li>• VERIFY the clearance in the Bearings of the Flywheels (12) (13). ADJUST and REGULATE the Flywheels (12) (13) and/or REPLACE the respective Bearings;</li> <li>• VERIFY the conicity of the Driven Flywheel (12) (must be 0.5°). REMOVE and SEND to Maintenance for recovery. <a href="#">CONTACT Starrett's Technical Assistance</a> before executing any kind of machining service.</li> </ul>

continuation:

PROBLEM	CAUSES AND SOLUTIONS
Cooling liquid does not reach the Band Saw Blade (10)	<ul style="list-style-type: none"> <li>• VERIFY if there is cooling liquid in the Reservoir (51). DISPOSE the old coolant liquid, CLEAN the inside of the Reservoir (51) and FILL with new coolant liquid;</li> <li>• VERIFY whether the Tap (55) is closed or open. OPEN the Tap (55) if it is closed;</li> <li>• VERIFY that coolant liquid is circulating through the Coolant Pump (36) and Tap (55) hoses. DISOBS-TRUCT or REPLACE the hoses, if they are clogged.</li> </ul>
Band Saw Blade (10) tooth breakage	<ul style="list-style-type: none"> <li>• VERIFY if the tooth pressure is excessive on the material to be cut. REDUCE feed rate by adjusting Regulating Valve (31);</li> <li>• VERIFY that the teeth of the Band Saw Blade (10) are correct. CONSULT <a href="#">Chapter 09</a> and/or the <a href="#">Starrett Technical Assistance</a>, if necessary;</li> <li>• VERIFY the conditions of the Side Bearings. VERIFY whether they are broken or not. REPLACE the Bearings (52) and ADJUST as item <a href="#">14.3.1 c.</a>;</li> <li>• VERIFY if the cutting speed is lower than recommended. INCREASE the speed by the Toggle Switch (32);</li> </ul>
Early wear of the Saw Blade Teeth (10)	<ul style="list-style-type: none"> <li>• VERIFY that the Band Saw Blade (10) is suitable for the material to be cut. REPLACE with a Band Saw Blade (10) recommended to <b>Starrett's</b> specification. <a href="#">CONTACT Starrett's Technical Assistance</a> if necessary;</li> <li>• VERIFY if the cutting speed is high relative to what is recommended. REDUCE the speed by Toggle Switch (32);</li> </ul>

continuation:

PROBLEM	CAUSES AND SOLUTIONS
Breakage of the Band Saw Blade (10) at the weld	<ul style="list-style-type: none"> <li>• VERIFY if the forward speed is lower than recommended. INCREASE the advance speed by adjusting the Regulating Valve (31);</li> <li>• VERIFY the weld of the Band Saw Blade (10) for defects. REPLACE the Band Saw Blade (10) with a new one;</li> </ul>
Band Saw Blade (10) breaks away from the weld	<ul style="list-style-type: none"> <li>• VERIFY if this problem occurs within a few hours of use. REALIZE machine maintenance and ADJUST the Guides (25) (26) according to <a href="#">14.3.1</a>;</li> <li>• VERIFY if this problem occurs with many hours of use. Wear and natural material fatigue of the Band Saw Blade (10);</li> </ul>
Crooked cut	<ul style="list-style-type: none"> <li>• VERIFY the condition of the Bearings (52) in the Guide (25) (26) set. ADJUST or REPLACE the Bearings (52);</li> <li>• VERIFY the adjustment of the Side Bearings (52) (clearance should be 0.95 mm). ADJUST according to item <a href="#">14.3.1 c.</a>;</li> <li>• 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;</li> <li>• 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);</li> <li>• 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. <a href="#">CONTACT Starrett's Technical Assistance</a>; if necessary.</li> </ul>

continuation:

PROBLEM	CAUSES AND SOLUTIONS
Crooked cut (continuation)	<ul style="list-style-type: none"><li>• VERIFY by the Manometer (38) the tension of the Band Saw Blade (10) (it must be 20,000 PSI). SEE <a href="#">item 3 of 10.1</a>. ADJUST the tension of the Band Saw Blade (10);</li><li>• VERIFY if the roller support brackets are misaligned with the Cutting Table (07) surface. ADJUST the support brackets;</li><li>• VERIFY the advance speed of the Bow (04). REDUCE advance speed by adjusting Regulating Valve (31).</li></ul>



## 15. DISASSEMBLY AND DEACTIVATION:

### 15.1. SPECIFIC SAFETY RECOMMENDATIONS:



#### **WARNING!: 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 **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 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 SKILLED 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 you 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.

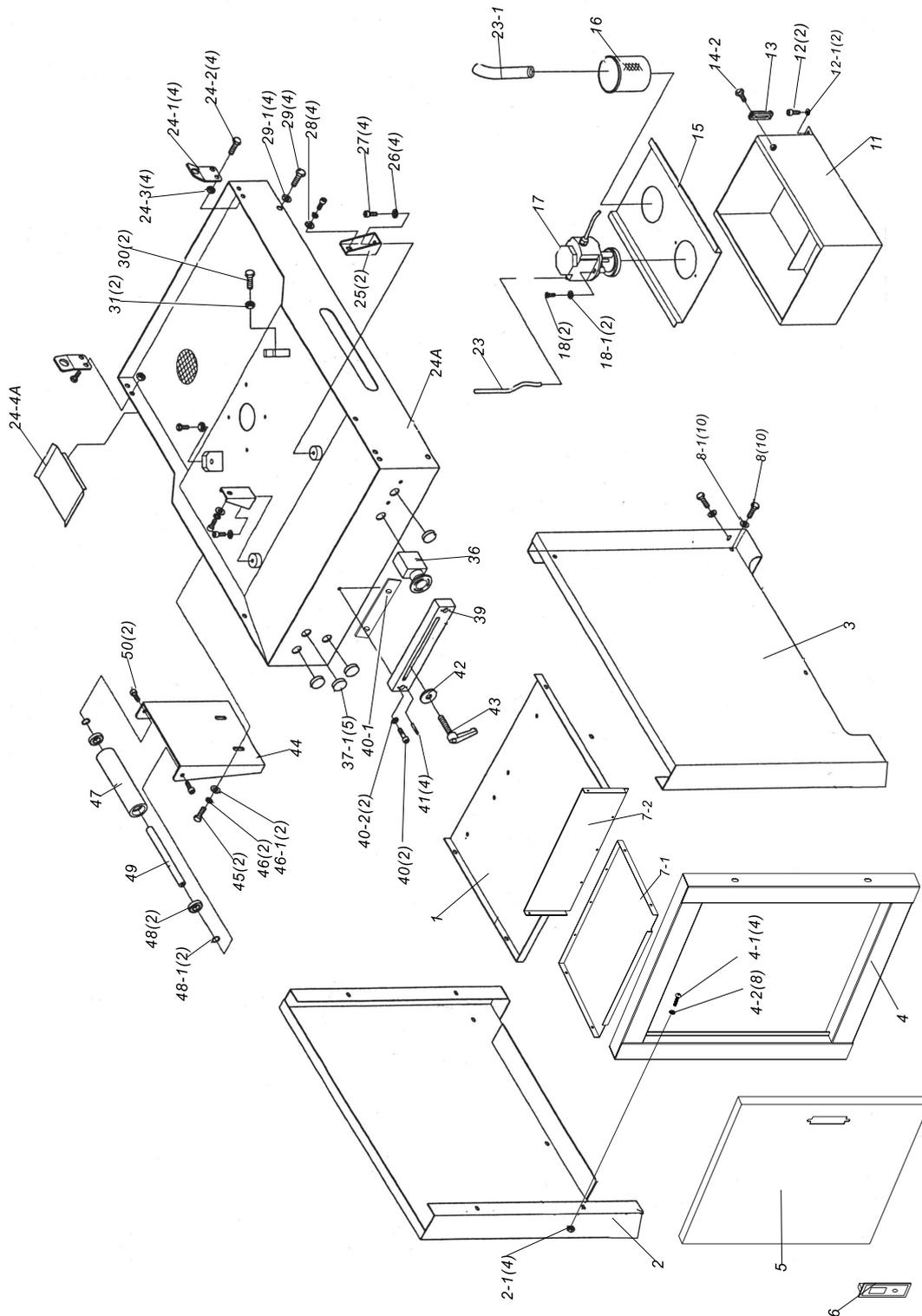
### 15.1.2. DEACTIVATION:

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

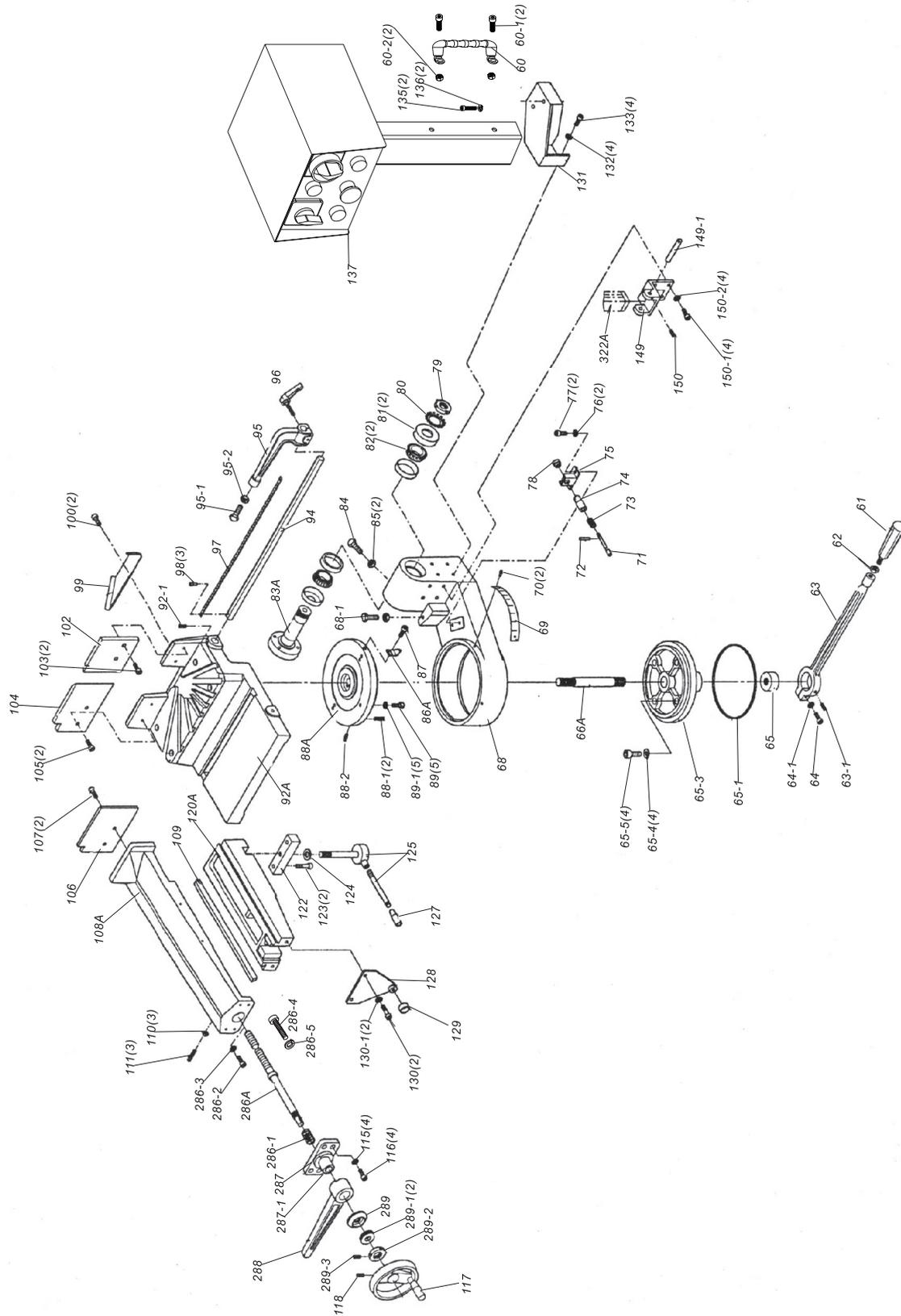
1. REMOVE and DISASSEMBLE the machine shall be the tasks of suitably SKILLED and AUTHORIZED people for this purpose, and who have experience and competence for this work;
2. DISCONNECT completely and correctly from the user's power grid, safely, making sure that the machine is totally powered off;
3. 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

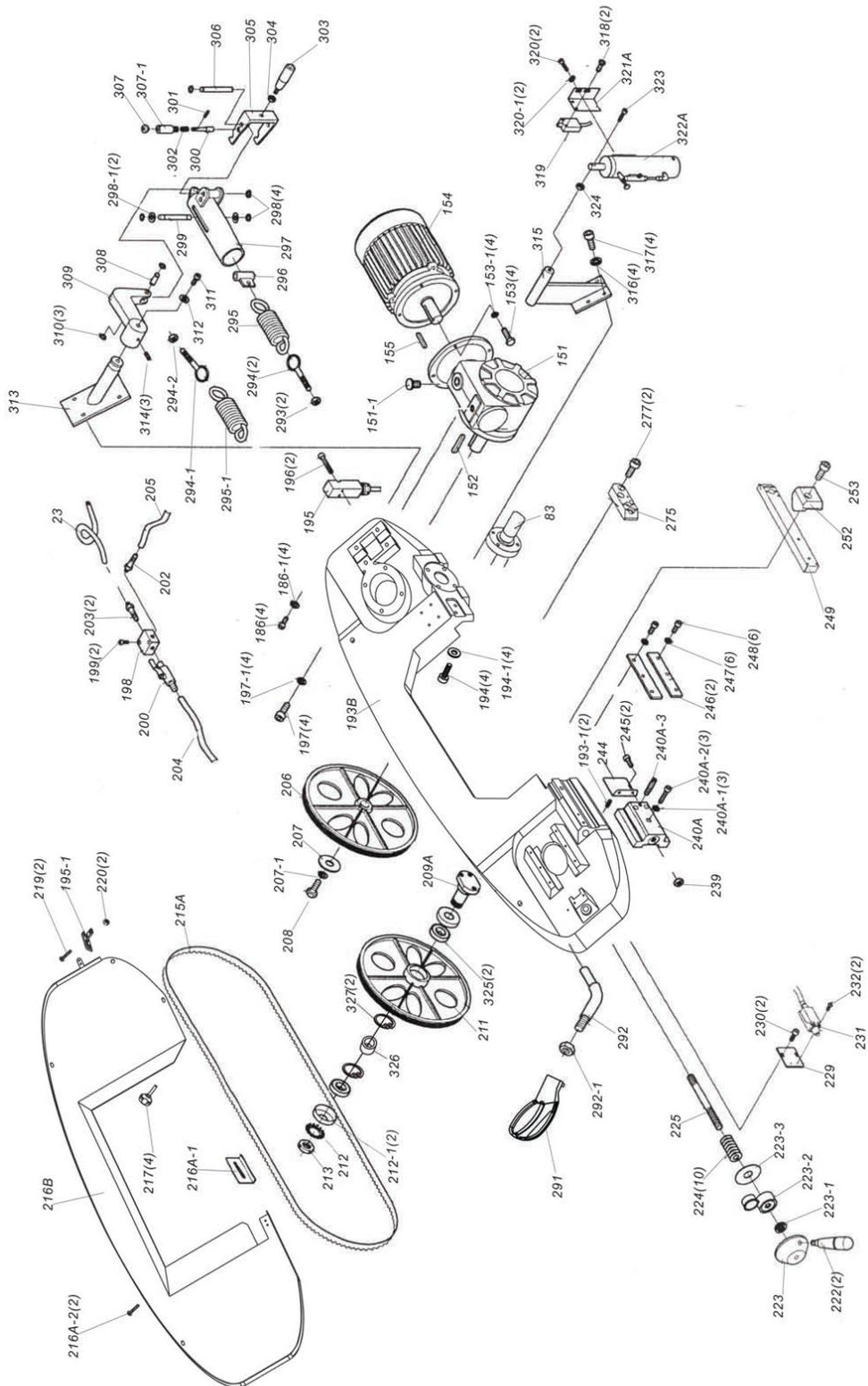
### 16.1. CABINET SET, COOLANT SYSTEM AND CONTROL PANEL:



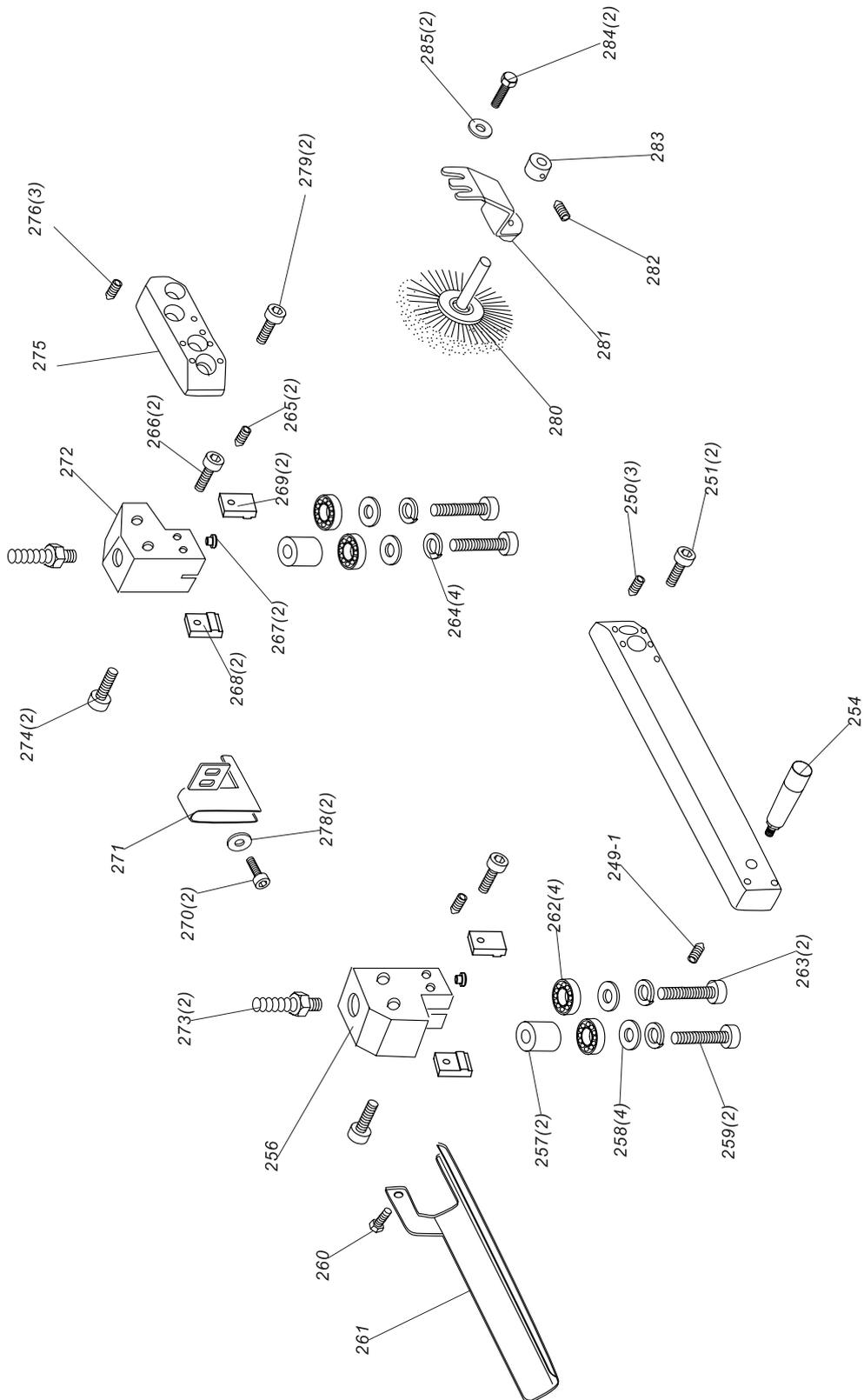
**16.2. VISE SET AND SWIVEL SUPPORT:**



## 16.3. Bow SET:



16.4. GUIDES SET:



**TABLES:**

POS	DESCRIPTION	QTY
1	BASE (BOTTOM PLATE)	1
2	BASE (LEFT PART)	1
2-1	NUT M8	4
3	BASE (RIGHT PART)	1
4	DOOR FRAME	1
4-1	HEX. CAP. BOLT M8X16	4
4-2	WASHER M8	8
5	DOOR	1
6	LOCK	1
7-1	H-SHELF	1
7-2	V-SHELF	1
8	HEX. CAP. BOLT M8X16	10
8-1	WASHER M8	10
11	COOLANT TANK	1
12	HEX. CAP. BOLT M8X16	2
12-1	WASHER M8	2
13	COOLANT GAUGE	1
14-2	HEX. CAP. BOLT M10X25	2
15	TANK COVER	1
16	FILTER	1
17	PUMP	1
18	ALLEN SCREW M6X25	2
18-1	WASHER M6	2
23	HOSE 5/16"X235cm	1
23-1	HOSE 1"X45cm	1
24A	COOLANT AND CHIP TRAY	1
24-1	SLING PLATE	4
24-2	HEX. CAP. BOLT M10X20	4
24-3	NUT M10	4
24-4	BLOCK PLATE	1
25	MOUNTING BRACKET	2
26	SPRING WASHER M10	4
27	ALLEN SCREW M10X20	4
28	WASHER M10	4
29	HEX.CAP. BOLT M10X20	4
29-1	WASHER M10	4
30	HEX. CAP. BOLT M12X40	2
31	NUT M12	2
36	EMERGENCY SWITCH	1

POS	DESCRIPTION	QTY
37-1	PLUG	5
39	TRACK	1
40	ALLEN SCREW M8X35	2
40-1	BOLT GUIDE	1
40-2	SPRING WASHER M8	2
41	SET SCREW M6X12	4
42	WASHER	1
43	HANDLE	1
44	ROOLER STAND	1
45	HEX.CAP. BOLT M12X25	2
46	SPRING WASHER M12	2
46-1	WASHER M12	2
47	ROLLER	1
48	BALL BEARING 6004ZZ	2
48-1	C-RING 20	2
49	ROLLER SHAFT	1
50	ALLEN SCREW M10X20	2
60	HANDLE	1
60-1	ALLEN SCREW M8X20	2
60-2	NUT M8	2
61	HANDLE	1
62	NUT M12	1
63	LOCKING LEVER	1
63-1	SET SCREW M10X16	1
64	ALLEN SCREW M10X35	1
64-1	SPRING WASHER M10	1
65	SHAFT NUT	1
65-1	OIL SEAL	1
65-3	DISK	1
65-4	SPRING WASHER M8	4
65-5	ALLEN SCREW M8X35	4
66A	SHAFT	1
68	SWIVEL ARM	1
68-14	HEX.CAP.BOLT M101X35	1
69	SCALE	1
70	RIVET 2.5X6	2
71	PIN	1
72	HOLLOW PIN Ø2.5X16	1
73	SPRING	1
74	BUSHING	1

POS	DESCRIPTION	QTY
75	BRACKET	1
76	SPRING WASHER M8	2
77	ALLEN SCREW M8X25	2
78	KNOB	1
79	JAM NUT ,40	1
80	STAR WASHER M40	1
81	ANTI-DUST COVER M40	2
82	BALL BEARING 32008	2
83A	SHAFT	1
84	HEX. CAP.BOLT M10X45	1
85	NUT M10	2
86A	POINTER	1
87	ALLEN SCREW M5X8	1
88A	COVER	1
88-1	HOLLOW PIN $\varnothing$ 6X202	2
88-2	SET SCREW M8X10	1
89	ALLEN SCREW M8X35	5
89-1	SPRING WAHSER M8	5
92A	TABLE	1
92-1	SET SCREW M6X12	1
94	BAR-STOP-ROD	1
95	BAR-STOP	1
95-1	HEX.CAP. BOLT M10X50	1
95-2	NUT M10	1
96	HANDLE M10X35	1
97	SCALE	1
98	RIVET	3
99	CHIP GUTTER	1
100	ALLEN SCREW M6X8	2
102	NO-BURR JAW	1
103	ALLEN SCREW M6X15	2
104	COUNTER VISE JAW	1
105	ALLEN SCREW M6X1	2
106	WISE JAW	1
107	FLAT HEAD MASCHINE SCREW M6X15	2
108A	WISE	1
109	DOVETAIL PLATE	1
110	THIN NUT M8	3
111	SET SCREW M8X25	3
115	SPRING WASHER M8	4

POS	DESCRIPTION	QTY
116	SAFETY SWITCH	4
117	ACTUATOR	1
118	SOCKET CAP SCREW M4 X 30	1
120A	HOSE 5/16 in X 2,350 mm	1
122	TAP 1/4P X 5/16	1
123	DISTRIBUTOR	2
124	SOCKET CAP SCREW M5 X 16	1
125	TAP 1/4P X 5/16	1
127	DRIVER FLYWHEEL	1
128	WASHER	1
129	NUT M4	1
130	ROUND HEAD SCREW M4 X 8	2
130-1	BACK COVER	2
131	BAND SAW BLADE	1
132	GREASE FITTING 1/16	4
133	NUT M30 X P1.5	4
135	SPRING WASHER M30	2
136	BEARING GUARD 30 mm	2
137	DRIVEN FLYWHEEL	1
149	BEARING 32006	1
149-1	DRIVEN FLYWHEEL SHAFT	1
150	CABLE + TRIGGER	1
150-1	NUT M16 X 2.0 X 8t	4
150-2	LEVER	4
151	ADJUSTABLE THREADED SCREW 16 X 230	1
151-1	SPRING WASHER SPECIAL	1
152	PLATE	1
153	PRESSURE GAUGE	4
153-1	BEARING 51104	4
154	TENSIONING NUT	1
155	CABLE	1
186	FIXATION PLATE	4
186-1	SOCKET CAP SCREW M6 X 12	4
193B	LIMIT SWITCH	1
193-1	SOCKET CAP SCREW M4 X 25	2
194	TENSIONING BLOCK	4
194-1	FLAT SOCKET CAP SCREW M10 X 25	4
195	PLATE GUARD	1
195-1	SOCKET CAP SCREW M6 X 8	1
196	PLATE	2

POS	DESCRIPTION	QTY
197	ALLEN SCREW M10X35	4
197-1	SPRING WASHER M10	4
198	PIPE FITTING SEAT	1
199	ROUND HEAD SCREW M6X30	2
200	COOLANT SWITCH	1
202	PIPE FITTING 1/4PX5/16	1
203	PIPE FITTING 1/4PX5/16	2
204	HOSE 5/16"X40 cm	1
205	HOSE 5/16"X90 cm	1
206	DRIVE FLYWHEEL	1
207	WASHER	1
207-1	SPRING WASHER M10	1
208	HEX. CAP. BOLT M10X25	1
209A	IDLE FLYWHEEL SHAFT	1
211	IDLE FLYWHEEL SHAFT	1
212	STAR WASHER 35	1
212-1	ANTI-DUST COVER 35	2
213	JAM NUT M35	1
215A	SAW BLADE	1
216B	BLADE COVER	1
216A-1	EXTENSION	1
216A-2	ROUND HEAD SCREW M6X8	2
217	PLUM SCREW M6X10	4
219	ROUND HEAD SCREW M4X8	2
220	NUT M4	2
222	HANDLE	2
223	HANDLE WHEEL	1
223-1	THRUST BEARING 51103	1
223-2	BLADE TENSION GAUGE	1
223-3	PLATE	1
224	SPECIAL SPRING WASHER	10
225	TENSION SHAFT	1
229	PLATE	1
230	ALLEN SCREW M6X12	2
231	LIMIT SWITCH	1
232	HEX. SOCKET CAP. BOLT M4X25	2
239	NUT M16	1
240A	SLIDE BRACKET	1
240A-1	SPRING WASHER M10	3
240A-2	ALLEN SCREW M10X45	3

POS	DESCRIPTION	QTY
240A-3	SET SCREW M10X25	1
244	COVER PLATE	1
245	ALLEN SCREW M6X8	2
246	GIB	2
247	SPRING WASHER M8	6
248	ALLEN SCREW M8X20	6
249	BLADE GUIDE MOVABLE ROD	1
249-1	SET SCREW M8X10	1
250	SET SCREW M6X12	3
251	ALLEN SCREW M8X20	2
252	SETTING BRACKET	1
253	ALLEN SCREW M12X50	1
254	HANDLE	1
256	GUIDE BRACKET	1
257	SPACER, GUIDE	2
258	WASHER M8	4
259	HEX HEAD SCREW M8X35	2
260	ALLEN SCREW M6X8	1
261	BLADE GUARD	1
262	BEARING 608-2Z	4
263	HEX. HEAD SCREW M8X20	2
264	SPRING WASHER 8	4
265	SET SCREW M6X16	2
266	ALLEN SCREW M6X25	2
267	UPPER TEETH	2
268	FIXED TEETH	2
269	ADJUSTABLE TEETH	2
270	ALLEN SCRW M5X8	2
271	BLADE GUARD	1
272	GUIDE BRACKET	1
273	PIPE FITTING 1/4PX5/16	2
274	ALLEN SCREWF M6X12	2
275	BALL BEARING BRACKET	1
276	SET SCREW M6X12	3
277	ALLEN SCREW M10X20	2
278	WASHER 5	2
279	ALLEN SCRW M8X20	2
280	BRUSH	1
281	BRUSH CLAMP	1
282	SET SCREW M5X5	1

POS	DESCRIPTION	QTY
283	SET BUSHING	1
284	HEX. CAP SCREW M6X12	2
285	WASHER M6	2
286A	LEAD SCREW	1
286-1	SPRING	1
286-2	SET SCREW M6X25	1
286-3	NUT M6	1
286-4	ALLEN SCREW M6X10	1
286-5	BIG WASHER 6	1
287	SETTING SEAT	1
287-1	BUSHING	1
288	LEAD SCREW SEAT	1
289	BEARING BUSHING	1
289-1	BALL BEARING2035	2
289-2	NUT	1
289-3	HOLLOW PIN Ø6X35	1
291	TRIGGER SWITCH	1
292	PIPE	1
292-1	NUT M16	1
293	NUT M12	2
294	SPRING HOOK	2
294-1	SPRING HOOK	1
294-2	NUT M10	1
295	SPRING	1
295-1	SPRING	1
296	SPRING SEAT	1
297	SPRING BUSHING	1
298	C-RING 13	4
298-1	WASHER 12	2
299	SHAFT	1
300	PIN	1
301	HOLLOW PIN 2.5X16	1
302	SPRING	1
303	FORK	1
304	NUT M10	1
305	ADJUSTING BRACKET	1
306	SHAFT	1
307	KONB	1
307-1	BUSHING	1
308	SHAFT	1

POS	DESCRIPTION	QTY
309	ARM	1
310	C-RING 12	3
311	ALLEN SCREW M10X25	1
312	SPRING WASHER 10	1
313	POST	1
314	SET SCREW M10X16	3
315	HYDRAULIC CYLINDER POST	1
316	SPRING WASHER 8	4
317	ALLEN SCREW M8X25	4
318	ROUND HEAD SCREW M5X10	2
319	LIMIT SWITCH	1
320	ALLEN SCREW M6X8	2
320-1	WASHER 6	2
321A	ADJUSTING BRACKET	1
322A	HYDRAULIC CYLINDER POST	1
323	ALLEN SCREW M10X40	1
324	NUT M10	1
325	BEARING 6007	2
326	SPACER BUSH	1
327	CIRCLIPS FOR HOLES	2

## 17. WARRANTY:



[Starrett Indústria e Comércio Ltda.](#)

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Itu - SP - Brazil – CEP 13306-900

Starrett Call Center: +55 11 2118 8000

falecom@starrett.com.br

www.starrett.com.br

### 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 or not the use of equipment.

During the warranty period, the Technical Support of **Starrett** provided will loose 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.**

(\*) SEE in: <http://starr.in/garantia>

**Starrett Indústria e Comércio Ltda.**



## **18. TECHNICAL STANDARDS REFERENCES:**

### **European Parliament and of the Council:**

**Directiva 2006/42 /CE - Machines;**

**Directiva 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®**