THOMAS

USE AND MAINTENANCE MANUAL

TRAD 350 SO DIGIT

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Contents

Ordering spare parts

- When ordering spare parts you must state:
  MACHINE MODEL
  SERIAL NUMBER
  PART REFERENCE NUMBER

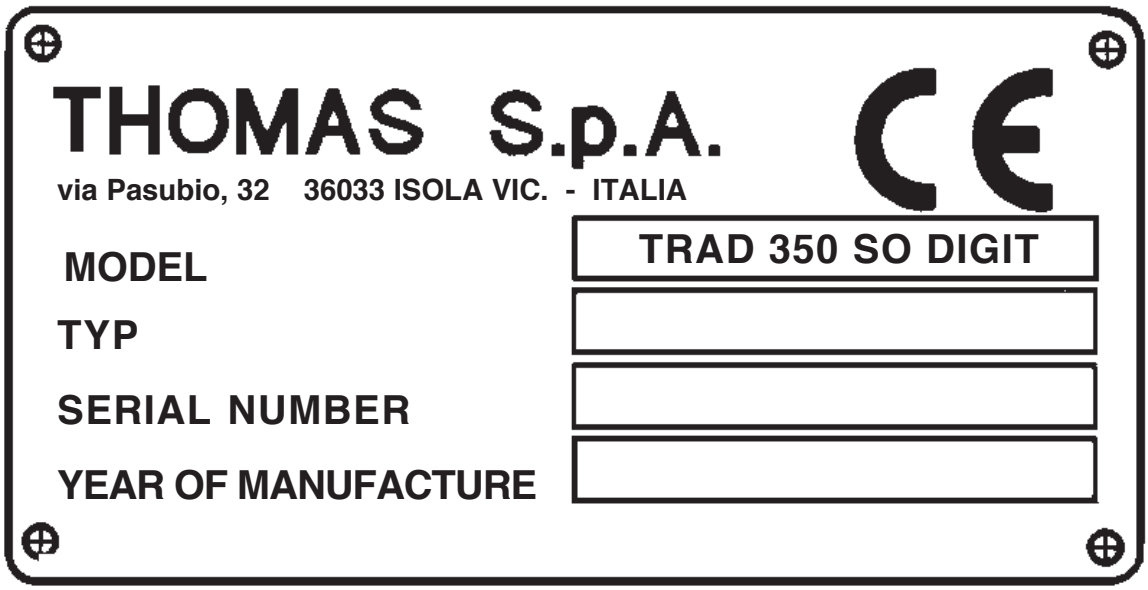
Without these references WE WILL NOT SUPPLY the spares. See point 10.1 - list of spare parts -

Guarantee

- The Company guarantees that the machine, described in this manual, has been designed to meet safety requirements. As for machine functionality, inspection has been successful.
- The machine is guaranteed for 12 months: the guarantee does not cover the electric motors, electric components, pneumatic components or any damage due to dropping or to bad machine management, the failure to observe maintenance standards or bad handling by the operator.
- The buyer has only the right to replacement of the faulty parts, while transport and packing costs are at his expense.
- The serial number on the machine is a primary reference for the guarantee, for after-sales assistance and for identifying the machine for any necessity.

Machine certification and identification marking

MACHINE LABEL



(Space reserved for the NAME and STAMP of the DEALER and/or IMPORTER)

1 REFERENCE TO ACCIDENT-PREVENTION REGULATIONS

This machine has been built to comply with the national and community accident-prevention regulations in force. Improper use and/or tampering with the safety devices will relieve the manufacturer of all responsibility.

1.1 - Advice for the operator

- Check that the voltage indicated on the plate, normally fixed to the machine motor, is the same as the line voltage.
- Check the efficiency of your electric supply and earthing system; connect the power cable of the machine to the socket and the earth lead (yellow-green in colour) to the earthing system.
- When the saw frame is in suspend mode (up) the toothed blade must not move.
- Only the blade section used for cutting must be kept unprotected. Remove guarding by operating on the adjustable head.
- It is forbidden to work on the machine without its shields (these are all white, grey or blue in colour).
- Always disconnect the machine from the power socket before blade change or carrying out any maintenance job, even in the case of abnormal machine operation.
- Always wear suitable eye protection.
- Never put your hands or arms into the cutting area while the machine is operating.
- Do not shift the machine while it is cutting.
- Do not wear loose clothing with sleeves that are too long, gloves that are too big, bracelets, chains or any other object that could get caught in the machine during operation; tie back long hair.
- Keep the area free of equipment, tools or any other object.
- Perform only one operation at a time and never have several objects in your hands at the same time. Keep your hands as clean as possible.
- All internal and/or internal operations, maintenance or repairs, must be performed in a well-lit area or where there is sufficient light from extra sources so as to avoid the risk of even slight accidents.

1.2 - Location of shields against accidental contact with the tool

- White, grey, blue metal guards, fastened with screws onto the stationary blade-guide and relevant holding arm.
- White, grey or blue metal guard fastened with screws onto the mobile blade-guide,ensures covering of blade section not used in cutting operation.
- White or grey metal guard, fastened with knobs onto the saw frame, to protect from flywheels.

1.3 - Electrical equipment according to Euro-pean Standard "CENELEC EN 60 204-1" which assimilates, with some integrating modifications, the publication "IEC 204-1"

- The electrical equipment ensures protection against electric shock as a result of direct or indirect contact. The active parts of this equipment are housed in a box to which access is limited by screws that can only be removed with a special tool; the parts are fed with alternating current at low voltage (24 V). The equipment is protected against splashes of water and dust.
- Protection of the system against short circuits is ensured by means of rapid fuses and earthing; in the event of motor overload, protection is provided by a thermal probe.
- In case of power failure or removal of the flywheel guard, the specific start-up button must be reset.
- The machine has been tested in conformity with point 20 of EN 60204.

1.4 - Emergencies according to European Standard "CENELEC EN 60 204-1"

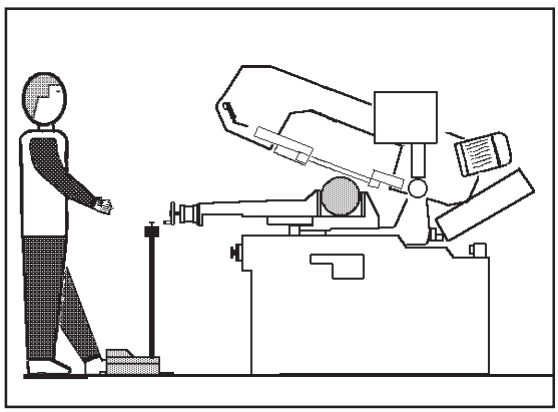
- In the event of incorrect operation or of danger conditions, the machine may be stopped immediately by pressing the red mushroom button.
- The casual or voluntary removal of the protection shield of the flywheels causes the stepping-in of a microswitch that automatically stops all machine functions.
- In case blade breaks, the tightening pressure switch stops all machine functions.

NOTE: Resetting of machine operation after each emergency stop is achieved by reactivating the specific restart button.

2 RECOMMENDATIONS AND ADVICE FOR USE

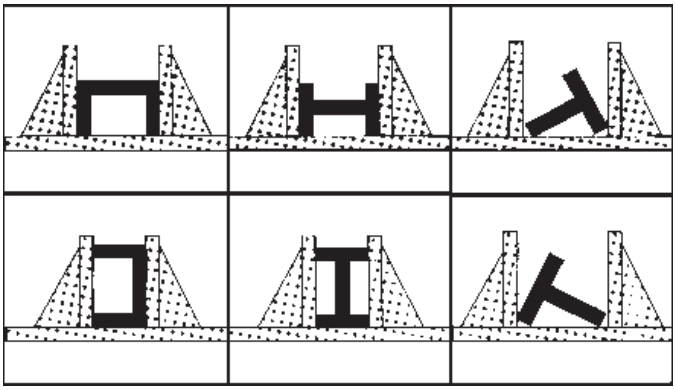
2.1 - Recommendations and advice for using the machine

- The machine has been designed to cut metal building materials, with different shapes and profiles, used in workshops, turner's shops and general mechanical structural work.
- Only one operator is needed to use the machine, that must stand as shown in the picture.



- Before starting each cutting operation, ensure that the part is firmly gripped in the vice and that the end is suitably supported.

These figures show examples of suitable clamping of different section bars, bearing in mind the cutting capacities of the machine in order to achieve a good efficiency and blade durability.



- Do not use blades of a different size from those stated in the machine specifications.
- If the blade does not cut through the material, immediately strike the emergency push-button and switch off the machine. Open the vice with the handwheel, remove part to be cut ad check that the blade teeth are not broken, If they are, replace tool.
- Check saw frame return spring to ensure proper balancing.
- Before carrying out any repairs on the machine, consult the dealer or apply to THOMAS.

3 TECHNICAL CHARACTERISTICS

3.1 - Table of cutting capacity and technical details standard model

	○	□	▭
90°	270	260	330x250
45° DX	230	210	230x150
60° DX	140	140	140x140

- Saw frame tilting	degrees	30
- Flywheel diameter	mm	330
- Blade dimensions	mm	**2925 x 27 x 0,9**
- Vice opening	mm	335
- Cooling pump electric motor	kW	0,11
- Hydraulic unit motor	kW	0,37
- Machine weight	kg	550

MODEL WITH REDUCTION UNIT

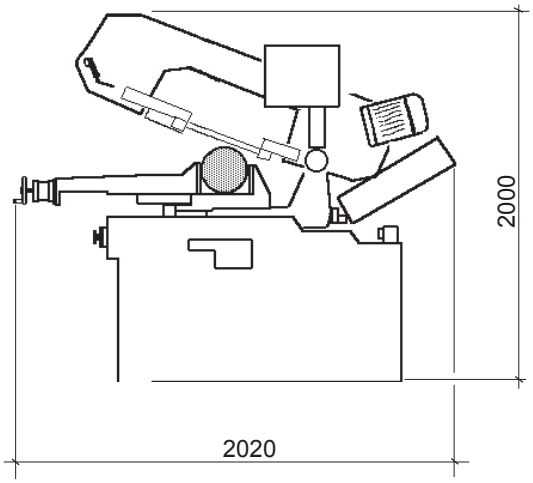
- Three-phase electric motor - blade rotation	kW	1,3 - 1,9
- Reduction unit in oil bath	ratio	1 : 40
- Blade cutting speed	m/min	36 ÷ 72

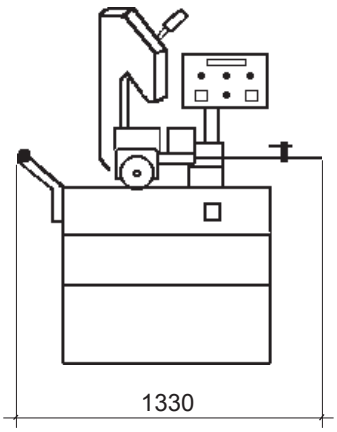
MODEL WITH SPEED VARIATOR

- Three-phase electric motor - blade rotation	kW	1,5
- Blade cutting speed	m/min	18 ÷ 90

4 MACHINE DIMENSIONS TRANSPORT INSTALLATION DISMANTLING

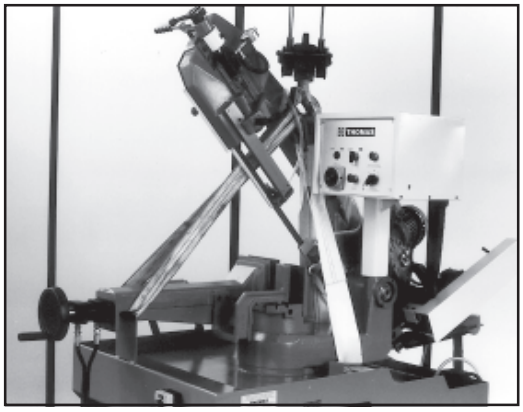
4.1 - Machine dimensions





4.2 - Transport and handling of the machine

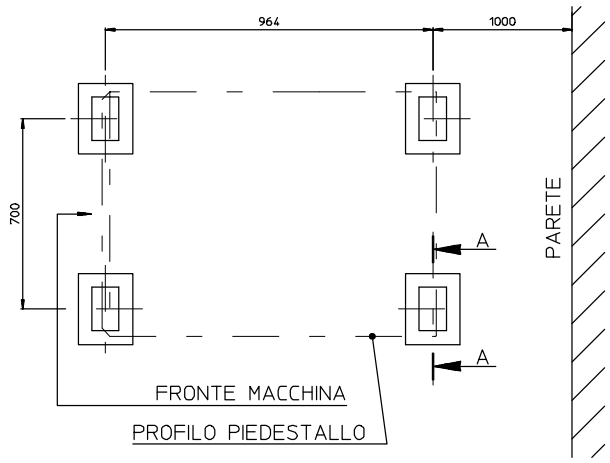
If the machine has to be shifted in its own packing, use a fork-lift truck or sling it with straps as illustrated.



4.3 - Minimum requirements for the premises housing the machine

- Mains voltage and frequency complying with the machine motor characteristics.
- Environment temperature from -10 °C to +50 °C.
- Relative humidity not over 90%.

4.4 - Anchoring the machine

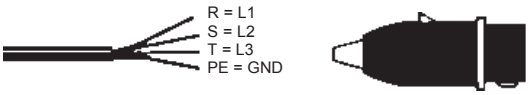


- Position the machine on a firm cement floor, maintaining, at the rear, a minimum distance of 1000 mm from the wall; anchor it to the ground as shown in the diagram, using screws and expansion plugs or tie rods sunk in cement, ensuring that it is sitting level.

4.5 - Instructions for electrical connection

- The machine is not provided with an electric plug, so the customer must fit a suitable one for his own working conditions:

1 - WIRING DIAGRAM FOR 4-WIRE SYSTEM FOR THREE-PHASE MACHINE - SOCKET FOR A 16A PLUG



4.6 - Instructions for assembly of the loose parts and accessories

- Fit the components supplied:
- Fit the bar-stop rod.
- Fit and align the roller carrying arm on the countervice bench.

4.7 - Disactivating the machine

- If the sawing machine is to be out of use for a long period, it is advisable to proceed as follows:

1) detach the plug from the electric supply panel
2) loosen blade
3) release the arch return spring
4) empty the coolant tank
5) carefully clean and grease the machine
6) if necessary, cover the machine.

4.8 - Dismantling

(because of deterioration and/or obsolescence)

General rules

If the machine is to be permanently demolished and/or scrapped, divide the material to be disposed of according to type and composition, as follows:

1) Cast iron or ferrous materials, composed of metal alone, are **secondary raw materials**, so they may be taken to an iron foundry for re-smelting after having removed the contents (classified in point 3);
2) electrical components, including the cable and electronic material (magnetic cards, etc.), fall within the category of material classified as being **assimilable to urban waste** according to the laws of the European community, so they may be set aside for collection by the public waste disposal service;
3) old mineral and synthetic and/or mixed oils, emulsified oils and greases are **special refuse**, so they must be collected, transported and subsequently disposed of by the old oil disposal service.

NOTE: since standards and legislation concerning refuse in general is in a state of continuous evolution and therefore subject to changes and variations, the user must keep informed of the regulations in force at the time of disposing of the machine tool, as these may differ from those described above, which are to be considered as a general guide line.

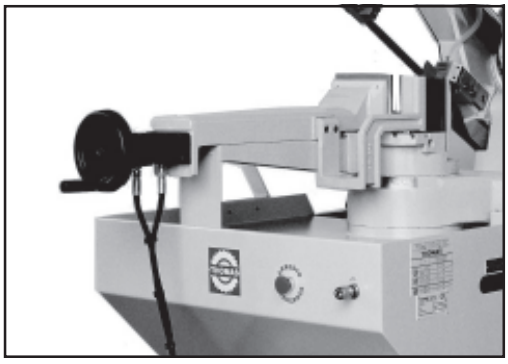
5 MACHINE FUNCTIONAL PARTS

5.1 - Operating head or saw frame

- Part of the machine consisting of drive members (gearmotor or variable speed motor, flywheels), tightening and guide (blade tightening slide, blade guide head) of tool.

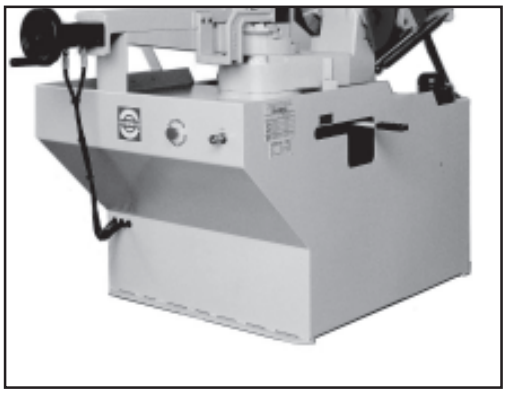
5.2 - Vice

- Material clamping system during the cutting operation by means of an approach handwheel and hydraulic clamping. .



5.3 - Bed

- Structure supporting the SAW FRAME OPERATING HEAD (revolving arm for degree cutting along with clamping system), the VICE, the BAR STOP, the ROLLER for the support of the mateial. The bedplate houses the cooling liquid TANK, the CONTROL BOARD, ELECTRICAL PART and the DEVICE CONTROLLING THE AUTOMATIC HYDRAULIC LOWERING AND RISE OF THE SAW FRAME.



6 DESCRIPTION OF THE OPERATING CYCLE

Before operating, all the main organs of the machine must be set in optimum conditions (see the chapter on "**Regulating the machine**").

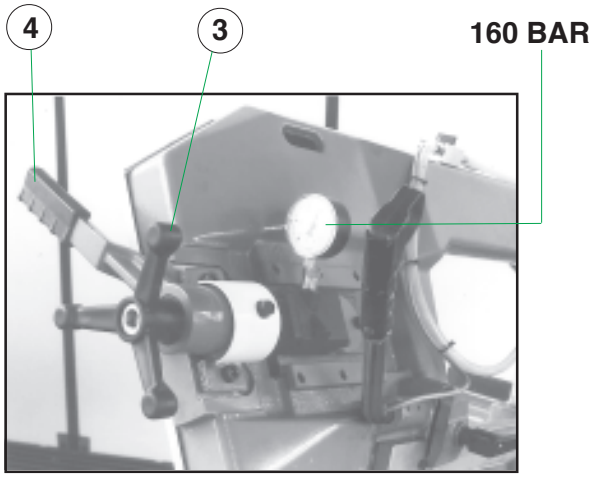
6.1 - Starting up

CUTTING CYCLE:

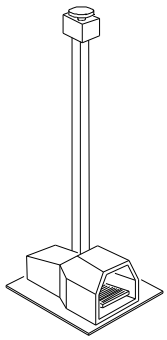
- Vice locking
- Sawframe downfeed
- Sawframe lifting
- Vice opening

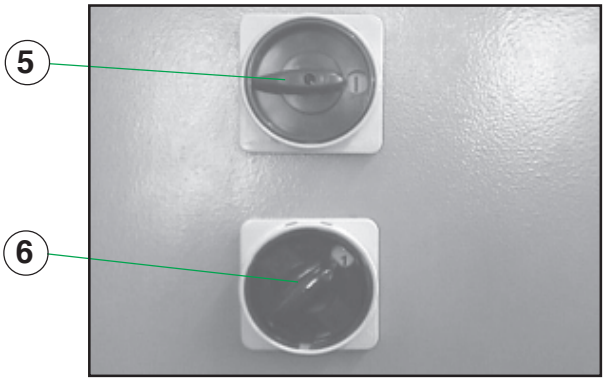
PRELIMINARY :

- Ensure that the machine is not in emergency stop condition; if it is, release the red mushroom button (**1**) placed on the control panel and on the foot control switch.
- Rotate the blade tension handwheel (**3**) clockwise and the quick tension lever (**4**) towards the left against the mechanical stop, until the blade tension pressure reaches **160** Bars.
- Rotate the main switch (**5**) to position 1.
- Press the key activating the hydraulic pump (see following page).
- Check that the pressure gauge, located on the hydraulic unit reads **30** BAR, if it doesn't attempt to swap one of the electric power supply wires (only during installation).
- On the standard model, select the cutting speed on commutator (**6**):
  Position 1 = 36 m/min.
  Position 2 = 72 m/min.



FOOT CONTROL SWITCH

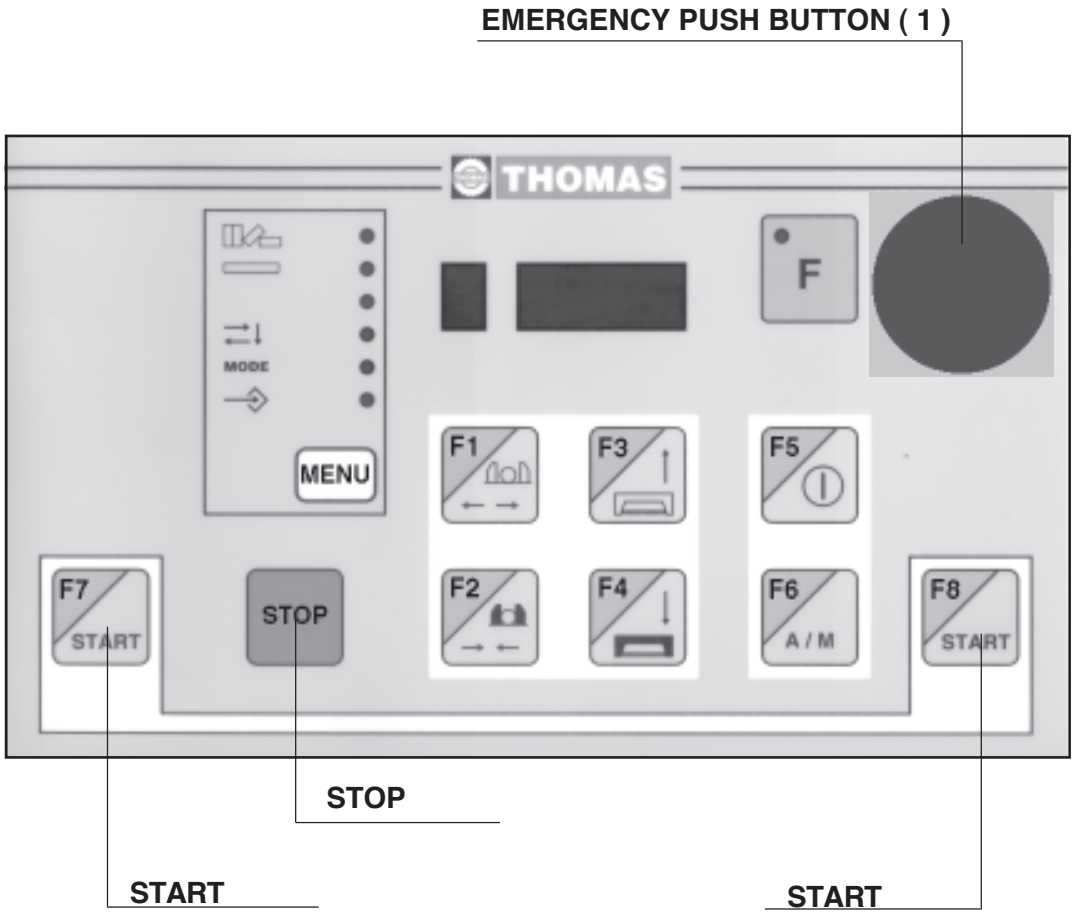




- Set the starting position of the sawframe according to the dimensions of the part to be cut: the blade must be at **10 mm** from the workpiece (see chapter **7**, paragraph *7.5*).
- Set device for the control of the sawframe downfeed speed, adapting to the specifications and the shape of the material to be cut.
- Activate the device controlling the start of the cutting cycle (see paragraph *6.2*).
- Put the piece to be cut inside the vice, approach the vice jaw up to **3 - 4 mm**.
- Start the cutting cycle. Check that blade rotates in the proper direction, the coolant liquid flows regularly and the cutting cycle is carried out properly until the stop of the sawframe at the top position.

Keep your hands off the cutting area

CONTROL UNIT



F1 *Vice opening*
+ F = Piece-counter zero-setting

F2 *Vice locking*
+ F = Piece-counter +10pcs.

F3 *Sawframe raise*
+ F = Piece-counter +1pc.

F4 *Sawframe downfeed*
+ F = Piece-counter -1pc.

F5 *ON/OFF Hydraulic Pump.*

F6 *Manual Cutting (Option)*

F7 *Cycle Start*

F8 *Cycle Start*

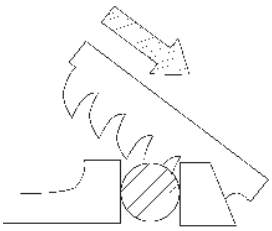
F *Function key (see following instructions)*

MENU' *Diagnosis*

The machine is now ready to start work, bearing in mind that the CUTTING SPEED and the TYPE of BLADE - combined with a suitable lowering of sawframe - are of decisive importance for cutting quality and for machine performance (for further details on this topic, see below in the chapter on "**Material classification and blade selection**").

- **When starting to cut with a new blade, in order to safeguard its life and efficiency, the first two or three cuts must be made while exerting a slight pressure on the part, so that the time taken to cut is about double the normal time** (see below in the chapter on "**Material classification and blade selection**" in the section on *Blade running-in*).
- Press the red emergency button (**1**) when there are conditions of danger or malfunctions in general, so as to stop machine operation immediately.
- Release the red emergency button (**1**) and press the Start key activating the hydraulic pump to continue.

BLADE CUTTING DIRECTION



6.2 - CYCLE START

- The machine is equipped with a double system to start a cutting cycle: in fact, it is possible to start the cutting cycle either from the control panel or from the foot control switch.

  1) from the control panel pressing **F7** or **F8**.

  2) from the foot control pressing the switch.

- The machine comes from the factory with the FOOT CONTROL SWITCH setting. However, if you want to start the cutting cycle from the control panel, you can change the machine setting as follows:

- Switch on the machine, press **F5** key to run the hydraulic pump. Now press and hold the key

so that **F8** can be pressed at the same time for approx. 8 seconds:

- Release both keys as soon as the display starts winking.
- Repeat the same operation if you want to come back to the previous setting.

6.3 - Piece-counter

- The Control Unit counts the number of the cuts automatically. It is possible to programm the number of the cuts so that the machine stops automatically as soon as the programmed number has been reached.
- Press the key:

alongwith one of the following keys :

PIECE-COUNTER ZERO-SETTING

PIECE-COUNTER +1PC.

PIECE-COUNTER -1PC.

PICE-COUNTER +10PCS.

- **Note:** *Make the zero-setting to start again the machine.*

6.4 - Cutting speed (Option)

This device permits to the change the cutting speed from 18 to 90 – m/1'.

To enter the cutting speed operate as follows :

- Close the bow downfeed regulator
- Set up the machine for the cutting process
- Turn the variator handwheel and set up the most suitable speed according to the material to cut. For the set up refer to the following table.
- Open the bow downfeed regulator to start cutting

WARNING : the cutting speed must be changed only when the variator motor is turning.

VOLANTINO VARIATORE POSIZIONE N°	VELOCITA' DI TAGLIO m/min
1	18
2	25,5
3	34
4	41,5
5	49,5
6	57,5
7	65,5
8	73
9	81,5
10	90

6.5 - Manual Cutting (Option)

- It is possible to use the machine manually too.
- Press the key :

F6

- Load the material to be cut and lock the vice.
- Grab the grip-switch on the lever starting the balde rotation and the coolant pump.
- Lower the sawframe to cut the material.
- Press the key '**F6**' again to abandon this function.

6.6 - Emergency

- In case the Display indicates an alphanumeric code
- Press the key:

STOP

- The following codes represent a trouble-shooting guide that helps the operator to find out the problem :

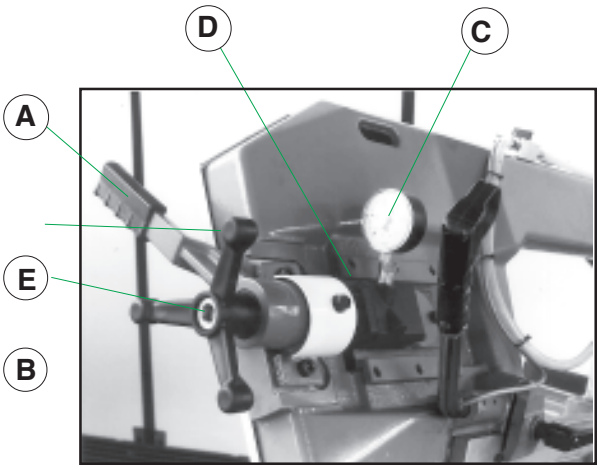
E001	- Release the red push-button. - Thermal relay of the hydr.unit interrupted the circuit. Press the little red button on the relay itself.
E008	- Insufficient blade tension or blade breakage. - Turn Commutateur (6) to Pos.**1** or **2**. - Thermal feeler of Blade Motor interrupted the circuit. Wait some minutes to cool down the Motor. Press the little red button on the relay itself. - Close the flywheel Metal Cover activating the relevant microswitch. - Check coolant liquid pump.
E009	- Press the key '**F5**' (ON/OFF Hydraulic Pump).
E013	- Programmed cut number has been reached. Make piece-counter zero-setting.
E014	- Sawframe limit switch (down).
E015	- Sawframe limit switch (up).

7 REGULATING THE MACHINE

7.1 - Blade tension assembly

The ideal tightening of the blade is achieved by rotating the blade tightening hadwheel (B) clockwise and rotating the lever (A) towards the left against the mechanical stop pin.
Ideal tightening of the blade is 160 BAR read on the relative pressure bar (C).

Note: In case the saw is not used for a period of time, release blade pressure to about 60 - 70 BAR.
Always use blades having the dimensions specified in this manual.

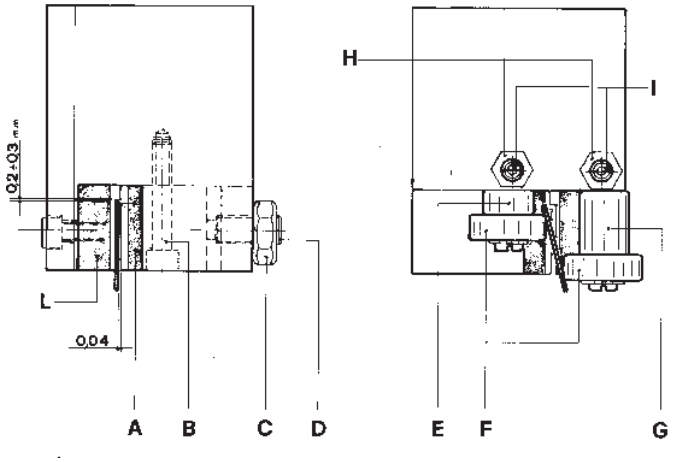


7.2 - Restoring oil level on blade tightening cylinder

The blade pressure can be read on the pressure gauge (C) mounted on the relative blade tightening cylinder allowing constant display of the blade tension. (PATENTED BY THOMAS).
Ideal tightening of the blade is 160 BAR.
Should any problems in the monitoring of the tension occur, this may be caused by the reduced capacity inside the blade tightening cylinder due to an oil leak.
Simply push the blade tightening cylinder stem (E) back into place and then restoring oil level through plug (D).
Use SHELL HYDRAULIC OIL 32 type oil or similar.
When this operation has been completed close the plug (D) and tighten the blade.

7.3 - Blade guide blocks

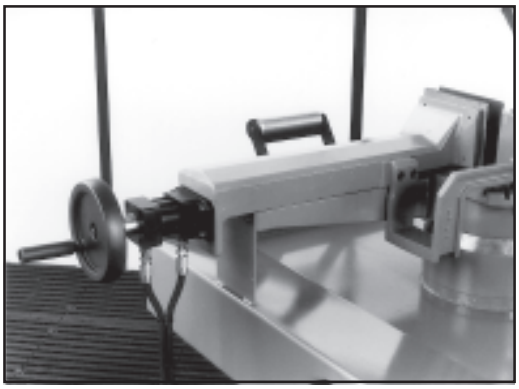
The blade is guided by means of adjustable pads set in place during inspection as per the thickness of the blade with minimum play as shown in the figure.



In case the blade needs to be replaced, make sure to always install 0,9 mm thick blades for which the blade guide pads have been adjusted. In the case of toothed blades with different thicknesses adjustment should be carried out as follows:
- Loosen nut (C), screw (B) and loosen dowel (D) widening the passage between the pads.
- Loosen the nuts (H) and the dowels (I) and rotate the pins (E - G) to widen the passage between the bearings (F).
- Mount the new blade, place the pad (A) on the blade and, loosening the dowel, allow a play of 0,04 mm for the sliding of the toothed blade; lock the relative nut and screw (B):
- Rotate the pins (E - G) until the bearings rest against the blade as indicated in the figure and then secure the dowels (I) and nut (H).
- Make sure that between the blade and the upper teeth of the block (L) this is at least 0,2 - 0,3 mm of play; if necessary, loosen the screws that fasten the blocks and adjust accordingly.

7.4 - Vice

- The device does not require any particular adjustment; in case of excess paly the sliding guide, tighten slide screw more.



7.5 - Saw frame return stroke limiting device

It consists in a mechanical adjustment system to reduce the passive phases of the operating cycle, in other words to eliminate the idle stroke that takes place when the size of the part to be cut is much smaller than the maximum cutting capacity. Practically, you adjust the starting position of the blade in proximity of the part, independently of its dimensions.

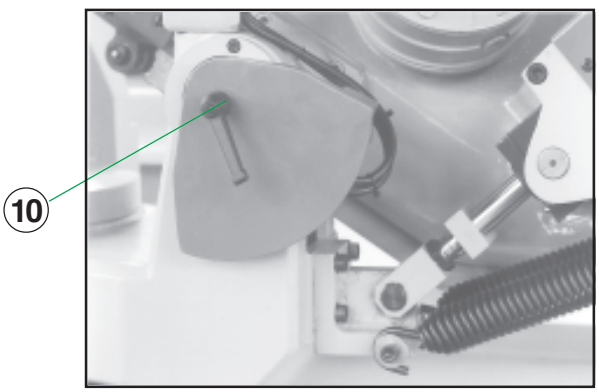
- Slightly open the regulator controlling sawframe downfeed.
- Loose the handle (**10**).
- Move the sawframe either up or down approaching the blade to **10mm** from the workpiece.

F4 ***DOWN***

F3 ***UP***

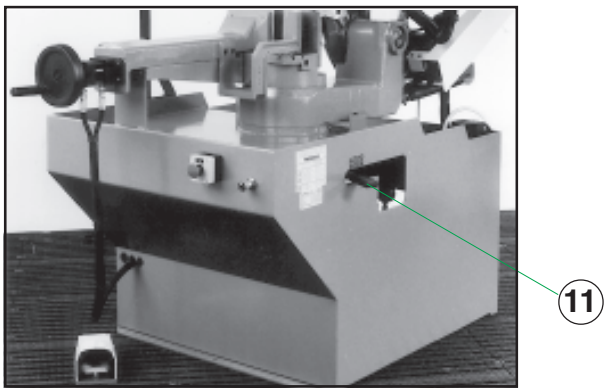
- Lock the handle (**10**).

- Attention: It is not necessary to adjust the mechanical stop everytime; one can bring the blade near the workpiece and then start the automatic cutting cycle which will take place from the actual position of the blade.
- Once the cut is completed, the sawframe will raise to the upper position (striking the relevant microswitch).



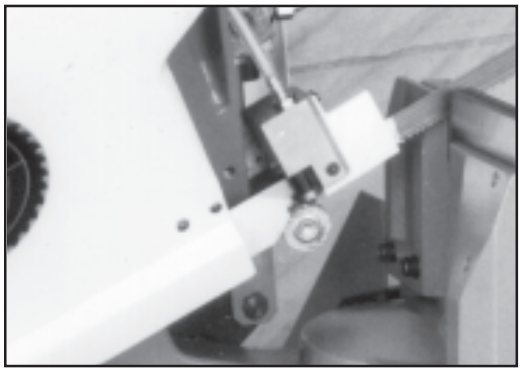
7.6 - Cutting angle adjustment

- Release lever (11), rotate the saw frame arm until it reaches the mechanical stop position at far angle and check that the zero index corresponds to 45°; if necessary operate on the rotation stop screws to meet the index.
- Make sure that the wanted angle perfectly meets with the reference index before locking with the lever (11).



7.7 - Blade cleaning brush

It is an ideal accessory for the cleaning of the blade during the cutting cycle. Periodically check the condition of the brush and if necessary proceed to further adjustment to ensure cleaning of the blade.



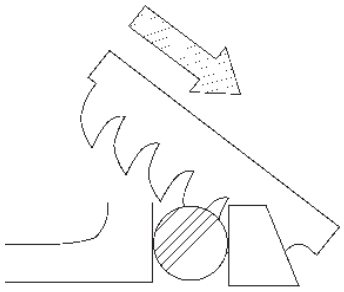
BEFORE PERFORMING THE FOLLOWING OPERATIONS, THE ELECTRIC POWER SUPPLY AND THE POWER CABLE MUST BE COMPLETELY DISCONNECTED.

7.8 - Changing the blade

- Lift the saw frame in upmost position.
- Loosen the blade with the handwheel, remove the mobile blade-guide cover, open the flywheel guard and remove the old blade from the flywheels and the blade guide blocks.
- Assemble the new blade by placing it first between the pads and then on the races of the flywheels, paying particular attention to the cutting direction of the teeth (*blade rotation diagram* page 8).
- Tension the blade to a pressure of 160 BAR and make sure it perfectly fits inside the races of the flywheels.
- Assemble the mobile blade-guide cover and the flywheel guard making sure that the safety microswitch is activated otherwise when electric connection will be restored the machine will not start.

WARNING: always use blades having dimensions specified in this manual and for which the blade guide heads have be set: otherwise, see chapter on **"Description of the operating cycle"** in the section *Starting-up.*

CUTTING DIRECTION



7.9 - Replacing saw frame return spring

- When performing this operation it is necessary to keep saw frame up using the lifting device.
- Replace the spring by loosening the upper coupling rod and releasing it from the lower tie-rod.

RELY ON SKILLED AND QUALIFIED PERSONNEL TO REPLACE OTHER MACHINE MEMBERS SUCH AS REDUCTION UNIT OR VARIATOR, PUMP MOTOR AND ELECTRICAL COMPONENTS.

8 ROUTINE AND SPECIAL MAINTENANCE

THE MAINTENANCE JOBS ARE LISTED BELOW, DIVIDED INTO DAILY, WEEKLY, MONTHLY AND SIX-MONTHLY INTERVALS. IF THE FOLLOWING OPERATIONS ARE NEGLECTED, THE RESULT WILL BE PREMATURE WEAR OF THE MACHINE AND POOR PERFORMANCE.

8.1 - Daily maintenance

- General cleaning of the machine to remove accumulated shavings.
- Clean the lubricating coolant drain hole to avoid excess fluid.
- Top up the level of lubricating coolant.
- Check blade for wear.
- Rise of saw frame to top position and partial slackening of the blade to avoid useless yield stress.
- Check functionality of the shields and emergency stops.

8.2 - Weekly maintenance

- More accurate general cleaning of the machine to remove shavings, especially from the lubricant fluid tank.
- Removal of pump from its housing, cleaning of the suction filter and suction zone.
- Clean the filter of the pump suction head and the suction area.
- Cleaning with compressed air the blade guide heads (guide bearings and drain hole of the lubricating cooling).
- Cleaning flywheel housings and blade sliding surfaces on flywheels.
- Check the condition of the blade cleaning brushes.

8.3 - Monthly maintenance

- Check the tightening of the motor flywheel screws.
- Check the tightening of the transmission flywheel ring nut.
- Check that the blade guide bearings on the heads are perfect running condition.
- Check the tightening of the screws of the gearmotor, pump and accident protection guarding.
- Check shields.

8.4 - Six-monthly maintenance
(every 2000 hours)

REDUCTION UNIT
- The worm drive gear box mounteed on the machine is maintenance-free guaranteed by its manufacture.
- Change grease using a long duration fluid for gearings such as IP ATINA 0, or ESSO FIBER - GREASE 370 or TOTAL CALIDRIS 0 or similar. Lubricate bearings using "extreme pressure grease" DIN 51825 K-P-F2K by adding grease throught the plug.
- Replace oil in the hydraulic unit with SHELL HYDRAULIC OIL 32 or MOBIL DTE 13 or again AGIP OSO 32 or similar.
- Check continuity of the equipotential protection circuit.

8.5 - Oils for lubricating coolant

Considering the vast range of products on the market, the user can choose the one most suited to his own requirements, using as reference the type SHELL LUTEM OIL ECO.
THE MINIMUM PERCENTAGE OF OIL DILUTED IN WATER IS 8 - 10 %.

8.6 - Oil disposal

The disposal of these products is controlled by strict regulations. Please see the Chapter on "**Machine dimensions - Transport - Installation**" in the section on *Dismantling*.

8.7 - Special maintenance

Special maintenance operations must be carried out by skilled personnel. However, we advise contacting THOMAS or their dealer and/or importer. Also the reset of protective and safety equipment and devices, of the reducer, the motor, the motor pump and electric components is to be considered extraordinary maintenance.

9 MATERIAL CLASSIFICATION AND CHOICE OF TOOL

Since the aim is to obtain excellent cutting quality, the various parameters such as **hardness of the material, shape and thickness, transverse cutting section** of the part to be cut, **selection of the type of cutting blade, cutting speed** and **control of saw frame lowering**.These specifications must therefore be harmoniously combined in a single operating condition according to practical considerations and common sense, so as to achieve an optimum condition that does not require countless operations to prepare the machine when there are many variations in the job to be performed.The various problems that crop up from time to time will be solved more easily if the operator has a good knoledge of these specifications.
WE THEREFORE RECOMMEND YOU TO ALWAYS USE GENUINE "THOMAS" SPARE BLADES THAT GUARANTEE SUPERIOR QUALITY AND PERFORMANCE.

9.1 - Definition of materials

The table at the foot of the page lists the characteristics of the materials to be cut, so as to choose the right tool to use.

9.2 - Selecting blade

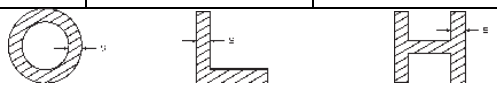
First of all the pitch of the teeth must be chosen, in the other words, the number of teeth per inch (25,4 mm) suitable for the material to be cut, according to these criteria:
- parts with a thin and/or variable section such as profiles, pipes and plate, need close toothing, so that the number of teeth used simultaneously in cutting is from 3 to 6;
- parts with large transverse sections and solid sections need widely spaced toothing to allow for the greater volume of the shavings and better tooth penetration;
- parts made of soft material or plastic (light alloys, mild bronze, teflon, wood, etc.) also require widely spaced toothing;
- pieces cut in bundles require combo tooth design.

9.3 - Teeth pitch

As already stated, this depends on the following factors:
- **hardness of the material**
- **dimensions of the section**
- **thickness of the wall**

BLADE TEETH SELECTION TABLE

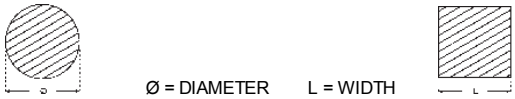
THICKNESS MM	Z CONTINUOUS TOOTH DESIGN	Z COMBO TOOTH DESIGN
TILL 1.5	14	10/14
FROM 1 TO 2	8	8/12
FROM 2 TO 3	6	6/10
FROM 3 TO 5	6	5/8
FROM 4 TO 6	6	4/6
MORE THAN 6	4	4/6



S = THICKNESS

TYPES OF STEEL						CHARACTERISTICS		
USE	I UNI	D DIN	F AF NOR	GB SB	USA AISI-SAE	Hardness BRINELL HB	Hardness ROCKWELL HRB	R=N/mm²
Construction steels	Fe360 Fe430 Fe510	St37 St44 St52	E24 E28 E36	---- 43 50	---- ---- ----	116 148 180	67 80 88	360÷480 430÷560 510÷660
Carbon steels	C20 C40 C50 C60	CK20 CK40 CK50 CK60	XC20 XC42H1 ---- XC55	060 A 20 060 A 40 ---- 060 A 62	1020 1040 1050 1060	198 198 202 202	93 93 94 94	540÷690 700÷840 760÷900 830÷980
Spring steels	50CrV4 60SiCr8	50CrV4 60SiCr7	50CV4 ----	735 A 50 ----	6150 9262	207 224	95 98	1140÷1330 1220÷1400
Alloyed steels for hardening and tempering and for nitriding	35CrMo4 39NiCrMo4 41CrAlMo7	34CrMo4 36CrNiMo4 41CrAlMo7	35CD4 39NCD4 40CADG12	708 A 37 ---- 905 M 39	4135 9840 ----	220 228 232	98 99 100	780÷930 880÷1080 930÷1130
Alloyed casehardening steels	18NiCrMo7 20NiCrMo2	---- 21NiCrMo2	20NCD7 20NCD2	En 325 805 H 20	4320 4315	232 224	100 98	760÷1030 690÷980
Alloyed for bearings	100Cr6	100Cr6	100C6	534 A 99	52100	207	95	690÷980
Tool steel	52NiCrMoKU C100KU X210Cr13KU 58SiMo8KU	56NiCrMoV7C100KU C100W1 X210Cr12 ----	---- ---- Z200C12 Y60SC7	---- BS 1 BD2-BD3 ----	---- S-1 D6-D3 S5	244 212 252 244	102 96 103 102	800÷1030 710÷980 820÷1060 800÷1030
Stainless steels	X12Cr13 X5CrNi1810 X8CrNi1910 X8CrNiMo17133	4001 4301 ---- 4401	---- Z5CN18.09 ---- Z6CDN17.12	---- 304 C 12 ---- 316 S 16	410 304 ---- 316	202 202 202 202	94 94 94 94	670÷885 590÷685 540÷685 490÷685
Copper alloys Special brass Bronze	Aluminium copper alloy G-CuAl11Fe4Ni4 UNI 5275 Special manganese/silicon brass G-CuZn36Si1Pb1 UNI5038 Manganese bronze SAE43 - SAE430 Phosphor bronze G-CuSn12 UNI 7013/2a					220 140 120 100	98 77 69 56,5	620÷685 375÷440 320÷410 265÷314
Cast iron	Gray pig iron G25 Spheroidal graphite cast iron GS600 Malleable cast iron W40-05					212 232 222	96 100 98	245 600 420

SOLID Ø OR L MM	Z CONTINUOUS TOOTH DESIGN	Z COMBO TOOTH DESIGN
TILL 30	8	5/8
FROM 30 TO 60	6	4/6
FROM 40 TO 80	4	4/6
MORE THAN 90	3	3/4



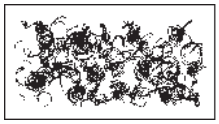
9.4 - Cutting and advance speed

The cutting speed (m/min) and the advance speed (cm^2/min = area travelled by the blade during removal of chip) are limited by the development of heat close to the tips of the teeth.
- The cutting speed is subordinate to the resistance of the material (R = N/mm^2), to its hardness (HRC) and to the dimensions of the widest section.
- Too high an advance speed (= lowering of the saw frame) tends to cause the blade to deviate from the ideal cutting path, producing non rectilinear cuts on both the vertical and the horizontal plane.

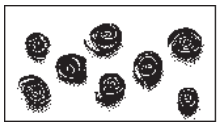
The best combination of these two parameters can be seen directly examining the chips.

Long spiral-shaped chips indicate ideal cutting.

Very fine or pulverized chips indicate lack of feed and/or cutting pressure.



Thick and/or blue chips indicate overload of the blade.



9.5 - Blade running-in

When cutting for the first time, it is good practice to run in the tool making a series of cuts at a low advance speed (= 30-35 cm^2/min on material of average dimensions with respect to the cutting capacity and solid section of normal steel with R = 410-510 N/mm^2), **generously spraying the cutting area with lubricating coolant.**

9.6 - Blade structure

Bi-metal blades are the most commonly used. They consist in a silicon-steel blade backing with electron beam or laser welded high speed steel (HHS) cutting edge. The type of stocks are classified in M2, M42, M51 and differ from each other because of their major hardness due to the increasing percentage of Cobalt (Co) and molybdenum (Mo) contained in the metal alloy.

9.7 - Blade type

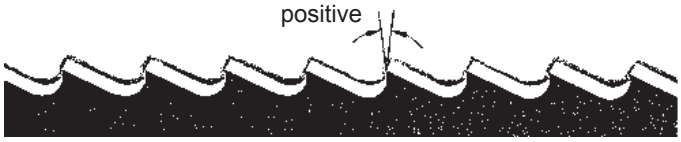
They differ essentially in their constructive characteristics, such as:
- **shape** and cutting **angle** of tooth
- **pitch**
- **set**

Shape and angle of tooth

REGULAR TOOTH: 0° rake and const ant pitch.

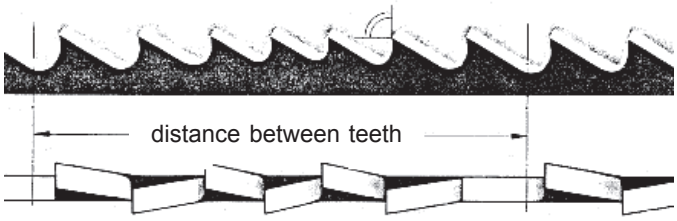
Most common form for transversal or inclined cutting of solid small and average cross-sections or pipes, in laminated mild steel and grey iron or general metal.

POSITIVE RAKE TOOTH: 9° - 10° positive rake and const ant pitch.



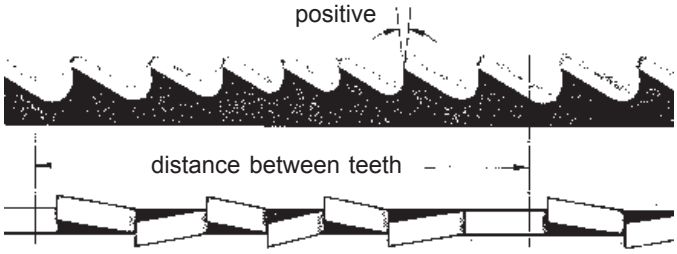
Particular use for crosswise or inclined cuts in solid sections or large pipes, but above all harder materials (highly alloyed and stainless steels, special bronze and forge pig).

COMBO TOOTH: pitch varies between teeth and consequently varying teeth size and varying gullet depths. Pitch varies between teeth which ensures a smoother, quieter cut and longer blade life owing to the lack of vibration.



Another advantage offered in the use of this type of blade in the fact that with an only blade it is possible to cut a wide range of different materials in size and type.

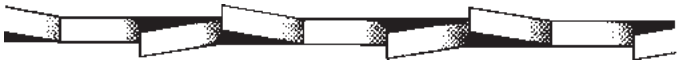
COMBO TOOTH: 9° - 10° positive rake.



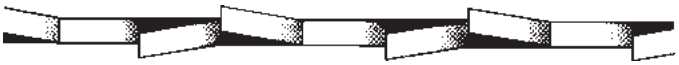
This type of blade is the most suitable for the cutting of section bars and large and thick pipes as well as for the cutting of solid bars at maximum machine capacity. Available pitches: 3-4/4-6.

Set

Saw teeth bent out of the plane of the saw body, resulting in a wide cut in the workpiece.



REGULAR OR RAKER SET: Cutting teeth right and left, alternated by a straight tooth.



Of general use for materials with dimensions superior to 5 mm. Used for the cutting of steel, castings and hard nonferrous materials.

WAVY SET: Set in smooth waves.

This set is associated with very fine teeth and it is mainly used for the cutting of pipes and thin section bars (from 1 to 3 mm).

ALTERNATE SET (IN GROUPS): Groups of cutting teeth right and left, alternated by a straight tooth.

This set is associated with very fine teeth and it is used for extremely thin materials (less than 1 mm).

ALTERNATE SET (INDIVIDUAL TEETH): Cutting teeth right and left.

This set is used for the cutting of nonferrous soft materials, plastics and wood.

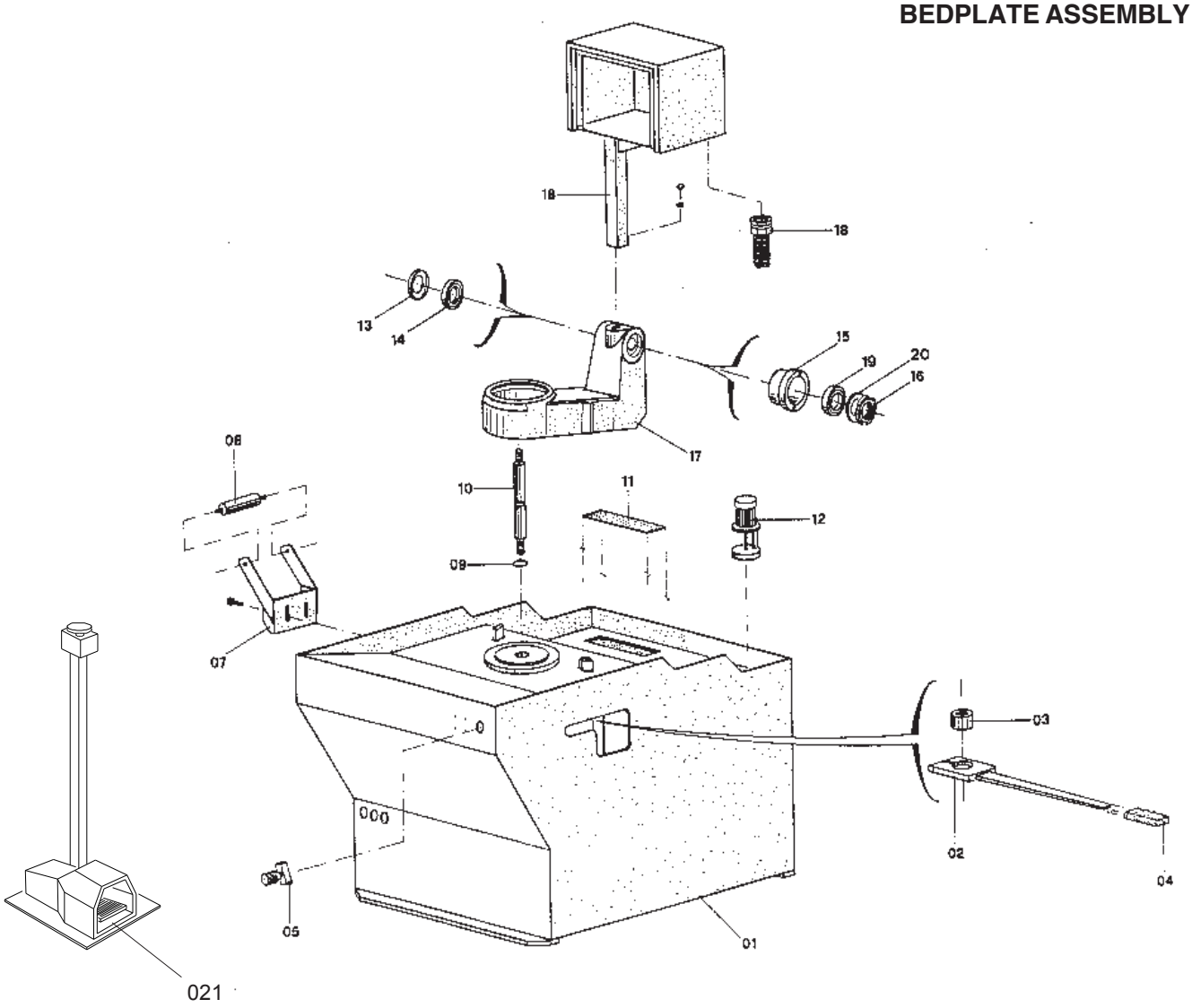
9.7.1 - RECOMMENDED CUTTING PARAMETERS

STEEL	CUTTING SPEED	LUBRICATION	REMOVAL cm²/min
CONSTRUCTION	60/80	EMULSIFIABLE OIL	40/60
CEMENTATION	40/50	EMULSIFIABLE OIL	20/40
CARBON STEEL	40/60	EMULSIFIABLE OIL	40/60
HARDENING AND TEMPERING	40/50	EMULSIFIABLE OIL	30/50
BEARINGS	40/60	EMULSIFIABLE OIL	15/30
SPRINGS	40/60	EMULSIFIABLE OIL	10/30
FOR TOOLS	30/40	EMULSIFIABLE OIL	6/20
FOR VALVES	35/50	EMULSIFIABLE OIL	20/30
STAINLESS STEEL	30/40	EMULSIFIABLE OIL	6/20
SPHEROIDAL GRAPHITE	20/40	EMULSIFIABLE OIL	6/30
CAST IRON	40/60	EMULSIFIABLE OIL	30/60
ALUMINIUM	80/600	KEROSENE	60/450
BRONZE	70/120	EMULSIFIABLE OIL	40/70
HARD BRONZE	30/60	EMULSIFIABLE OIL	6/20
BRASS	70/350	EMULSIFIABLE OIL	25/80
COPPER	50/720	EMULSIFIABLE OIL	——

10 MACHINE COMPONENTS

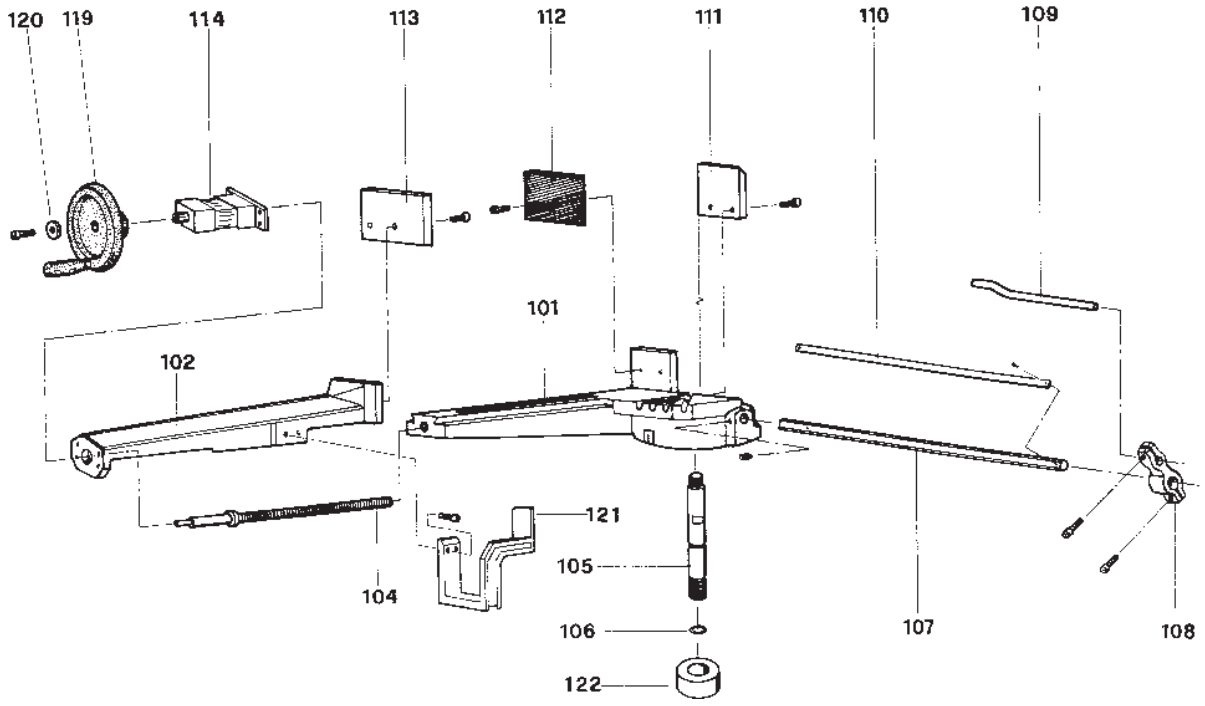
10.1 - List of spare parts

BEDPLATE ASSEMBLY



REFERENCE N°	DESCRIPTION	REFERENCE N°	DESCRIPTION
001	Bed	012	Electropump
002	Arm locking lever	013	Ring NILOS 32010 XAV
003	Arm locking bushing	014	Bearing 32010 X
004	Lever handgrip	015	Eccentric bushing
005	Saw frame lowering adjustment	016	Ring nut GUK M 45 x 1,5
		017	Revolving arm
006	Emergency push-button	018	Electric box
007	Roller supporting arm	019	Bearing 32009 X
008	Roller	020	Ring NILOS 32009 XAV
009	Ring OR 4081	021	CYCLE START pedal
010	Revolving arm locking pin		
011	Grid		

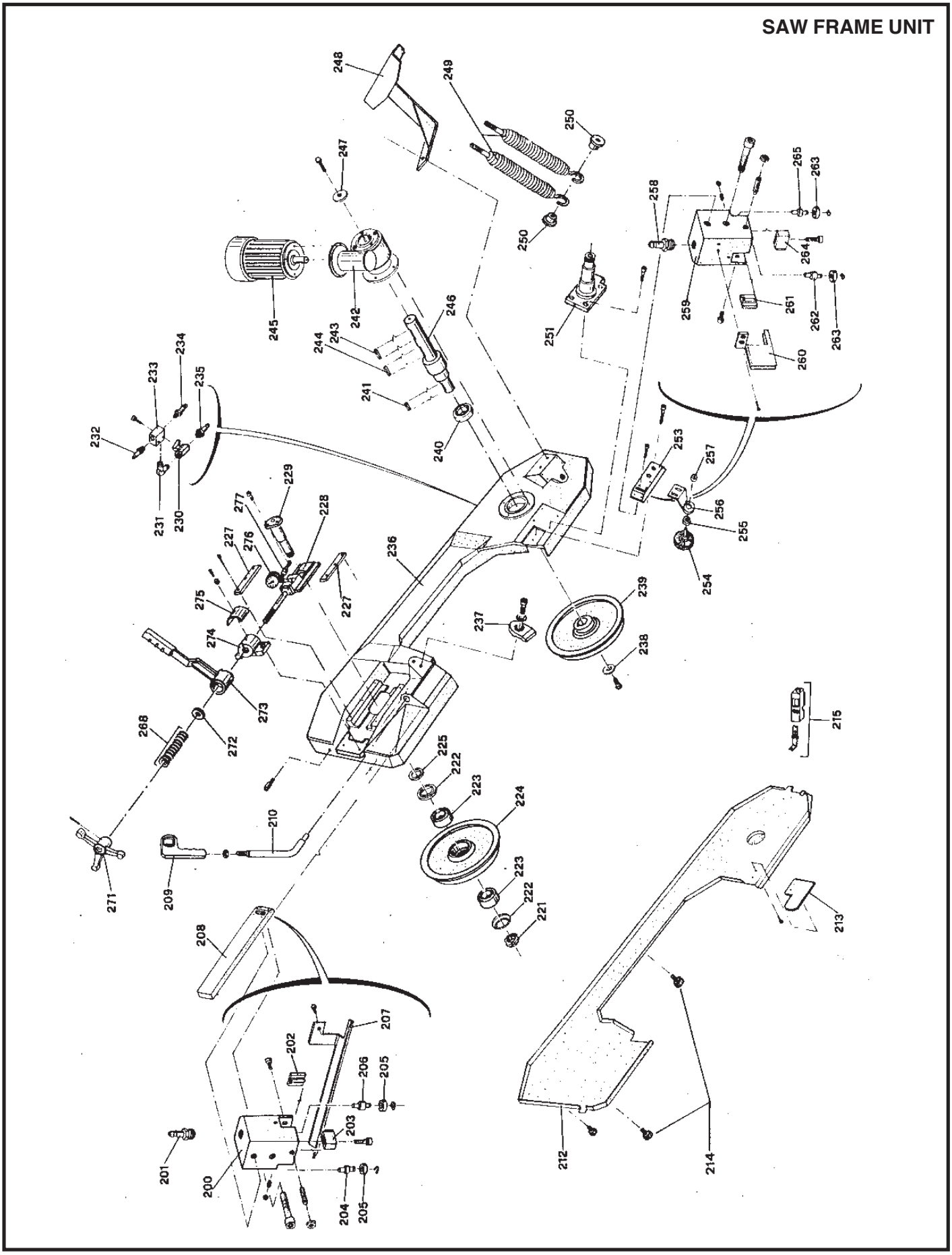
HYDRAULIC VICE



REFERENCE N°	DESCRIPTION
101	Countervice
102	Vice
103	
104	Vice thread for hydraulic drive
105	Saw frame arm rotation pin
106	O-Ring 4081
107	Bar-stop rod
108	Bar-stop
109	Bar-stop push rod
110	Millimetre ruller
111	No-burr jaw

REFERENCE N°	DESCRIPTION
112	Counter vice iaw
113	Vice jaw
114	Hydrailic drive vice cylinder
119	Vice handwheel
120	Washer
121	No-burr plate
122	Locking bush

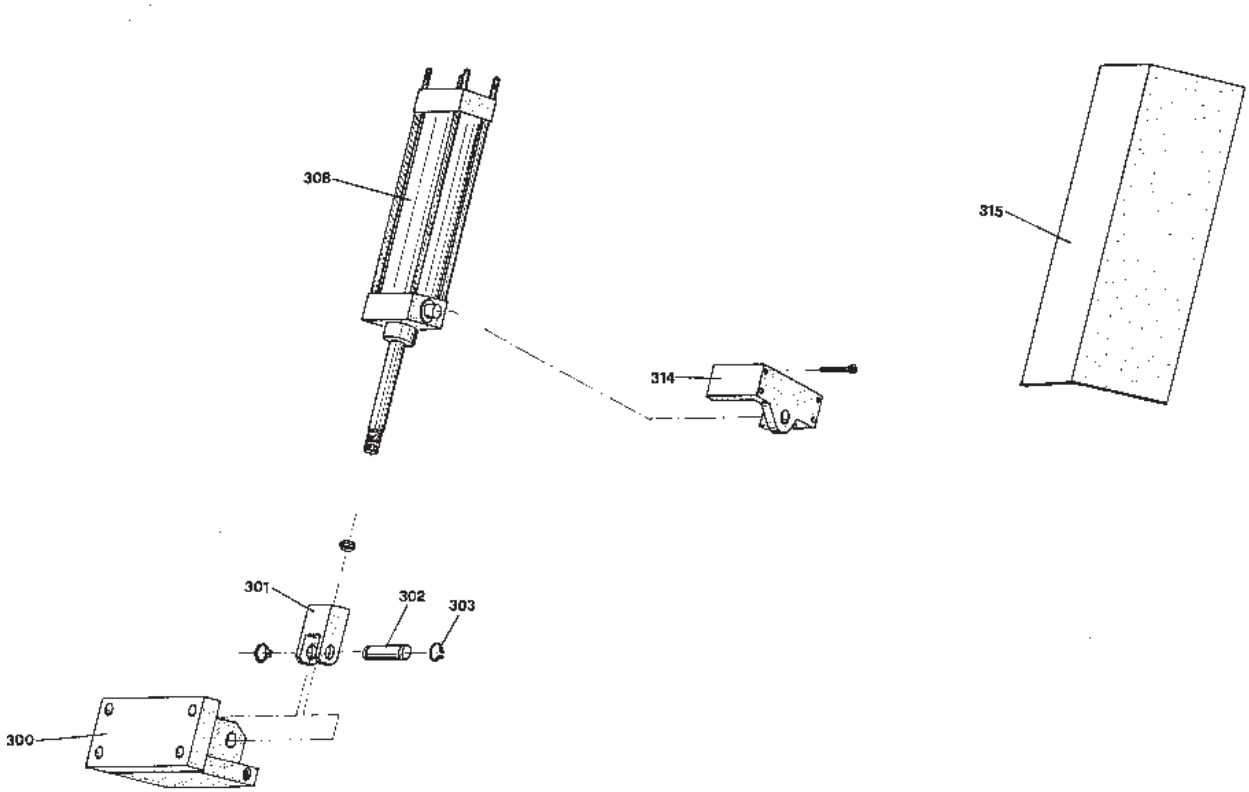
SAW FRAME UNIT



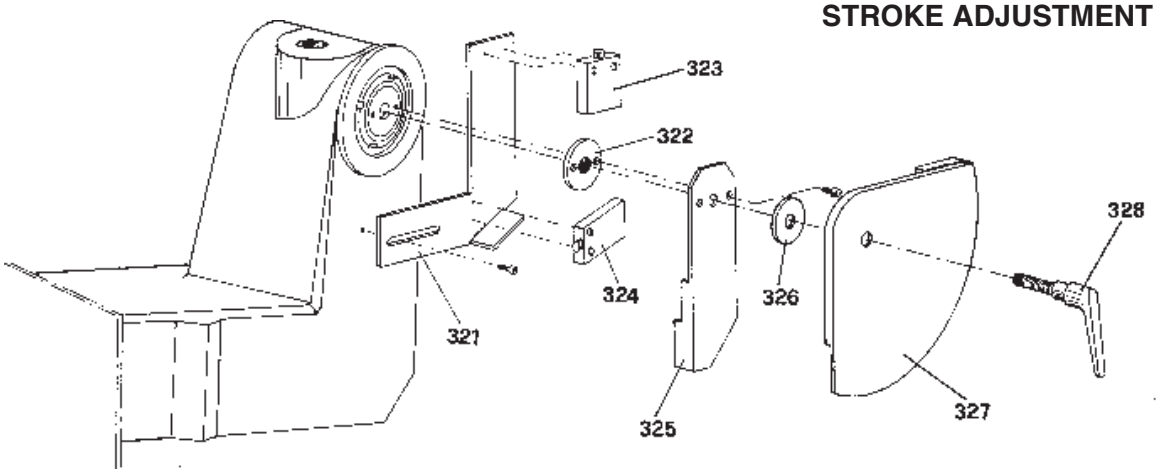
REFERENCE N°	DESCRIPTION
200	Adjustable blade guide block
201	Coupling
202	Fixed blade guide plate
203	Movable blade guide plate
204	Short eccentric pin
205	Bearing 608 2RS
206	Long eccentric pin
207	Blade guard on adjustable block
208	Blade guide adjustable rod
209	Handgrip with STZ switch
210	
211	
212	Saw frame guard
213	Fixed block l.h. blade guard
214	Saw frame knob
215	Safety microswitch
216	
217	
218	
219	
220	
221	GUK M 30x1.5 ring nut
222	Nilos 32006 XAV ring
223	Bearing 32006
224	Transmission flywheel
225	Transmission flywheel spacer ring
226	Guard closing clip
227	Blade tightening gib
228	Blade tension cylinder
229	Transmission flywheel pin
230	Cooling liquid cock
231	Union
232	Coupling
233	Cooling distributor
234	Coupling
235	Coupling
236	Flywheel saw frame
237	Adjustable rod block bracket
238	Motor flywheel washer
239	Motor flywheel
240	Bearing 6208 2RS
241	Key
242	Reduction unit
243	Key
244	Key
245	Three-phase motor
246	Motor flywheel shaft
247	Washer
248	Spring coupling blade
249	Saw frame spring
250	Saw frame return spring bushing

REFERENCE N°	DESCRIPTION
251	Hinge pin
252	
253	Blade guide fixed rod
254	Blade cleaning brush
255	Bearing 626 2RS
256	Blade cleaning brush support
257	Brush return ring
258	Coupling
259	Fixed blade guide block
260	Additional protection
261	Fixed blade guide plate
262	Long eccentric pin
263	Bearing 608 2RS
264	Movable blade guide plate
265	Short eccentric pin
266	
267	
268	Spring
269	
270	
271	Blade tension handwheel
272	Bearing AX 2542+CP
273	Quick blade tension lever
274	Lever support
275	Protection
276	Pressure gauge
277	Pressure switch

SAW FRAME DRIVE CYLINDER



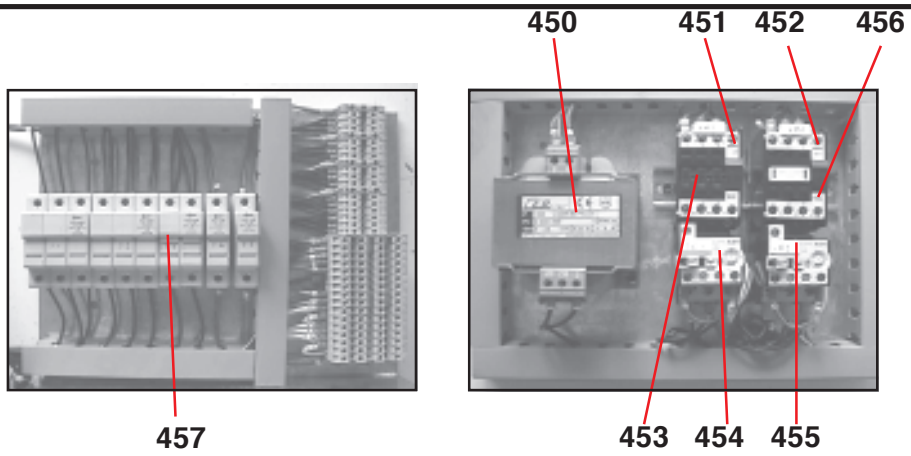
STROKE ADJUSTMENT UNIT



REFERENCE N°	DESCRIPTION	REFERENCE N°	DESCRIPTION
300	Front attachment boit	321	Microswitch plate
301	Cylinder fork	322	Bushing
302	Fork pin	323	Upper endstroke microswitch
303	Seeger ring Ø 20	324	Lower endstroke microswitch
308	Cylinder	325	Plate for sawframe low pos.
314	Cylinder coupling boit	326	Washer
315	Cylinder guard	327	Plate for sawframe upper position
		328	Handle

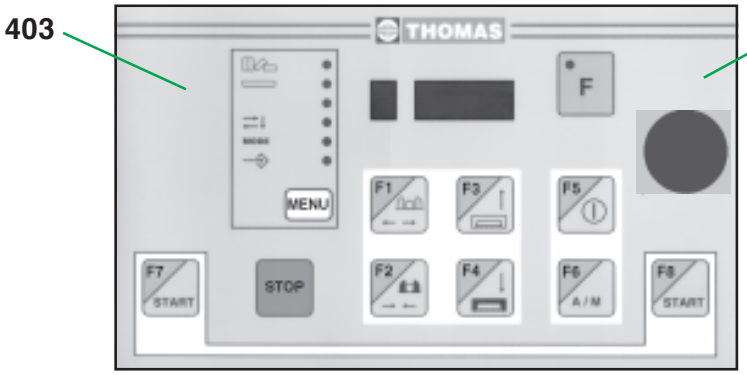
WIRING

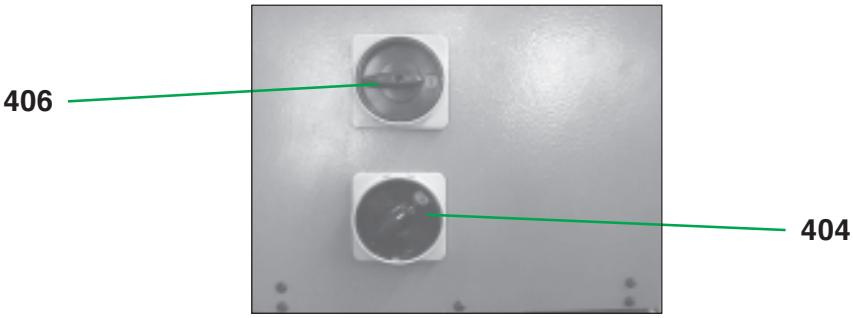
450 Transformer TC
451 Contact aux.
452 Contact aux.
453 Remote switch KM1
454 Thermal relay FR1
455 Thermal relay FR2
456 Remote switch KM2
457 Fuse cartridge



CONTROL UNIT

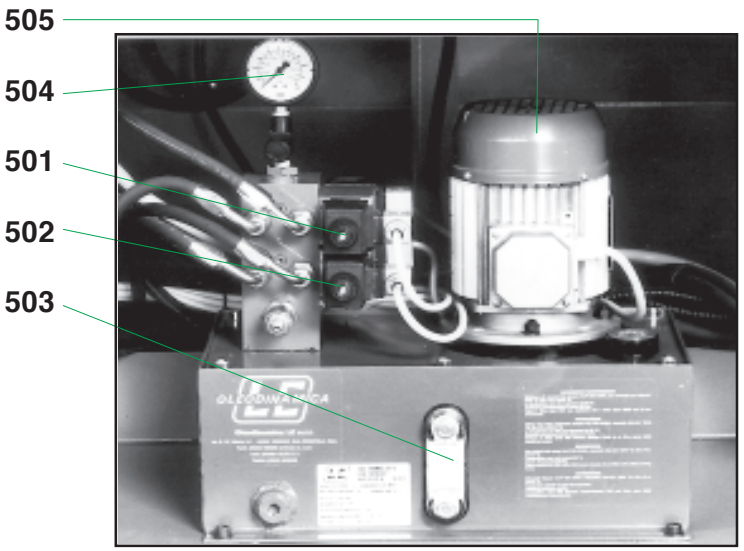
401 Emergency push button
402
403 Instrument 'SAW1'
404 Commutator
405 Sawframe downfeed regulator
406 Main switch

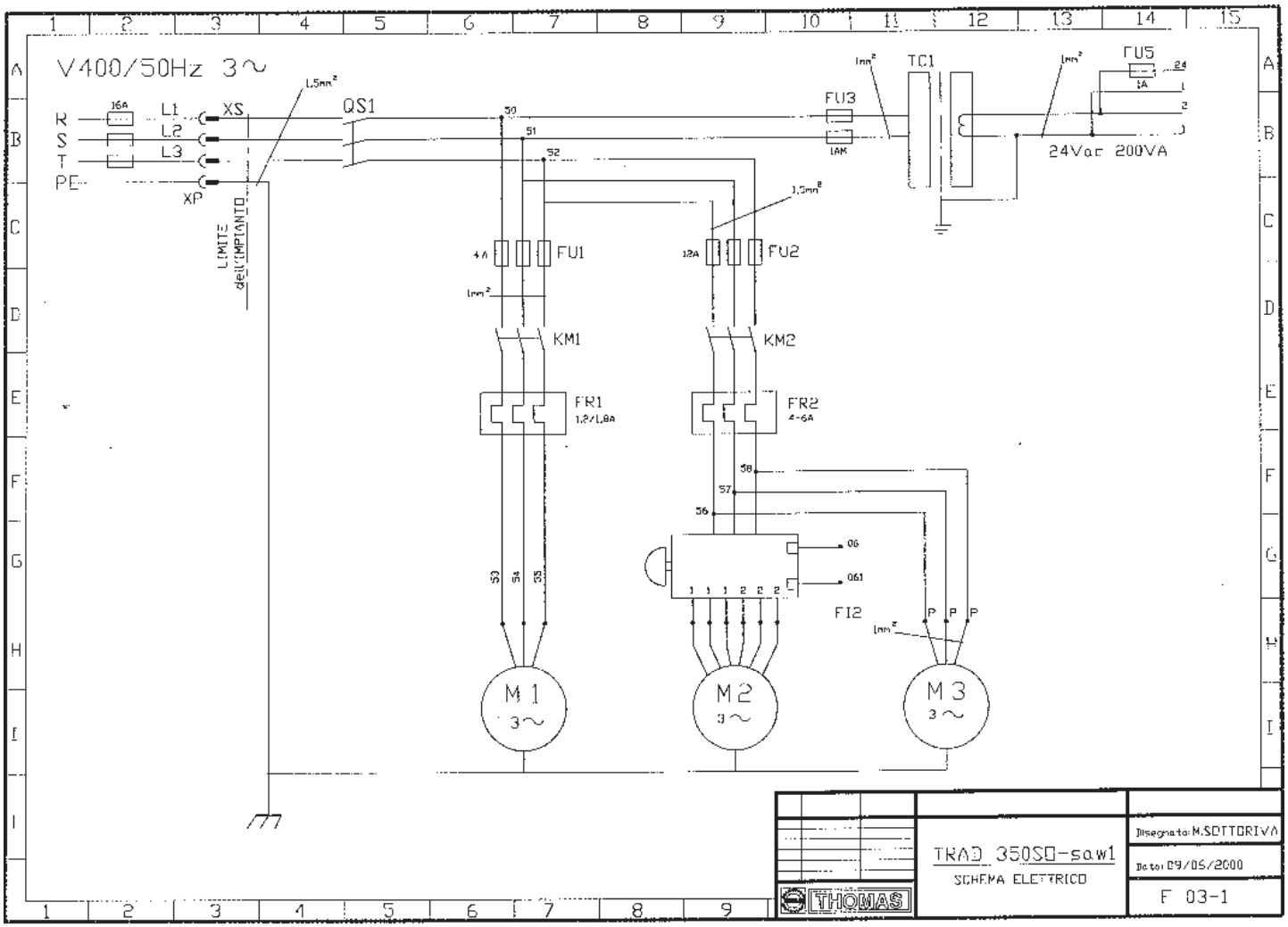




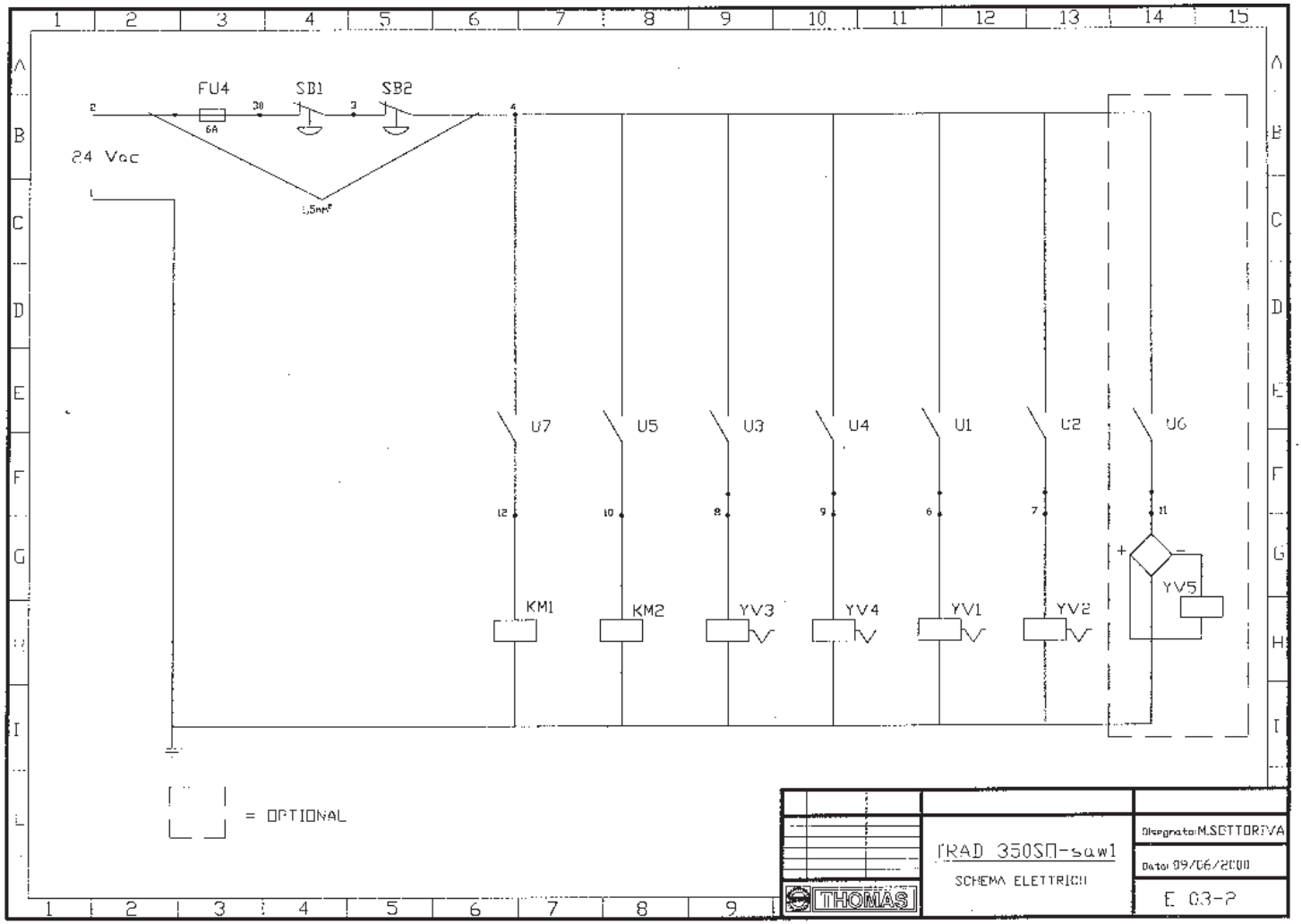
HYDRAULIC PUMP

501 Electrovalve -Vice-
502 Electrovalve -Sawframe-
503 Oil level
504 Manometer
505 Motor

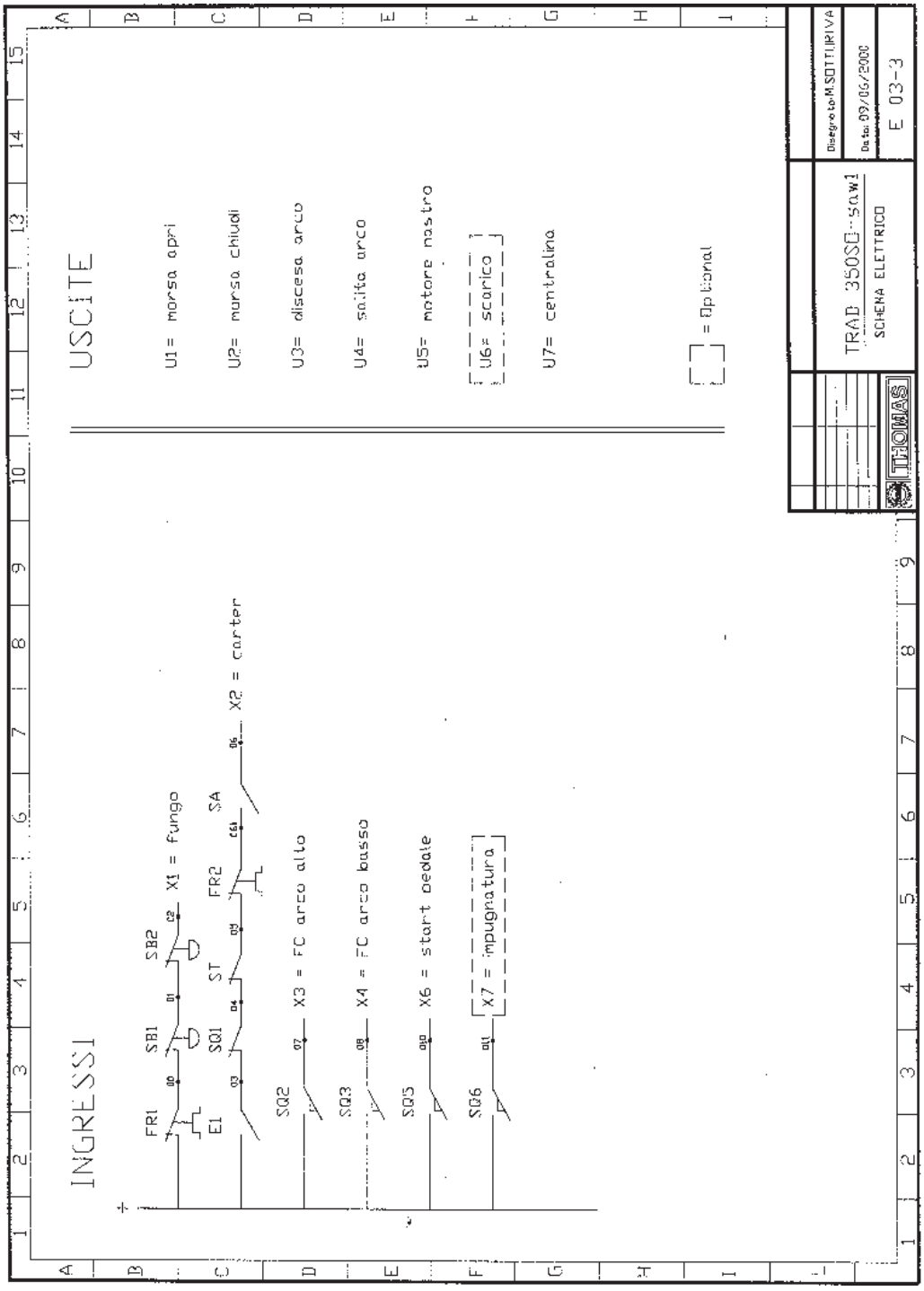


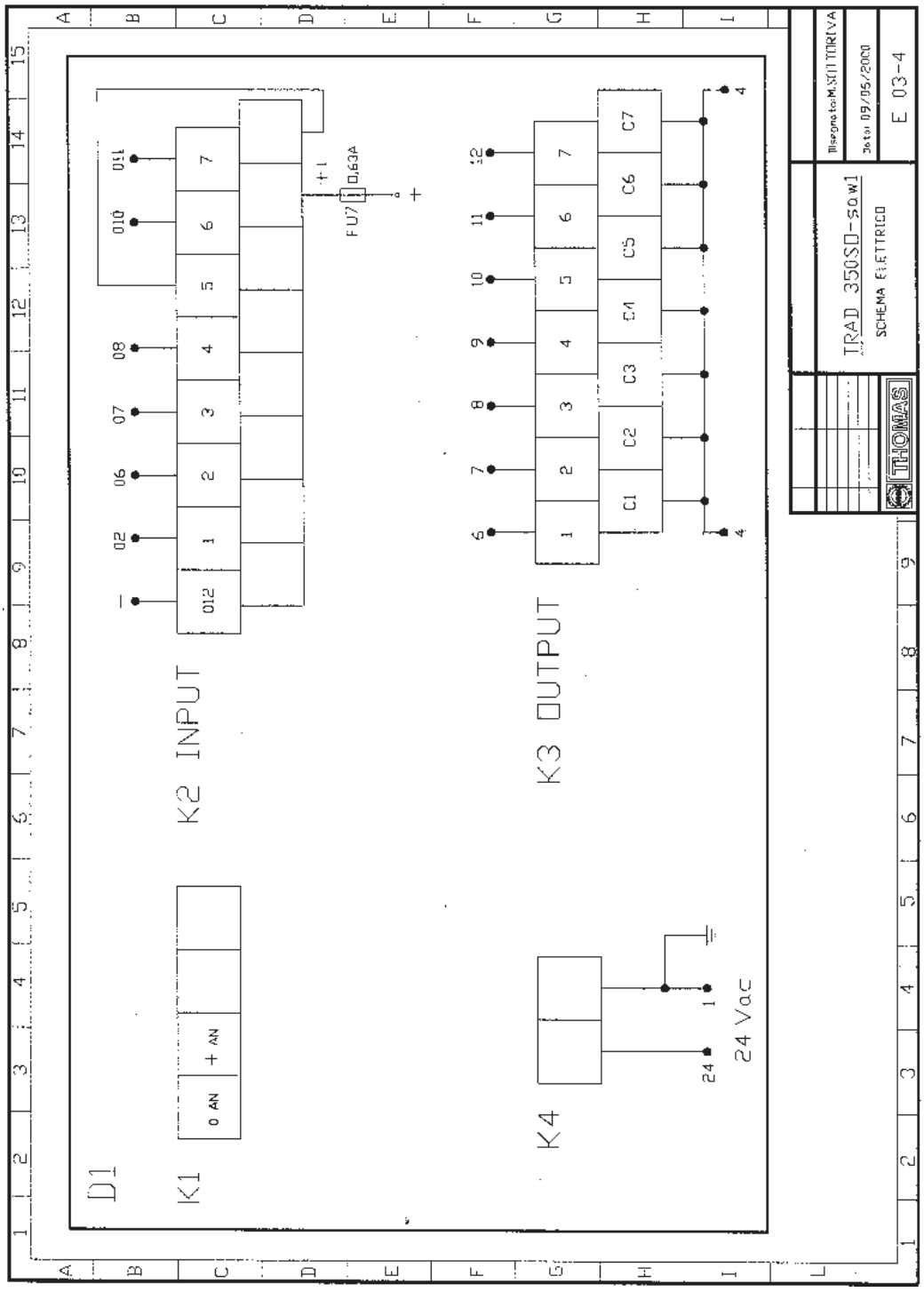


CODE	DESCRIPTION
QS1	Main disconnect switch
FU1	Fuse cartridge
FU2	Fuse cartridge
FU3	Fuse cartridge
KM1	Remote control switch
KM2	Remote control switch
SA	Speed switch
TC	Transformer
M1	Hydraulic unit three-phase motor
M2	Belt three-phase motor
M3	Pump
SQ1	Blade guard microswitch
SQ2	Cycle start microswitch
SQ3	Low saw frame microswitch
SQ4	Up saw frame microswitch
SB1	Emergency push-button
SB2	Light button
SB3	Cycle start push-button
KT	Base timer
ST1	Band motor temperature probe
FR1	Central temperature relay
E	Pressure switch
SA2	Saw frame moving selector
KA1	Auxiliary relay
KA2	Auxiliary relay
KA3	Auxiliary relay
KA4	Auxiliary relay
KA5	Auxiliary relay
YV1	Saw frame solen. valve bow dowfeed
YV2	Saw frame solen. valve bow upstroke
YV3	Vice solenoid valve
KT	Timer Auxiliary contact
HL	Light

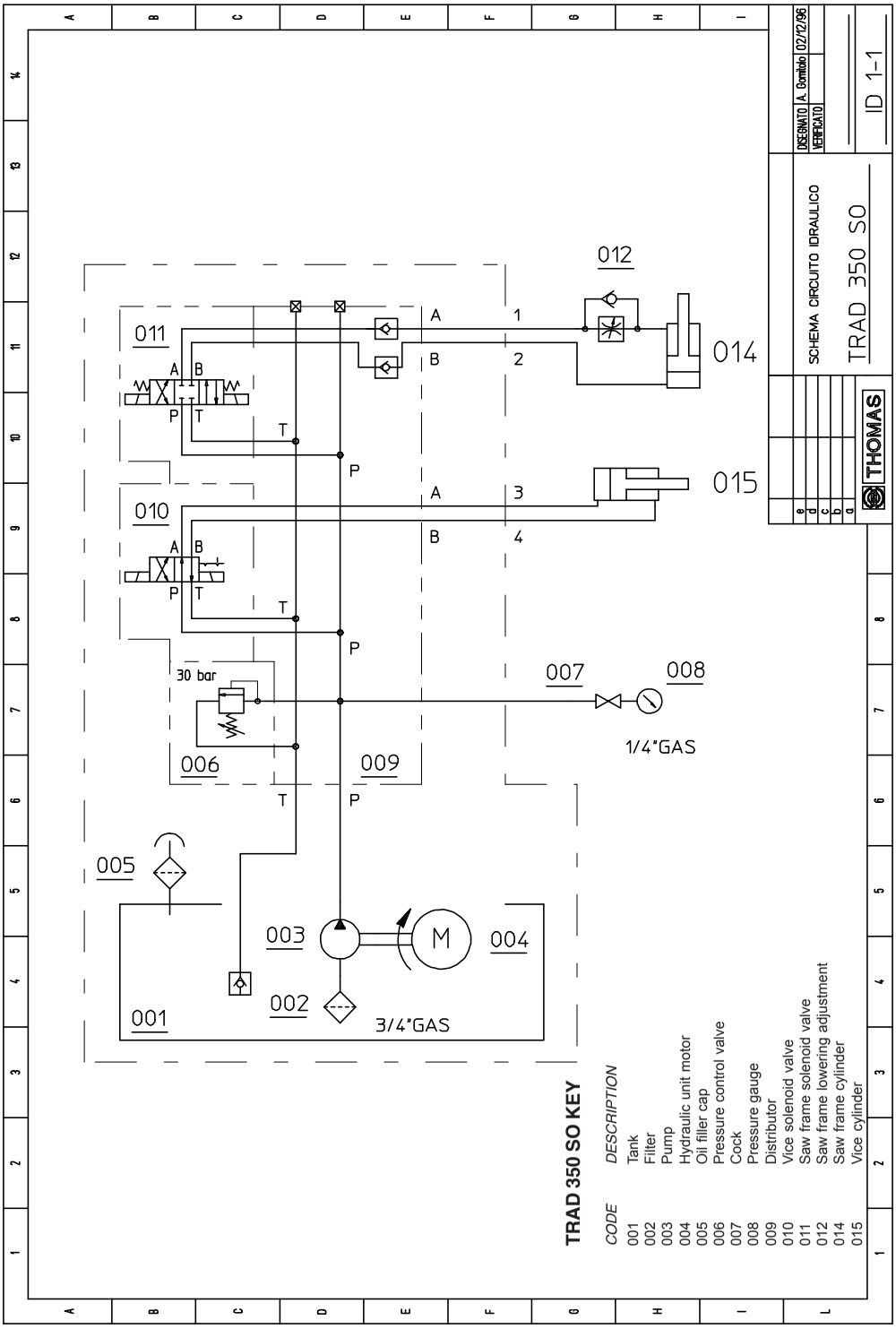


CODE	*DESCRIPTION*
QS1	Main disconnect switch
FU1	Fuse cartridge
FU2	Fuse cartridge
FU3	Fuse cartridge
KM1	Remote control switch
KM2	Remote control switch
SA	Speed switch
TC	Transformer
M1	Hydraulic unit three-phase motor
M2	Belt three-phase motor
M3	Pump
SQ1	Blade guard microswitch
SQ2	Cycle start microswitch
SQ3	Low saw frame microswitch
SQ4	Up saw frame microswitch
SB1	Emergency push-button
SB2	Light button
SB3	Cycle start push-button
KT	Base timer
ST1	Band motor temperature probe
FR1	Central temperature relay
E	Pressure switch
SA2	Saw frame moving selector
KA1	Auxiliary relay
KA2	Auxiliary relay
KA3	Auxiliary relay
KA4	Auxiliary relay
KA5	Auxiliary relay
YV1	Saw frame solen. valve bow dowfeed
YV2	Saw frame solen. valve bow upstroke
YV3	Vice solenoid valve
KT	Timer Auxiliary contact
HL	Light


USCITE
U1= morsa apri
U2= morsa chiudi
U3= discesa arco
U4= salita arco
U5= motore nastro
U6= scarico
U7= centralina
= Optional
INGRESSI
FR1
SB1
SB2
X1 = fungo
E1
SQ1
ST
FR2
SA
X2 = carter
SQ2
X3 = FC arco alto
SQ3
X4 = FC arco basso
SQ5
X6 = start pedale
SQ6
X7 = impugnatura
TRAD 350SO-saw1
SCHEMA ELETTRICO
THOMAS
E 03-3


K2 INPUT
K3 OUTPUT
K4
K1
D1
FU7 0,63A
24 Vac
TRAD 350SO-SO.W.1
SCHEMA ELETTRICO
E 03-4
THOMAS

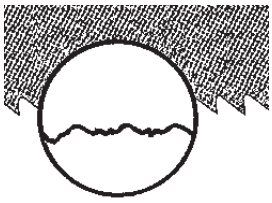
11.2 - Hydraulic electric diagram

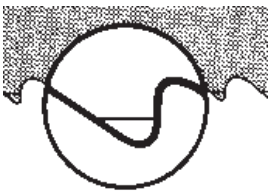
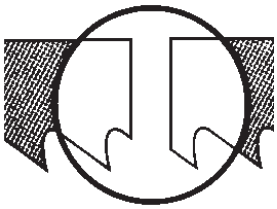


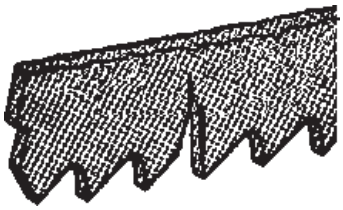
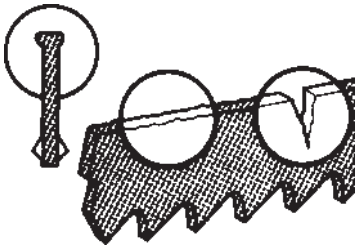
12 TROUBLESHOOTING

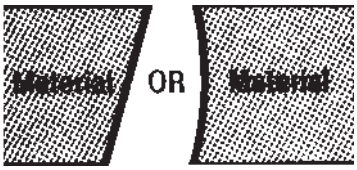
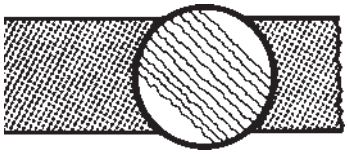
This chapter lists the probable faults and malfunctions that could occur while the machine is being used and suggests possible remedies for solving them.
The first paragraph provides diagnosis for TOOLS and CUTS, the second for ELECTRICAL COMPONENTS.

12.1 - Blade and cut diagnosis

FAULT	PROBABLE CAUSE	REMEDY
TOOTH BREAKAGE	Too fast advance	Decrease advance, exerting less cutting pressure.
	Wrong cutting speed	Change blade speed and/or type of blade. See Chapter **"Material classification and blade selection"** in the *Blade selection table according to cutting and feed speed.*
	Wrong tooth pitch	Choose a suitable blade. See Chapter **"Material classification and blade selection".**
	Chips sticking onto teeth and in the gullets or material that gums	Check for clogging of cooling liquid drain holes on the blade-guide blocks and that flow is plentiful in order to facilitate the removal of chips from the blade.
	Defects on the material or material too hard	Material surfaces can be oxidised or covered with impurities making them, at the beginning of the cut, harder that the blade itself, or have hardened areas or inclusions inside the section due to productive agents used such as casting sand, welding wastes, etc. Avoid cutting these materials or in any case perform cutting with extreme care, cleaning and removing such impurities as quickly as possible.
	Ineffective gripping of the part in the vice	Check the gripping of the part.
	The blade gets stuck in the material	Reduce feed and exert less cutting pressure.
	Starting cut on sharp or irregular section bars	Pay more attention when you start cutting.
	Poor quality blade	Use a superior quality blade.
	Previously broken tooth left in the cut	Accurately remove all the parts left in.
	Cutting resumed on a groove made previously	Make the cut elsewhere, turning the part.
	Vibrations	Check gripping of the part.
	Wrong tooth pitch or shape	Replace blade with a more suitable one. See Chapter **"Material classification and blade selection"** in the *Blade Types* section.
	Insufficient lubricating refrigerant or wrong emulsion	Check level of liquid in the tank. Increase the flow of lubricating refrigerant, checking that the hole and the liquid outlet pipe are not blocked. Check the emulsion percentage.
	Teeth positioned in the direction opposite the cutting direction	Turn teeth in correct direction.

FAULT	PROBABLE CAUSE	REMEDY
PREMATURE BLADE WEAR	Faulty running-in of blade	See Chapter **"Material classification and blade selection"** in the *Blade running-in* section.
	Teeth positioned in the direction opposite the cutting direction	Turn teeth in correct direction.
	Poor quality blade	Use a superior quality blade.
	Too fast advance	Decrease advance, exerting less cutting pressure. Adjust the braking device if mounted on the machine.
	Wrong cutting speed	Change speed of blade. See Chapter **"Material classification and blade selection"** in the *Blade selection table according to cutting and feed speed.*
	Defects on the material or material too hard	Material surfaces can be oxidised or covered with impurities making them, at the beginning of the cut, harder that the blade itself, or have hardened areas or inclusions inside the section due to productive agents used such as casting sand, welding wastes, etc. Avoid cutting these materials or in any case perform cutting with extreme care, cleaning and removing such impurities as quickly as possible.
	Insufficient lubricating refrigerant or wrong emulsion	Check level of liquid in the tank. Increase the flow of lubricating refrigerant, checking that the hole and the liquid outlet pipe are not blocked. Check the emulsion percentage.
BLADE BREAKAGE	Faulty welding of blade	The welding of the blade is of utmost importance. The meeting surfaces must perfectly match and once they are welded they must have no inclusions or bubbles; the welded part must be perfectly smooth and even. They must be evenly thick and have no bulges that can cause dents or instant breakage when sliding between the blade guiding block pads.
	Too fast advance	Decrease advance, exerting less cutting pressure. Adjust the braking device if mounted on the machine.
	Wrong cutting speed	Change blade speed and/or type of blade. See Chapter **"Material classification and blade selection"** in the *Blade selection table according to cutting and feed speed.*
	Wrong tooth pitch	Choose a suitable blade. See Chapter **"Material classification and blade selection"**.
	Ineffective gripping of the part in the vice	Check the gripping of the part.
	Blade touching material at beginning of cut	At the beginning of the cutting process, never lower the saw frame before starting the blade motor.

FAULT	PROBABLE CAUSE	REMEDY
	Blade guide pads not regulated or dirty because of lack of maintenance	Check distance between pads (see Chapter **"Machine adjustments"** in the *Blade Guide blocks* section): extremely accurate guiding may cause cracks and breakage of the tooth. Clean carefully.
	Blade too slack	Check that on the blade tightening pressure gauge reads 160 BAR, yhe ideal tightening value.
	Blade guide block too far from material to be cut	Approach head as near as possible to material to be cut so that only the blade section employed in the cut is free, this will prevent deflections that would excessively stress the blade.
	Improper position of blade on flywheels	The back of blade rubs against the support due to deformed or poorly welded bands (tapered), causing cracks and swelling of the back contour.
	Insufficient lubricating refrigerant or wrong emulsion	Check level of liquid in the tank. Increase the flow of lubricating refrigerant, checking that the hole and the liquid outlet pipe are not blocked. Check the emulsion percentage.
STREAKED OR ETCHED BANDS	Damaged or chipped blade guide pads	Replace them.
	Tight or slackened blade guide pads	Adjust them (see Chapter **"Machine adjustments"** in *Blade guide blocks* section).
CUTS OFF THE STRAIGHT	Blade not parallel as to the counter-vice	Check fastenings of the blade guide heads as to the counter-vice so that they are not too loose and adjust heads vertically; bring into line the position of the degrees and if necessary adjust the stop screws of the degree cuts.
	Blade not perpendicular due to the excessive play between the guide bearings and maladjustment of the heads	Check and vertically re-adjust the blade guide blocks; reset proper side guide play (see Chapter **"Machine adjustments"** in *Blade guide blocks* section).
	Too fast advance	Decrease advance, exerting less cutting pressure. Adjust the braking device if mounted on the machine.
	Blade guide block too far from material to be cut	Approach head as near as possible to material to be cut so that only the blade section employed in the cut is free, this will prevent deflections that would excessively stress the blade.
	Blade too slack	Check that the tightening pressure gauge reads 160 BAR, the ideal tightening value.
	Worn out blade	Replace it.
	Wrong tooth pitch	Blade used probably has too large teeth; use one with more teeth (see Chapter **"Material classification and blade selection"** in the *Selecting blade* section).

FAULT	PROBABLE CAUSE	REMEDY
	Broken teeth	Irregular work of the blade due to the lack of teeth can cause deflection in the cut; check blade and if necessary replace it.
	Insufficient lubricating refrigerant or wrong emulsion	Check level of liquid in the tank. Increase the flow of lubricating refrigerant, checking that the hole and the liquid outlet pipe are not blocked. Check the emulsion percentage.
FAULTY CUT 	Worn out flywheels	The support and guide flange of the band are so worn out that they cannot ensure the alignment of the blade, causing faulty cutting; blade rolling and drawing tracks can have become tapered. Replace them.
	Flywheel housing full of chips	Clean with compressed air.
	Blade too slack	Check that on the blade tightening pressure gauge reads 160 BAR, the ideal tightening value.
STREAKED CUTTING SURFACE 	Too fast advance	Decrease advance, exerting less cutting pressure. Adjust the braking device if mounted on the machine.
	Poor quality blade	Use a superior quality blade.
	Worn out blade or with chipped and/or broken teeth	Replace it.
	Wrong tooth pitch	Blade used probably has too large teeth; use one with more teeth (see Chapter **"Material classification and blade selection"** in the *Selecting blade* and *Blade Types* sections).
	Blade guide head too far from material to be cut	Approach head as near as possible to material to be cut so that only the blade section employed in the cut is free, this will prevent deflections that would excessively stress the blade.
	Blade too slack	Check that on the blade tightening pressure gauge reads 160 BAR, the ideal tightening value.
	Insufficient lubricating refrigerant or wrong emulsion	Check level of liquid in the tank. Increase the flow of lubricating refrigerant, checking that the hole and the liquid outlet pipe are not blocked. Check the emulsion percentage.
NOISE ON GUIDE BLOCKS	Chipped bearings	Dirt and/or chips between blade and guide bearings. Replace them.
	Worn out or damaged pads	Replace them.

12.2 - Electrical components diagnosis

FAULT	PROBABLE CAUSE	REMEDY
THE MOTOR OF THE HYDRAULIC UNIT DOES NOT RUN	Power supply	Check: phases cables socket plug The RST terminals on the control panel must be energized.
	Main disconnect switch	It must be on position 1.
	Fuses “FU1”	Make sure that cartridges are not damaged and if tripped, check for shorts in the power circuit.
	Fuses "FU2 - FU3"	Make sure cartridges are not damaged and if tripped, check for shorts in the transformer or the control parts (push-button-coils).
	"TC" transformer	Check that the supply voltage is the same as the line voltage and that it gives a value of 24 V at output.
	Emergency button “SB1”	Ensure that it is off and that its contacts are unbroken. If there is no contact, replace it.
	Thermal relay FR1	Check that it is in its housing and that it operates efficiently. It stops the band saw if it remains still for more than one minute after having carried out the cutting cycle. Check that the "KM1" remote control coil is not burnt. Replace if necessary. Check for mechanical efficiency of the push-button and replace it if damaged.
THE MOTOR OF THE HYDRAULIC UNIT ROTATES BUT THERE IS NO PRESSURE ON THE PRESSURE SWITCH AND NO OPERATIONS ARE POSSIBLE ON THE MACHINE	Hydraulic unit motor	Check that the hydraulic unit motor rotates in the direction of the arrow. The cock of the hydraulic unit pressure gauge must be open, if necessary set pressure on 30 BAR. Check that hydraulic pump is running efficiently. If not, replace it.
THE SAW FRAME DOES NOT LOWER MANUALLY	solenoid valve coil	Check that coil terminals are 24 V. If not, replace it.
	Hydraulic adjustment	Check the functionality, it must allow the flow of oil.
	Electrically speaking all is fine but the valve does not work	Check the mechanical operation of the valve, replace it if necessary.

FAULT	PROBABLE CAUSE	REMEDY
THE VICE DOESN'T OPEN AND CLOSED	electric coil	Check that coil terminals have are 24 V. If not, replace it.
	up and down saw frame microswitch	Check that it is actuated at end of cycle with saw frame up. If not, replace it.
	Electrically speaking all is fine but the valve does not work	Check the mechanical operation of the valve, replace it if necessary.
THE BAND ROTATION MOTOR DOES NOT WORK	"SQ1" safety band guard microswitch	Check that the flywhell guard is properly closed and check efficiency of the device.
	Pressure switch	Make sure to have tightened the blade to a value of 160 BAR with the special tightening handwheel.
	low saw frame microswitch	Check that it is released and that it operates well.
	"SA" speed switch	It must be turned towards position 1 or 2.
	Thermal relay FR2	Verify if relay switched on
	Band motor temperature relay	Check for current continuity on both wires of the probe after a motor cooling time of 10 - 15 minutes. If there is no current continuity on these two wires, the motor must be replaced or rewound.
	cycle start push-button cycle start pedal	Check the functioning and/or possible damages. If so, replace it.
	"KM2" remote control switch	Check that the phases are present at input and at output, that it isn't jammed, that it closes when energized, that it doesn't cause shorts. If not, replace it.
	"KM2" remote control switch is energized but the blade motor doesn't rotate	Check that the band is not hindered mechanically, that the motor terminals are energized. If not, replace them.
THE PUMP DOES NOT WORK	"KM2" remote control switch	If the remote control switch is energized and the pump does not rotate, check that pump terminals are energized. If not, replace or rewind motor.

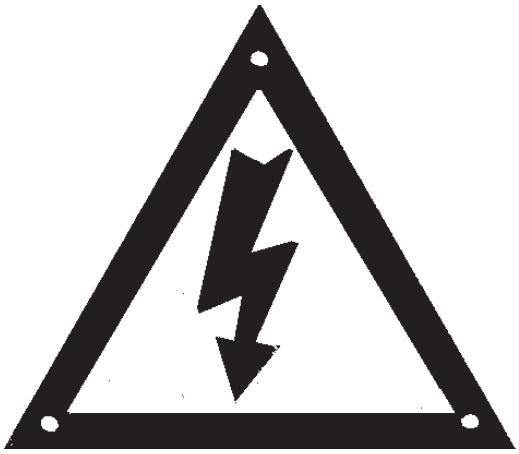
13 *NOISE TESTS*

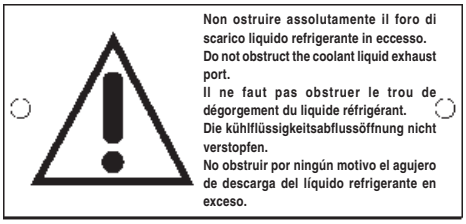
In accordance with point 1.7.4.f of the Machines Directive EEC 89/392

INTEGRATING PHONOMETER " DELTA OHM " mod. HD9091K1 serial n. 110996B295.
MICROPHONE mod. HD 9019S1.
SOUND GAUGER mod. HD9101 at 94 dB/110dB 1.000 Hz in CLASS 1 according to IEC regulation n. 942 1988 and ANSI S1.40 1984
3 measurements with the machine operating unloaded.
- The microphone was been located close to the operator's head, at medium height.
- The weighted equivalent continuous acoustic pressure level was 71.0 dB (A).
- The maximum level of the WEIGHTED instantaneous acoustic pressure C was always less than 130 dB.

NOTE: with the machine operating, the noise level will vary according to the different materials being processed. The user must there-fore assess the intensity and if necessary provide the operators with the necessary personal protection, as required by Law 277/1991.

PLATES AND LABELS





REMARKS: _____

THOMAS S.p.A. - Via Pasubio, 32 - 36033 Isola Vicentina (VI) - Telephone 0444 / 97.61.05 - Fax 0444 / 97.69.34