

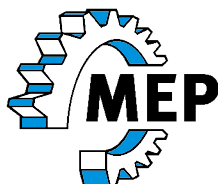
USE AND MAINTENANCE MANUAL

EN **DM10P**

YEAR OF MANUFACTURE: _____

"CE" CONFORMITY DECLARATION
(according to EEC MACHINES DIRECTIVE 2006/42/CE annex II A)

The manufacturer:



MEP S.p.A.
 Via Enzo Magnani, 1
 61045 Pergola (PU) ITALIA
 Tel. 072173721 - Fax 0721734533

Hereby declares that the bandsawing machine:

Machine Type:	SAWING MACHINE
Machine model:	DM- 10P
Serial number:	
Year of manufacture:	

is in specification with the following directives:

- **EEC MACHINES DIRECTIVE 2006/42/CE (D.Lgs. 17/2010)**
 - EN 13898:2003 + A1:2009
- **DIRECTIVE 2014/30/UE "EMC" (D.Lgs. 80/2016)**
 - EN 50370- 1:2005 Emission
 - EN 50370- 2:2003 Immunity
- **DIRECTIVE 2014/35/UE "LVD" (D.Lgs. 86/2016)**

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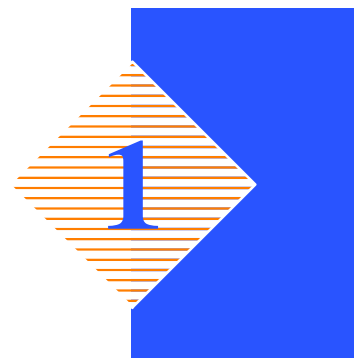
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Introduction and technical specifications



Foreword

MEP S.p.A., in response to modern production techniques, has developed the new **DM10P**.

This work tool has been designed to satisfy the wide range of cutting needs of a modern workshop with simplicity and reliability, while at the same time complying with all EEC safety standards.

The **DM10P** is structurally rigid, silent and safe: it produces a minimum of waste while its great versatility makes it suitable for cutting various materials such as stainless steel light alloys, aluminium, copper and bronze at high speed and with high precision.

Its high cutting capacity enables it to handle both single workpieces and bundles, which, combined with the possibility of making inclined cuts from 60° left to 45° right, make this machine the ideal solution for satisfying the wide range of cutting needs of machine shops, turneries, structural steel shops and engineering workshops.

Please keep this instruction manual for future reference in a known location and easily accessible to all users of the device. HYD·MECH offers a great variety of options, components, and features for its various models.

Therefore, some of the equipment described in this manual (various illustrations and drawings) may not be applicable to your particular machine.

The information and specifications provided in this manual were accurate at the time of printing. HYD·MECH reserves the right to discontinue or change specifications or design at any time without notice and without incurring any obligation.

Congratulations for having chosen this product which, by following the **instructions** contained in this user and maintenance handbook, will guarantee years of dependable service.

This band saw has been exclusively designed to cut metals.

Warning

Machine presentation

Functioning is SEMI- AUTOMATIC. It can be equipped with manual and semi- automatic/dynamic cycle upon the order.

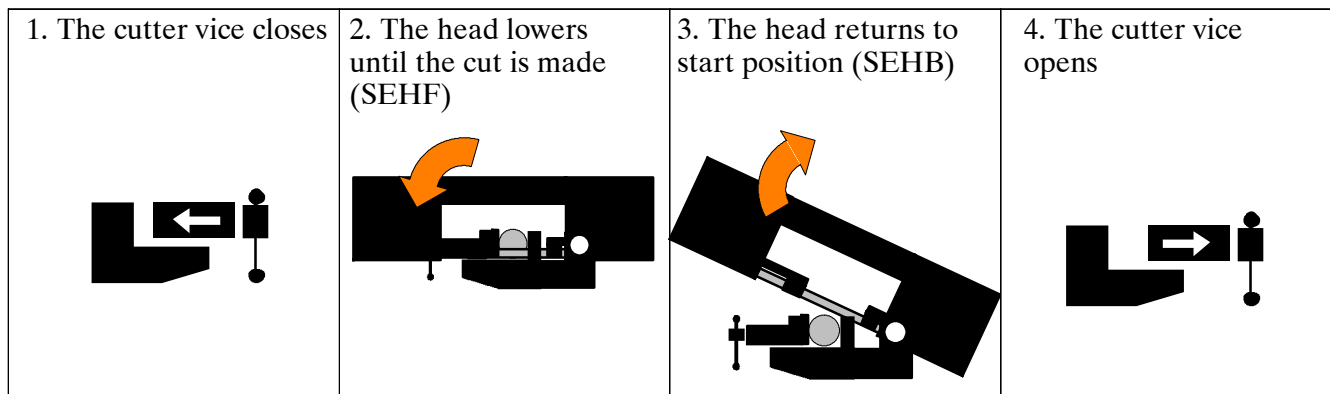
In **Semi- automatic** mode, after setting the head cutting stroke on the control panel and the head downstroke speed, the operator positions the vice 2÷3 mm from the workpiece and presses the start button (or optional foot pedal if fitted) on the control panel to start up the band saw. The vice then clamps the material,

the head lowers, cuts the piece and returns to its start position and the vice opens again.

In **Manual** mode, after making sure the workpiece is correctly clamped in the vice, the operator grips the head control lever and presses the band saw start micro- switch. The head then moves downwards to cut the material at the preset length.




The **Semi- automatic/Dynamic** cycle instead controls semi- automatic operation of the band saw, with the exception of the head stroke setting for which the operator may manually set the cutting head start point. In fact, after setting the head downstroke speed, the operator simply positions the vice 2÷3 mm from the workpiece and lowers the cutting head blade to within about 10 mm of the stock. He then presses the handgrip button to start the band saw. The vice now clamps the piece and the cutting head lowers to cut it. The blade then stops, returns to its start position and the vice opens again.

N.B. The Semi- automatic/Dynamic cycle is particularly useful for cutting workpieces of different sections requiring variable cutting strokes.



Machine specification

The anodised aluminium name plate is riveted on the side of the machine; the same data are reproduced on the declaration of conformity included with this use and maintenance manual.

	MEP SPA via Enzo Magnani, 1 61045 Pergola (PU) ITALY tel: 0721/73721 fax: 0721/734533 www.mepsaws.com	 www.HYDMECH.COM			
model	HYD MECH		HP		
serial					
1 PH 60 Hz	V	FLA	3 PH 60 Hz	V	FLA
S/C RATING 5KA @		V	kg/lbm		

N.B. When communicating with the Technical Service department, the model, serial number and year of manufacture of the machine must be quoted.

CUTTING SPEEDS		
1st Slow Speed	mt/min ft./min	36 116.73
2nd Fast Speed	mt/min ft./min	72 233.46

Warning

All models can be equipped with the Inverter, an optional device, which offers a range of speeds comprised between **20 and 90 mt/min**. As the machine is predisposed for the Inverter, it can be installed by the client or factory pre-installed on request made during the ordering procedure.

BAND SAW		
Rated size	mm in.	2950 x 27 x 0,9 116.14x1.06x0.03
Max/min blade length	mm in.	2920 ÷ 2990 from 116.53 to 114.96
Blade height	mm in.	27 1.06
Blade width	mm in.	0,9 0.03
Band saw tension	bar / Kg / psi	70 / 900 / 1015

Attention

When choosing the cutting tool, if its dimensions do not correspond to those included in the "Rated size" section, check that the dimensions at least fall within the admissible max/min specifications.

INSTALLED ELECTRICAL POWER		
Spindle motor	Kw HP	1,8 / 1,5 2.5/2
Monobloc hydraulic power pack motor	KW HP	0,37 0.50
Lubricant/coolant fluid electric pump motor	KW HP	0,06 0.1
Max. installed electrical power	KW HP	2,176 3.1

WORKING PRESSURE		
Working pressure	Bar/psi	26- 30/377- 435
Working pressure of vice with optional adjuster	Bar/psi	16- 25/232- 363

LUBRICANT/COOLANT FLUID AND OIL		
Oil for transmission box	capacità Kg	0,32
Oil for monobloc hydraulic power pack	capacità Lt	2,5
Lubricant/coolant fluid (oil concentration 5- 6%)	capacità Lt	13

VICE		
Vice max. opening	mm in.	285 11.42

SPINDLE MOTOR					
No.of poles	Current (Volts)	Absorption (Amps)	Power (Kw)	rpm	Band saw speed
2/4	400	5,6/4	1,8/1,5	2.860/1400	72/36 m/min 233.46/116.73 ft./min
4/8 optional	400	3,1/2,7	1,1/0,55	680/1330	36/18 m/min 116.73/58.36
Stator wound with enamelled copper wire, class H 200° C.					
Class F insulation (limit temperature TL 155° C).					
IP 55 protection rating (total against contact with live parts, water sprayed from all directions, with shaft oil seal).					
Conforming to CEI norms, publication: IEC 34 of 01/07/1985.					

N.B. Example of class F insulation: in air- cooled machines at an ambient temperature of 40° C (according to CEI 2- 3 and IEC 85), the allowable overtemperature is 100° C (where 100 C represents the allowable DT).

Warning

The machine is supplied with a 2/4 pole three phase motor giving 2 band saw speeds:




- 1^a speed (4 poles) = 36 mt/min

- 2^a speed (2 poles)= 72 mt/min;

The OPTIONAL 4/8 pole motor gives speeds of 36/18 mt./min.

ELECTROPUMP MOTOR Single phase; Frequency 50 Hz.					
Voltage (Volts)	Absorption (Amps)	Power (Kw)	rpm	Delivery rate lt/min	Head (mt.)
230	0,40	0,06	2800	24	1,5
400	0,20	0,06	2800	24	1,5

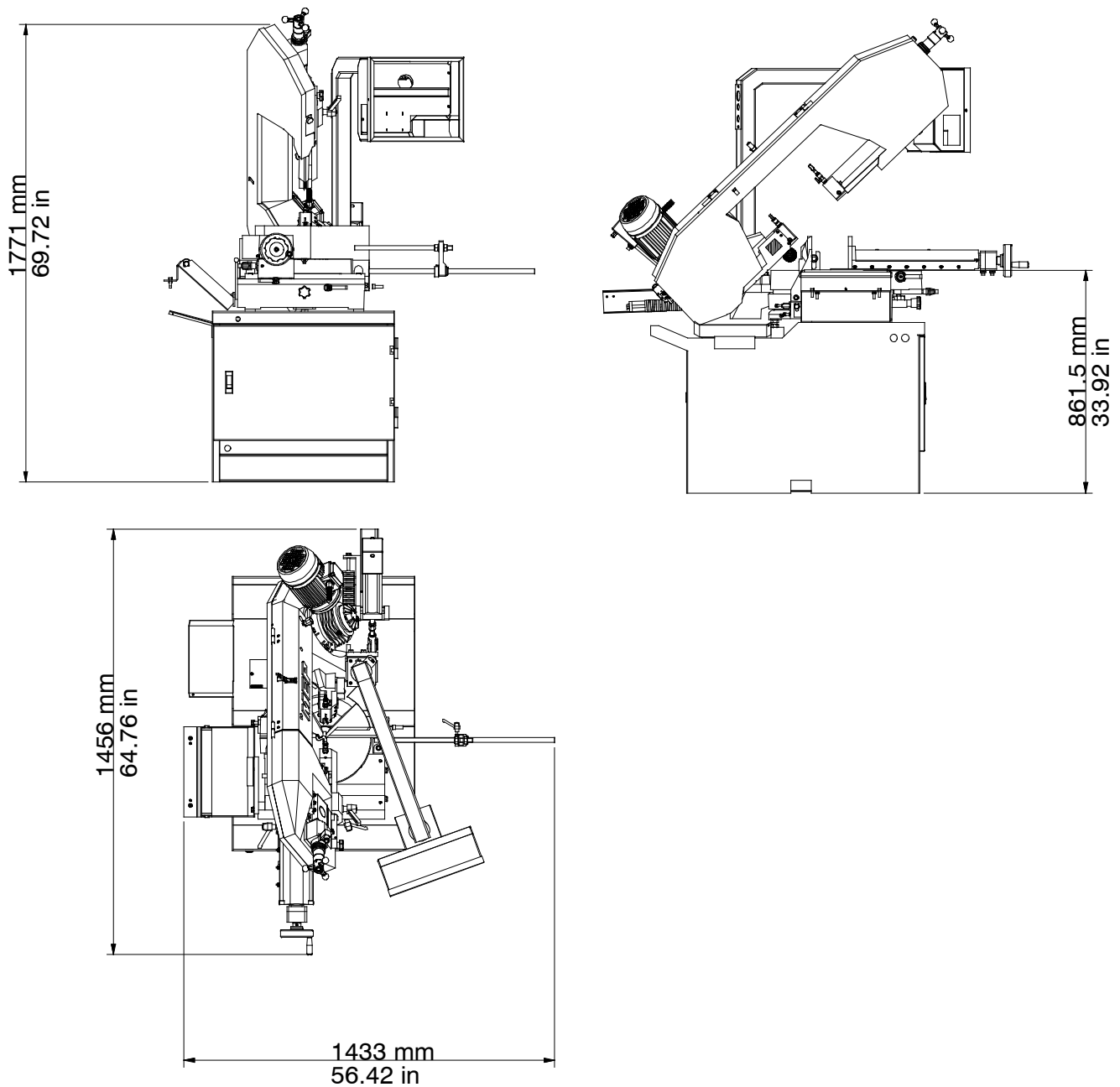
HYDRAULIC POWER PACK MOTOR SPECIFICATIONS 4- pole, three- phase, asynchronous; frequency 50 Hz.				
Nr. of poles	Voltage (Volts)	Absorption (Amps.)	Power (Kw)	RPM
4	230/400	2,1/1,2	0,37	1390
Protection rating IP 54.				
Conforming to CEI norms, publication: IEC 34 of 01/07/1985.				

CUTTING CAPACITY			
Section			
0°	250 mm 9.84 in.	220 mm 8.66 in.	280 x 220 mm 11.02x8.66 in.
45° ↙	230 mm 9.05 in.	200 mm 7.87 in.	220 x 200 mm 8.66 x 7.87 in.

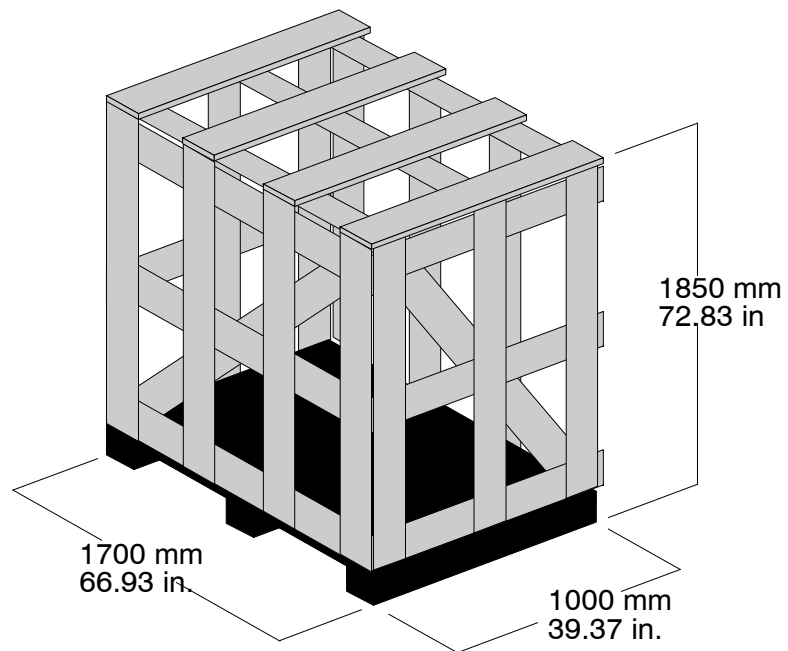
CUTTING CAPACITY			
60° ↙	120 mm 4.72 in.	80 mm 3.15 in.	140 x 80 mm 5.51 x 3.15 in.
45° ↘	200 mm 7.87 in.	170 mm 6.70 in.	200 x 140 mm 7.87 x 5.51 in

Dimensions

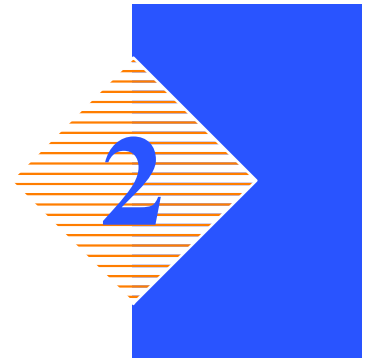
MACHINE INSTALLED		
Work table height	mm in	810 31.89
Weight	kg	475



PACKED WEIGHT		
Wooden cage and pallet	kg	100
Wooden pallet	kg	30

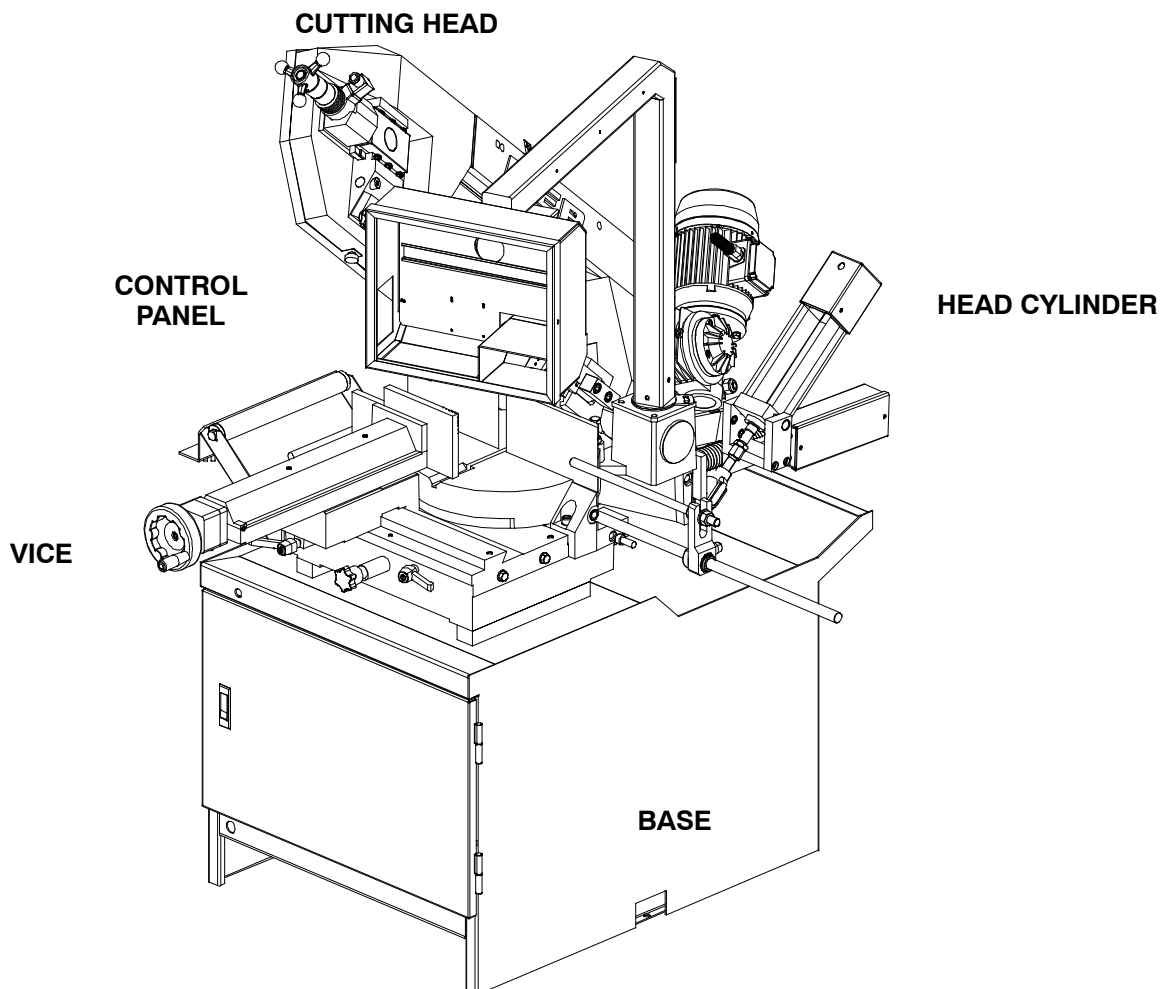


Functional parts



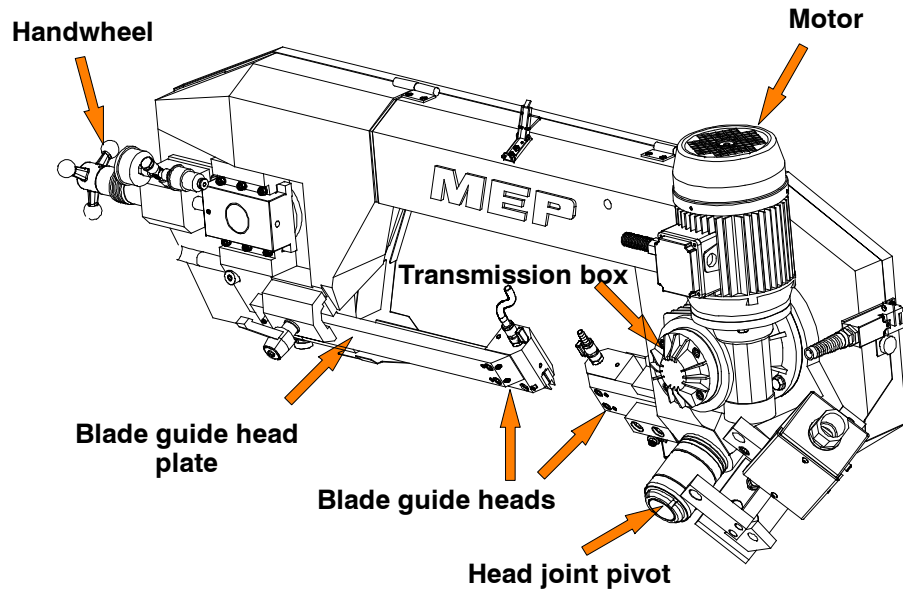
DM10P model

In order for the user to move towards a full understanding of how the machine works, which is described in detail in the chapter 5, this chapter deals with the main units and their locations.



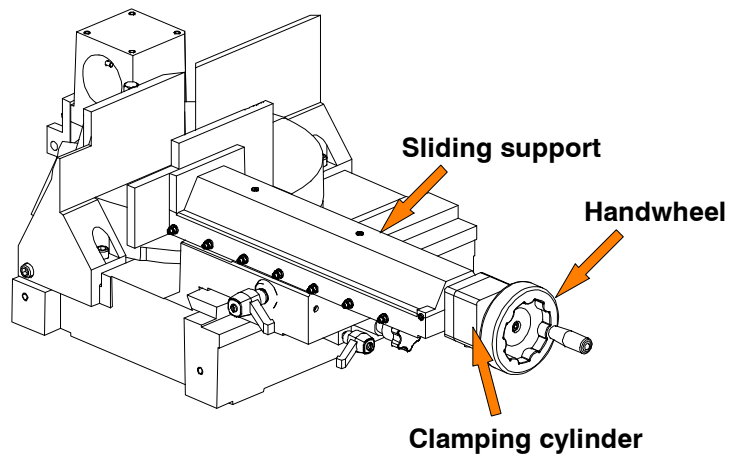
Cutting head

The cutting head is the unit that actually cuts the material. It consists of a cast- iron bow- shaped section on which the following parts are mounted: the blade, blade guides, blade tensioning unit, worm reduction gear and spindle motor. The cutting head is restrained by the articulated joint made on the surface to be cut, and performs a cutting sequence thrust by driving cylinder.



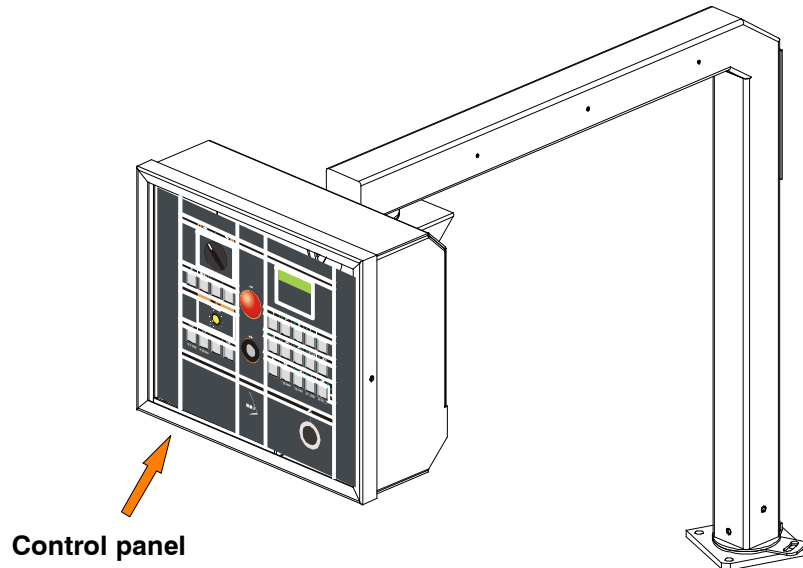
Cutting vice

The vice is the unit that holds the workpiece in place during cutting. It consists of a vice support, commonly known as a "lead nut", fixed to the work table, and a lead screw with a sliding support on which the mobile jaw is mounted.



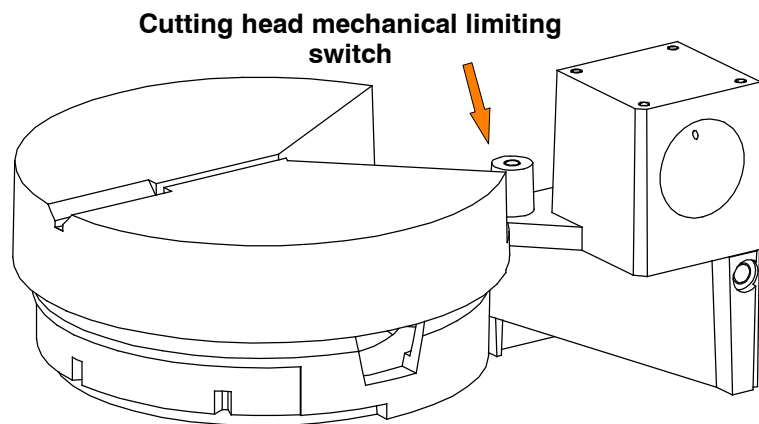
Control Panel

The control panel has a protection class of IP 54 and contains the machine's electronic equipment. Access to the control panel is protected by a hinged safety panel fastened with screws, specially designed to prevent tampering. The control panel swivels on two articulated joints so that it can be positioned as required by the operator for greater ease- of- use and safety.



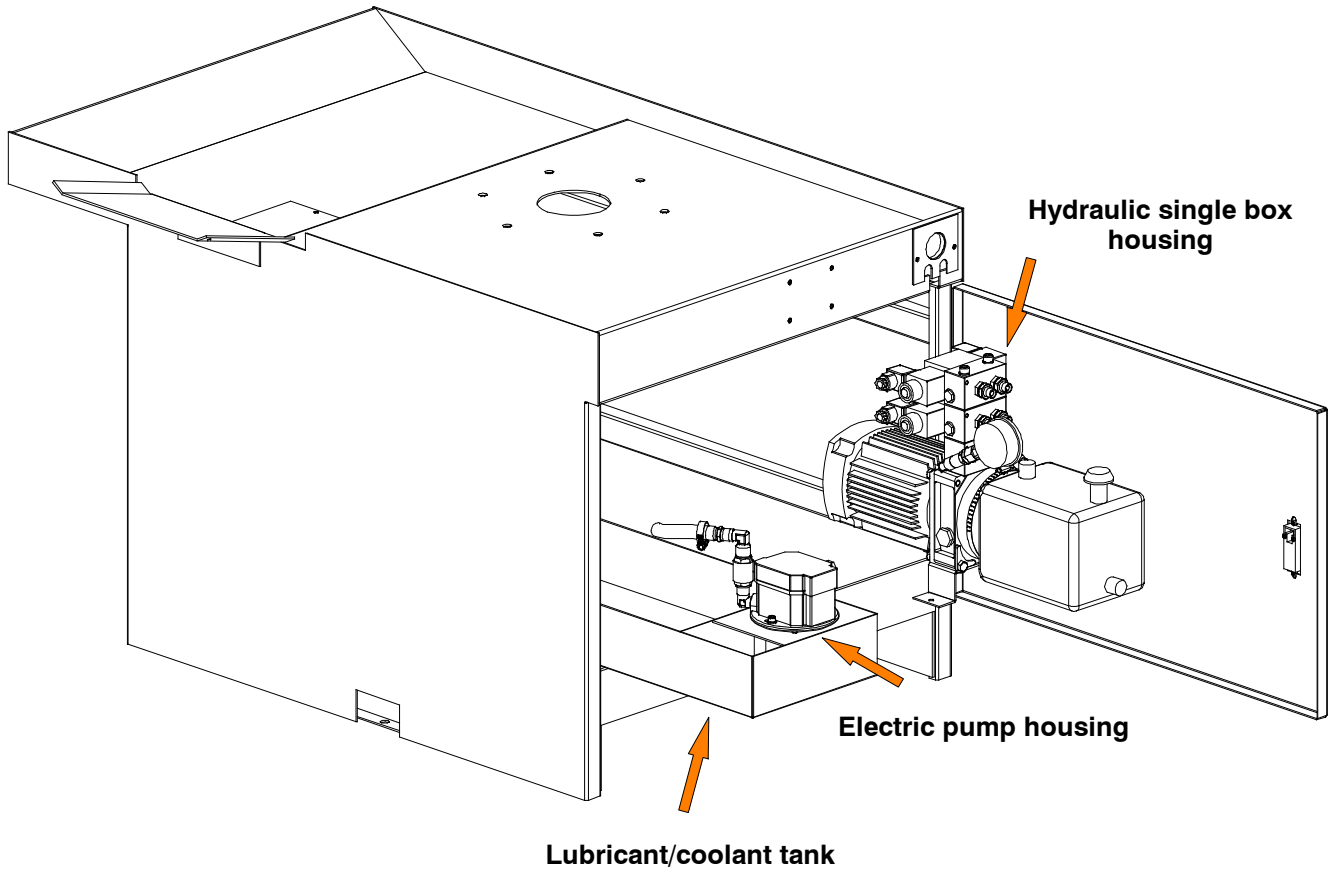
Turntable

A cast iron casting forms the fulcrum for the cutting head, and the support for the work table and the control panel. Releasing the locking lever on the slideway allows the cutting head to be rotated to the right and to the left.



Base

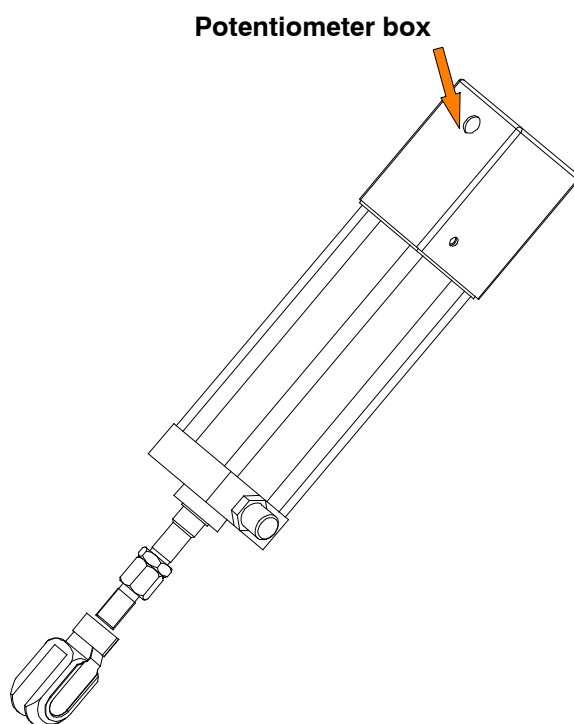
In electro- welded structural frame, it includes the coolant tank complete with electric pump and the hydraulic control unit for operating the head and the cutting vice. The optional inverter for changing the blade motor speed is located on the right of the hydraulic control unit, if the machine is equipped with this option.



The lock/release lever for the head rotation is located on the right side of the base.

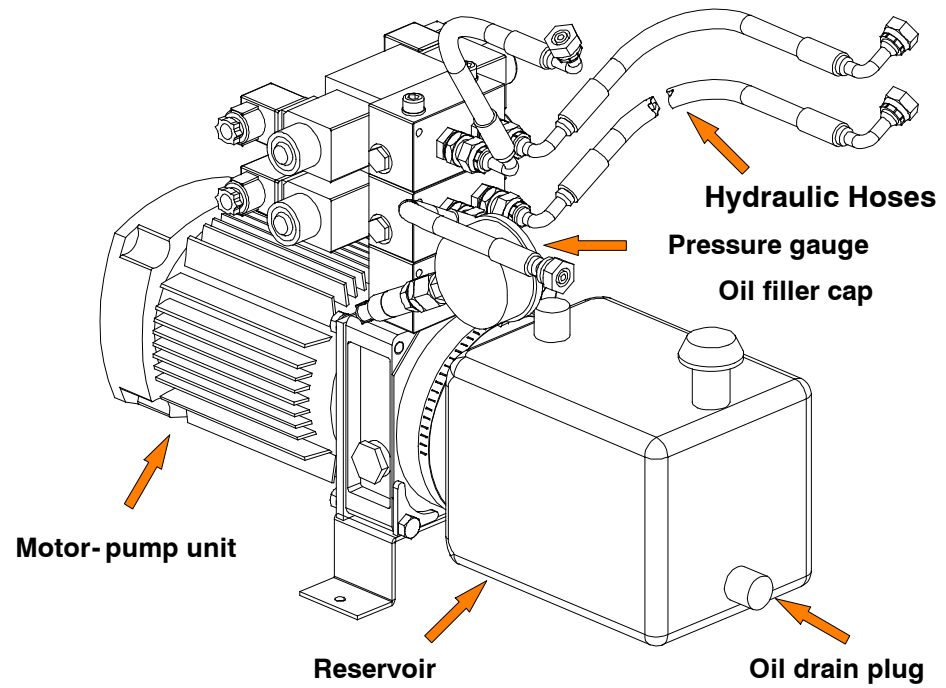
Head actuator cylinder

The head actuator cylinder is the organ which moves the cutting head down and up and vice versa.



Hydraulic power pack

The power pack operates the cutting head and the shearing vice.



Safety and accident prevention



The **DM10P** has been designed and produced in accordance with European standards. For the correct use of the machine we recommend that the instructions contained in this chapter are carefully followed.

Use of the machine

The **DM10P** band saw cutting machine is intended exclusively for cutting metallic materials, ferrous or non-ferrous, in section or solid.

Other types of material and machining are not compatible with the specific characteristics of the saw.

The employer is responsible for instructing the personnel who, in turn, are obliged to inform the operator of any accident risks, safety devices, noise emission and accident prevention regulations provided for by international standards and national laws regarding the use of the machine. The operator must be perfectly aware of the position and function of all the machine's controls. The instructions, warnings and accident prevention standards in this manual must be respected without question by all those concerned. The following definitions are those provided for by **EEC MACHINES DIRECTIVE 2006/42/CE** :

- “Danger zone”: any zone in and/or around a machine in which the presence of a person constitutes a risk for the safety and health of that person.
- “Person exposed”: any person finding himself either completely or partly in a danger zone.
- “Operator”: the person or persons given the responsibility of installing, operating, adjusting, maintaining, cleaning, repairing or transporting the machine.

Attention

The manufacturer declines any responsibility whatsoever, either civil or criminal, should there be unauthorised interference or replacement of one or more parts or assemblies on the machine, or if accessories, tools and consumable materials are used that are different from those recommended by the manufacturer itself or if the machine is employed in a plant system and its proper function is thereby altered.

General recommendations

LIGHTING

Insufficient lighting for the types of operation envisaged could constitute a safety hazard for the persons concerned. For this reason, the machine user must provide lighting in the working area sufficient to eliminate all shadowy areas while also avoiding any blinding light concentrations. (Reference standard ISO 8995- 89 “Lighting in work environments”).

CONNECTIONS

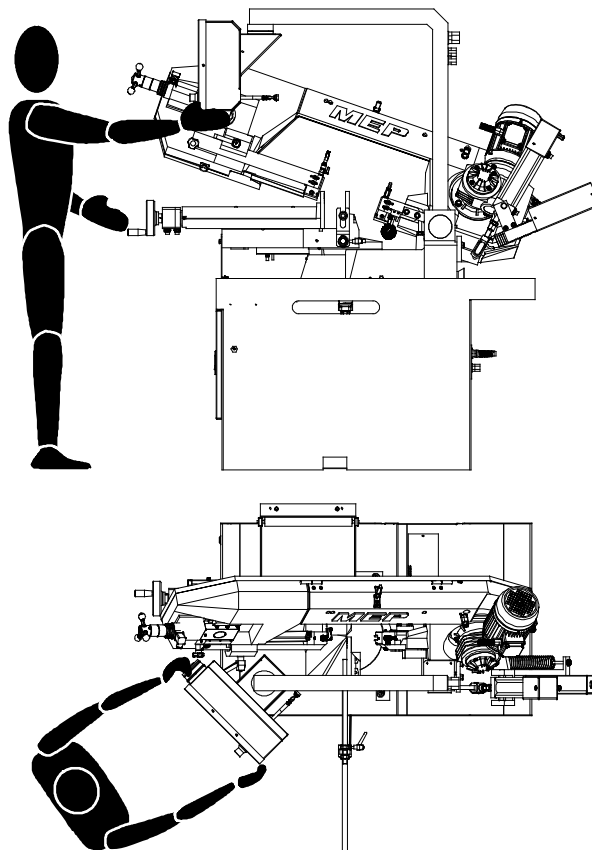
Check that the power supply cables and pneumatic feed systems comply with the maximum machine absorption values listed in the ”Machine Specification” tables; replace if necessary.

EARTHING

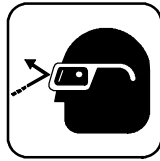
The installation of the earthing system must comply with the requirements set out in EN STANDARD 60204- 1:2010.

OPERATOR POSITION

The position of the operator controlling machine operations must be as shown in the diagram below.



Recommendations to the operator



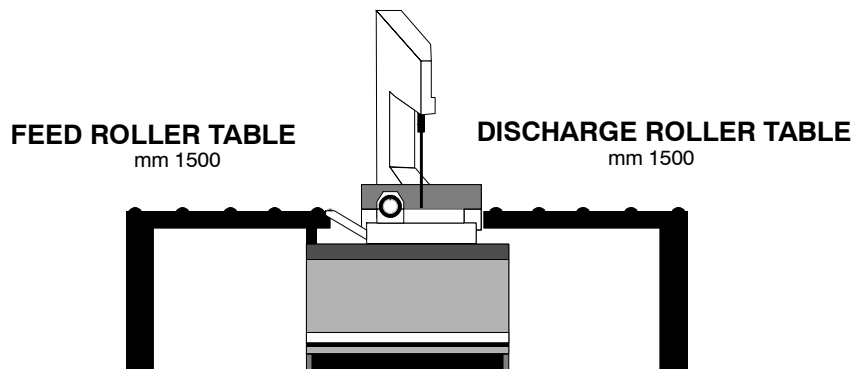
Always wear proper goggles or protective glasses.



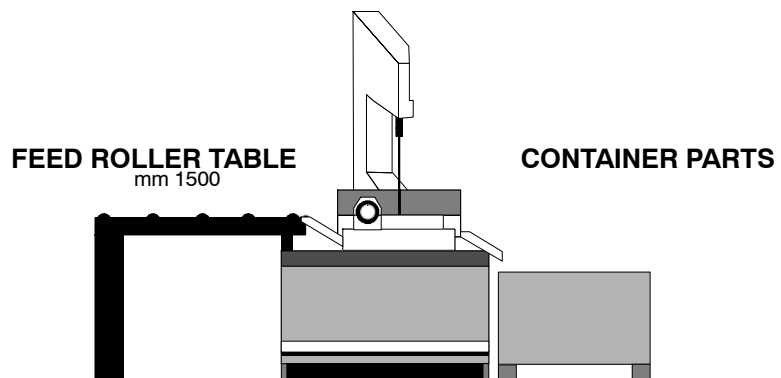
Do not use the machine without the guards in position. Replace the polycarbonate windows, if subject to corrosion.



Before starting cutting operations, support the material at both ends of the machine using the support arm - standard, or OPTIONAL accessories such as the feed and discharge roller tables shown in the diagram below. Before removing the devices supporting and moving the material, fasten the latter in place using the machine's clamping devices or other suitable equipment.



Arrange recovery/collection systems for the cut pieces, such as metal baskets, for example.



Do not allow hands or arms to encroach on the cutting zone while the machine is in operation.



Do not wear oversize clothing with long sleeves, oversize gloves, bracelets, necklaces or any other object that may become entangled in the machine during working; long hair must be tied back and bunched.



Always disconnect the power supply to the machine before carrying out any maintenance work whatsoever, including in the case of abnormal operation of the machine.



Any maintenance work on the hydraulic or pneumatic systems must be carried out only after the pressure in the system has been released.



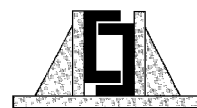
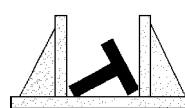
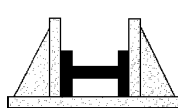
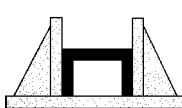
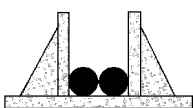
The operator must not perform any risky operations or operations not required for the machining operation under way (e.g. remove swarf or metal shavings from the machine while cutting).



Remove equipment, tools or any other objects from the cutting zone; always keep the working area as clean as possible.



Before starting any cutting operations, ensure that the workpiece is securely held in the vice and the machine has been set correctly. A number of examples of how to clamp different profiles correctly in our machines are shown below.



Do not use the machine to cut pieces that exceed the capacity of the machine as listed in the machine specifications.



Never move the machine while it is cutting.



Do not use blades of different sizes to those recommended in the machine specifications.



When cutting very short pieces, make sure that they are not dragged behind the support shoulder, where they could jam in the blade.



When the hydraulic vice is used automatically, check it actually locks the piece, as its stroke is 8 mm only, and that the tightening pressure is correct.



When working on the band saw, wear gloves only when handling materials and for tool changing or adjustment operations. Only perform one operation at a time and do not hold more than one item or operate more than one device simultaneously. Keep hands as clean as possible.



Warning: if the blade jams in the cut, press the emergency stop push- button immediately. If this does not free the blade, slowly loosen the vice, remove the piece and check the blade or blade teeth for breakage. Replace the blade if necessary.



Before carrying out any repair work on the machine, consult the Hydmech Technical Assistance Service: this can be done through a representative in the country of use of the machine.



Adjustment of the blade- guide head must only be carried out with the machine at a standstill.

Machine safety devices

This use and maintenance manual is not intended as purely a guide for the use of the machine in a strictly productive environment, it is instead an instrument providing information on how to use the machine correctly and safely. The following standards are those specified by the EEC Committee in the directives regarding safety of machinery, health and safety at work, personal protection and safeguarding of the environment. These standards have been applied to the **DM10P** band saw.

Reference standards

MACHINE SAFETY

- EEC MACHINES DIRECTIVE 2006/42/CE ;
- EEC directive no. 2014/30/EU “EMC - Electromagnetic Compatibility”;
- EEC Directive No. 2014/35/EU known as “Low voltage directive”.
- EN 13898:2003+A1:2009 Machine tools - Safety - Sawing machines for cold metal
- EN ISO 12100:2010 ”Safety of machinery - General principles for design - Risk assessment and risk reduction”.

HEALTH AND SAFETY AT WORK

- EEC Directive No. 80/1107; 83/477;86/188;88/188; 88/642 for the protection of workers against risks caused by exposure to physical, chemical and biological agents during working;
- EEC Directive No. 89/391 and Special EEC Directives No. 89/654 and No. 89/655 for improvements in health and safety at work;
- EEC Directive No. 90/394 for the protection of workers against risks deriving from exposure at work to carcinogenic substances;
- EEC Directive No. 77/576 and No. 79/640 on safety signs at work.

PERSONAL PROTECTION

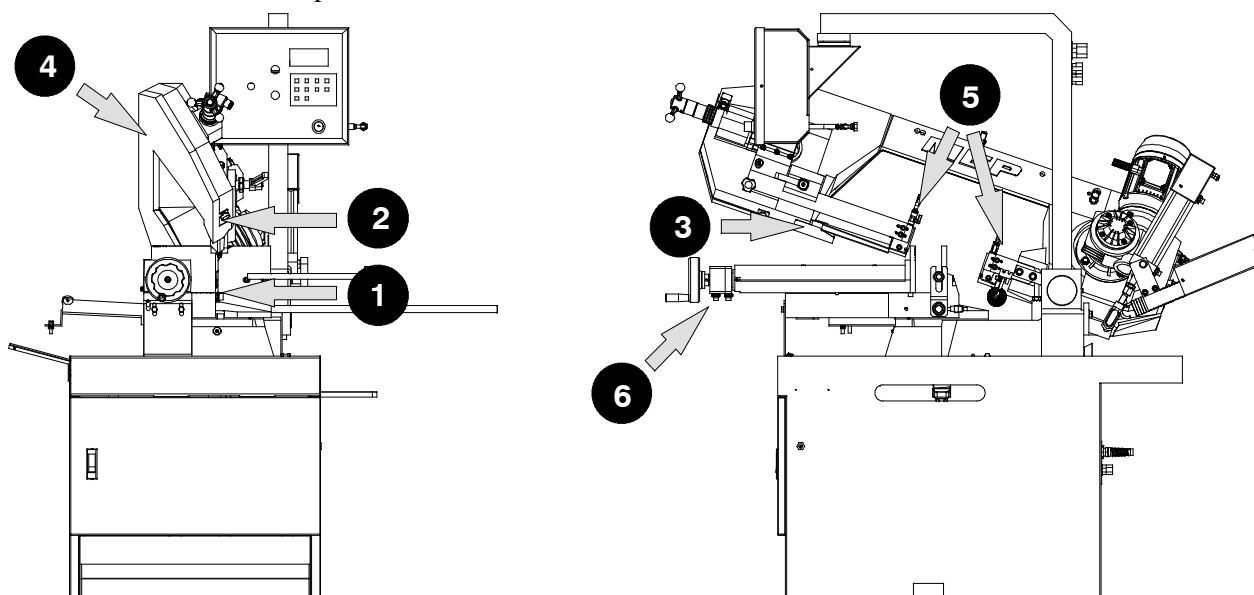
- EEC Directive No. 89/656 and No. 89/686 on the use of personal protection devices.

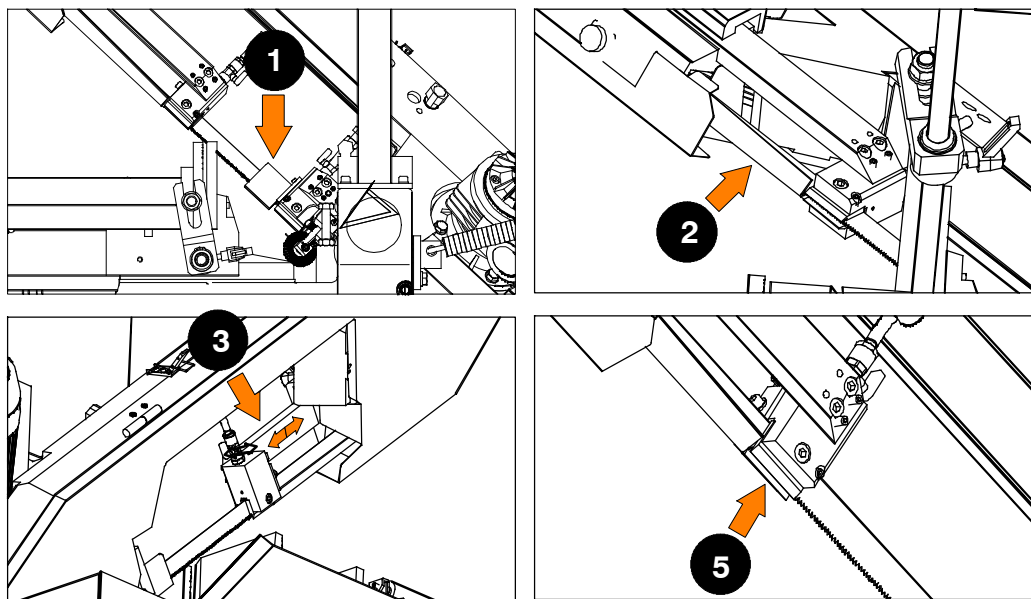
ENVIRONMENTAL PROTECTION

- EEC Directive No. 75/442 on waste disposal;
- EEC Directive No. 75/439 on the disposal of used oil.
- Directive 2002/95/EC on the restriction of the use of certain hazardous substances in electrical and electronic equipment (RoHS).

Protection against accidental contact with the blade

1. Metal guard screwed to the rear blade guide head (machine side);
2. metal guard screwed to the front blade guide head (operator side);
3. front head sliding support: when the head is at maximum aperture, the support ensures that the blade is covered, leaving free only the part of the blade engaged in the actual cutting, in accordance with Presidential Decree no. 547/55, art. 108;
4. hinged protective cover over blade, fitted with “removable” closing devices;
5. Blade guide plates which completely cover the blade teeth in the zone under the blade guide heads.
6. the cutting vice is operated by hydraulic devices, with a max. stroke of 8 mm; the jaws locking the piece must be moved at a distance of 2P3 mm from the piece to be machined.





Electrical equipment

In accordance with Italian standard CEI EN 60204- 1:2010, derived from European Standard EN 60204- 1:2010:

- Access to electrical control panel limited by screws and panel- lock device, allowing panel to be opened only after the electricity supply has been turned off;
- 24 Vac Control voltage for actuators, in accordance with chapter 6 or European Standard "Control and indication circuits", paragraph 2 "Control Circuits" sub- section 1 "Preferential voltage values for control circuits";
- plant short- circuit protection by means of rapid fuses, earthing of all plant parts connected with work as well as all foreseeable accidental contact; a thermal- magnetic overload cutout switch shuts down the motor;
- protection from accidental start- up by a minimum voltage relay in case of power failure.

Emergency devices

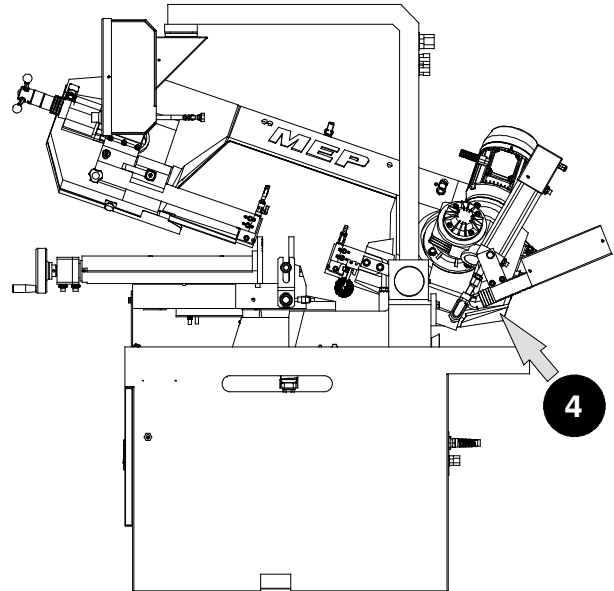
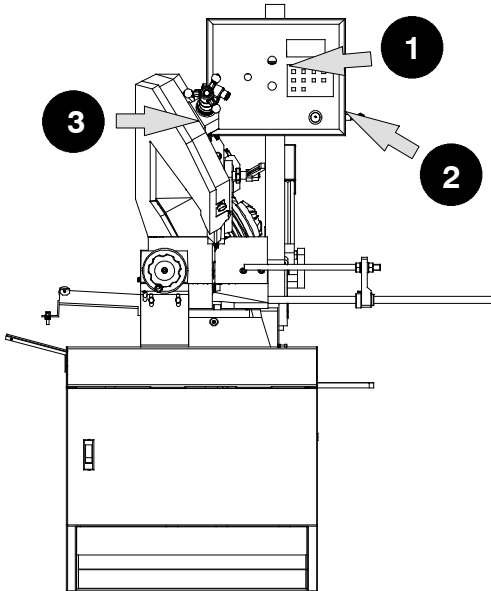
In accordance with Standard EN 60204- 1:2010:

- **Chapter 5 Section 6 Sub- section 1 "Emergency stop device"**: «the emergency stop device immediately stops all the dangerous and other functions of the machine»;
- **chapter 6 Section 2 Sub- section 4 Point 7 "Protective guards"**: «the removal of protective guards designed to prevent access to dangerous parts or zones causes the machine to stop immediately; replacing the guards does not restart the functions, which must be reset».

...Emergency devices applicable to the DM10P:

1. **Emergency stop**: a non- return mushroom- head pushbutton, colour red on yellow background, is located on the control panel of the machine. To release the pushbutton, the actuator must be rotated 45°. After the emergency situation has been resolved, the machine must be reset.
2. **Strain gauge to meter the belt tension**: if the blade breaks or runs off its pulley the machine is immediately stopped.

3. **Automatic thermal- magnetic cutout switch with thermal- magnetic relay:** the machine auto switch, located on the control panel, has two protection systems against voltage drops. In the case of a voltage drop, all electrical components are disengaged, the machine stops immediately, and automatic restart when the power supply returns is inhibited. Another function is that of resetting the thermal relay provided to protect against overcurrents.
4. **Protective guard for blade:** a coded key microswitch is operated if the blade cover is accidentally or intentionally opened during the machine operating cycle, immediately shutting down all functions.



Noise level of the machine

Noise can cause hearing damage and represents one of the problems faced by many countries who adopt their own standards. In accordance with the **EEC MACHINE-CHINE DIRECTIVE 2006/42/CE**, we are listing the standards that specify noise levels for machine tools.

The following paragraph explains the modes and the detected sound power and pressure values released by the sawing machine.

These values comply with norm EN 13898:2003 + A1:2009, EN ISO 12100:2010 and EN ISO 4871:2009, concerning the rules for drawing and presenting a procedure for noise tests and the declaration and check of sound emission values by machines and equipment.

Noise level measurement

Noise levels are measured using an instrument known as an Integrator noise-meter which registers the equivalent continuous acoustic pressure level at the work station. The damage caused by noise depends on three parameters: level, frequency and duration. The equivalent level concept L_{eq} combines the three parameters and supplies just one indication. The L_{eq} is based on the principle of equal energy, and represents the continuous stationary level containing the same amount of energy, expressed in dBA, as that actually fluctuating over the same period of time. This calculation is made automatically by the integrator noise-meter. The measurements are taken every 60 seconds, in order to obtain a stabilised value. The reading stays on the display for a sufficient time to enable a reading to be taken by the operator. Measurements are taken by holding the instrument at approximately 1 metre from the machine at a height of 1.60 metres above the platform at the operator's work station.

Two measurements are taken: the first while the machine operates without cutting anything, the second while cutting in manual mode.

Noise level values

Identification	
Machine type	Band saw for metal applications
Model	DM10P
Reference standard	ISO 3746

Results		
Test 1st	Description	C 40 steel cut - pipe 50x82 mm Bimetal band 2950x27x0,9 S.GLB Z 5/7
	Results	Mean sound level (Leq) 76,42 dB (A) Environmental correction (K) 3,54 dB(A) Peak sound power (Lw) 87,34 dB(A)
Test 2nd	Description	C 40 steel cut - solid rod 150 mm dia. Ø Bimetal band 2950x27x0,9 S.GLB Z 5/7
	Results	Mean sound level (Leq) 76,50 dB(A) Environmental correction (K) 3,54 dB(A) Peak sound power (Lw) 87,42 dB(A)
Test 3rd	Description	C 40 steel cut - solid rod 90 mm dia. Ø 2950x27x09 bi- metal blade S.GLB Z 5/7
	Results	Mean sound level (Leq) 76,19 dB(A) Environmental correction (K) 3,54 dB(A) Peak sound power (Lw) 87,12 dB(A)

Vibration emission

This sawing machine complies with the norms EN1299 and EN1033, as the machine vibration emission on the devices controlled by the operator does not exceed the threshold of 2.5 m/s²

Electromagnetic compatibility

As from 1 January 1996 all electrical and electronic appliances bearing the CE marking that are sold on the European market must conform to Directive 2014/30/UE e 2014/35/UE and **EEC MACHINES DIRECTIVE 2006/42/CE** . The prescriptions regard two specific aspects in particular:

1. “EMISSIONS: during its operation, the appliance or system must not emit spurious electromagnetic signals of such magnitude as to contaminate the surrounding electromagnetic environment beyond clearly prescribed limits”;
2. “IMMUNITY: the appliance or system must be able to operate correctly even when it is placed in an electromagnetic environment that is contaminated by disturbances of defined magnitude”.

The following text contains a list of the applied standards and the results of the electromagnetic compatibility testing of machine model **DM10P**; Test report no. 140201.

Product family standards

- CEI EN 55011 (1999) Industrial, scientific, and medical radio frequency appliances (ISM). Characteristics of radio frequency disturbance - Limits and methods of measurement.
- EN 50370- 2:2003 Electromagnetic compatibility (EMC) - Product family standard for machine tools - Part 2: Immunity
- EN 50370- 1:2005 Electromagnetic compatibility (EMC) - Product family standard for machine tools - Part 1: Emission

Basic standards

- EN 61000- 4- 2 + A1 + A2 (1996- 1999- 2001) Electromagnetic Compatibility (EMC) - Part 4: Test and measurement techniques - Section 2: Electrostatic discharge immunity tests - Basic publication.
- EN 61000- 4- 3 + A1 + A2 (2003 - 1999 - 2001): Electromagnetic Compatibility (EMC) Part 4: Test and measurement techniques - Section 3: Radiated, radio- frequency, electromagnetic field immunity test.
- EN 61000- 4- 4 + A1 + A2 (1996 - 2001 - 2002) Electromagnetic Compatibility (EMC) - Part 4: Test and measurement techniques - Section 4: Fast transients/ bursts immunity tests - Basic publication.
- EN 61000- 4- 5 + A1 (1995 - 2001): Electromagnetic Compatibility (EMC) - Part 4: Test and measurement techniques - Section 5: Surge immunity test.
- EN 61000- 4- 6 + A1 (1997 - 2001) Electromagnetic Compatibility (EMC) - Part 4: Test and measurement techniques - Section 6: Immunity to conducted interference, induced by radio frequency fields.
- EN 61000- 4- 11 + A1 (1995 - 2001): Compatibilità Elettromagnetica (EMC) Part 4: Test and measurement techniques - Section 11: Voltage dips, short interruptions and voltage variations immunity tests.

Emissions

CONDUCTED EMISSIONS				
Gate A	Freq. (MHz)	Q- peak limit (dBuV)	Mean value limit (dBuV)	Result
A.C. power supply input	0.15 - 0.5	79 - 73 (linear reduction with log of frequency)	66 - 60 (linear reduction with log of frequency)	Complies
	0.5 - 5	73	60	
	5 - 30	73	60	

IRRADIATED EMISSIONS			
Gate	Freq. (MHz)	Q- peak limit (10 m) (dBuV/m)	Result
Enclosure	30 - 230	40	Complies
	230 - 1000	47	

Immunity

IMMUNITY TO ELECTROSTATIC DISCHARGES			
Gate	Test levels	Evaluation criterion	Result
Enclosure	contact 4 kV steel plate 4 kV in air 8 kV	B	Complies

IMMUNITY TO VOLTAGE (BURSTS)			
Gate	Test levels	Evaluation criterion	Result
A.C. power supply input	2 kV	B	Complies

IMMUNITY TO HIGH VOLTAGE PULSES (Surge)			
Gate	Test levels	Evaluation criterion	Result
A.C. power supply input	1 kV (Phase - phase) 2 kV (Phase - earth)	B	Complies

IMMUNITY TO DIPS AND SHORT VOLTAGE INTERRUPTIONS (PQT)			
Gate	Test levels	Evaluation criterion	Result
A.C. power supply input	70% per 0.5 periods	B	Complies
	0% per 0.5 periods	B	
	40% per 5 periods		
	40% per 50 periods		

IMMUNITY TO CONDUCTED ELECTROMAGNETIC FIELDS			
Gate	Test levels	Evaluation criterion	Result
A.C. power supply input	10V	A	Complies

IMMUNITY TO IRRADIATED ELECTROMAGNETIC FIELDS			
Gate	Test levels	Evaluation criterion	Result
Enclosure	10 V/m	A	Complies

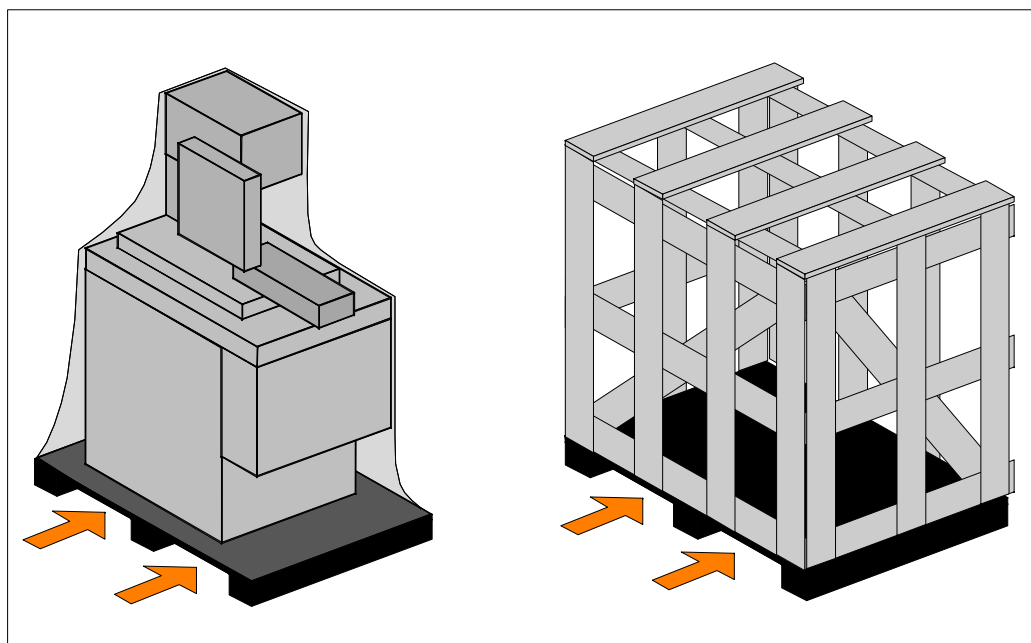
Machine installation



Packaging and storage

MEP S.p.A. use packing materials that guarantee the integrity and protection of the machine during its transport to the customer.

The type of packing differs according to the size, weight and destination. Therefore the customer will receive the machine in one of two following ways:



1. on a pallet with straps and heat- shrink plastic;
2. on a pallet with straps, heat- shrink plastic and a wooden crate.

Warning

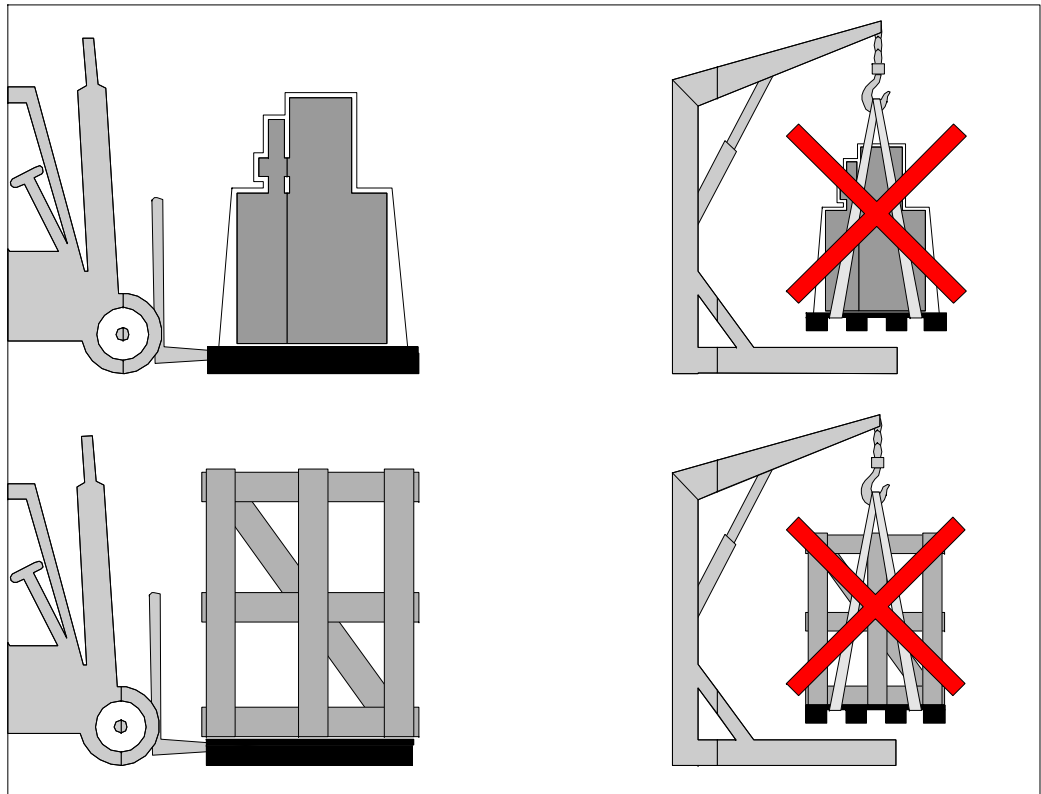
In both cases, for correct balancing the machine must be handled using a fork- lift truck, inserting the tines at the points indicated by the arrows, using the reference marks on the crate itself.

Attention

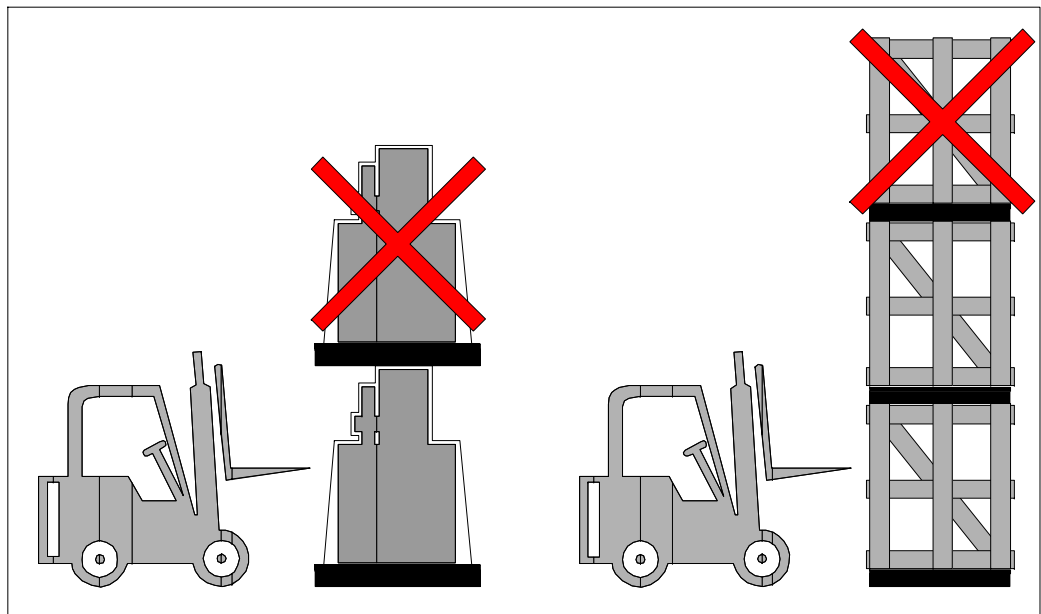
Before carrying out lifting operations, make sure that the weight of the machine, as indicated on the crating or other packaging, is within the forklift truck load limit.

Attention

Do not handle the packed machine using slings.

**Attention**

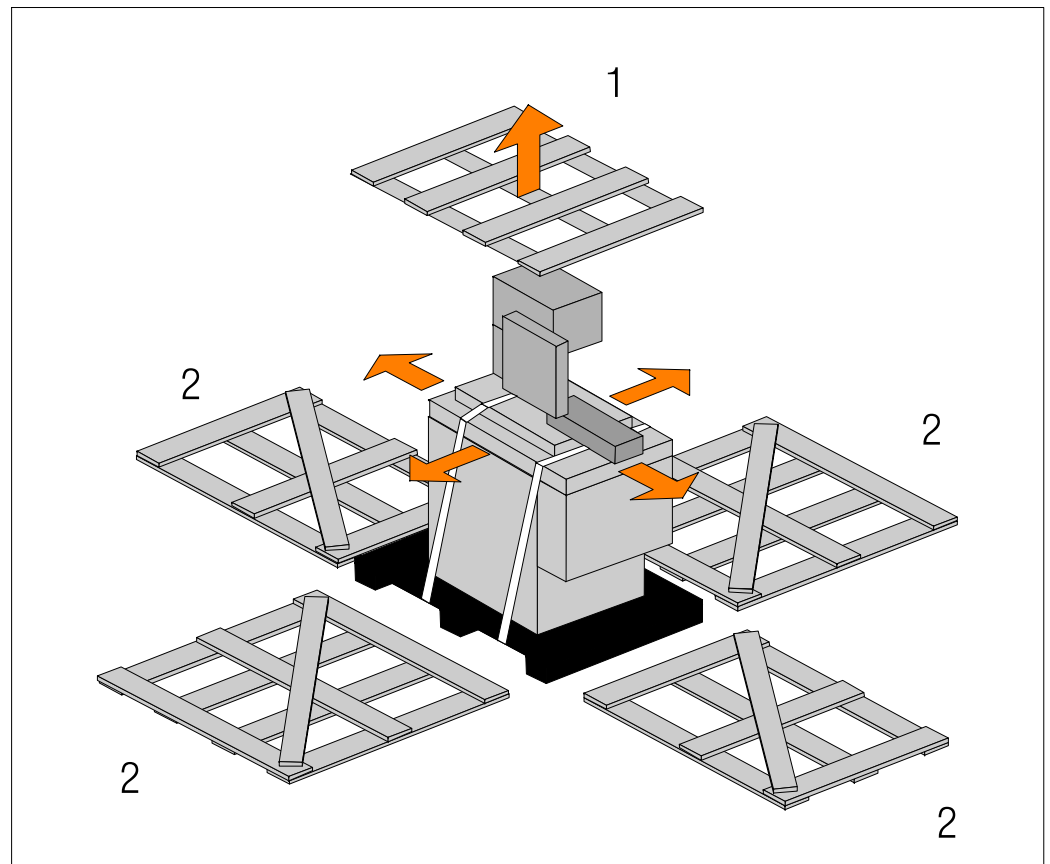
When storing, machines palletized and shrink-wrapped must not be stacked two high, and machines palletized and crated must not be stacked three high.



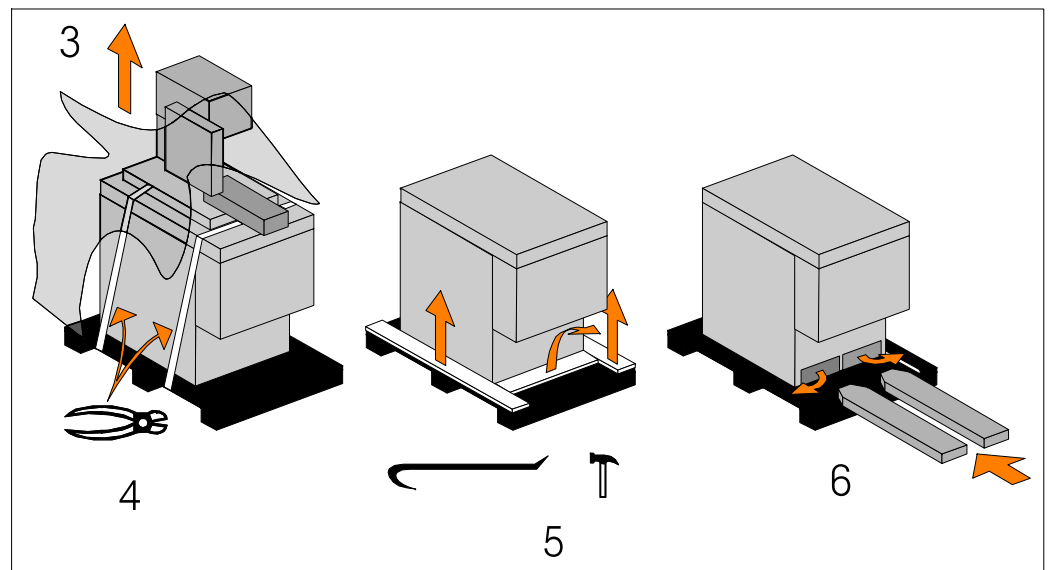
To install the machine, first remove the packing, paying particular attention not to cut any electric wires or hydraulic hoses; if necessary use pliers, a hammer and a cutter.

Open crate in the illustrated order:

1. remove nails and lift the top of the cage;
2. remove nails and lower walls;



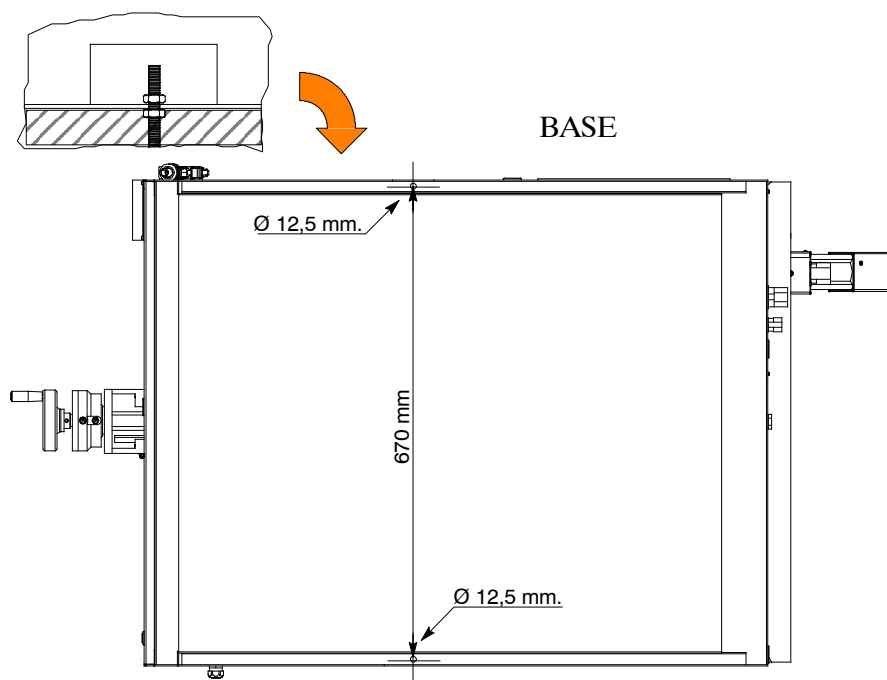
3. remove heat-shrink covering;
4. remove the straps;
5. remove nails from pallet securing planks and remove planks;
6. remove the front panel and insert fork tines.



To locate the machine in the workplace, **the machine dimensions** and necessary operator working space, including **the spaces laid down in safety standards, must be taken into account.**

Anchoring the machine

The base of the machine is anchored to the floor by two permanent studs located on the sides of the base. The studs are screwed into nuts previously sunk into the concrete, and tightened from above with lock nuts. The schematic specifications set out in Chapter 1 should be taken into account when positioning the machine.



Minimum requirements

For the machine to function correctly, the room in which it is to be installed must satisfy the following requirements:

- power supply voltage/frequency: refer to the values on the rating plate;
- working pressure (MA version) not less than 6 Bar and not greater than 8 Bar;
- temperature of machine location: from - 10 to + 50° C;
- relative humidity: not more than 90%;
- lighting: not less than 500 Lux.

Warning

The machine is already protected against voltage variations, but will only run trouble-free if the variations do not exceed $\pm 10\%$.

Check list

Before starting installation, check that all the accessories, whether standard or optional, supplied with the machine are present. The basic version of the **DM10P 2- SPEED** machine is supplied complete with:

CHARACTERISTICS	STANDARD	OPTIONAL
Base with large swarf collection drawer, removable coolant tank and electropump for band saw lubrication/cooling	✓	
2.950x27x0.9 (116.14x1.06x0.03 in.) bimetal blade for solid and section materials	✓	
Program with several special cutting cycles	✓	
Blade cleaning brush	✓	
Designed for transpallet handling systems	✓	
New console with all centralized controls, installed on an articulated arm to be easily moved in every operating position, complete with: entirely identifiable wiring, main switch with lock, motor overload cutout, min. voltage coil, phase shortage protection	✓	
Blade protection behind and below blade guide heads	✓	
IP 55 handgrip		✓
Precision stops for cuts at 0°, 45°, 60° left and 45° right	✓	
Accessory kit	✓	
Mobile START device for semi- automatic cycle/EMERGENCY		✓
Electronic transducer for belt tensioning	✓	
Console diagnostics	✓	
Message display	✓	
4/8 pole motor for 36/18 (11.21 / 5.60 ft./min) mt/min speed*		✓
2.950 x27x0.9 (116.14x1.06x0.03 in.) M2/M42 bimetal band saw		✓
Electronic speed control (inverter) 20 to 90 (from 64.85 to 291.83 ft./min) mt/min*		✓
Millimetre rule with adjustable stop	✓	
Console -set- up	✓	
Digital ammeter indicating motor current absorption	✓	
New latest generation hydraulic control unit, with high efficiency and low energy consumption	✓	
Possibility of machine dialogue with SMV3000 and SMV3000PRO, if both products are simultaneously in MEP*		✓
Vice pressure control	✓	
Head pressure control	✓	
Arm with roller	✓	
Semi- automatic working cycles	✓	
Display of belt rotation speed	✓	
Low voltage soft keyboard, in polyester, with thermo- shaped buttons, with tactile feeling and sound signal when operating	✓	
Manual and semiautomatic/dynamic processing cycles*		✓
Bar support		✓
K110 roller table on supply side - kit 1500 mm (59.05 in.)		✓
Feed side roller table support		✓
Discharge side roller table adaptor		✓

CHARACTERISTICS	STANDARD	OPTIONAL
K110 roller table for discharge side, 1500÷6000 mm (59.05 in. ÷ 236.22 in.)		✓
5 l can of emulsible oil		✓

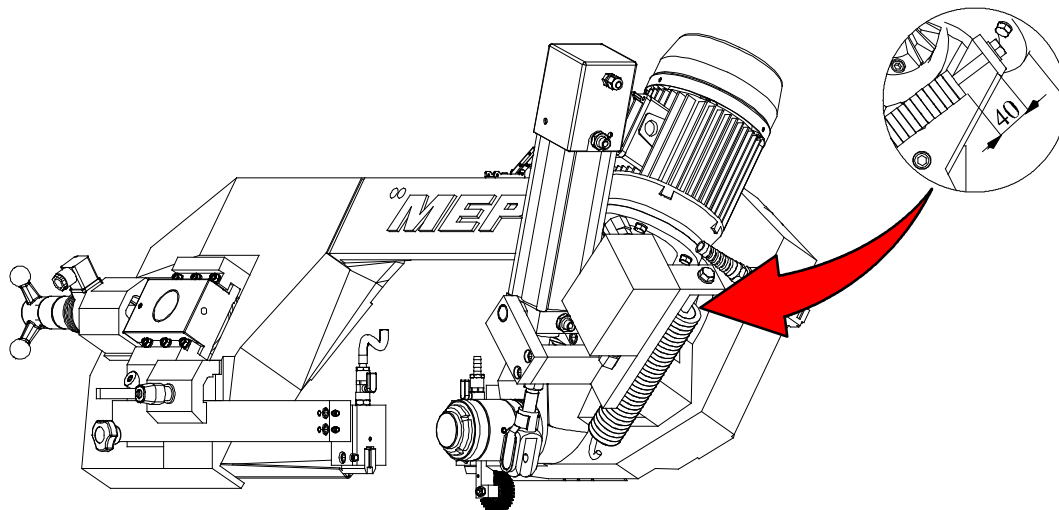
***ACCESSORIES AVAILABLE ON REQUEST**

The bag of accessories is enclosed in the machine before being packed and contains:

- 3,4,5,6 and 10 mm Allen keys;
- pipe wrench 10 mm;
- 36 mm wrench;
- manual pump for topping up the oil in the pneumatic cylinder.

Balancing the cutting head

Before making the electric and hydraulic connection, tension the head call spring to balance the bow weight. Tension the spring till reaching the distance of 40 mm (1.57 in.) between bracket and the first spring turn.



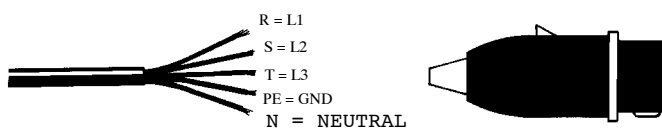
Connection to the power supply

Before connecting the machine to the power supply, check that the socket is not connected in series with other machines. This requirement is fundamental for the good operation of the machine.

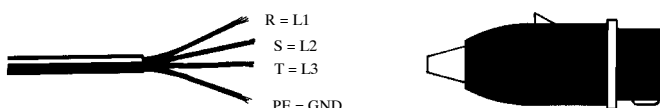
To connect the machine to the power supply, proceed as follows:

- connect the power supply cable of the machine to a plug which matches the socket to be used. (EN 60204- 1; par. 5.3.2)

CONNECTION FOR "5-CORE" WIRE SYSTEMS WITH NEUTRAL



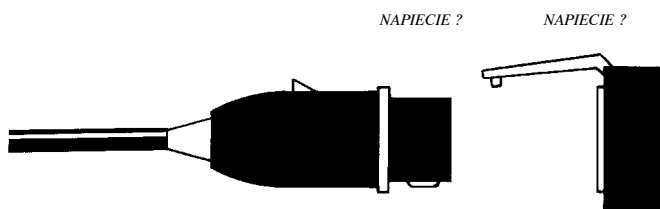
CONNECTION FOR "4-CORE" WIRE SYSTEMS WITH NEUTRAL



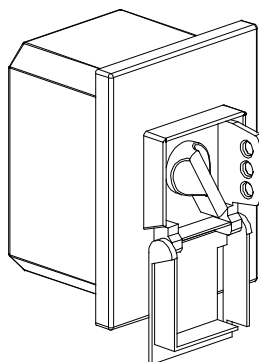
Attention

When using systems with a neutral wire, special care must be taken when connecting the **blue** neutral wire, in that if it is connected to a phase wire it will discharge the **phase voltage** to the equipment connected for **voltage: phase- neutral**.

- Insert the plug in the socket, ensuring that the mains voltage is the same as that for which the machine has been setup.

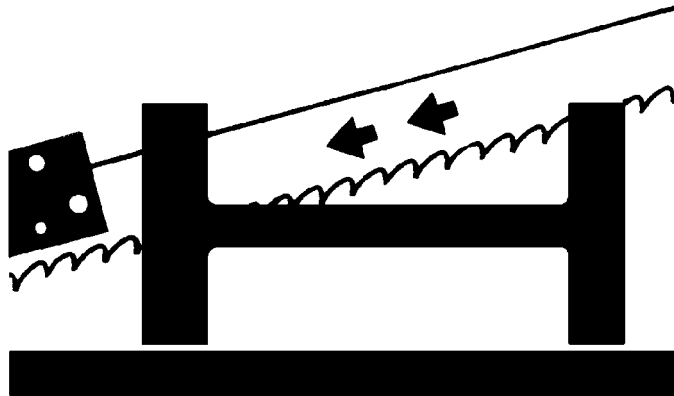


- Power the machine, rotating the main switch on the console left side (the control console lights up).



Attention

Ensure that the blade moves in the correct direction as shown in the above figure. If it does not, simply reverse two of the phase wires on the machine power supply input.



The sawing machine is now ready to start the work for which it was designed. Chapter 5 provides a detailed description of the various functions of the machine and its operating cycles.

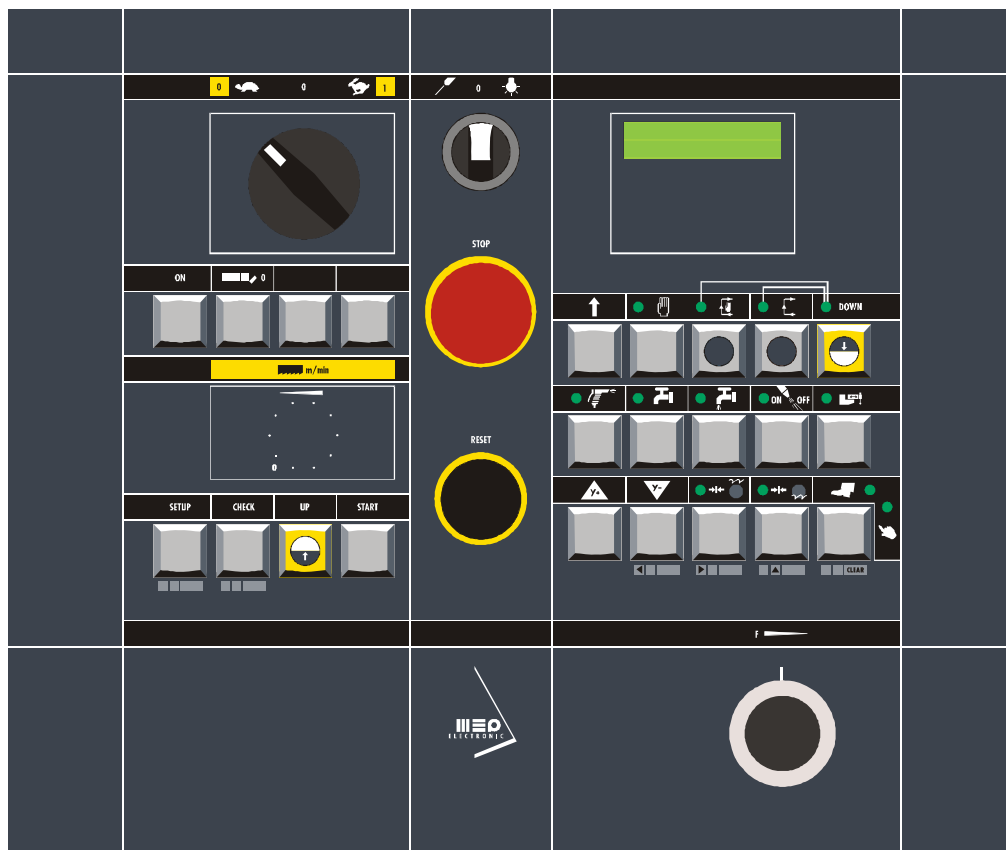
Description of machine operation




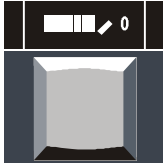

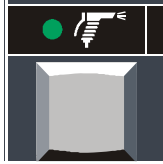
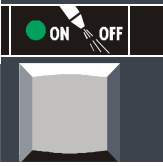

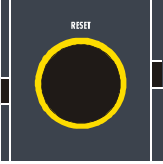
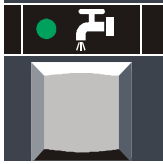
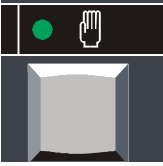
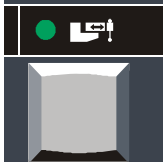
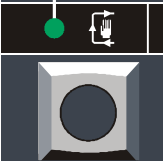
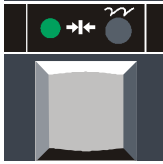
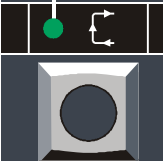
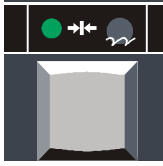

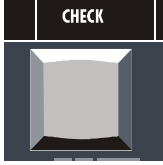
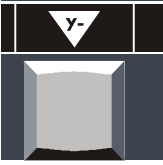
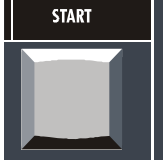
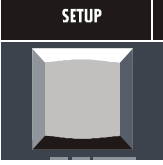

This chapter analyses all the machine functions. We begin with a description of the pushbuttons and other components on the control panel.

Description of the control panel

The control console is housed inside the control panel, a tamperproof IP 54 protection class housing sealed against dust and moisture. The control panel swivels on two articulated joints so that it can be positioned as required by the operator for greater ease- of- use and safety. The control board of the **DM10P** is shown in the picture below:

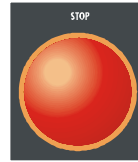


Key of control console keyboard

	Initialisation key: enables machine operation		Zeroing key for cuts made
	Cutting speed selection: hare (fast), turtle (slow) and zero (deselection)		Nonoperating
	Selection for min. lubrication (optional)		No lubricant/coolant key
	RESET key: resets the machine after an emergency condition or conflicting command		Lubricant/coolant spray cock key (only available during cycle)
	Manual cycle key (optional)		Vice opening/closing
	Semi- automatic/Dynamic cycle key (optional)		FCTI (Head Upstroke Limit) memory key for Head Positioning System
	Semi- automatic cycle key		FCTA (Head Downstroke Limit) memory key for Head Positioning System
	Head “up” key		Diagnostics key
	Head “down” key		Programmed cycle start key
	Machine parameters input/edit key		Foot pedal or console START selection key



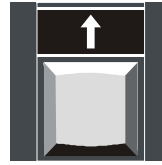
Optional: electronic speed control (inverter). Blade cutting speed potentiometer: 20 to 45 m/min. (from 64.85 to 145.91 ft./min) at low speed and 35 to 90 m/min. (from 113.49 to 291.83 ft./min) at high speed



Mushroom head emergency stop button: when pressed, this button immediately shuts down the machine. To reset the emergency stop button, simply rotate through 45°



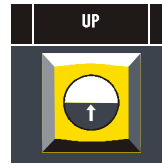
Hydraulic adjuster for choosing the head lowering speed



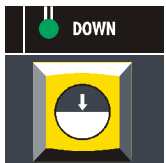
Key for displaying the machine parameters for performing a machining cycle: TL blade tension, PT head position, VL blade speed, T cutting time, PZ cut piece number, I motor absorption



Switch to activate or deactivate the laser to position the bar accurately to carry out non- standard or facing cuts, or to activate or deactivate the lamp for lighting the cutting area.

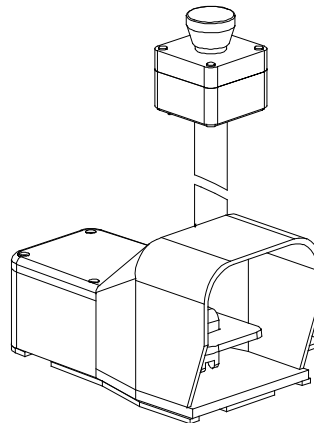


Button to take the cutting head to the stored RHLS point during the semiautomatic and semiautomatic- dynamic machining cycle, when the head reaches the cut end and if the DOWN button has been previously activated.



Button to stop the cutting head at the FHLS point when it reaches the cut end in the semiautomatic and semiautomatic- dynamic machining cycle.

MOBILE START-EMERGENCY DEVICE (optional)



The machine can be equipped with a remote control device, enabling the start of the semiautomatic cycle through pedals and the emergency stop through red mushroom push button (optional).

THERMAL-MAGNETIC CIRCUIT-BREAKER WITH UNDERVOLTAGE COIL AND DOOR LOCKING DEVICE

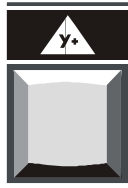
On the left side of the control board, the machine is equipped with a main switch that, when set ON (1), powers the machine. When set to ON (1), this switch powers up the machine. The main switch is fitted with three power failure protection systems. In fact, in the event of a power failure, this switch disconnects all the electrical devices, causing the machine to immediately shut down, and prevents it from automatically starting up again when power is restored. This device also resets the thermal relay fitted to protect against current overloads.

Basic instructions for carrying out a cutting operation cycle

Manoeuvring the cutting head

The cutting head may be operated by the head “up” and “down” buttons of the Head Positioning System (previously illustrated in the key for the control console

keyboard), which are enabled in SEMI- AUTOMATIC mode.



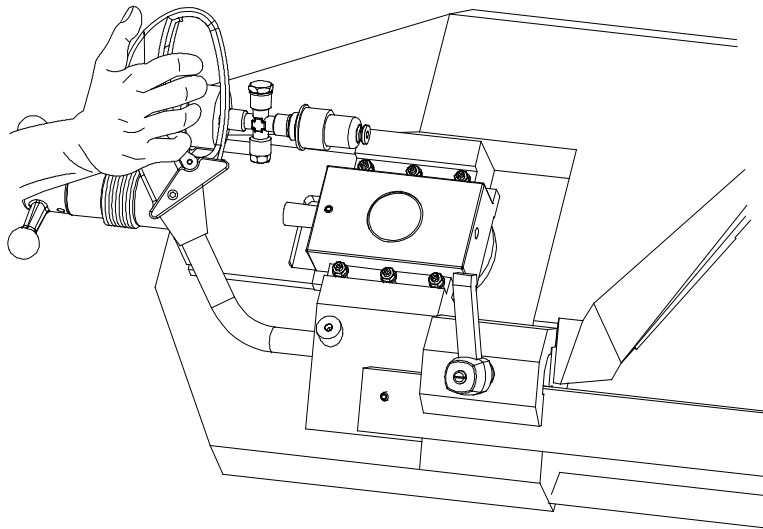
Head “down” key



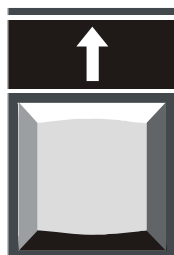
Head “up” key

The operating head can be moved also through the control handle with the operation set in MANUAL or SEMIAUTOMATIC/DYNAMIC, in the machines equipped with these optionals. The best balancing of the head weight, thanks to the pulling force of the spring on the machine rear, aids the operator in the bow positioning.

Moreover, the hand grip on the cutting head control lever allows the operator to have a firm grip. The operator can start- up belt rotation by pressing the activation lever on the micro- switch integrated into the hand grip itself.



N.B. During any processing cycle it is possible to control the machine operating parameters BT (blade tensioning) and HP (head position), pressing the key below it is also possible to display the values BS (blade speed), CT (cutting time), PC (cut piece counting) and IBM (motor current absorption).



SEMAUT.: READY

BT=0880 HP=0968

BS=0 CT=00:00:00

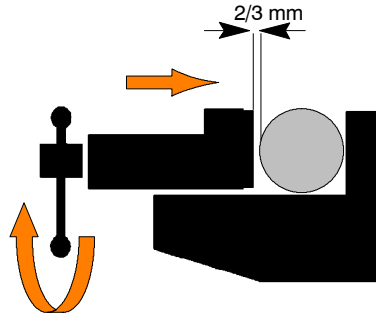
TOTALIZ=00000:00

PC=0001 IBM=00.0A

Clamping the work piece in the vice

Vice opening and closure is controlled by the corresponding buttons on the control console. However, to ensure that the workpiece is securely clamped in the vice, proceed as follows:

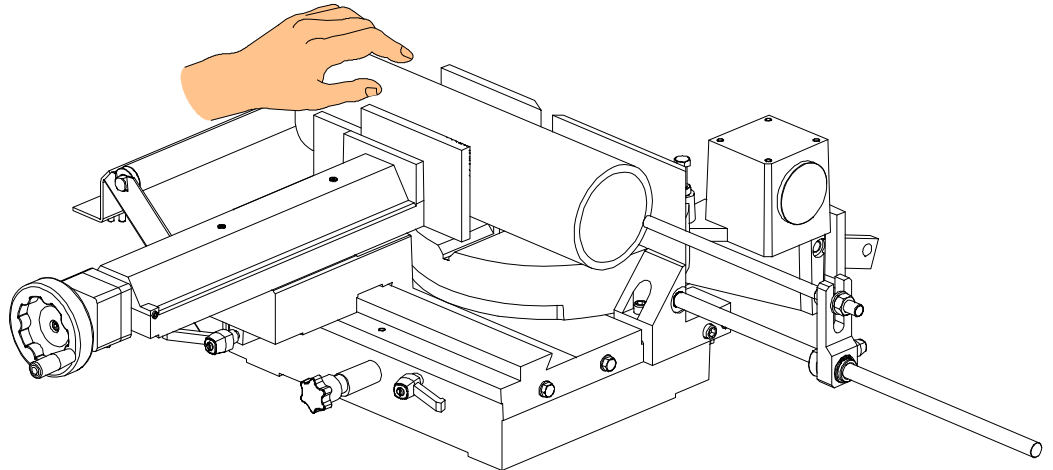
- ▶ Make sure the workpiece dimensions do not exceed the machine's cutting capacity;
- ▶ make sure the piece is correctly supported on both sides of the machine;
- ▶ move the vice to within 2÷3 mm of the workpiece using the handwheel;



- ▶ press the vice opening/closing push button;



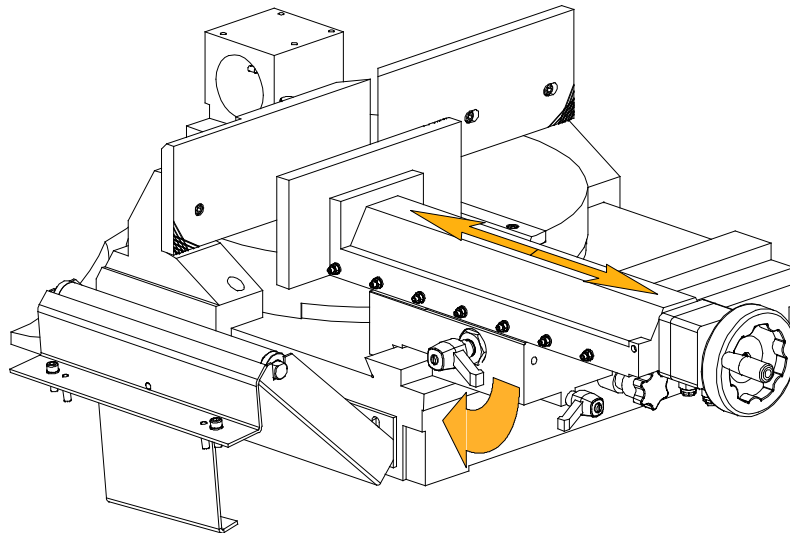
- ▶ make sure the workpiece is securely clamped in the vice by trying to move it manually.



Rapid vice positioning

By means of a simple device the vice can be slid back and forth to accelerate vice opening and closing operations.

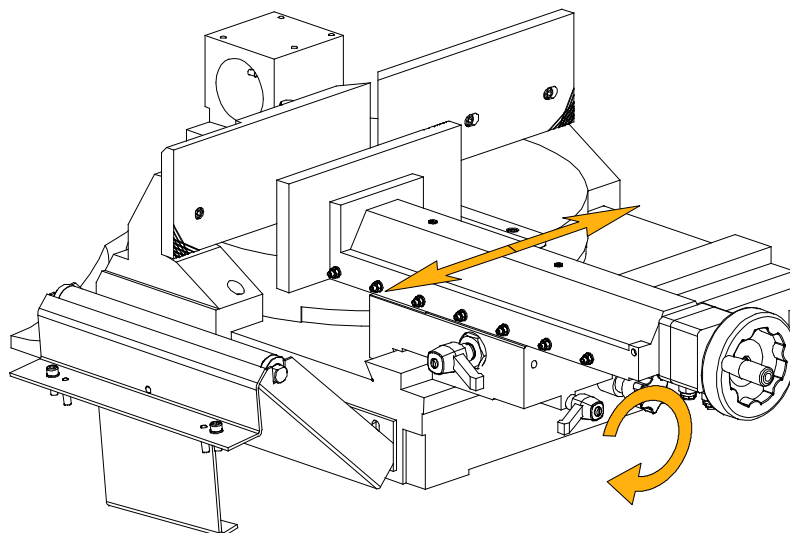
- ▶ Grip the lever illustrated in the figure below and rotate in a clockwise direction: the vice is now free to slide back and forth to the required position. Once positioned, release the lever to lock the vice in place.
- ▶ Finally, position the vice to within 2-3 mm of the workpiece using the handwheel.



Rapid vice translation

For angled cuts, the vice may be slid to the left or right along the prismatic guide.

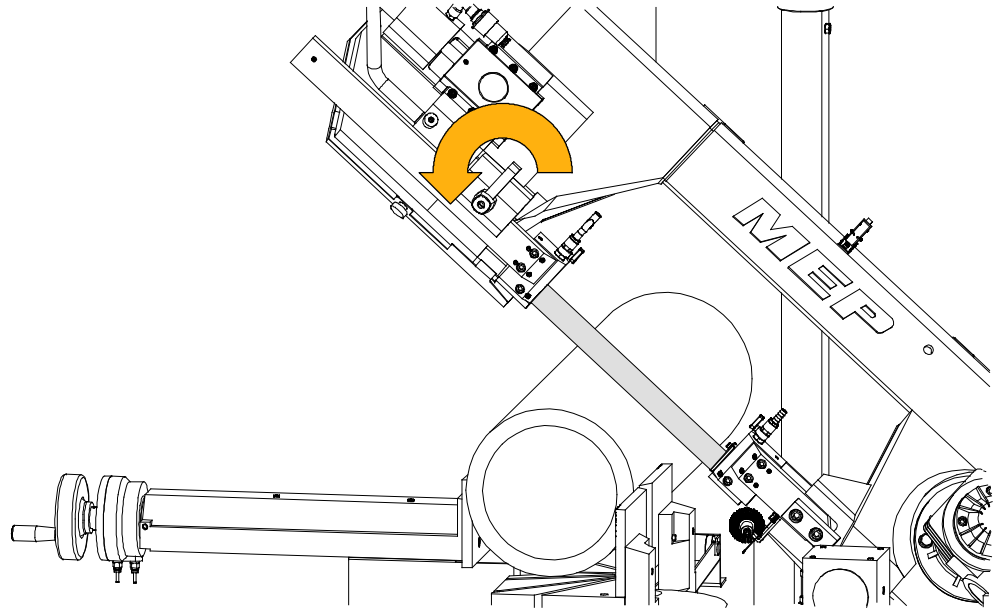
- ▶ Release the locking lever illustrated in the figure below.
- ▶ Position the vice to the right or left and lock the lever.



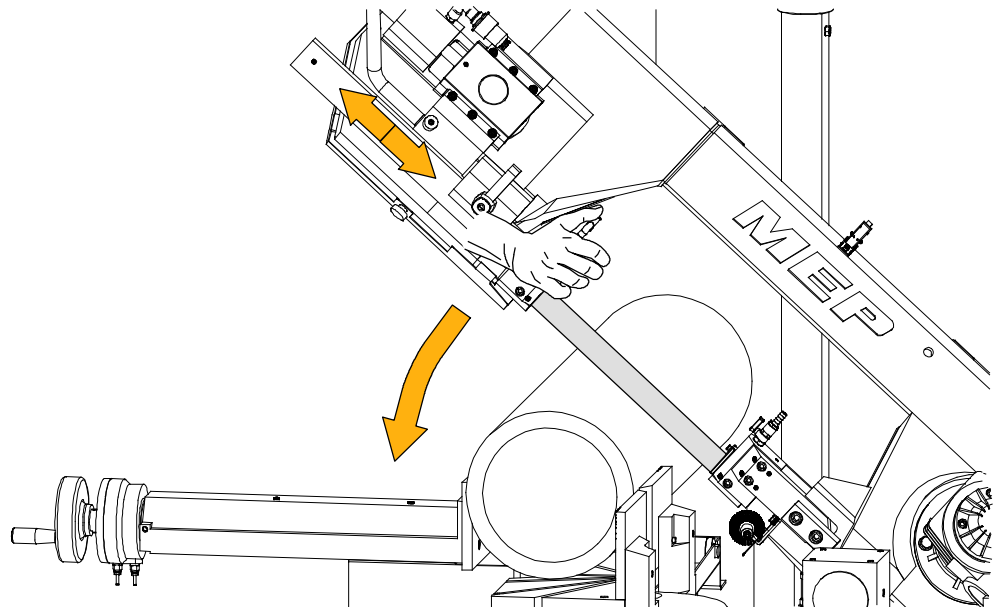
Width of cut

The machine is fitted with protections which protect the entire blade stroke, leaving exposed only the part of the blade required to make the cut itself as specified by current standards. The width of the cut is determined by the longitudinal section of the workpiece, so that only the part of the blade required to make the cut is actually exposed.

- Position the workpiece on the work table in proximity to the blade downstroke trajectory and clamp it in the vice;
- Slacken the ratchet lever on the sliding shaft of the front blade guide head.



- Position the mobile front guide head near the workpiece so that the downstroke trajectory exceeds the mobile vice jaw.



- Tighten the ratchet lever to lock the head slide.

Preliminary check list for cutting operation

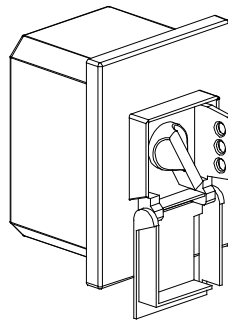
To guarantee complete safety during cutting cycles, the operator should work through a check list of the entire apparatus, checking:

- ▶ blade tension;
- ▶ that the blade guide head bracket is locked in the correct position;
- ▶ that the cutting angle is correct and the cutting head is locked;
- ▶ that the work piece is properly clamped in place;
- ▶ that the blade teeth are correct for the job to be begun;
- ▶ that the speed selected is right for the kind of piece to be cut;
- ▶ that all protections are in place and correctly locked;
- ▶ the level of lubricant/coolant and that the electropump is activated;
- ▶ that the blade downstroke speed and the cutting pressure are correct.

Manual operating cycle (optional)

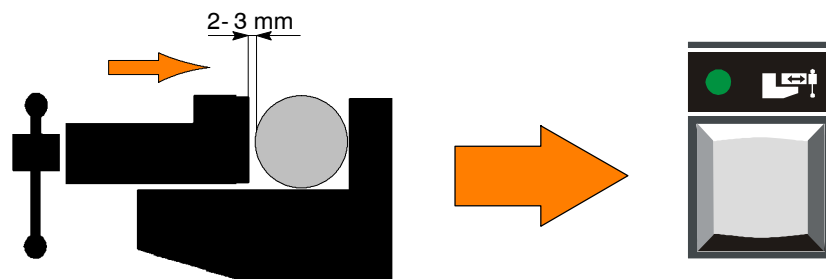
Manual cutting sequence:

- ▶ power up the machine by turning the main switch.

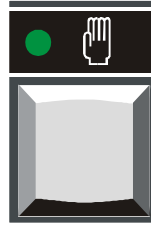


The following sequence applies to cuts of all dimensions:

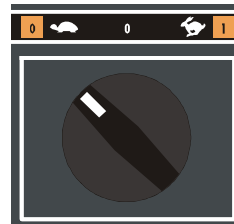
- ▶ position the piece in the vice and calculate the length of cuts (using the cut- to- size rod).
- ▶ Manually position the vice to within 2÷3 mm of the workpiece. Lock the vice using the corresponding “close” button on the control console.



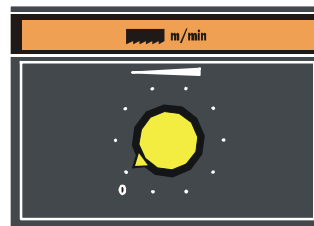
- Select manual mode by pressing the corresponding button on the control console.



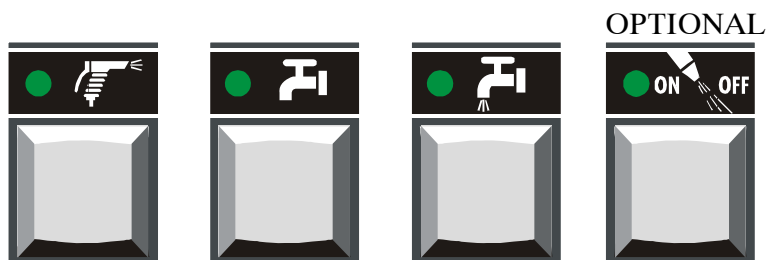
- Select the required cutting speed in accordance with the type of material to be cut (shape, gauge, hardness, etc.). Press the button marked by the “tortoise” symbol to select low speed and the button marked by the “hare” symbol to select high speed.



N.B. If the machine is equipped with the optional inverter, set the speed for the type of material being cut using the potentiometer on the control console.

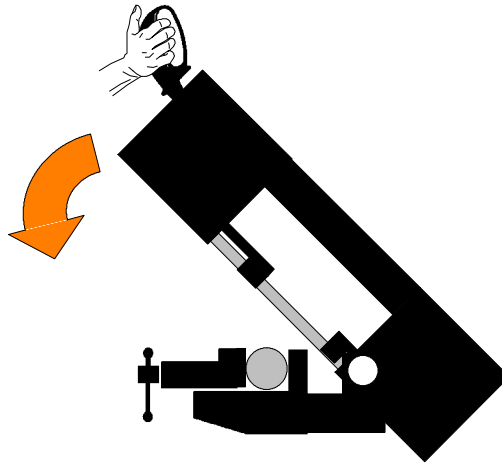


- Program the lubricant/coolant spray using the corresponding button on the control console and adjust the delivery rate using the cocks on the blade guide heads. It is also possible to set the lubricant/coolant delivery mode.

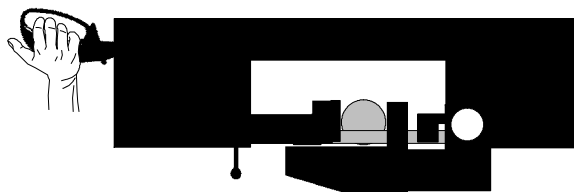


N.B. The machine is delivered without lubricant/coolant to facilitate shipment and storage. Therefore, before activating the lubricant/coolant spray, prepare an emulsion of water and lubricant/coolant oil (5- 6% oil). For further information about types of lubricant/coolant oils, refer to the section on *Consumables* in Chapter 8.

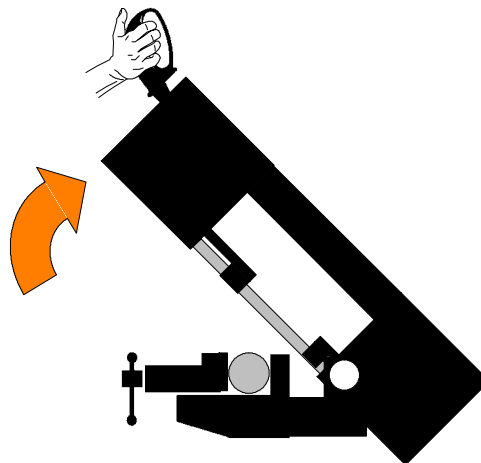
- Grip the head control lever and start the blade rotating by pressing the microswitch on the handgrip; the downstroke speed of the head is manually controlled by the operator.



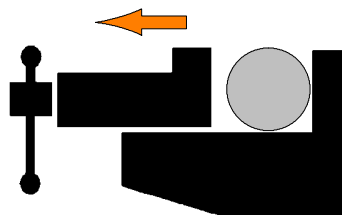
- The motor starts up and sets the blade in rotary motion; the lubricant/coolant pump starts up at the same time.



- At the end of the cutting operation, the head can be raised.



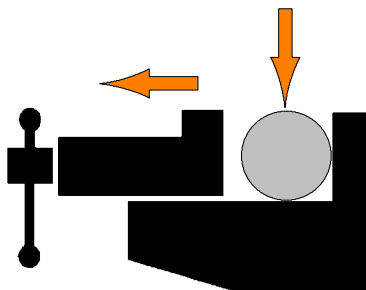
- Free the piece from the vice and open using the “open” button.



Semi- automatic operating cycle

Semi- automatic cutting sequence:

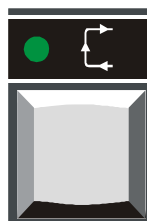
- ▶ power up the machine by turning the main switch;
- ▶ position the workpiece in the vice.



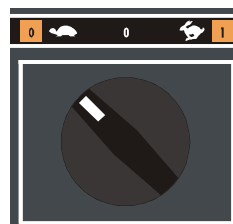
Warning

During this programming phase of the cycle, do not position the workpiece perpendicular to the blade so that the head may be moved up and down without colliding with the workpiece.

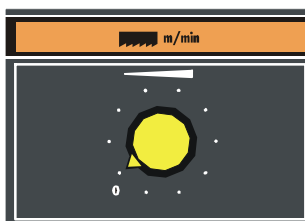
- ▶ Select semi- automatic mode by pressing the corresponding button on the control console.



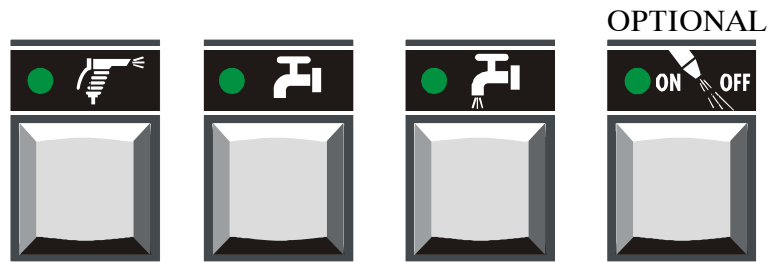
- ▶ Select the required cutting speed in accordance with the type of material being cut (tortoise = low speed; hare = high speed).



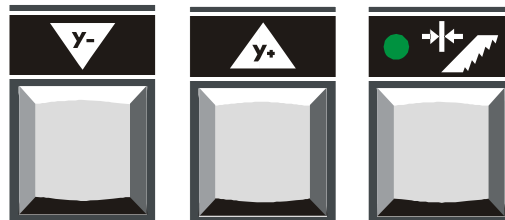
N.B. If the machine is equipped with the optional inverter, set the speed for the type of material being cut using the potentiometer on the control console.



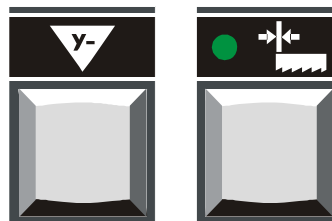
- ▶ Program the lubricant/coolant spray using the corresponding button on the control console and adjust the delivery rate using the cocks on the blade guide heads. It is also possible to set the lubricant/coolant delivery mode.



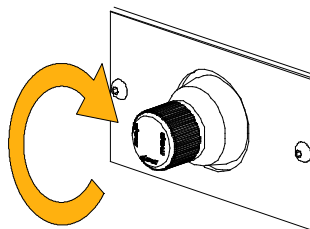
- ▶ Position the cutting head about 10 mm from the workpiece using the up (Y+) and down (Y-) arrow keys.
- ▶ Press the FCTI (Head Upstroke Limit) memory button to save the head start position at the beginning of the cycle.



- ▶ Lower the head to the end- of- cut position by pressing the down (Y-) arrow key.
- ▶ Press the FCTA (Head Downstroke Limit) memory key to determine the final position of the head at the end of the cut. As soon as you have pressed the FCTA memory key the vice will close and the head will return up to the FCTI position ready for cycle start.

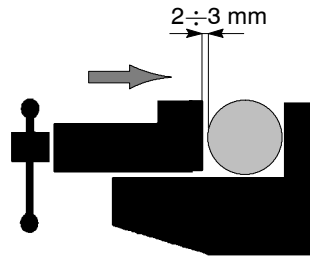


- ▶ Fully close the head lowering adjuster, on the right side of the control console.

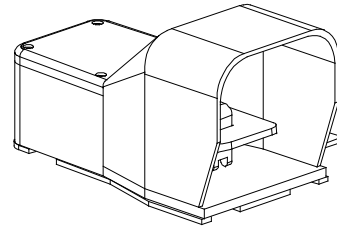


- ▶ Correctly position the workpiece in the vice and calculate the length of cuts (using the cut- to- size rod).

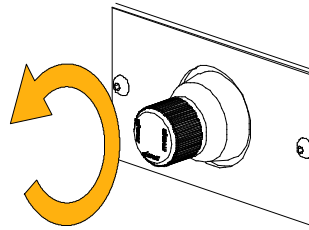
- Open the vice using the relative button and manually move the vice towards the material, leaving a minimum distance of $2 \div 3$ mm. (as illustrated in the Manual cycle).



- Start the cutting cycle pressing the start key or the pedal control (optional).



- After you have given the START command, the blade starts to rotate, the vice clamps the workpiece and the coolant spray is activated. The cutting head will remain in the start position until the head descent regulator located on the front right of the base is opened.



Warning

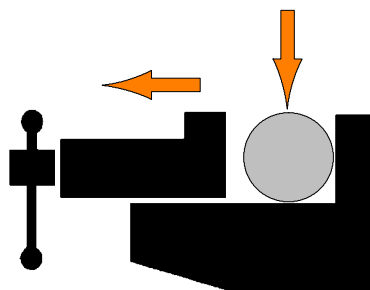
Adjust the head downstroke speed in accordance with the type of material being cut, the blade rotation speed and the quality of finish required.

- Once the piece has been cut (FCTA position), the blade stops rotating, the cutting head returns to the FCTI position and the vice opens. The machine is now ready to start a new cycle.

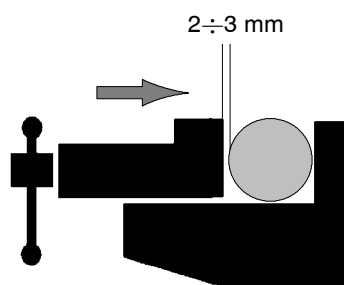
Semi- automatic / Dynamic operating cycle (Optional)

Semi- automatic / Dynamic cutting sequence:

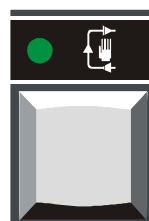
- ▶ Power up the machine at the main power switch.
- ▶ Position the piece in the vice and calculate the length of cuts (using the cut- to- size rod).



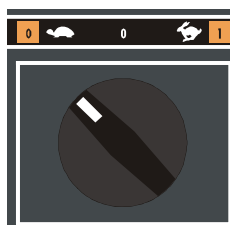
- ▶ Manually position the vice to within 2÷3 mm of the workpiece.



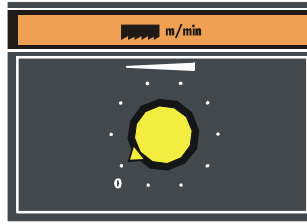
- ▶ Select semi- automatic / dynamic mode by pressing the corresponding button on the control console.



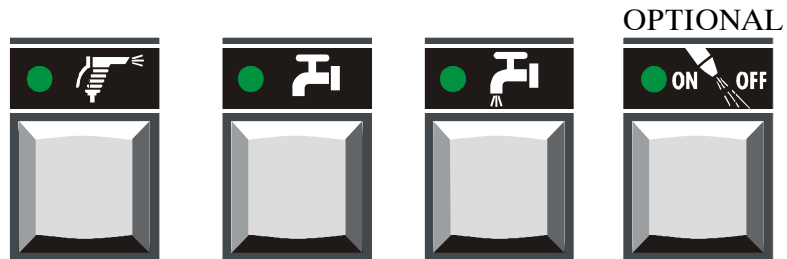
- ▶ Select the required cutting speed in accordance with the type of material being cut (tortoise = low speed; hare = high speed).



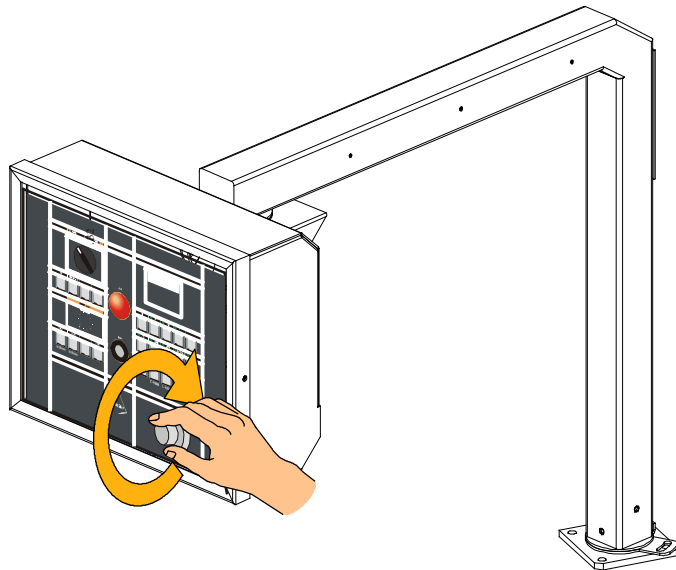
- N.B.** If the machine is equipped with the optional inverter, set the speed for the type of material being cut using the potentiometer on the control console.



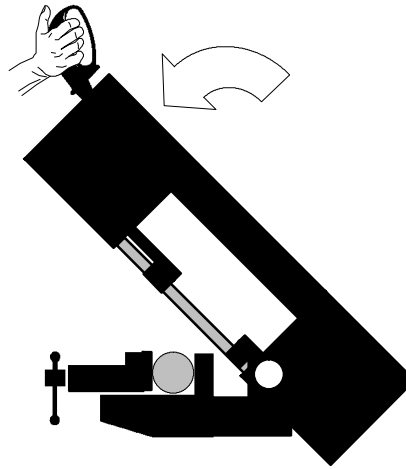
- Program the lubricant/coolant spray using the corresponding button on the control console and adjust the delivery rate using the cocks on the blade guide heads. It is also possible to set the lubricant/coolant delivery mode.



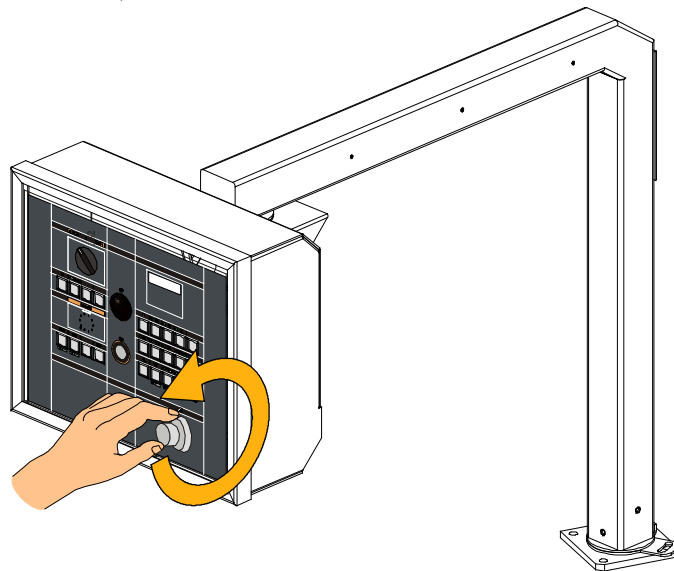
- Fully close the head lowering adjuster, on the right side of the control console, selecting 0; in this way, accidental head starts after the cycle start are prevented.



- Grip the head control lever and lower the blade to within about 10 mm of the workpiece. This done, press the micro- switch on the handgrip to START the cycle (this operation saves the FCTI position - Head Upstroke Limit).



- After you have given the START command, the blade starts to rotate, the vice clamps the workpiece and the coolant spray is activated. The cutting head will remain in the start position until the head descent regulator is opened (clockwise rotation).



Warning

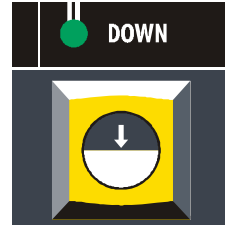
Adjust the head downstroke speed in accordance with the type of material being cut, the blade rotation speed and the quality of finish required.

- Once the piece has been cut (FCTA position), the blade stops rotating, the cutting head returns to the FCTI position and the vice opens. The machine is now ready to start a new cycle.


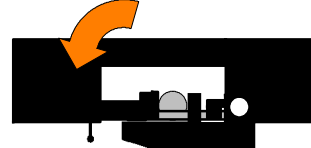


UP and DOWN function

In the semiautomatic cycle this function enables to stop the head at the RHLS to make operations on the cut piece holding it locked in the vice after the cut.

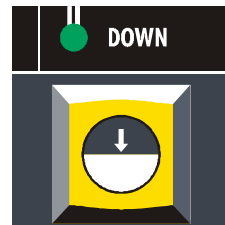
- Select the semiautomatic cycle, press the DOWN button.



The cutting cycle is the following:

1. The cutter vice closes	2. The band starts and the head lowers till the cut end (FHLS)	3. The head stops at the FHLS point and the band stops	4. The cutting vice remains closed
			

- Press the UP button to return the head to the RHLS, then the vice opens automatically.



Warning

In the semiautomatic-dynamic machining cycle the head return spring must be detensioned to prevent the spring pulling force from lifting the head when it has reached the FHLS point.

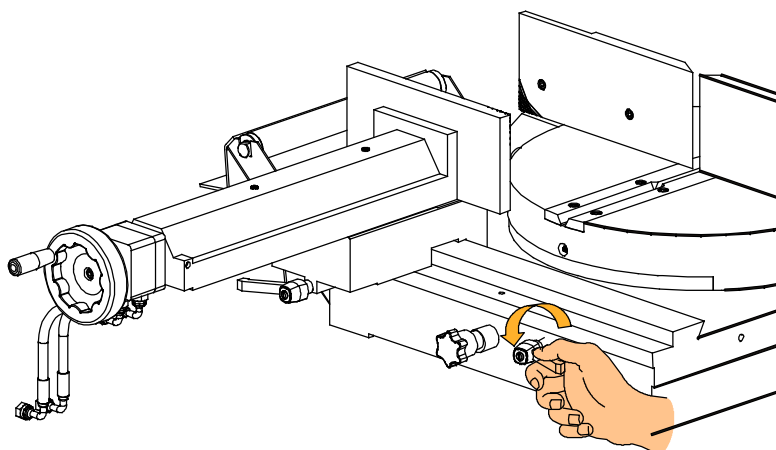
- **Press the Down button to deactivate this function.** Press the Down button to deactivate this function.

Angled cuts

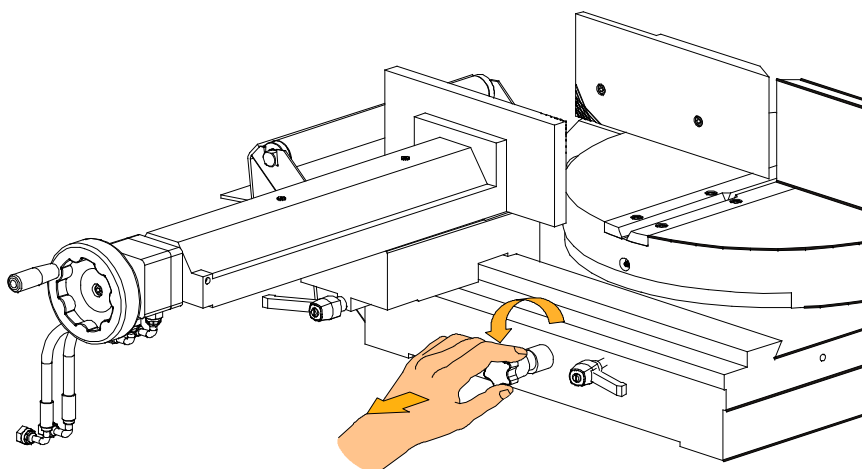
The machine can make angled cuts from 60° left to 45° right. Reference stops are mounted on the sides of the turntable to facilitate rapid 0°, 45° and 60° cuts to the left and 45° cuts to the right.

Angled cuts 45° to the left

- ▶ Make sure the vice is positioned to the left of the 0° cutting slot;
- ▶ slacken the turntable lock/release lever.



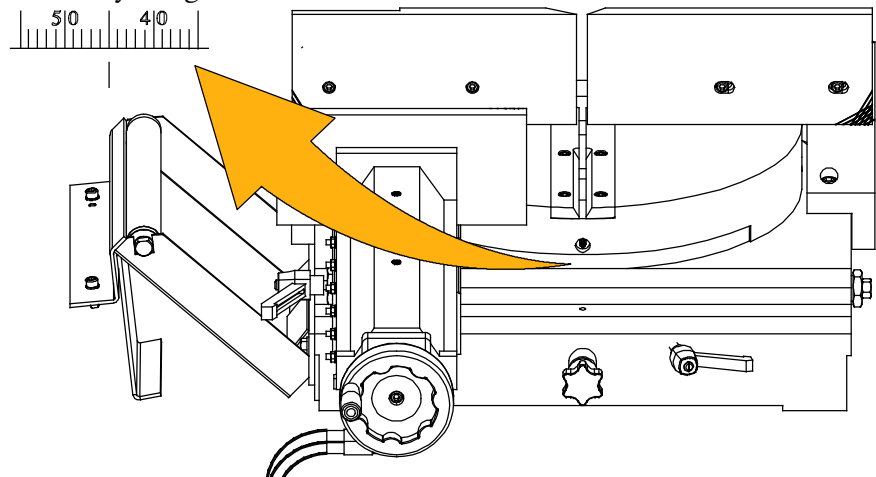
- ▶ Pull the eccentric pin knob towards you (0° reference stop) and rotate slightly to raise it.



Warning

The 0, 45 and 60° reference stops for cuts to the left and the 45° reference stop for cuts to the right facilitate rapid head positioning during turntable rotation. However, the eccentric pin is only correctly positioned if the initial rotation of the turntable when released is corrected.

- Swing the head from left to right until it is positioned at the required angle, as indicated by the graduated scale on the turntable.



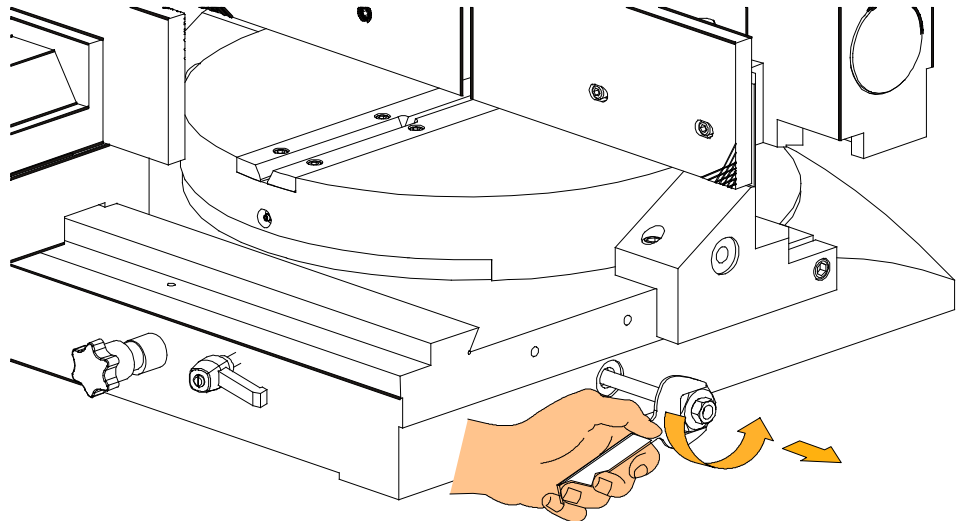
Attention

Always rotate the head when it is in the upper position to avoid blade collision with the moving jaw on the clamp.

- Relock the turntable lock/release lever.
- Make the cut in the required operating mode, following the preliminary safety instructions set out in this chapter.

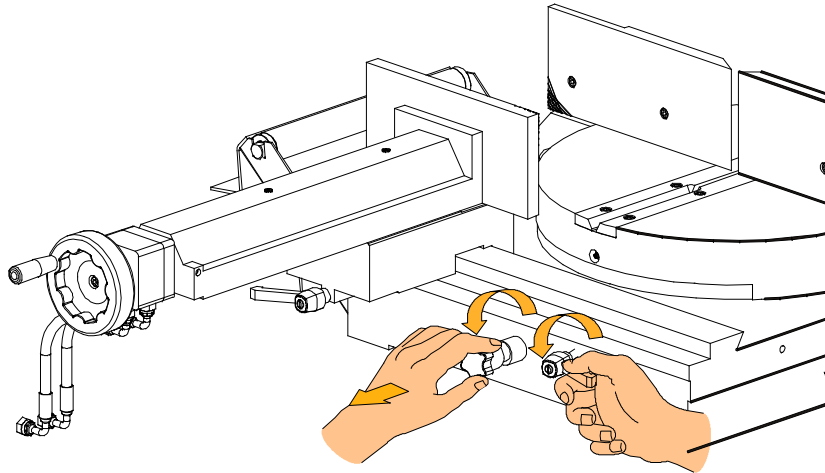
Angled cuts 60° to the left

- Undo the bush on the 45° left reference stop, as illustrated in the figure below, using a 36 mm wrench.
- Remove the 45° reference stop.



- Slacken the turntable lock/release lever.

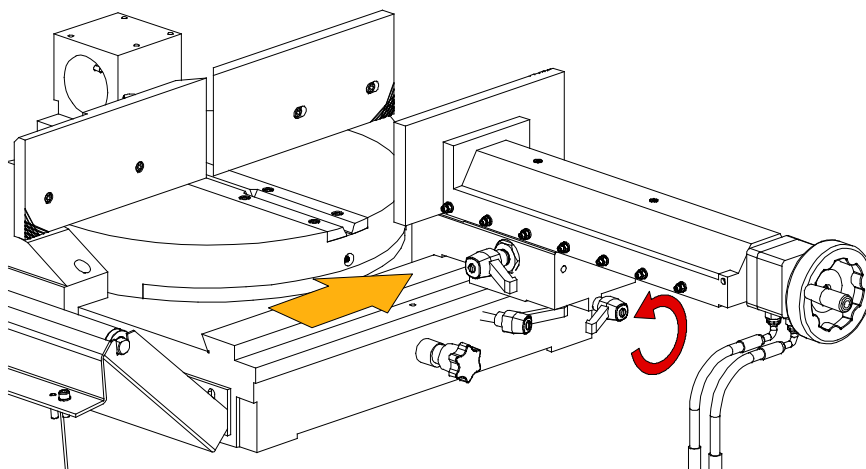
- ▶ Pull the eccentric pin knob towards you (0° reference stop) and rotate slightly to raise it.



- ▶ Swing the head from left to right until it is positioned at the required angle, as indicated by the graduated scale on the turntable.
- ▶ Relock the turntable lock/release lever.
- ▶ Before cutting, remove the lever from the front head support and replace it with the grub screw in the accessory pack.
- ▶ Make the cut in the required operating mode, following the preliminary safety instructions set out in this chapter.

Angled cuts 45° to the right

- ▶ Make sure the vice is positioned to the right of the 0° cutting slot.
- ▶ slacken the locking lever as shown in the figure below;
- ▶ position the vice to the right and lock the lever.

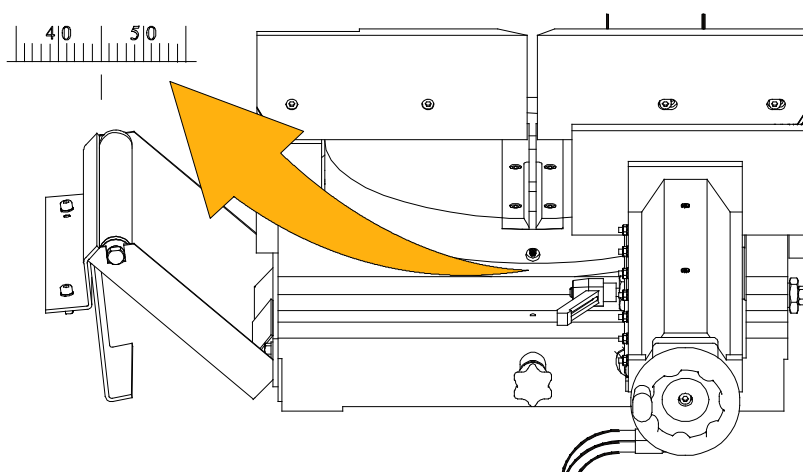


Attention

When positioning the vice to the left or right, make sure the moving jaw is beyond the 0° cutting slot to avoid any risk of collision with the blade downstroke.

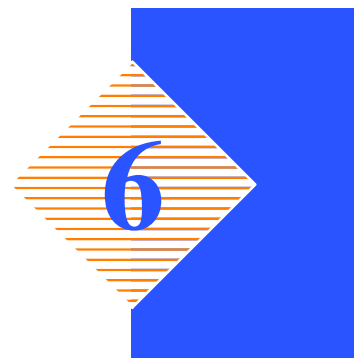
Following the same procedure described above for 45° cuts to the left, now position the head for 45° cuts to the right:

- ▶ slacken the turntable lock/release lever;
- ▶ pull the eccentric pin knob towards you (0° reference stop) and rotate slightly to raise it;



- ▶ swing the head from left to right until it is positioned at the required angle, as indicated by the graduated scale on the turntable;
- ▶ relock the turntable lock/release lever;
- ▶ make the cut in the required operating mode, following the preliminary safety instructions set out in this chapter.

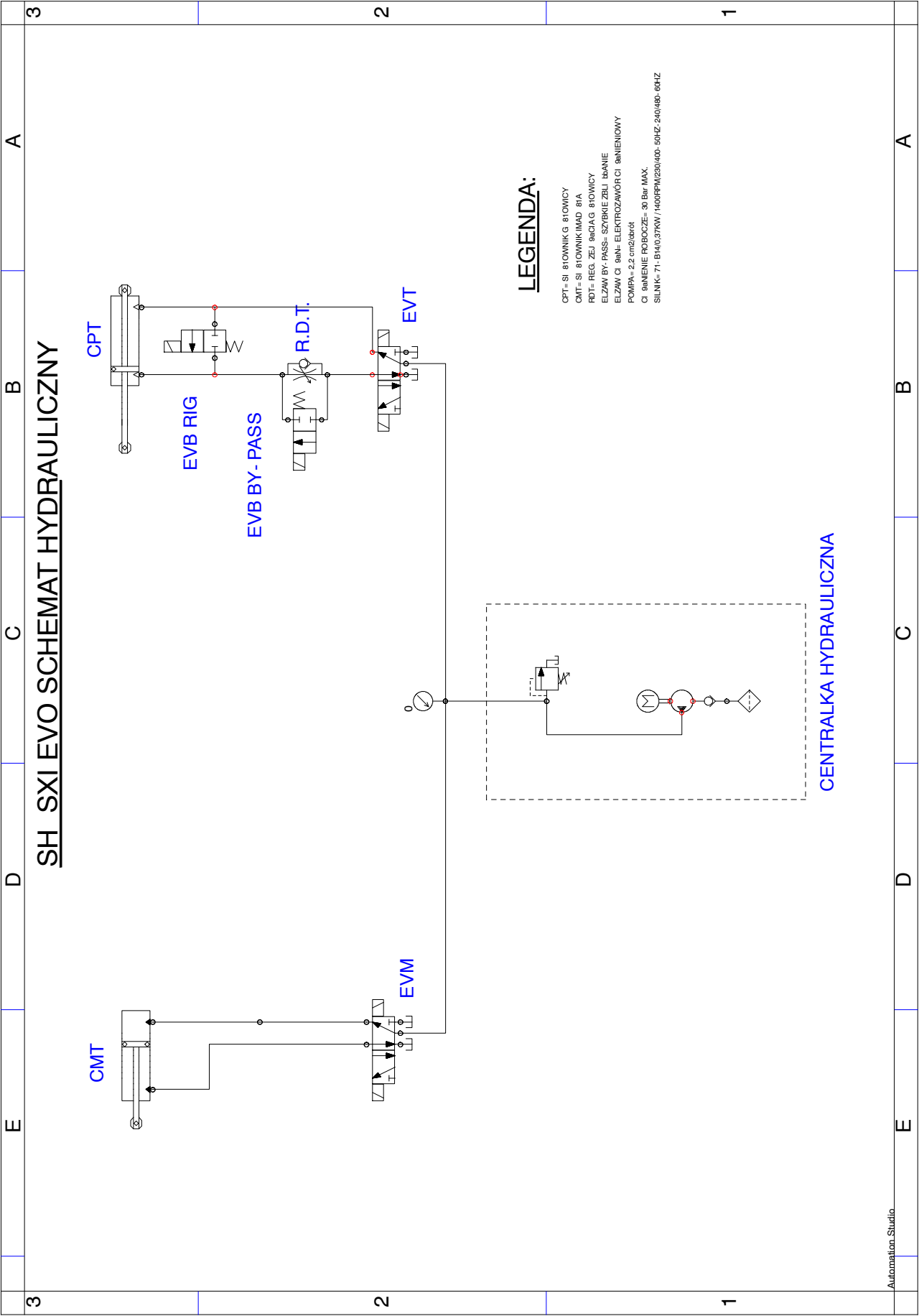
Diagrams, exploded views and replacement parts



This chapter contains functional diagrams and exploded views of the **DM10P**. This document is intended to help in identifying the location of the various components making up the machine, giving information useful in carrying out repair and maintenance operations; This chapter will also enable the user to order replacement parts with no risk of misunderstanding, as all parts are given codes.

Hydraulic components legend					
M1	CPT Mono- control unit	CMT	Cutting clamp cylinder	RDTM	Motorised flow adjuster (cutting head descent speed)
M2	CMT Mono- control unit	RDT	Flow adjuster (cutting head descent speed)	RPP	Cutting head pressure adjuster
RPM	Vice pressure adjuster	EV.RIG	Regenerator electrovalve	CPT	Cutting head holder cylinder

Hydraulic diagram

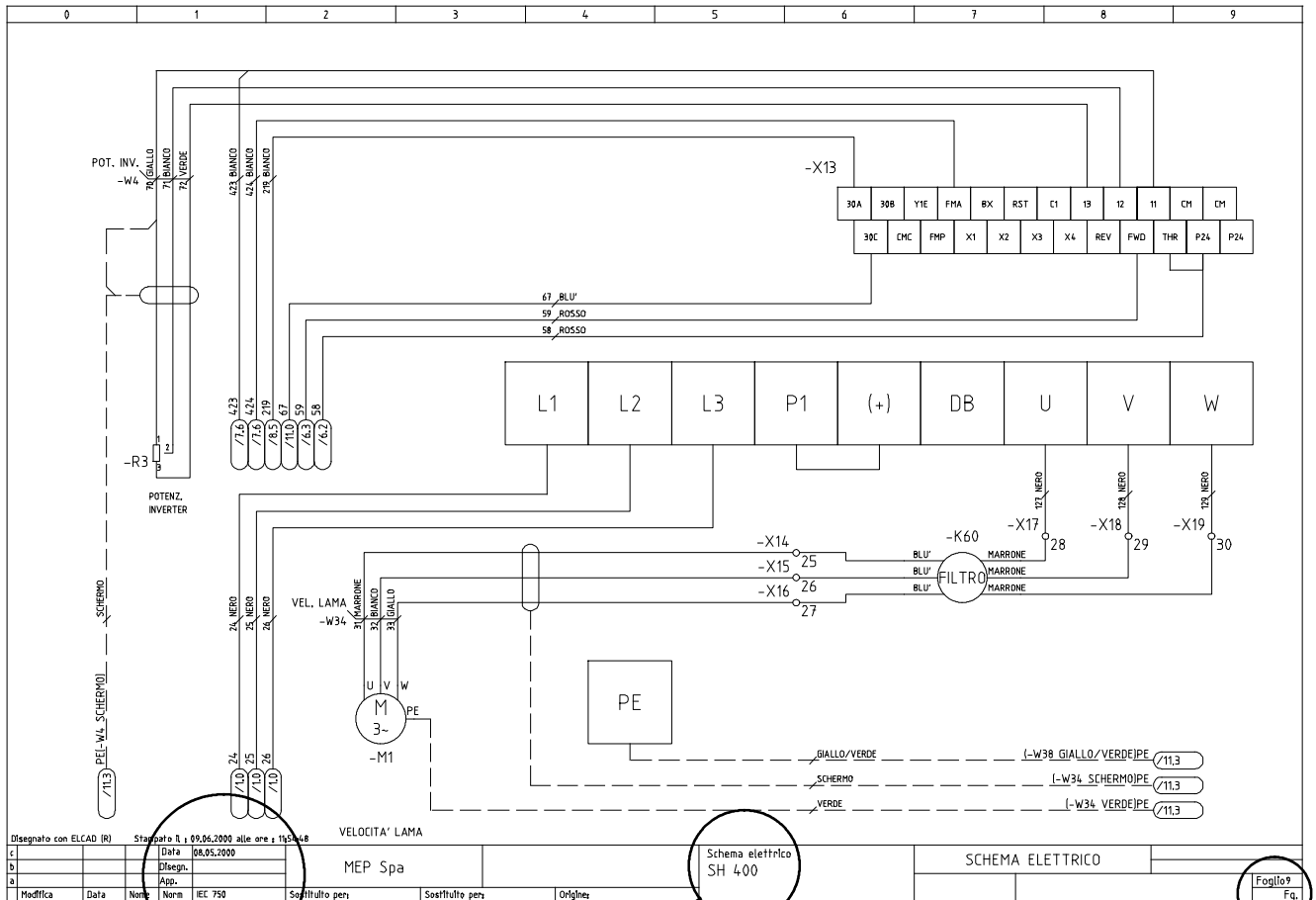


How to read the wiring diagrams

With the introduction of the new standardised wiring diagrams, the following gives an illustration of the way in which they have been drawn up.

Each sheet of the project contains a box which gives the following information:

The numbers indicate the columns into which the entire drawing is divided



Schema elettrico
SH 400

Indications of the
model of machine

Data	08.05.2000
Disegn.	MARIO ROSSI
App.	
Norm	IEC 750

Indications of the date production
started

Identification of the designer

Identification of the Reference Standard

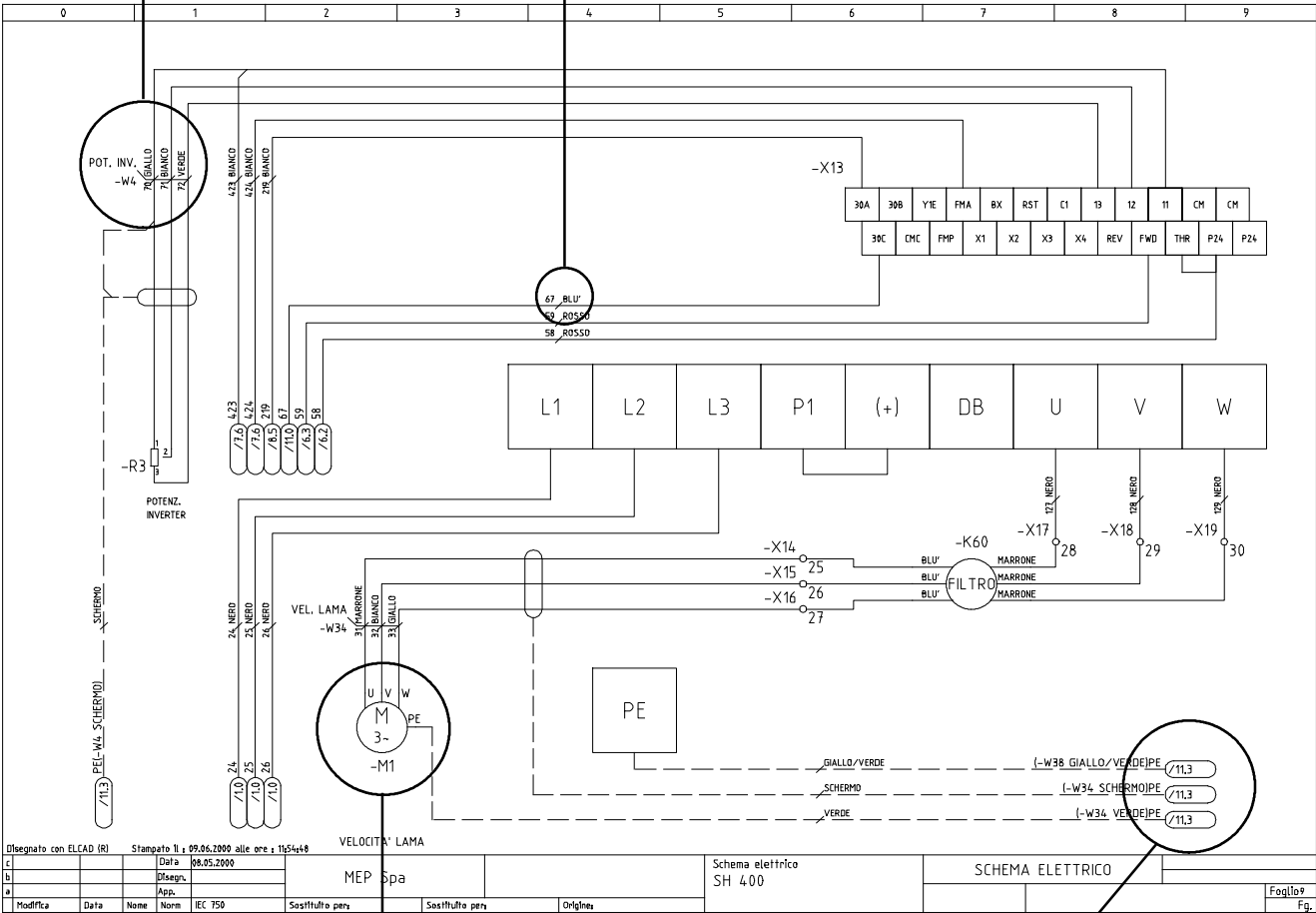
Foglio 9
Eg.

Indication of the
page number

Each component in the wiring diagram is identified by a unique alphanumeric identification code, in compliance with regulations:

The wire is identified by the code - W4

This symbol identifies the wire with its relative number and colour



The motor is identified by the code - M1

These symbols, known as potentials, are used to provide page references: the first number indicates the page to be referred to, the second number, after the dot, identifies the column on that page; example /11.8 indicates that the wire continues on page no. 11 in column 8

The pages following the wiring diagrams contain the following lists:

- 5. components list (list of all components) and terminals list (list of all the terminals) with the following information:
 - ✓ in- house article code;
 - ✓ identification code;
 - ✓ reference, no. of the page and column on which it can be found;
 - ✓ description;
 - ✓ manufacturer.

ART. COD.	ID	PRES. REF	DESCRIPTION	MANUFACTURER
022.2151	- B1	/5.2	STRAIN GAUGE	DELTATEC

6. wires list (list of all wires) with the following information:

- ✓ in- house article code;
- ✓ identification code;
- ✓ description;
- ✓ section of wire (mm²);
- ✓ colour of wire;
- ✓ start: indicates the component (identification code and contact number) at which the wire starts;
- ✓ end: indicates the component (identification code and contact number) at which the wire ends; e.g.

CODE	CABLE	DESCRIPTION	SECTION	NO.	COLOUR	START		END	
022.0141	- W7	RESET+EMER-GENZA	0.50	317	BIANCO	- S3	4	- K10	14

In this example, wire no. 317 white, identified as - W7, starts from contact no. 4 on component - S3, and ends at contact no. 14 on component - K10.

Enclosed below is Appendix D2 to European Standard EN 60204- 1

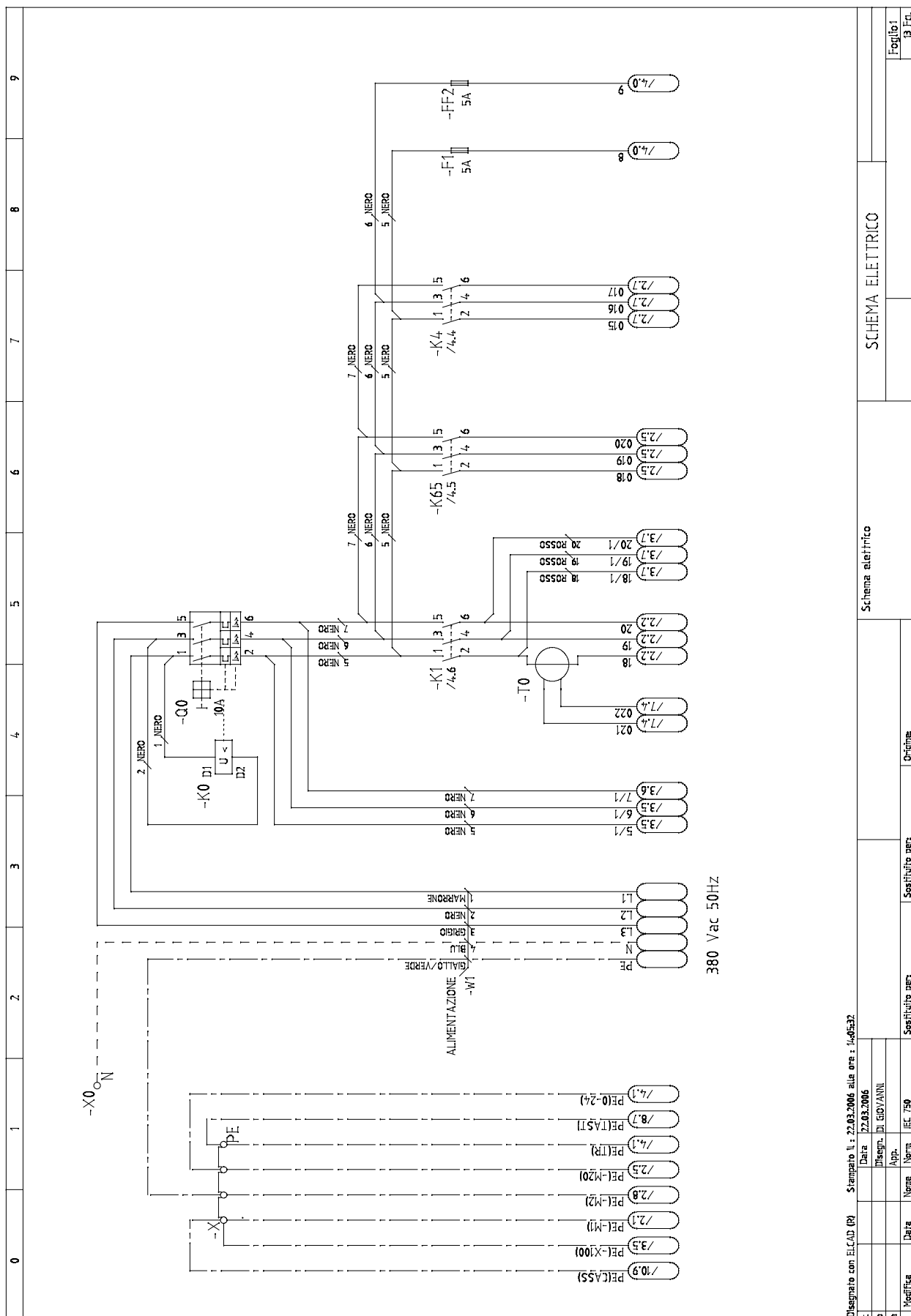
D2- Letter codes used to designate the type of component

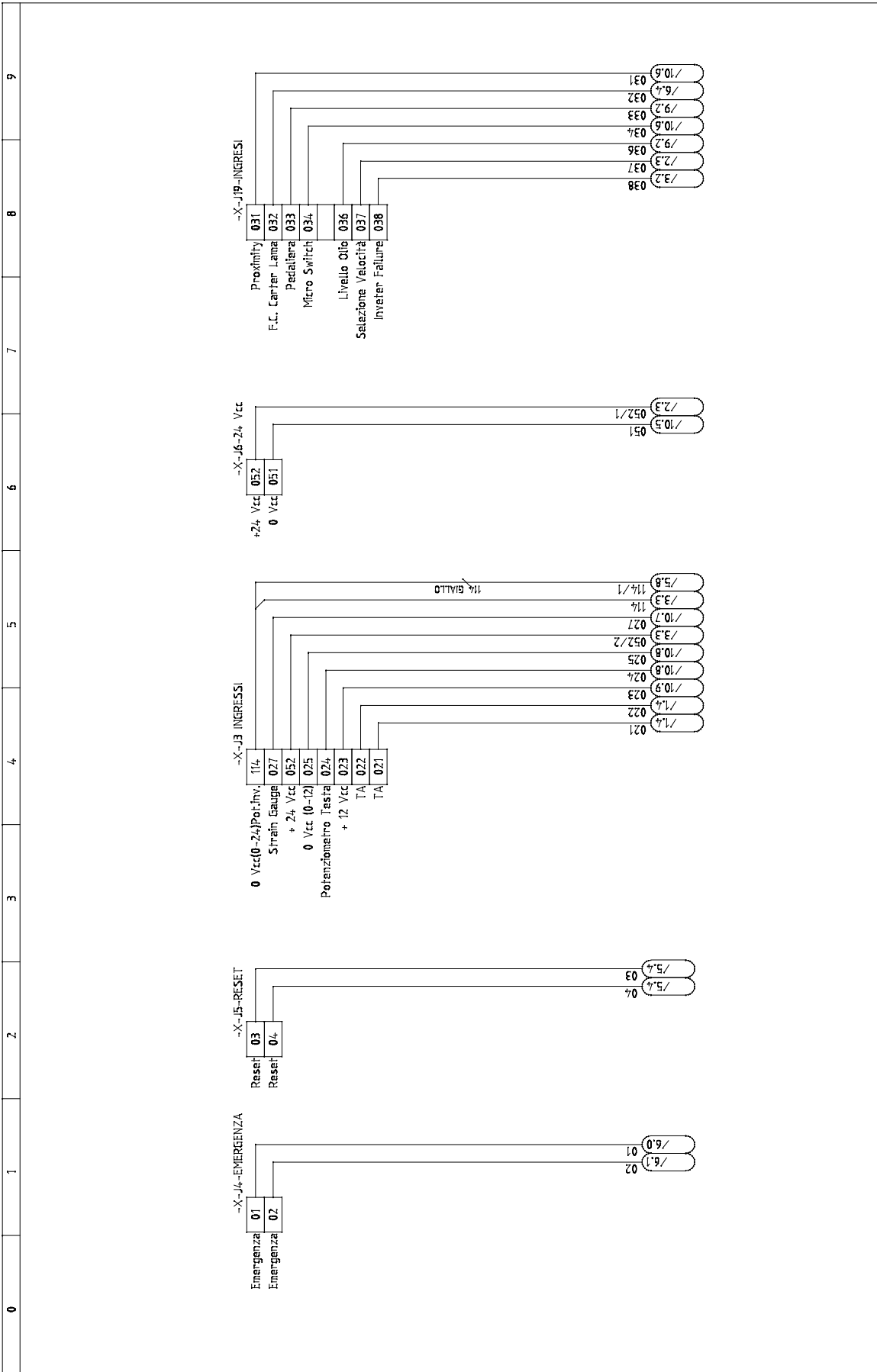
LETTER	TYPE OF COMPONENT	EXAMPLES	IDENTIFICATION OF THE APPLIANCE
A	Complex units	Laser Maser Regulator	A
B	Transducers converting a non electrical signal to an electrical signal and vice versa	Transistor amplifier IC amplifier Magnetic amplifier Valve amplifier Printed circuit board Drawer Rack	AD AJ AM AV AP AT AR
C	Capacitors		C
D	Binary operators, timing devices, storage devices	Digital integrated circuits and devices: Delay line Bistable element Monostable element Recorder Magnetic memory Tape or disk recorder	D
E	Various materials	Devices not specified in this table	E
F	Protective Devices	Lightning protectors Arrestors	F
		Instant action current threshold protector	FA
		Delayed action current threshold protector	FR
		Instant and delayed action current threshold protector	FS
		Fuse	FU
		Voltage threshold protector	FV

LETTER	TYPE OF COMPONENT	EXAMPLES	IDENTIFICATION OF THE APPLIANCE
G	Generators, feeders	Rotating generators Crystal oscillators	G
		Accumulator battery Rotating or static frequency converter Power feeder	GB GF GS
H	Signaling Devices	Buzzer Optical signal, indicator light device	HA HL
J			
K	Relays, Contactors	Instant all or nothing relays or instant contactors Bistable relays or interdependent contactors (All or nothing contactors with mechanical contact or permanent magnet etc.) Contactors Polarised relays Reed relays All or nothing timed relays (timers)	KA KL KM KP KR KT
L	Inductors, reactors	Inductor Stop coil Reactor	I
M	Motors		M
N	Analogue integrated circuits	Operational amplifiers Hybrid analog/digital appliances	N
P	Measurement equipment, test devices	Indicator, recorder and integrator measurement devices Signal generators	P
Q	Power circuit switching appliances	Automatic switch Engine saver switch Knife switch	QF QM QS
R	Resistors	Fixed or variable resistor (rheostat)	R
S	Command or control devices	Selector or switch Button (including electronic proximity switch) Numerical all or nothing sensors (single step) of mechanical and electronic type: - Liquid level sensor - Pressure sensor Position sensor (including proximity) - Rotation sensor - Temperature probe	SA SB SL SP SQ SR ST

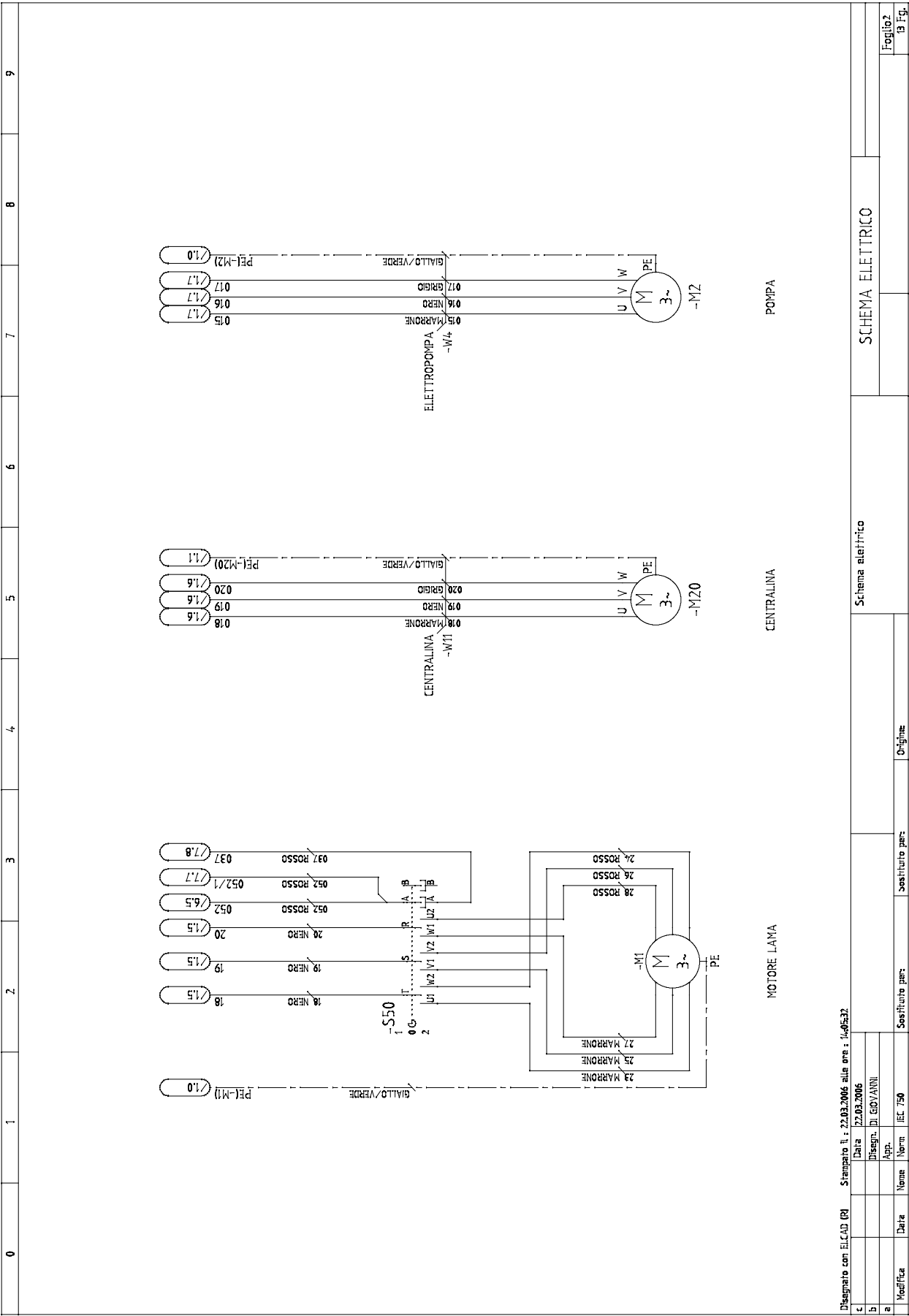
LETTER	TYPE OF COMPONENT	EXAMPLES	IDENTIFICATION OF THE APPLIANCE
T	Transformers	Current transformer Control circuit supply transformer Power transformer Magnetic stabiliser Voltage transformer	TA TC TM TS TV
U	Modulators, converters	Discriminator Demodulator Frequency converter Coder Converter Inverter Telegraphic repeater	U
V	Electronic pipes, semiconductors	Electronic pipe Gas discharge pipe Diode Transistor Thyristor	V
W	Transmission lines, wave guides, antennas	Conductor Cable Bar Wave guide Wave guide directional coupler Dipole Parabolic antenna	W
X	Terminals, sockets, plugs	Connector bar Test plug Plug Socket Terminal connector band	XB XJ XP XS XT
Y	Electrically operated mechanical appliances	Electromagnet Electromagnetic brake Electromagnetic clutch Magnetic table spindle Electromagnetic valve	YA YB YC YH YV
Z	Transformers, impedance adapters, equalizers, band limiters	Line equalizer Compressor Crystal filter	Z

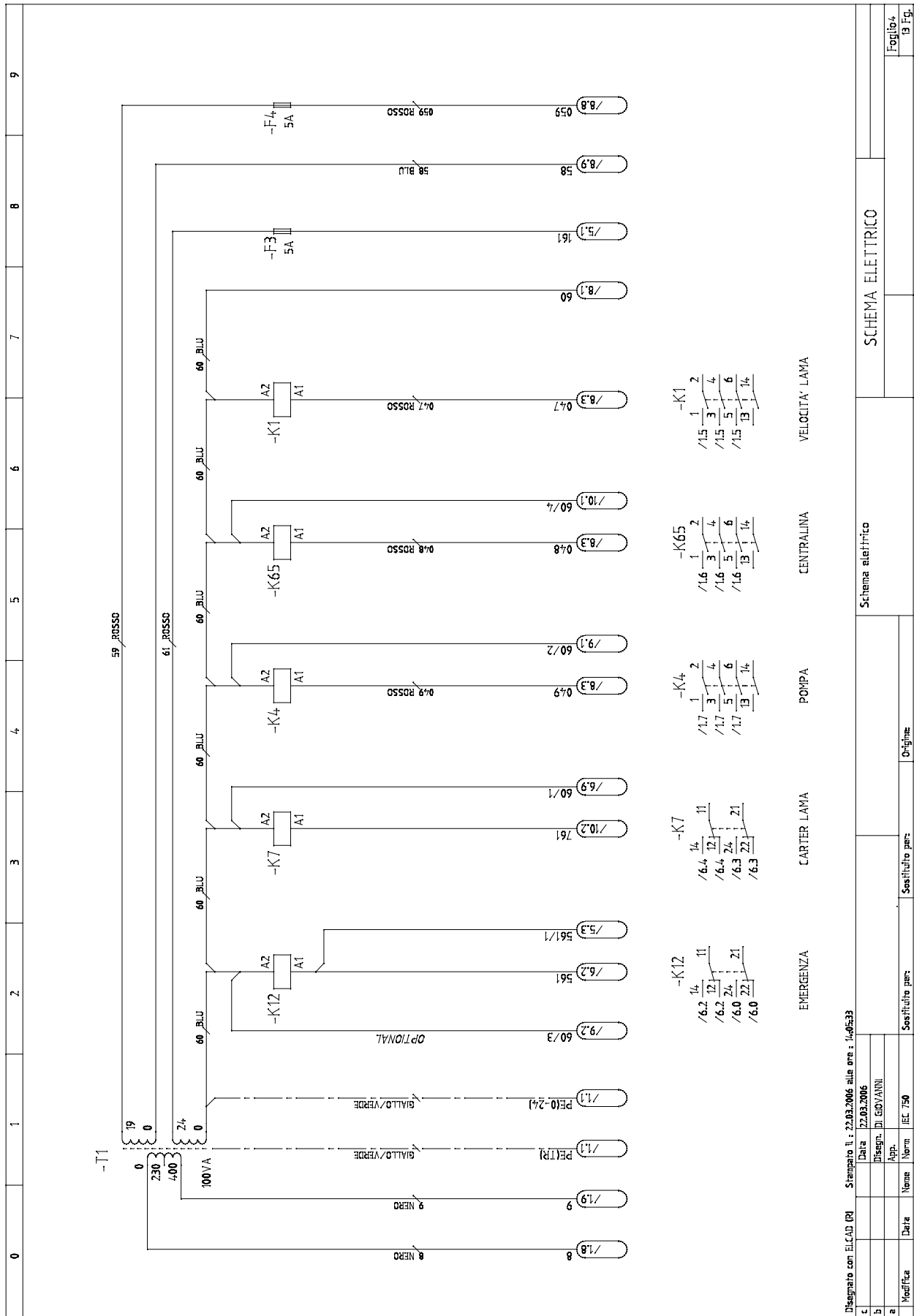
Standardised Wiring Diagrams (CENELEC Standard)

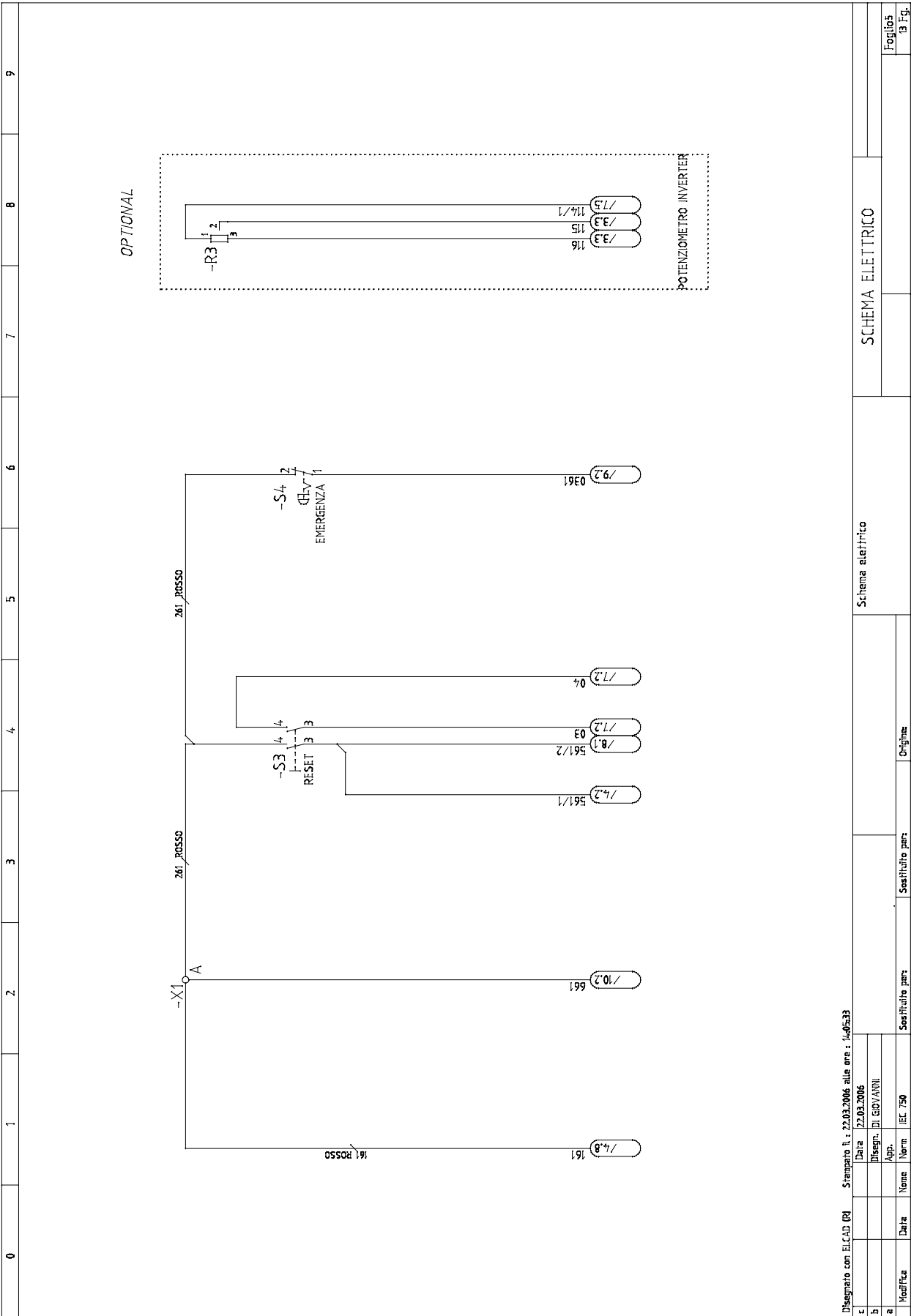




Disegnato con ELCAD (P)		Stampato il : 22.03.2006 alle ore : 14.05.34		Schema elettrico		SCHEMA ELETTRICO		Foglio 7	
a	Modifica	Data	Nome	Norm	IEC 750	Sostituito per:	Origine	13 Fg.	
b	Disegn.	22.03.2006	DI GIOVANNI	Appr.					
c	Data								







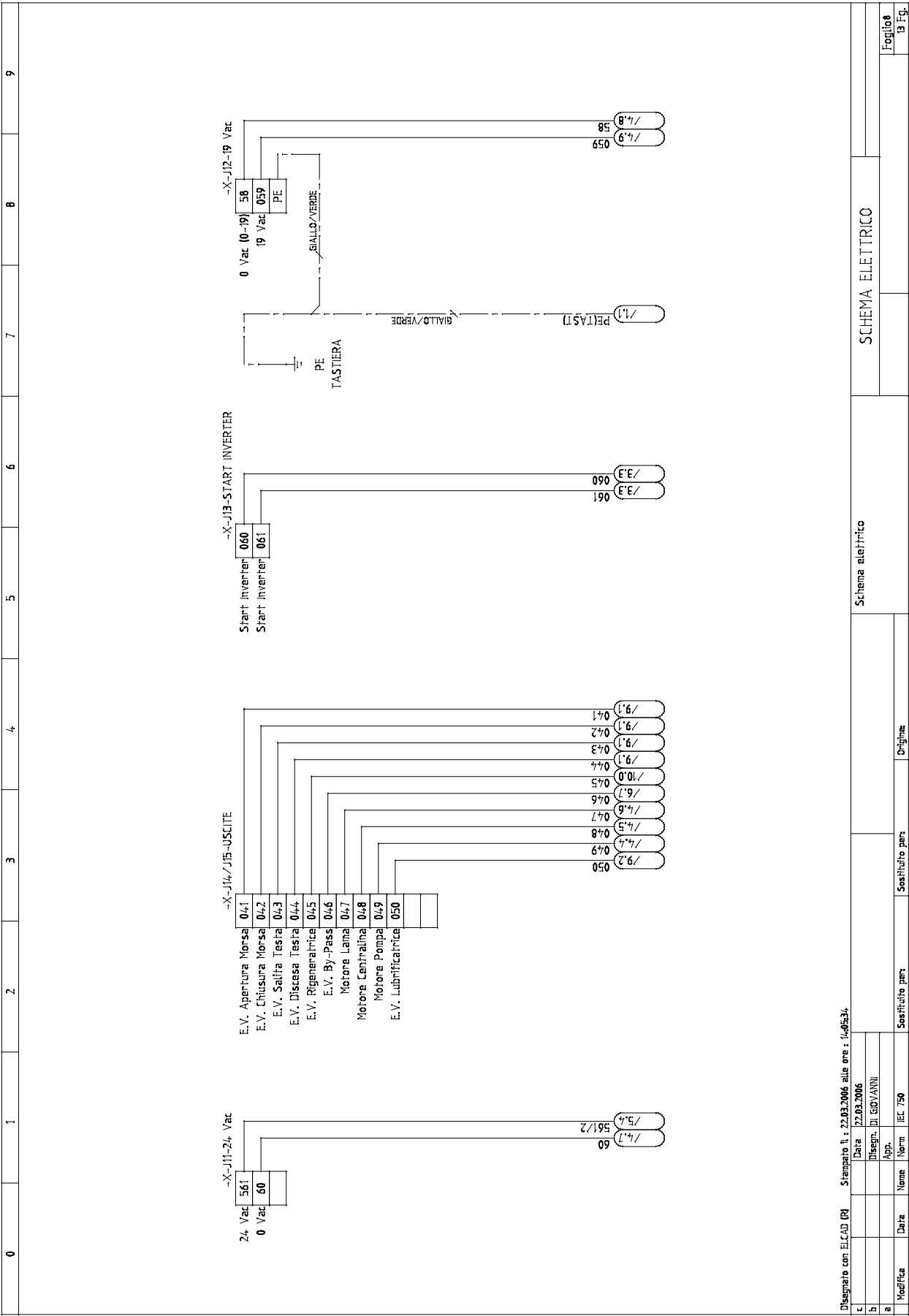
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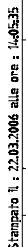
c	Data	22.03.2006
b	Disegn.	DI GIOVANNI
a	Appr.	

Modifica	Data	Nome	Norm	IEC 750	Sostituito per	Sostituito per	Origine
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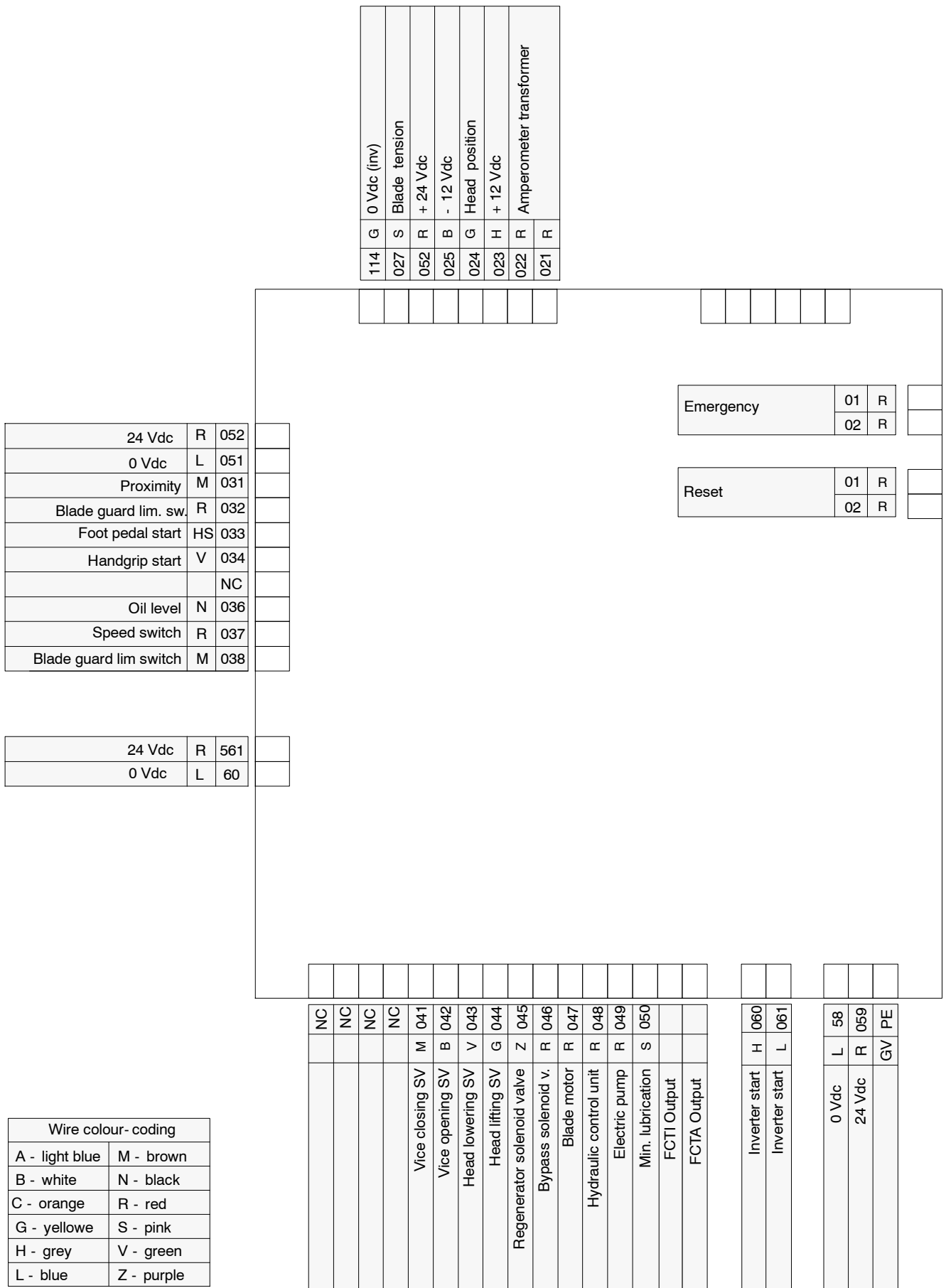
Schema elettrico		SCHEMA ELETTRICO	
Foglio 5		13 Pg.	

[illegible]





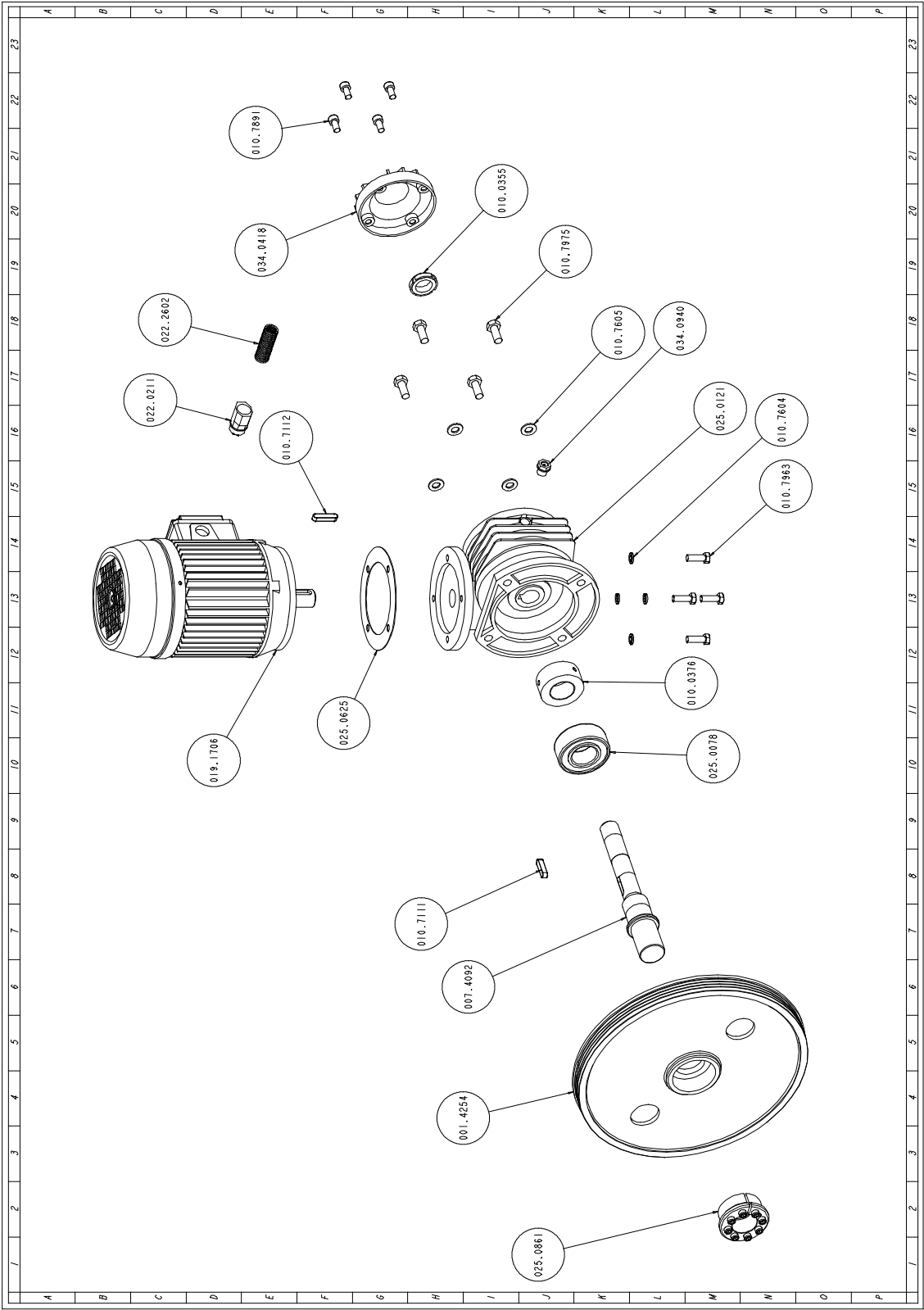
IUD/IUV card



Exploded views

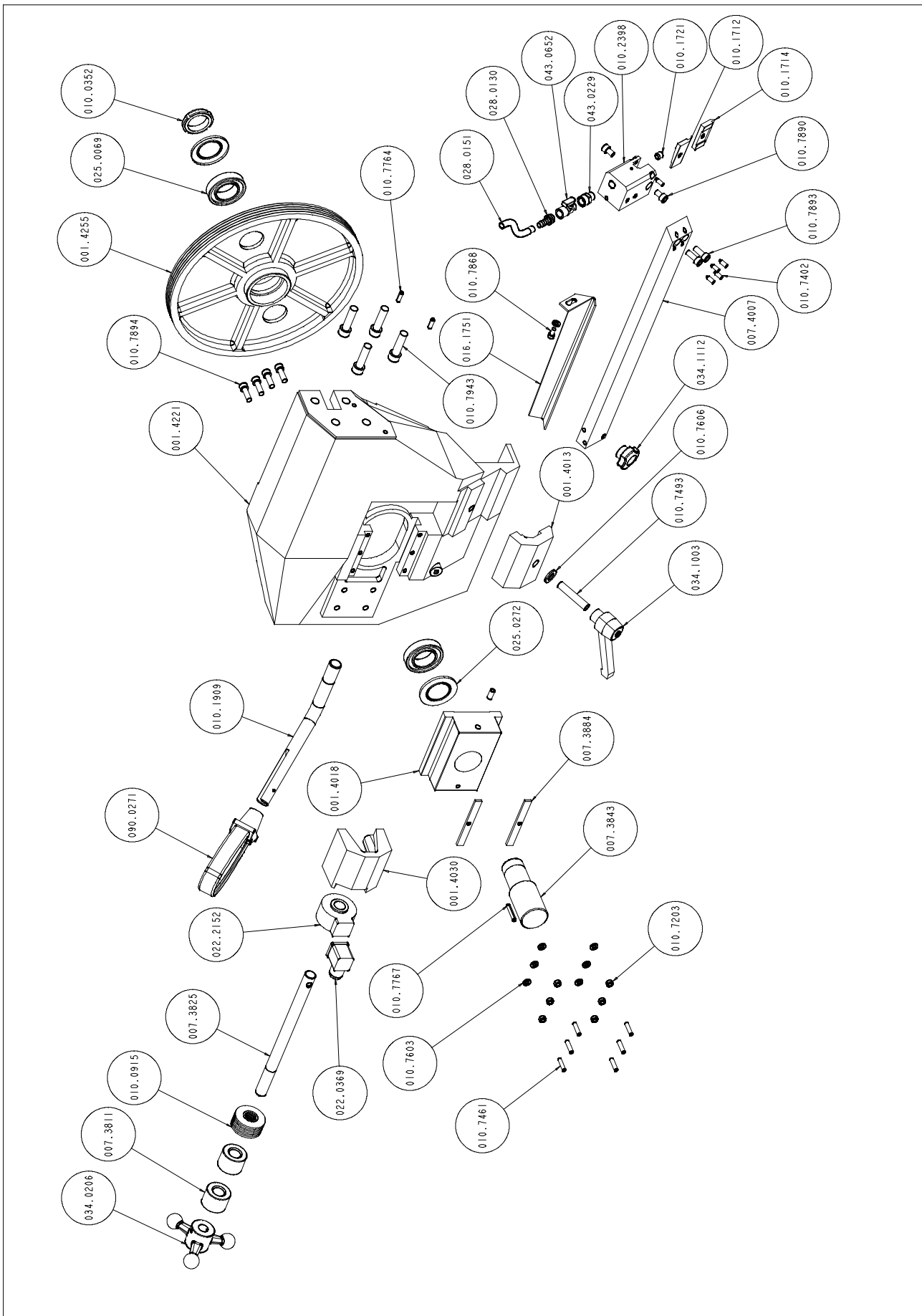
This part of the manual contains detailed exploded views of the machine which can help to gain a deeper knowledge of how it is made.

Motor assembly



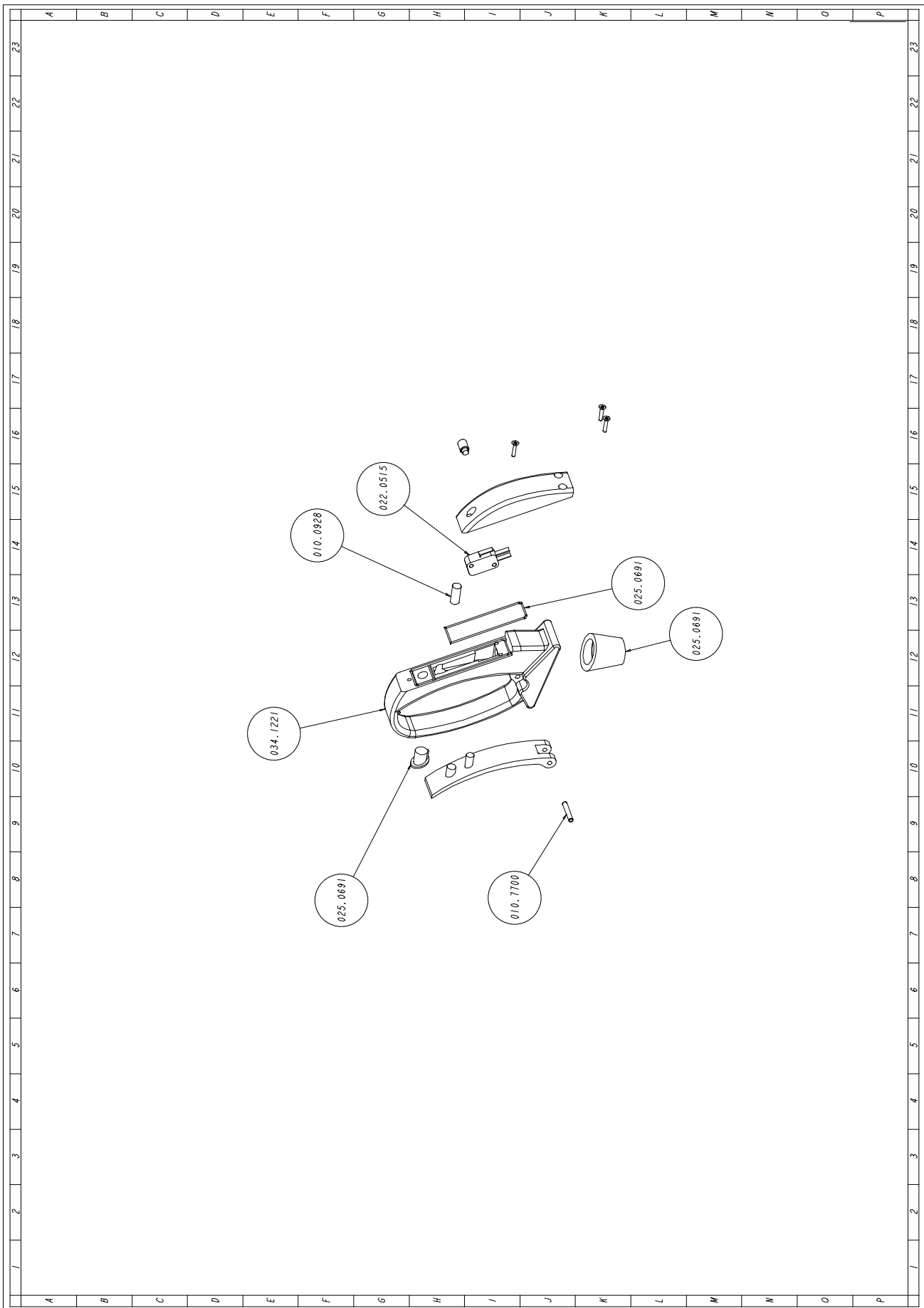
Code	Description	U. of M.	Quantity
001.4254	PULEGGIA MOTRICE	NR	1,000
007.4092	ALBERO RIDUTTORE CON GHIERA SH	NR	1,000
010.0355	GHIERA AUTOBLOCCANTE 25X1,5	NR	1,000
010.0376	GHIERA X ALBERO RIDUTTORE SH 2	NR	1,000
010.7111	CHIAVETTA 8 X 7 X 32	NR	1,000
010.7112	CHIAVETTA 8 X 7 X 35	NR	1,000
010.7604	RONDELLA DIAM. 8	NR	4,000
010.7605	RONDELLA DIAM. 10	NR	4,000
010.7891	VITE TCEI 8 X 16	NR	4,000
010.7963	VITE TE 8 X 25	NR	4,000
010.7975	VITE TE 10 X 25	NR	4,000
019.1706	HP 2/2,5 2/4P V.380 B14 FC90L	NR	1,000
022.0211	RACCORDO RAPIDO SEM PG 13,5	NR	1,000
022.2602	GUAINA POLIFLEX NW 14- 1200143	MT	1,000
025.0078	CUSCINETTO 3207A- 2RS1TN9	NR	1,000
025.0121	RIDUTTORE MVF 63 FCO 1A38 90 B	NR	1,000
025.0625	GUARNIZIONE MOTORE	NR	1,000
025.0861	CALETTATORE 0 35X60	NR	1,000
034.0418	COPERCHIO RIDUTTORE	NR	1,000
034.0940	TAPPO LIVELLO OLIO	NR	1,000

Front flywheel assembly



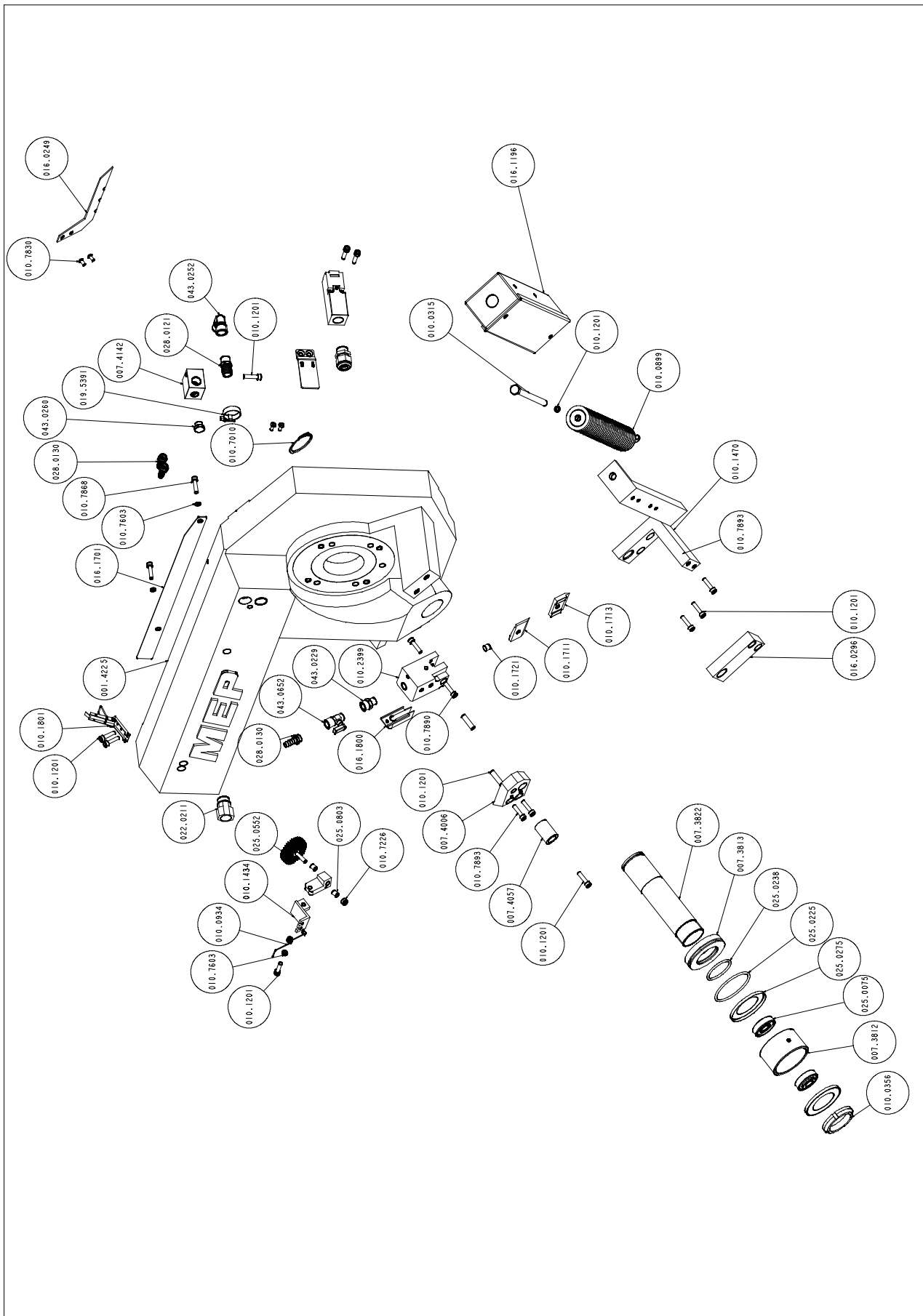
Code	Description	U. of M.	Quantity
001.4013	STAFFA BLOCCAGGIO GUIDA TESTIN	NR	1,000
001.4018	SLITTA TENDILAMA	NR	1,000
001.4030	SUPPORTO TENSIONAMENTO LAMA EL	NR	1,000
001.4221	ARCHETTO SEZIONE PULEGGIA FOLL	NR	1,000
001.4255	PULEGGIA FOLLE	NR	1,000
007.3811	DISTANZIALE VOLANTINO	NR	2,000
007.3825	PERNO REGISTRO TENSIONAMENTO L	NR	1,000
007.3843	ALBERO VOLANO LIBERO	NR	1,000
007.3884	LARDONE SLITTA TENDILAMA	NR	2,000
007.4007	STAFFA TEST.GUIDALAMA ANT. SH	NR	1,000
010.0352	GHIERA AUTOBLOCCANTE 35X1,5	NR	1,000
010.0915	MOLLA A TAZZA	NR	6,000
010.1714	GUIDALAMA 2 INSERTI ANTERIORE	NR	1,000
010.1721	PREMILAMA	NR	1,000
010.7203	DADO M6	NR	6,000
010.7402	GRANO VCE P.CIL. 6 X 12	NR	5,000
010.7461	GRANO VCE PUNTA PIANA 6 X 25	NR	6,000
010.7493	GRANO VCE PUNTA PIANA 12 X 60	NR	1,000
010.7603	RONDELLA DIAM. 6	NR	7,000
010.7606	RONDELLA DIAM. 12	NR	1,000
010.7764	SPINA ELASTICA DIAM. 6 X 20	NR	2,000
010.7767	SPINA ELASTICA DIAM. 6 X 35	NR	1,000
010.7868	VITE TCEI 6 X 12	NR	1,000
010.7893	VITE TCEI 8 X 20	NR	2,000
010.7894	VITE TCEI 8 X 25	NR	4,000
010.7943	VITE TCEI 12 X 45	NR	4,000
016.1751	PROTEZIONE LAMA ANTERIORE SH	NR	1,000
025.0069	CUSCINETTO 32007X	NR	2,000
025.0272	ANELLO DI PROTEZIONE NILOS 320	NR	2,000
028.0130	RACCORDO 1/4- 9 CL 2601	NR	1,000
028.0151	TUBO PLASTIFICATO 07- 11	MT	1,000
034.0206	VOLANTINO TENSIONAMENTO LAMA	NR	1,000
034.1003	LEVA A SCATTO 12 MA	NR	1,000
034.1112	VOLANTINO DIAM.40 M8	NR	1,000
043.0229	RIDUZIONE MF 1/4 - CL 2520	NR	1,000
043.0652	RUBINETTO 1/4 F.M.	NR	1,000
022.0369	CONNETTORE PER BOBINA U2 E TENSIONATORE	NR	1,000
010.1909	LEVA COMANDO TESTA BT/NOT- AUS SH 260- 280	NR	1,000
010.2398	TESTINA GUIDALAMA ANTERIORE SH 281- 282	NR	1,000
010.7890	VITE TCEI 8X12	NR	2,000
010.7456	GRANO VCE PUNTA CONICA 8X16	NR	1,000
010.1712	GUIDALAMA 1 INSERTO ANTERIORE	NR	1,000
090.0271	IMPUGNATURA COMPLETA TIPO MEP	NR	1,000
022.2152	TENSIONATORE ELETTRONICO TRSA/3T.00	NR	1,000

Handgrip



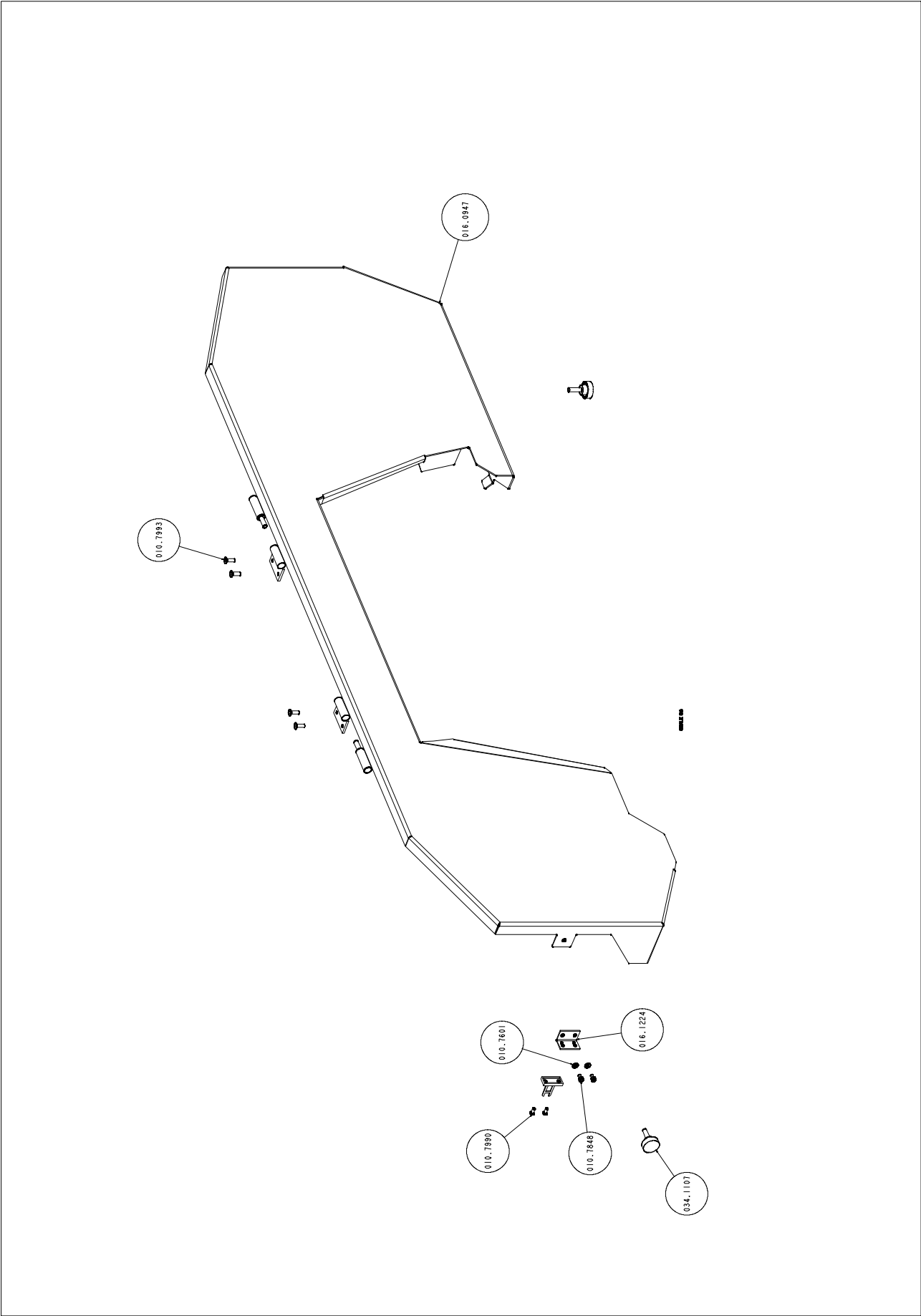
Code	Description	U. of M.	Quantity
010.0928	MOLLA X IMPUGNATURA	NR	1,000
010.7409	GRANO VCE P.CIL. 8 X 10	NR	1,000
010.7700	SPINA CILINDRICA DIAM. 4 X 24	NR	1,000
010.7802	VITE AUTOFILETTANTE 3,9 X 16	NR	3,000
022.0515	MICROINTERRUTTORE V- 21- 1C6	NR	1,000
025.0691	SERIE GUARNIZIONI X IMPUGNATUR	NR	1,000
034.1223	MANIGLIA MEP CON MOLLA- GUARNIZ	NR	1,000

Motor flywheel assembly



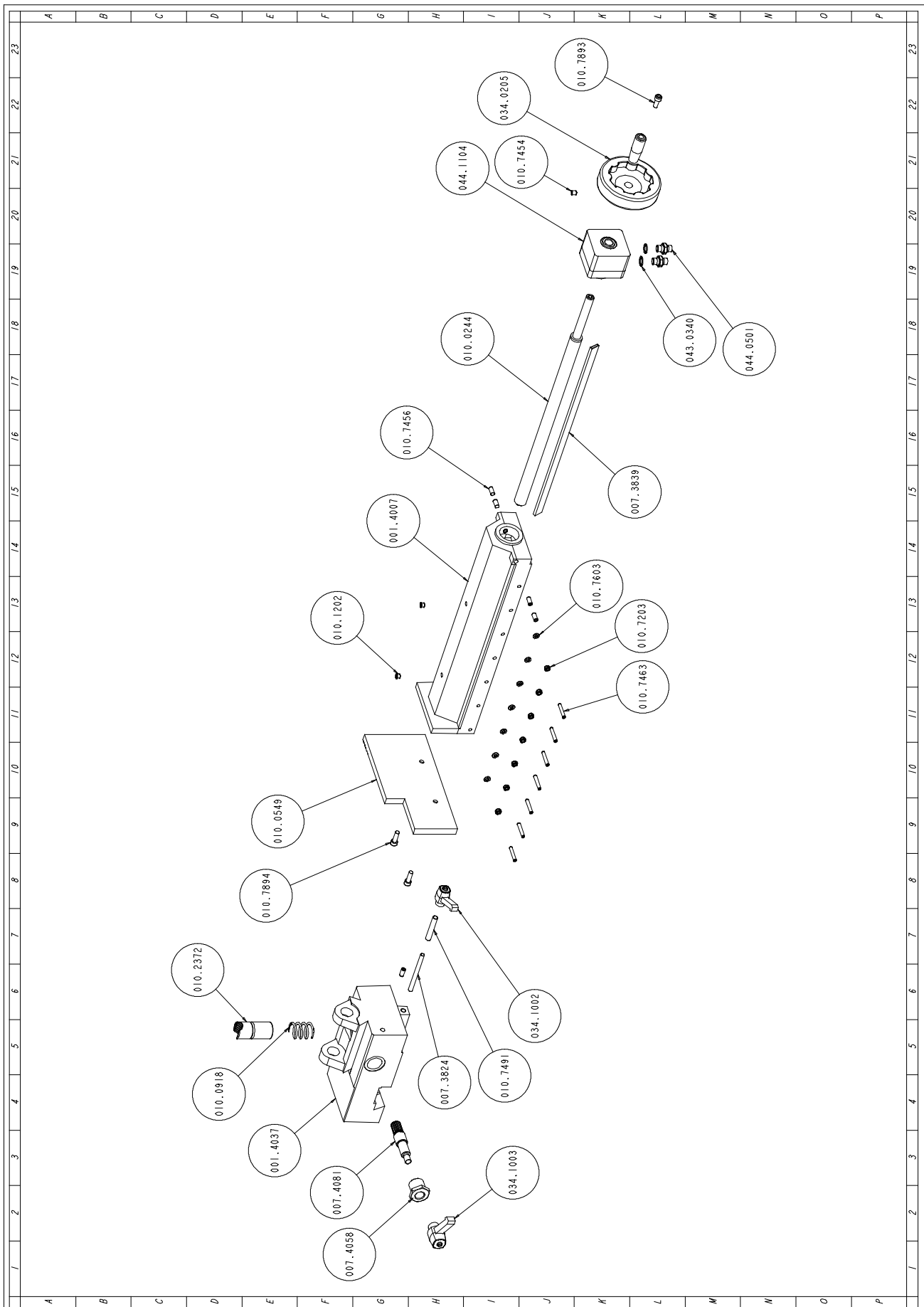
Code	Description	U. of M.	Quantity
001.4225	ARCHETTO SEZIONE PULEGGIA MOTRICE SH 282	NR	1.000
007.3812	DISTANZIALE CUSCINETTO SNODO TESTA SHARK	NR	1.000
007.3813	DISTANZIALE ARCHETTO SH	NR	1.000
007.3822	PERNO SUPPORTO SNODO TESTA SH 260- 280- 282- 292- 320- 332	NR	1.000
007.4006	STAFFA TEST. GUIDALAMA POSTERIORE SH 282MA - SX	NR	1.000
007.4057	BOCCOLA BATTUTA FINECORSIA TI MA- SX- AXSH 260- 282	NR	1.000
007.4142	SQUADRETTO PER LIQUIDO SH 282- 292- 320- 330- 332	NR	1.000
010.0315	VITE 8.8 TESTA ESAGONALE 10X140 TUTTOFILETTO ZINCATA	NR	1.000
010.0356	GHIERA AUTOBLOCCANTE 45X1,5 SH	NR	1.000
010.0899	MOLLA RICHIAMO TESTA SH 260- 280 NT 282292	NR	1.000
010.0934	MOLLA X PULILAMA SH 280- 282- 292- 332	NR	1.000
010.1434	STAFFA FIX SPAZZOLA PULILAMA SH 282X	NR	1.000
010.1470	STAFFA SUPPORTO CILINDRO SH280/292 SX- SXI- SH 282 SX- CNC	NR	1.000
010.1711	GUIDALAMA 1 INSERTO POSTERIORE SH 260	NR	1.000
010.1713	GUIDALAMA 2 INSERTI POSTERIORE SH 260	NR	1.000
010.1721	PREMILAMA SHARK	NR	1.000
010.1801	CHIUSURA LEVA 'D' ZINCATA SH	NR	1.000
010.2208	PORTASPAZZOLA PULILAMA SH 260- 282- 320- SH 332	NR	1.000
010.2399	TESTINA GUIDALAMA POSTERIORE SH 281 282	NR	1.000
010.7010	ANELLO SEEGER 0 45 (010.7010)	NR	1.000
010.7226	DADO AUTOBLOCCANTE M6 (010.7226)	NR	1.000
010.7467	GRANO VCE PUNTA PIANA 6 X 12 (010.7467)	NR	5.000
010.7603	RONDELLA 0 6 (010.7603)	NR	3.000
010.7605	RONDELLA 0 10 (010.7605)	NR	1.000
010.7830	VITE BUTON 5 X 10	NR	2.000
010.7850	VITE TCEI 4 X 8	NR	2.000
010.7855	VITE TCEI 4 X 30 (010.7855)	NR	2.000
010.7868	VITE TCEI 6 X 12 (010.7868)	NR	2.000
010.7873	VITE TCEI 6 X 30 (010.7873)	NR	2.000
010.7890	VITE TCEI 8 X 12 (010.7890)	NR	2.000
010.7893	VITE TCEI 8 X 20 (010.7893)	NR	4.000
010.7923	VITE TCEI 10 X 25 (010.7923)	NR	2.000
010.7940	VITE TCEI 12 X 30	NR	1.000
010.7944	VITE TCEI 12 X 60	NR	1.000
010.7993	VITE TSPEI 5 X 12 (010.7993)	NR	2.000
016.0249	PROTEZIONE LAMA POSTERIORE SH 260 _ 282	NR	1.000
016.0296	STAFFA ESTERNA CILINDRO SH	NR	1.000
016.1196	SCATOLA DI DERIVAZIONE SH SXI EVO	NR	1.000
016.1251	PIASTRA ATTACCO F.C. CHIUSURA COPERCHIOARCHETTO SH N.T.	NR	1.000
016.1701	PROTEZIONE CAVI SH 280 N.T.- 282- 292	NR	1.000
016.1800	PROTEZIONE NASTRO SH 282- MA- SXI NC EVO	NR	1.000
019.5391	FASCETTA MINUS GT 0 16X25	NR	1.000
022.0037	INTERRUTTORE DI SICUREZZA FR 690 SH	NR	1.000
022.0211	RACCORDO RAPIDO SEM PG 13,5	NR	1.000
022.0227	PRESSACAVO PLASTICA TEC- SM 2006.3.9 M20	NR	1.000
025.0075	CUSCINETTO 32009X	NR	2.000
025.0225	ANELLO TENUTA OR 171- 68,26	NR	1.000
025.0238	ANELLO DI TENUTA OR 149- 44,45X3,53	NR	1.000
025.0275	ANELLO DI PROTEZIONE NILOS 32009X	NR	2.000
025.0552	SPAZZOLA PULILAMA 6X25 030 SHARK	NR	1.000
025.0803	BOCCOLA GRAFITATA L. 10 DIAM. 6	NR	2.000
028.0121	RACCORDO 3/8- 17 CL 2601	NR	1.000
028.0130	RACCORDO 1/4- 9 CL 2601	NR	3.000
043.0229	RIDUZIONE MF 1/4 - CL 2520	NR	1.000
043.0252	GOMITO MF 3/8 CL 2020	NR	1.000
043.0260	TAPPO TTE4 1/4 - CL 2611	NR	1.000
043.0652	RUBINETTO 1/4 F.M.	NR	1.000

Cutting head cover



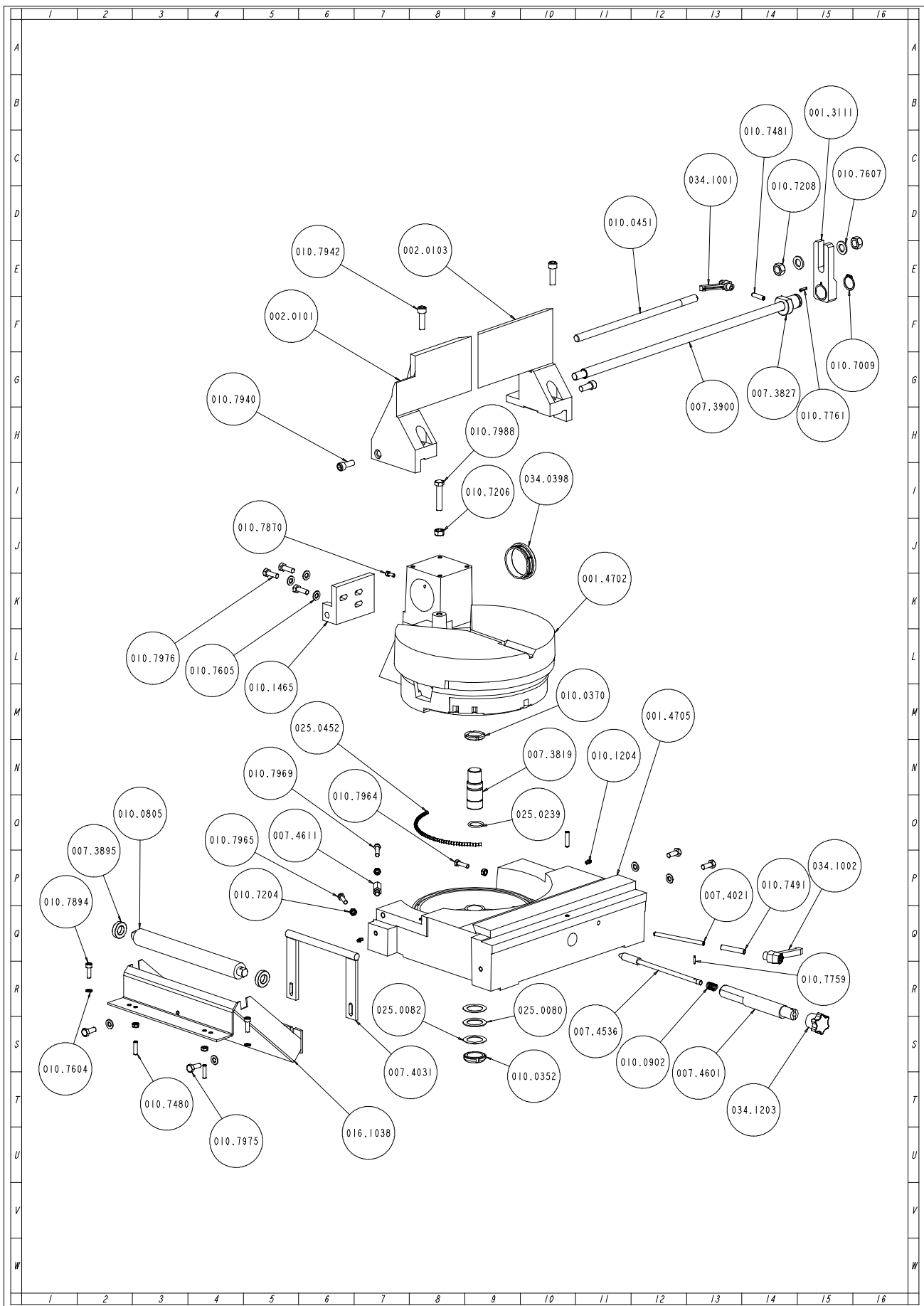
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010.7601	RONDELLA DIAM. 4	NR	2,000
010.7848	VITE TCEI 4 X 6	NR	2,000
010.7990	VITE TSPEI 4 X 8	NR	2,000
010.7993	VITE TSPEI 5 X 12	NR	4,000
016.0947	COPERCHIO ARCHETTO SH 281- 282	NR	1,000
016.1224	PIASTR.FIX INTER.SICUR.COPERCHIO	NR	1,000
034.1107	VOLANTINO DIAM.30 M6 X 20	NR	2,000

Vice assembly



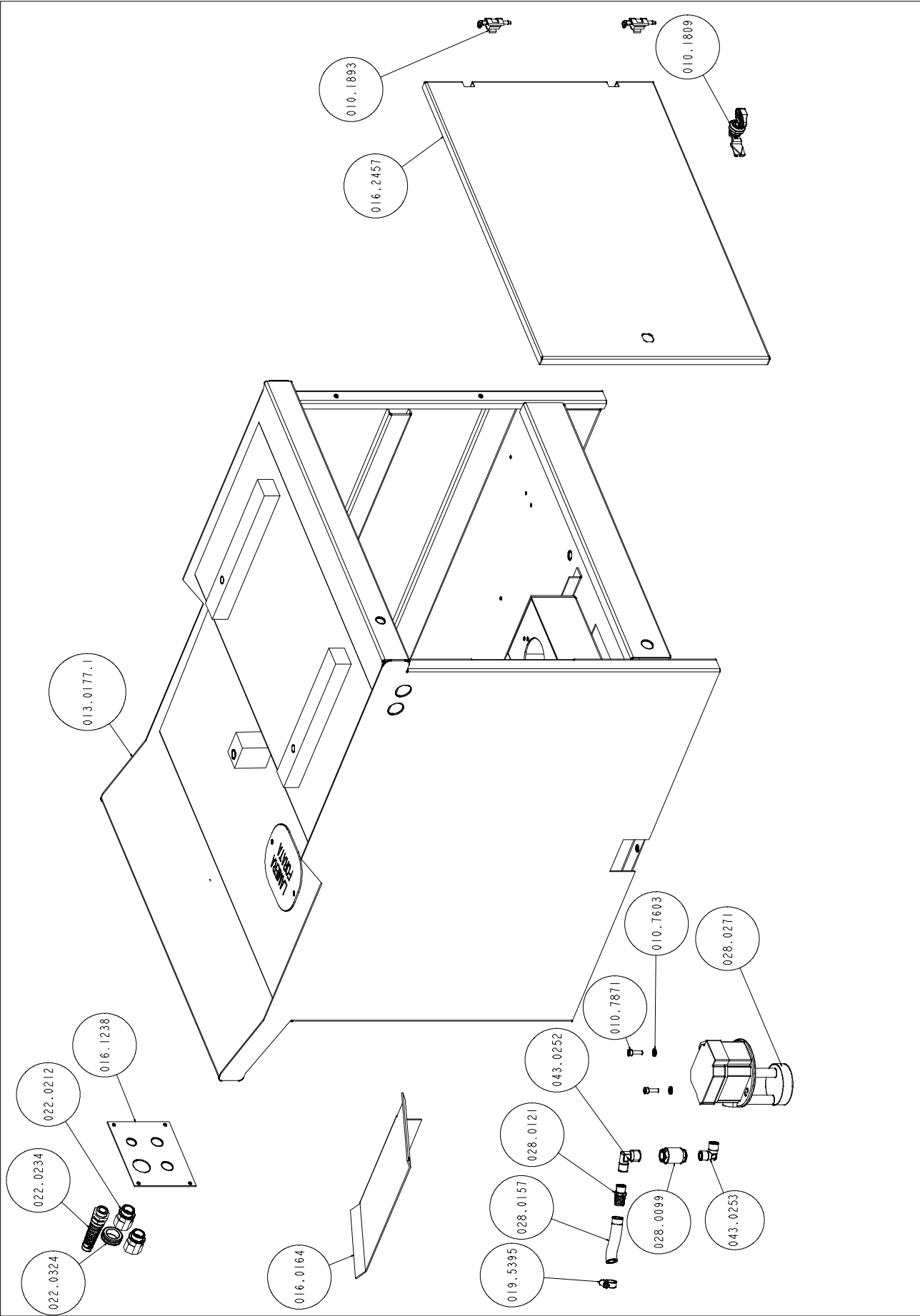
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001.4007	SCORREVOLE MORSA	NR	1,000
001.4037	SUPPORTO MORSA	NR	1,000
007.3824	PERNO BLOCCAGGIO MORSA MSR	NR	1,000
007.3839	LARDONE MORSA	NR	1,000
007.4058	BOCCOLA ECCENTRICA	NR	1,000
007.4081	PIGNONE SBLOCCAGGIO SCORREVOLE	NR	1,000
010.0244	VITE MORSA	NR	1,000
010.0549	GANASCIA MORSA MOBILE SHARK 28	NR	1,000
010.0918	MOLLA RICHIAMO CHIOCC.VITE MOR	NR	1,000
010.1202	OLIATORE A SFERA DIAM. 8	NR	2,000
010.2372	CHIOCCIOLA BRONZO 45° SH 332	NR	1,000
010.7203	DADO M6	NR	7,000
010.7454	GRANO VCE P.CON. 8 X 8	NR	1,000
010.7456	GRANO VCE P.CON. 8 X 16	NR	5,000
010.7463	GRANO VCE P.CON. 6 X 35	NR	7,000
010.7491	GRANO VCE PUNTA PIANA 10 X 60	NR	1,000
010.7603	RONDELLA DIAM. 6	NR	7,000
010.7859	VITE TCEI 5 X 12	NR	4,000
010.7893	VITE TCEI 8 X 20	NR	1,000
010.7894	VITE TCEI 8 X 25	NR	6,000
034.0205	VOLANTINO VPRA/125 MR	NR	1,000
034.1002	LEVA A SCATTO 10 MA	NR	1,000
034.1003	LEVA A SCATTO 12 MA	NR	1,000
043.0340	RONDELLA RAME 13X19X1,5- 1/4	NR	2,000
044.0501	NIPPLO NP 1/4 IDRAULICO	NR	2,000
044.1104	CILINDRO VOLAMPRESS	NR	1,000

Fixed work table



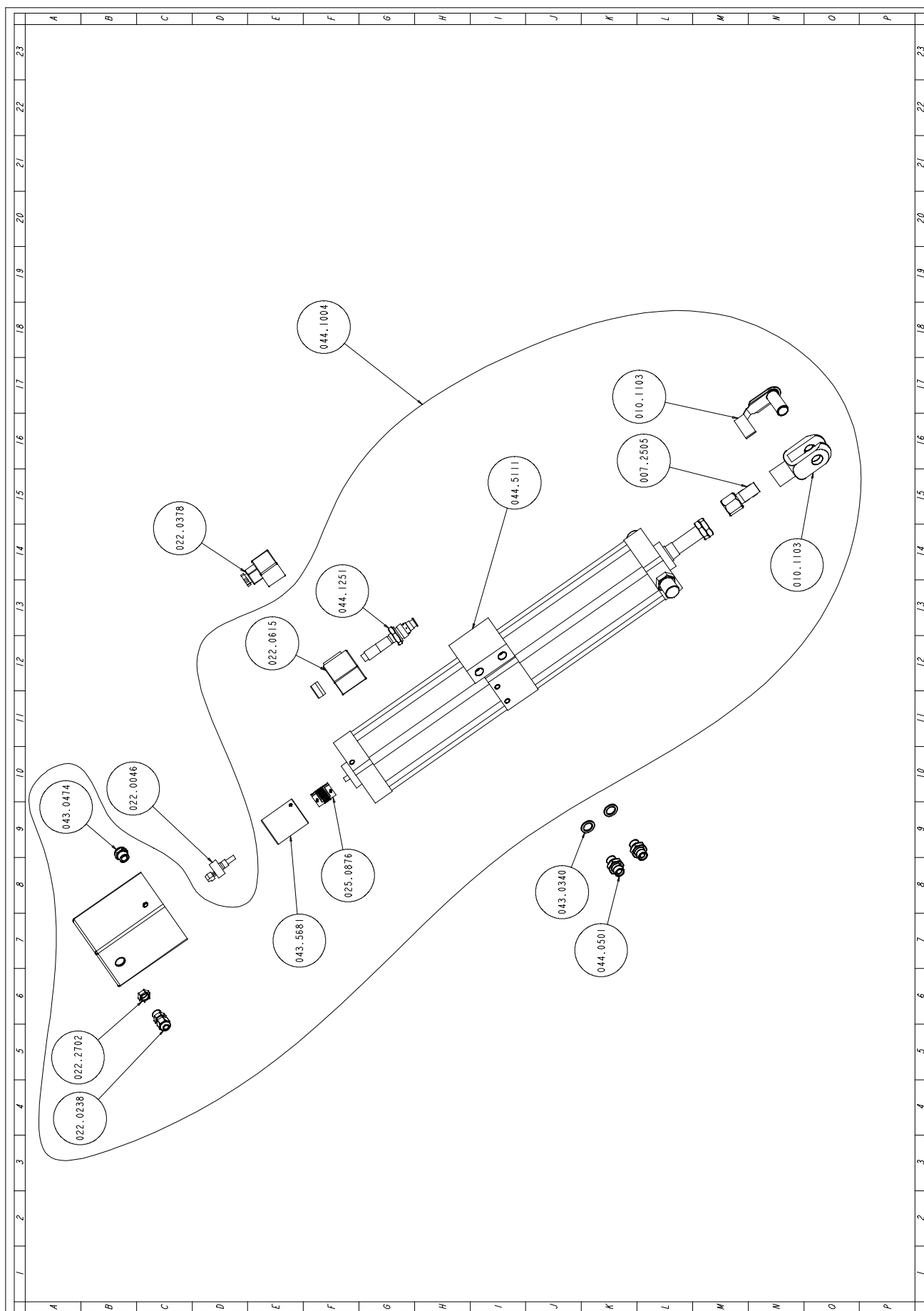
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001.3111	DISTANZIALE BATTUTA	NR	1,000
001.4702	PIANO ROTANTE	NR	1,000
001.4705	.PIATTAFORMA FISSA SH 270 N.T.	NR	1,000
002.0101	SQUADRO MORSA SINISTRO	NR	1,000
002.0103	.SQUADRO MORSA DESTRO SH 270 N	NR	1,000
007.3819	PERNO DI CENTRO	NR	1,000
007.3827	BOCCOLA PER BATTUTA	NR	1,000
007.3895	BOCCOLA Ø 38 X RULLO	NR	2,000
007.3900	ASTA TAGLI A MISURA	NR	1,000
007.4021	PERNO BLOCCAGGIO PIANO GIREVOL	NR	1,000
007.4536	PERNO PUNTO FISSO	NR	1,000
007.4601	CILINDRETTO PUNTO FISSO	NR	1,000
007.4611	BATTUTA X 60° DX- SX	NR	1,000
010.0352	GHIERA AUTOBLOCCANTE 35X1,5	NR	1,000
010.0370	GHIERA 5S 30X1,5	NR	1,000
010.0451	TIRANTE BATTUTA TAGLI MISURA	NR	1,000
010.0805	RULLO CARBONITRURATO	NR	1,000
010.0899	MOLLA RICHIAMO TESTA SH 260- 28	NR	1,000
010.0902	MOLLE PUNTO FISSO TESTA	NR	1,000
010.1204	INGRASSATORE M 6	NR	2,000
010.1465	STAFFA AGGANCIO MOLLA	NR	1,000
010.7009	ANELLO SEEGER DIAM. 30	NR	1,000
010.7204	DADO M8	NR	5,000
010.7206	DADO M12	NR	1,000
010.7208	DADO M16	NR	2,000
010.7480	GRANO VCE PUNTA PIANA 8 X 30	NR	2,000
010.7481	GRANO VCE PUNTA PIANA 8 X 35	NR	2,000
010.7491	GRANO VCE PUNTA PIANA 10 X 60	NR	1,000
010.7604	RONDELLA DIAM. 8	NR	2,000
010.7605	RONDELLA DIAM. 10	NR	7,000
010.7607	RONDELLA DIAM. 16	NR	2,000
010.7759	SPINA ELASTICA DIAM. 3 X 16	NR	1,000
010.7761	SPINA ELASTICA DIAM. 4 X 20	NR	1,000
010.7870	VITE TCEI 6 X 16	NR	1,000
010.7894	VITE TCEI 8 X 25	NR	2,000
010.7940	VITE TCEI 12 X 30	NR	2,000
010.7942	VITE TCEI 12 X 40	NR	2,000
010.7964	VITE TE 8 X 30	NR	1,000
010.7965	VITE TE 8 X 35	NR	1,000
010.7969	VITE TE 8 X 50	NR	1,000
010.7975	VITE TE 10 X 25	NR	4,000
010.7976	VITE TE 10 X 30	NR	3,000
010.7988	VITE TE 12 X 60	NR	1,000
016.1038	BRACCETTO APPOGGIA BARRA SH 28	NR	1,000
025.0080	GABBIA ASSIALE A RULLINI AXK 3	NR	1,000
025.0082	RALLA AS 3552	NR	2,000
025.0239	ANELLO DI TENUTA OR 4112	NR	1,000
025.0452	RULLI 6X6 AISI 420	NR	139,000
034.0398	COPERCHIO SNODO TESTA SH N.T.	NR	1,000
034.1001	LEVA A SCATTO 8 MA PK55	NR	1,000
034.1002	LEVA A SCATTO 10 MA	NR	1,000
034.1203	IMPUGNATURA NS. DISEGNO M10	NR	1,000

Base unit



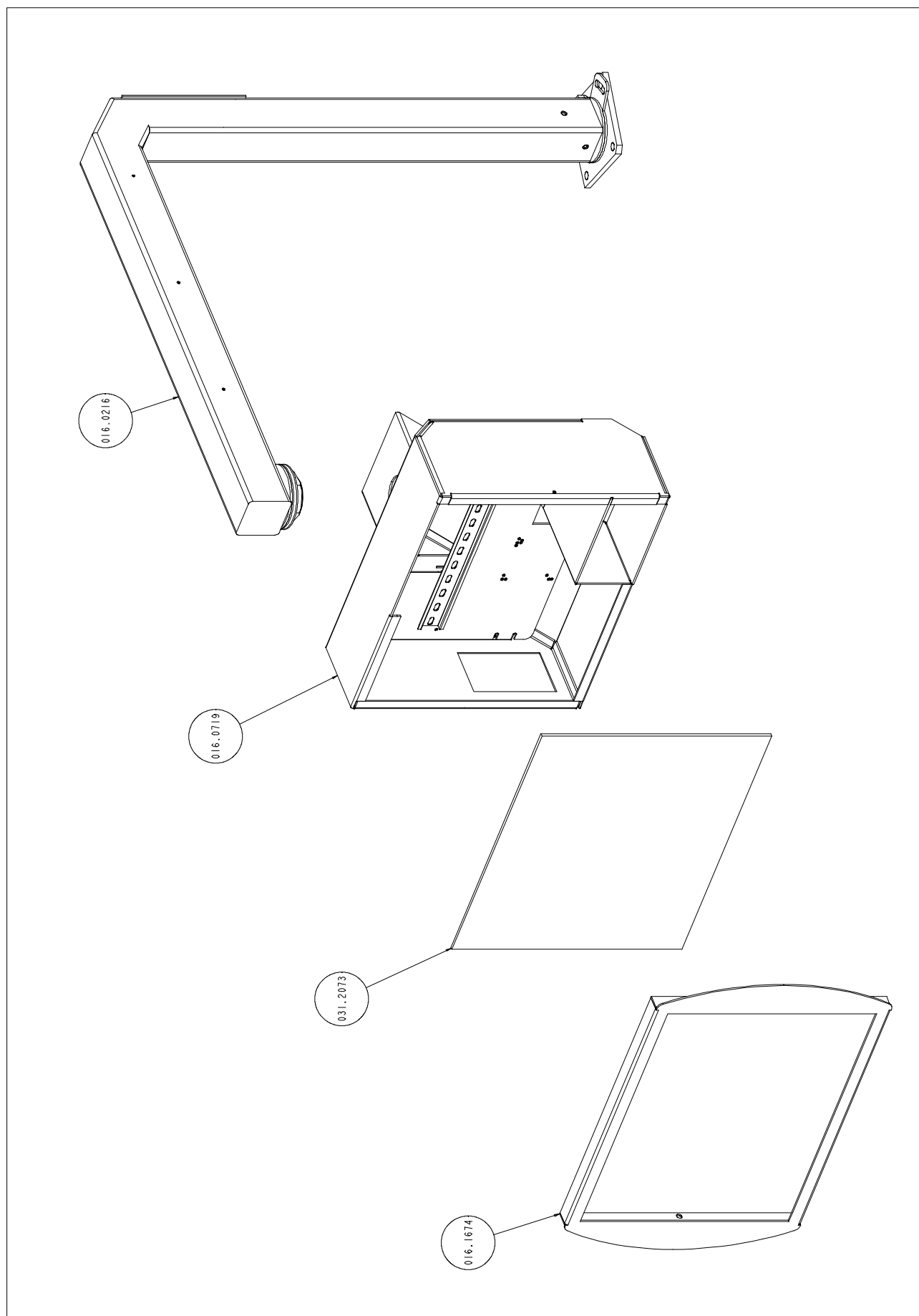
Code	Description	U. of M.	Quantity
010.7603	RONDELLA DIAM. 6	NR	2,000
016.1238	PIASTRA PASSACAVI POSTERIORE S	NR	1,000
022.0212	RACCORDO RAPIDO SEM PG 16	NR	2,000
022.0234	PRESSACORDONE 3246 NERO PG 13,	NR	1,000
022.0324	PASSACAVI 24 INC.MM.2.5	NR	1,000
028.0099	VALVOLA DI NON RITORNO 3/8"	NR	1,000
028.0121	RACCORDO 3/8- 17 CL 2601	NR	1,000
028.0157	TUBO RETINATO DIAM.13- 19	MT	1,000
028.0271	ELETTROPOMPA EZ/C V. 220- 380	NR	1,000
043.0252	GOMITO MF 3/8 CL 2020	NR	1,000
043.0253	GOMITO M.M.3/8 CL 2010	NR	1,000
016.0164	RACCOGLITORE ACQUA ARCHETTO SHARK	NR	1,000
019.5395	FASCETTA MINUS 0 13X20	NR	1,000
010.7871	VITE TCEI 6 X 20	NR	1,000
013.0177.1	PIEDISTALLO SH 282- MA- CCS- MA CCS- SXI EVO	NR	1,000
016.2457	SPORTELLLO PIED. SH 282- MA- CCS- MA CCS- SXI	NR	1,000
010.1893	CERNIERA SPORTELLLO PIEDISTALLO N.T.	NR	1,000
010.1809	CHIUSURA SPORTELLLO	NR	1,000

Cylinder unit



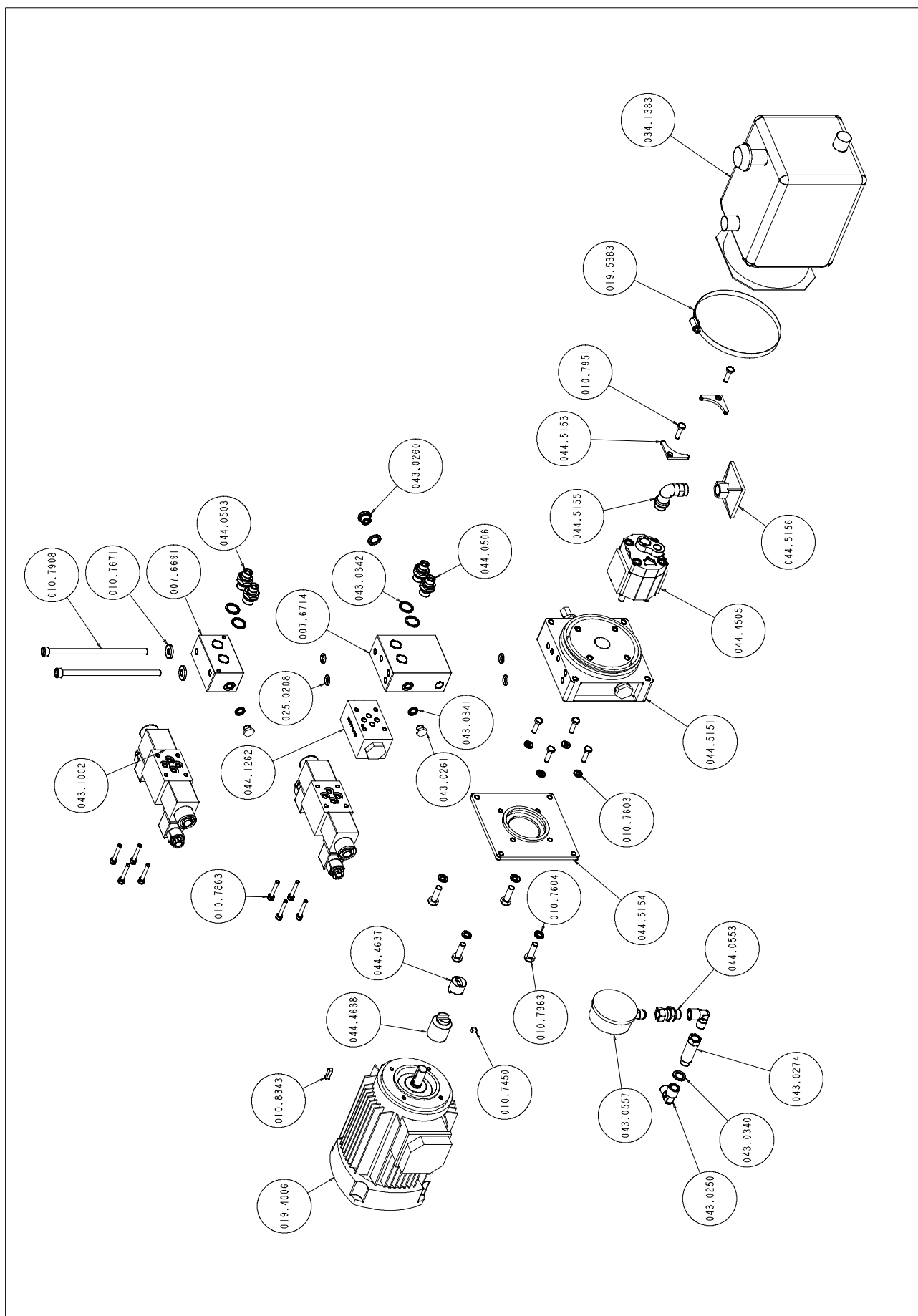
Code	Description	U. of M.	Quantity
010.1103	FORCELLA 16 X 1,5	NR	1,000
022.0046	POTENZIOMETRO 6639S- 001- 202	NR	1,000
044.1004	CILINDRO IDRAULICO 50.150 MM SENZA CONNETTORE SH282- 332 SXI- EVO	NR	1,000
044.5111	CAMICIA VALVOLA RIGENERATRICE	NR	1,000
044.1251	VALVOLA RIGENERATRICE CILINDRO SH 310 SX	NR	1,000
022.0238	PRESSACAVO PG 7 BS01	NR	1,000
022.2702	DADO PG 7 BL01	NR	1,000
043.0474	SILENZIATORE IN OTTONE 1/4'	NR	1,000
043.5681	SUPPORTO POTENZIOMETRO CILINDRO	NR	1,000
022.0378	CONNETTORE X BOBINA VALVOLA	NR	1,000
022.0615	BOBINA V24 RAC X VALVOLA RIGENERATRICE	NR	1,000
025.0876	GIUNTO WA 6- 6 MM.28 X CILINDRO	NR	1,000
043.0340	RONDELLA RAME 13X19X1,5- 1/4	NR	1,000
044.0501	NIPPLO NP 1/4 IDRAULICO	NR	1,000
010.1103	FORCELLA 16 X 1,5	NR	1,000
007.2505	PROLUNGA FORCELLA SH 280- CB 350	NR	1,000

Control panel



Code	Description	U. of M.	Quantity
016.0216	ASTA MOBILE X CONS.COMPL.DI GIUNTO	NR	1,000
016.1674	CORNICE QUADRO COMANDI X SXI EVO	NR	1,000
031.2073	CONSOLLE DI PROGRAMMAZIONE SX- SXI EVO NT	NR	1,000
016.0719	QUADRO COMANDI SH 281- 282- 332 SXI- EVO X	NR	1,000

Hydraulic control unit



Code	Description	U. of M.	Quantity
044.0037	MONOCENTRALINA SENZA MOTORE	NR	1,000
044.0012	MONOCENTRALINA IDRAULICA CTRG15	NR	1,000
007.6612	DISTANZIALE BLOCCHETTO IDRAULICO	NR	1,000
007.6691	PANNELLO IDRAULICO TERMINALE	NR	1,000
007.6692	PANNELLO IDRAULICO CENTRALE	NR	1,000
010.7604	RONDELLA DIAM. 8	NR	6,000
010.7908	VITE TCEI 8 X 50	NR	2,000
019.4006	MOTORE CENTRALINA HP 0,5 C71	NR	1,000
043.0250	GOMITO M.F. 1/4 CL 2020	NR	1,000
043.0340	RONDELLA RAME 13X19X1,5- 1/4	NR	7,000
043.0557	MANOMETRO DIAM.60 WIKA	NR	1,000
043.1002	ELETTROVALVOLA MD 1L- S1/10N- D24K1	NR	1,000
044.0503	NIPPLO IDRAULICO M 3/8- M 1/4	NR	2
044.0506	NIPPLO E.22X32,5 ZINC.G.	NR	2
044.0553	RACCORDO IDRAULICO MF 1/4 GIREVOLE X MAN	NR	1
044.4505	POMPA IDRAULICA MONOCENTRALINA CC 1,7 X	NR	1
044.4637	GIUNTO COLLEGAMENTO LATO POMPA X	NR	1
044.4638	GIUNTO LATO MOTORE X MONOCENTR.SXI- EVO	NR	1
044.5151	COLLETTORE PER POMPA DA 1,7 SXI- EVO	NR	1
044.5153	STAFFA SERBATOIO X MONOCENTRALINA	NR	2
044.5154	FLANGIA MONOCENTRALINA SXI- EVO X MOTORE	NR	1
044.5155	ASTA PESCANTE X MONOCENTRAL. SXI- EVO "A"	NR	1
044.5156	FILTRO ASPIRAZ.X MONOCENTRAL.SXI- EVO "A"	NR	1
019.5383	FASCETTA NS KC 140- 9 MM. 120- 140	M	1
025.0208	ANELLO TENUTA OR 109- 9,13	NR	6
034.1383	SERBATOIO X MONOCENTRALINA SXI- EVO	NR	1
043.0261	TAPPO TTE8 1/8 - CL 2611	NR	2
043.0274	RACCORDO MF 1/4- 43 CL 2525 SH 330	NR	1
043.0341	RONDELLA RAME 10X5 - 1/8	NR	2
043.0342	RONDELLA RAME 3/8	NR	4
010.7450	GRANO VCE PUNTA CONICA 6 X 6	NR	1
010.7603	RONDELLA Ø 6 (010.7603)	NR	4
010.7671	RONDELLA SPESSORE DIAM. 8 X 3 (010.7671)	NR	2
010.7863	VITE TCEI 5 X 30	NR	8
010.7951	VITE TE 6 X 20 (010.7951)	NR	6
010.7963	VITE TE 8 X 25 (010.7963)	NR	4
010.8343	LINGUETTA A5X5X20	NR	1
044.1262	VALVOLA MODULARE DI BLOCCO SH SXI / NC	NR	1

Adjustments



This chapter describes the operations required to adjust the electronic, mechanical and also the hydraulic systems. By following these instructions, you can “customise” your machine to suit the type of cut required, thereby optimising cutting times.

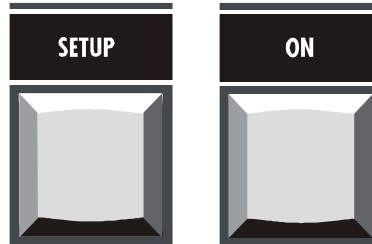
Displaying and editing the set-up parameters

The machine set-up parameters may be programmed directly from the control console.

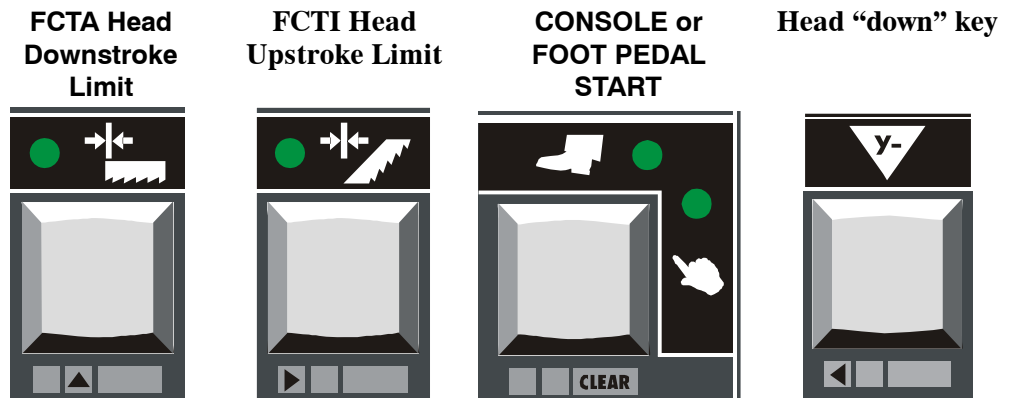
► Power up the machine at the main switch located on the left hand side.



- ▶ Press simultaneously and in sequence the keys SET- UP and ON;



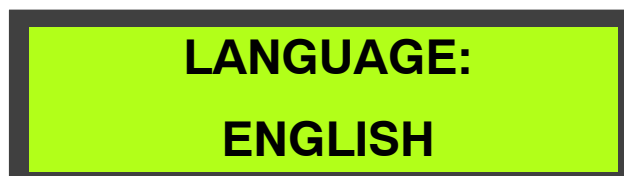
- ▶ Once inside the SET- UP menu, use the following keys to navigate through the different menu screens:



- ▶ The FCTA key (▲) allows you to change parameter settings in increments of one unit.
- ▶ The FCTI key (▶) instead has two functions: it is used to save parameter settings and navigate inside the SET- UP menu.
- ▶ The console or foot pedal START selection key allows you to zero the current parameter setting.
- ▶ The key "Y- " enables the cursor to return to the previous positions.
- ▶ To quit the SETUP parameters, press in sequence and simultaneously the SETUP and ON keys.

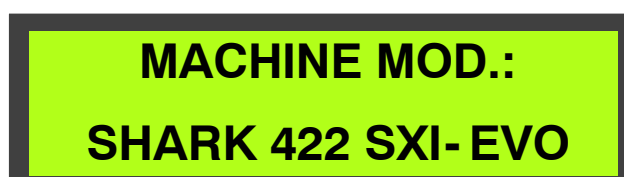
Set language parameter

- ▶ Press ▲ to change the display messages presentation language.



Set parameter for machine type

- ▶ Press ▶ to display the parameter for the machine type. Press the ▲ key to change machine type; each press of the key corresponds to a different machine configuration.



Semiautomatic- Dynamic and Manual operation setting (optional)

- ▶ In this video page it is possible to configure the possible presence of optional operating cycles, such as the Manual and Semiautomatic- Dynamic cycle. Pressing the key ▶ go to the item of this parameter, then with the ▲ key choose YES or NO.

MAN&SAD CYCLE:
NO

Pedal control setting (optional)

- ▶ Press ▶ to display the pedal control parameter, then press ▲ to set the presence (YES) or the absence (NO) of this optional.

PEDAL START
YES

Optional inverter presence settings

- ▶ Press ▶ to display the inverter parameter and then press ▲ to set the presence or absence of this optional device by selecting "yes" or "no".

INVERTER:
NO

Blade speed proximity settings

- ▶ Press ▶ to display the band speed detection proximity parameter, then press ▲ to set the presence or the absence of this optional, choosing YES or NO.

BLADE SPEED PROXY:
NO

Minimal lubrication system settings

- ▶ Press ▶ to display the min. lubrication system parameter, then press ▲ to set the presence or the absence of this optional, choosing YES or NO.

MIN. LUBR.:
NO

FCTI / FCTA digital output enabling setting

- ▶ Press the ► key to display the parameter enabling or disabling the outputs of the positions FCTI (backward head limit switch) and FCTA (forward head limit switch). Press the ▲ key to set YES or NO.

FCTI/A OUTPUTS
NO

Blade stop setting

- ▶ Press the ► key to display the blade stop parameter, then press ▲ to set the value of this parameter.

If the value is set as 2, the blade never stops;

if it is set as 1, the blade stops in the FCTI (backward head limit switch) point;

if the values is set as 0, the blade stops in the FCTA (forward head limit switch) point.

BLADE MOTOR OFF
NEVER/FCTI/FCTA: 0

Cutting vice opening setting

- ▶ Press the ► key to display the parameter indicating if the shearing vice must open when the head is in the FCTI (backward head limit switch) point or in the FCTA (forward head limit switch) point; press ▲ to set the value as 0 (vice opening in FCTA), or as 1 (vice opening in FCTI).

CUTTING VICE OPENING
FCTA/FCTI: 1

Cutting vice opening/closing time setting

- ▶ Press the ► key to display the parameter indicating the time between the vice closing and the cut start and between the cut end and the vice re- opening. Press ▲ to change this value, ranging between 0.0 and 9.9 seconds.

VICE OPENING/CLOSING
TIME = 0.0

Machine maximum power input setting

- ▶ Press the ▶ key to display the parameter and then increase or reduce the value with the ▲ key.

MOTOR I MAX
BLADE= 00.0

N.B. The factory set values are relative to the motor installed on the machine.

Measurement unit setting

- ▶ Press the ▶ key to display the parameter, then press ▲ to set the value as 0 or 1, to choose the measurement unit expressed respectively in pounds or kilograms.

MEASUREMENT UNIT
FIPS/MKS = 0

Setting minimum blade tensioning

The machine will enter emergency mode if the band is not tensioned correctly. This parameter allows to set the minimum blade tension threshold (Kg 600);

MIN. BLADE
TIGHTENING = 0600

Display backlighting time setting

- ▶ Press the ▶ key to display the LCD backlighting time parameter, then press the ▲ and ▶ keys to set the time expressed in minutes.

LCD BACKLIGHTING
TIME = 10

Cutting head stroke

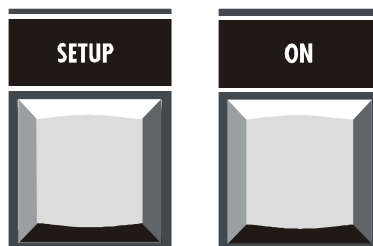
The cutting head crosses the space between the forward and backward position definable in the SET- UP with the CUTTING HEAD POSITION parameter. A value between 000 and 254 must be set.

Check that the bow, really and not virtually, crosses the amplitude of the cut between the structural limits of cutting head backward end run and cutting head forward end run. The scope of adjustment is to set the value of the real cutting head position both at FCTI (backward limit $252 \div 254$) and at FCTA (forward limit $008 \div 012$).

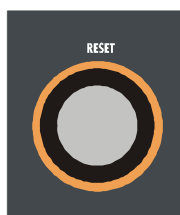
Two adjustments are performed to obtain this result: one on the cutting head

cylinder and the other on the IUD/IUV layout of the MEP 30 controller.
Operation sequences:

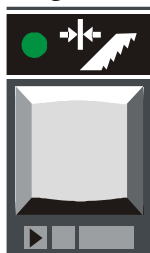
- ▶ Power the machine rotating the main switch on the left side of the console;
- ▶ Press simultaneously and in sequence the keys SET- UP and ON;



- ▶ Press the RESET.

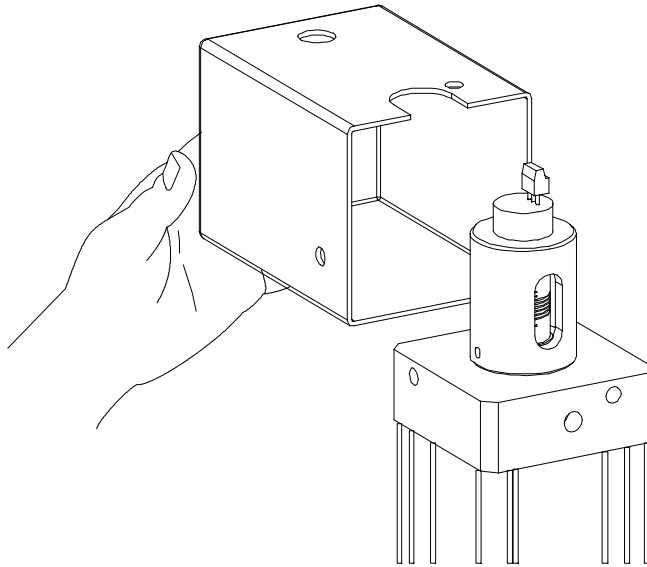


- ▶ scroll the machine parameters with the key indicated in the figure till reaching the following video page:

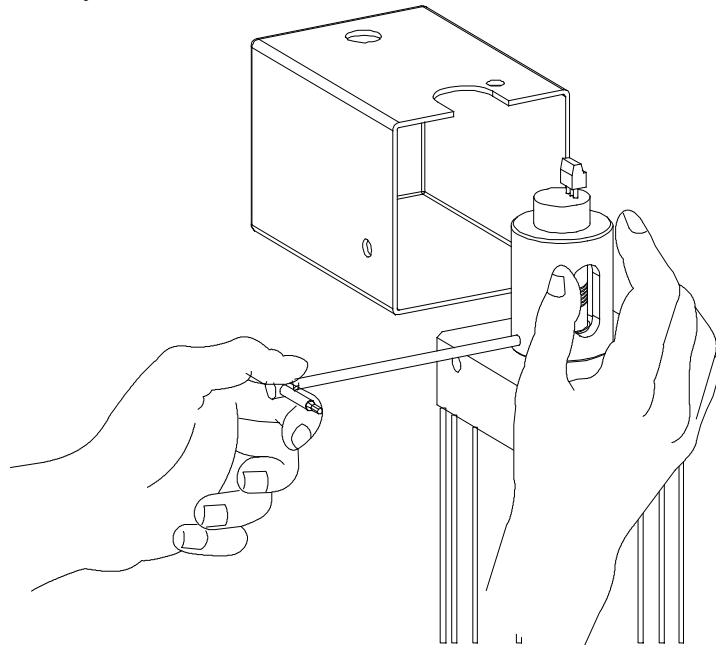


- ▶ Press the RESET.
- ▶ Press in sequence and simultaneously the ^ key and the key for the head lowering (Y-), position the bow completely downwards;
The down position must have a value ranging between 008 and 012, otherwise operate as follows:
- ▶ Remove the fixing screws from the black box on the cylinder using a hex wrench.

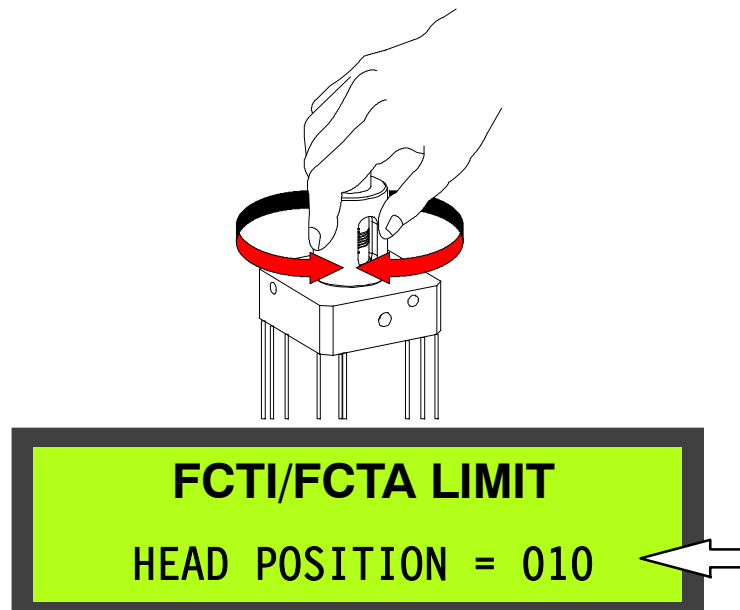
-
- Remove the box protecting the potentiometer, taking care not to tug at the connection cables.



- Using an Allen key, slacken the grub screws fixing the rod and free the potentiometer body.

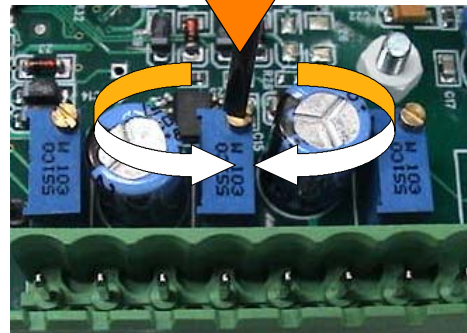
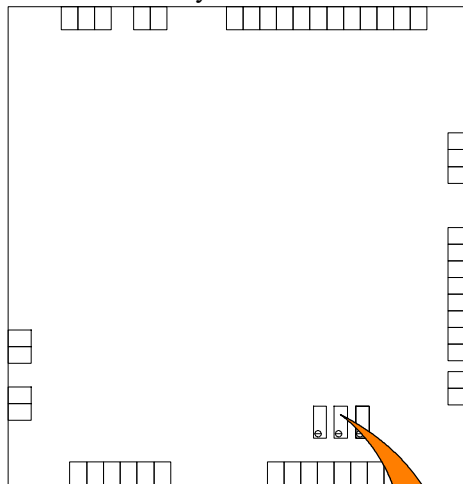


- ▶ Manually rotate the potentiometer body until the display readout is between 008÷012.

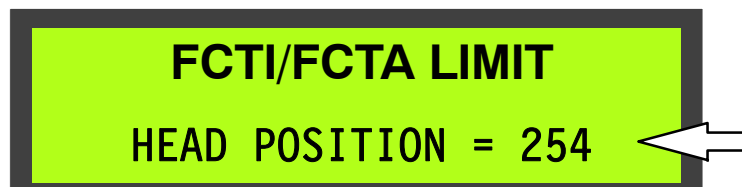


- ▶ Lock the potentiometer support in place using the grub screw. Close the cylinder box and tighten down the screws.
- ▶ Press the ↑ and FCTA keys in sequence and simultaneously.
- ▶ Set the FCTI point, taking the head completely backwards pressing in sequence and simultaneously the ↑ key and the key for the head lifting (Y+).
- ▶ Open the control board removing the frame and pull the keyboard out of the console;

- Identify the board IUD/IUV of the controller MEP 30 to adjust the potentiometer indicated by the arrow in the following image:



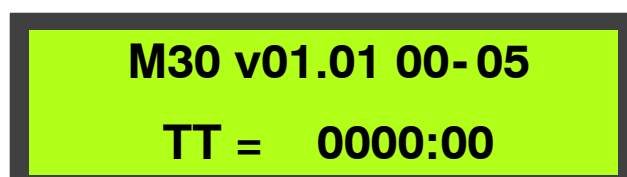
- Three potentiometers are mounted on the IUD/IUV card. Adjust the adjustment screw of the potentiometer indicated by the arrow by a screw- driver at a value of $252 \div 254$; the obtained variation is displayed on the machine.



- Press the \uparrow and FCTI keys in sequence and simultaneously.
- Press simultaneously and in sequence the keys SET- UP and ON to quit the SETUP parameters:
- Test to make sure it is functioning correctly.

Software version and total use time of the machine

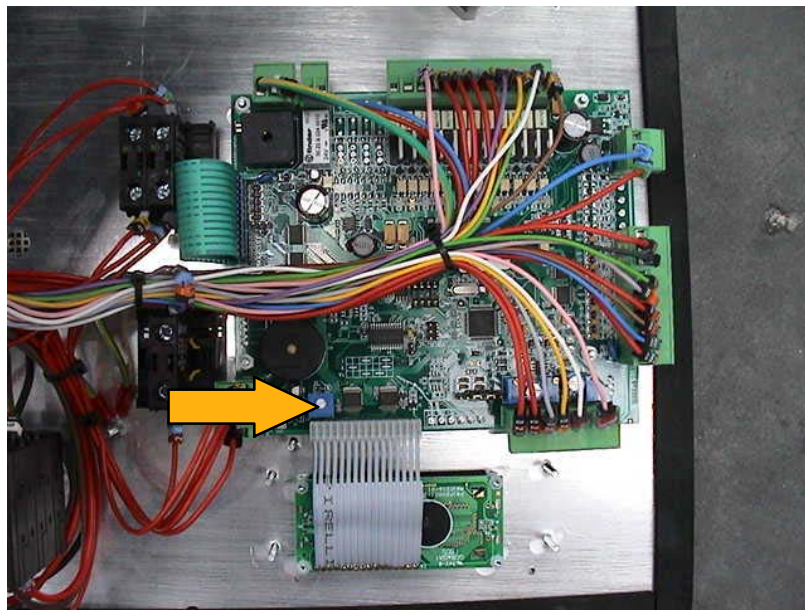
- This parameter indicates the installed software version and the total working time of the machine.



Adjusting the display brightness

If external factors like changing ambient lighting conditions in the machine installation site, affect visibility, adjust the brightness of the control and programming console display. This is very important since the operator must be able to clearly read the display messages at all times.

- To adjust the brightness, first remove the screws fixing the front console panel. The photo below illustrates the MEP 30 controller card on which the brightness potentiometer is marked by an arrow.



- Using a screwdriver, rotate the potentiometer until the required display brightness is obtained.

Machine working pressures

This section describes the procedures to change the vice and head operating pressures. Both adjustments strongly depend on the material type being processed.

The vice locking pressure can be set if the material could be strained or could be quite unstable while cutting.

The head lowering speed can be set by a flow adjuster on the control console.



Hydraulic pressure

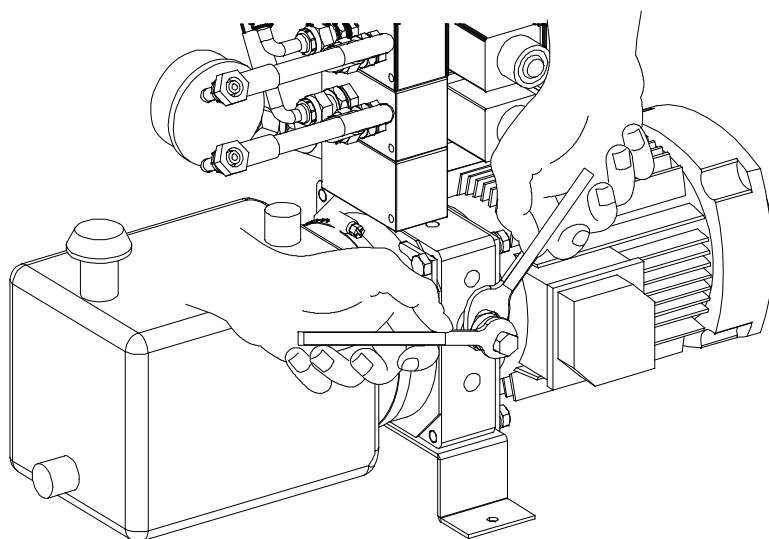
Both vice and head pressures can be adjusted by the power pack.

Warning

Both the pneumatic and hydraulic vices have a maximum travel of 8 mm. This means that after positioning the workpiece on the work table and before starting the cycle, the moving jaw must be positioned to within 2÷3 mm of the workpiece as previously described in Chapter 5.

The operating pressures (shearing vice and cutting head) can be adjusted by the max. pressure adjusting valve.

- ▶ Open the door of the machine base, remove the fastening screws and pull out the power pack from inside the base.
- ▶ Slacken the hex nut on the relief valve, and using an Allen key, increase (clockwise) or reduce (counter-clockwise) the pressure reading on the pressure gauge.



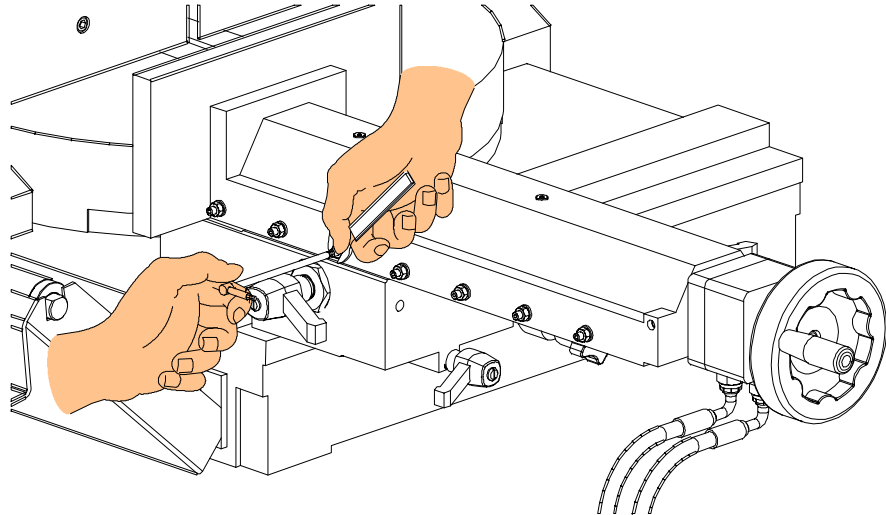
- ▶ This done, tighten the lock nut and return the hydraulic power pack back inside the base.

Vice

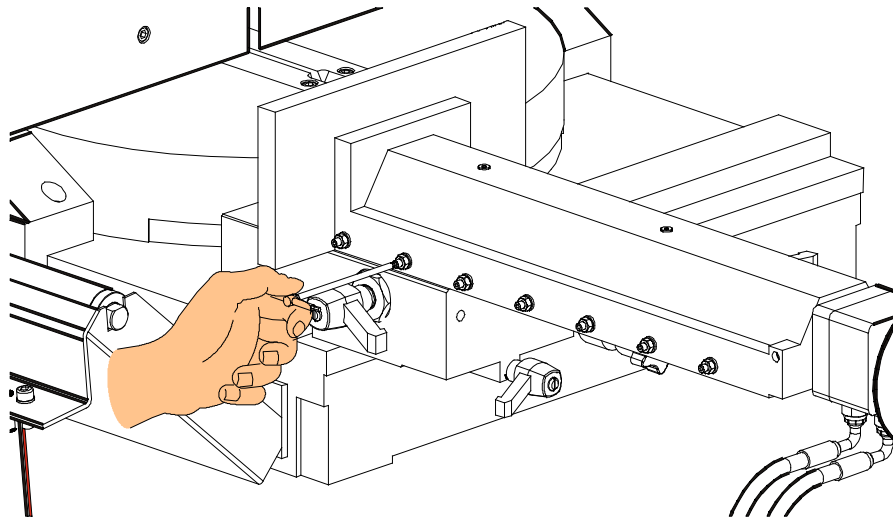
Vice play adjustment

Any play that develops between the slideway and the slide gib on the vice must be compensated by adjusting the grub screws regulating the distance between the gib and the lead screw, proceeding as follows:

- ▶ slacken all the locknuts on the grub screws, using a hexagonal key to hold the screws still;
- ▶ open the vice to its full extension;

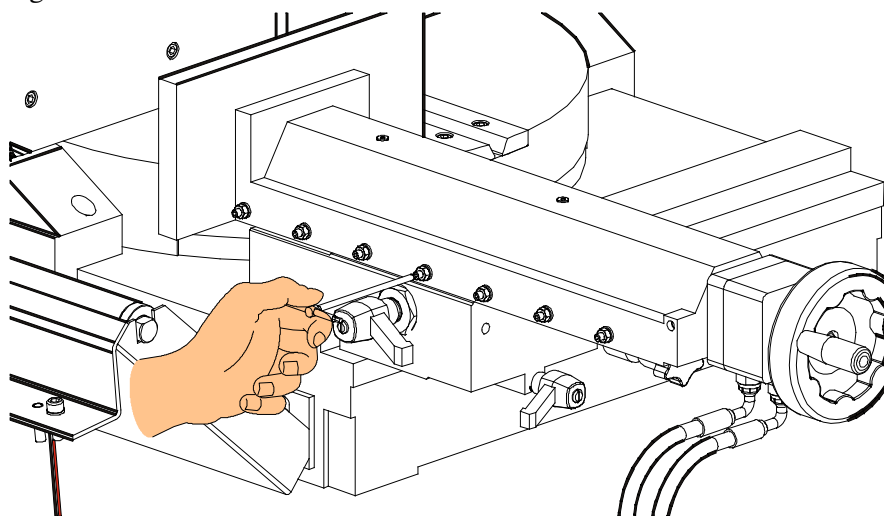


- ▶ adjust the slight pressure exerted by the grub screws on the gib, starting with the first two in contact with the lead screw;
- ▶ after adjusting the two grub screws, tighten the locknut, holding the grub screws with the hexagonal key;



- ▶ close the vice until two more grub screws are in the same position as the first two previously;
- ▶ repeat the operation on the gib grub screws on all the slideway grub screws;

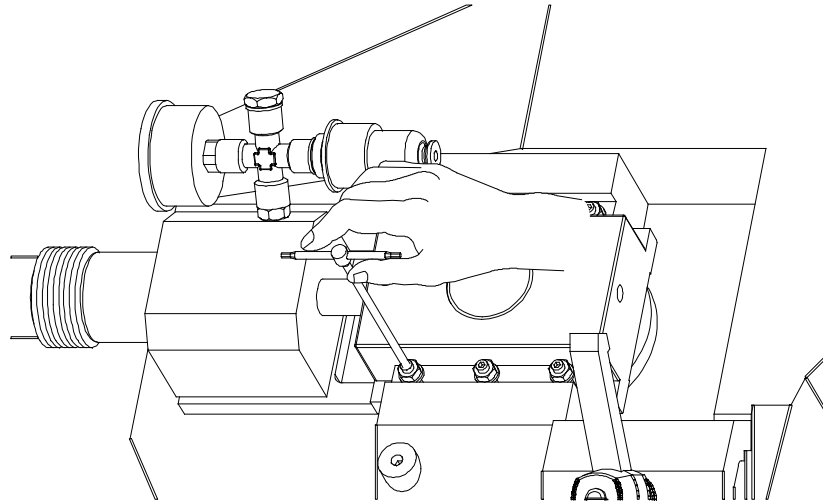
-
- at the end of the operation, use the handwheel to move the slideway back and forth, identifying the zones where the grub screws exert greater pressure on the gib.



Cutting head

Blade tensioner slide play adjustment

To reduce the play which develops over a period of time between the blade tensioner slide and the slide gibs, the grub screws separating the gibs from the slide must be adjusted as follows:

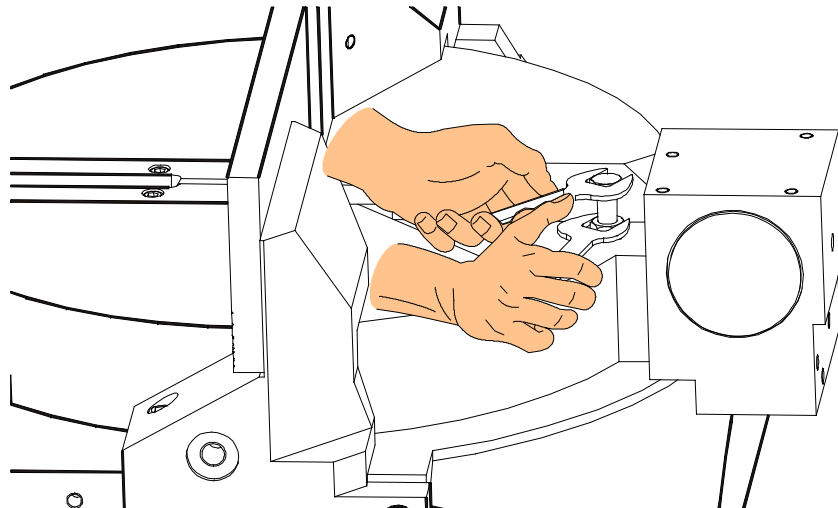


- ▶ remove the blade from the flywheels;
- ▶ move the slide backwards and forwards to locate any friction or play;
- ▶ slacken the nuts, holding the grub screws with a hexagonal pipe wrench;
- ▶ if there is play, tighten the grub screws; if there is friction rubbing, loosen the grub screws.

Adjusting operating head travel

During the cutting cycle the cutting head stroke is limited by the FCTI (Head Upstroke Limit) and FCTA (Head Downstroke Limit), set electronically on the control panel, as described on Page 5. The cutting head has a mechanical limiting switch that determines its downstroke:

- ▶ to change this setting, two hexagonal spanners must be used, one to keep the nut in position, and the other to tighten and loosen the stop screw.



Blade guide parts

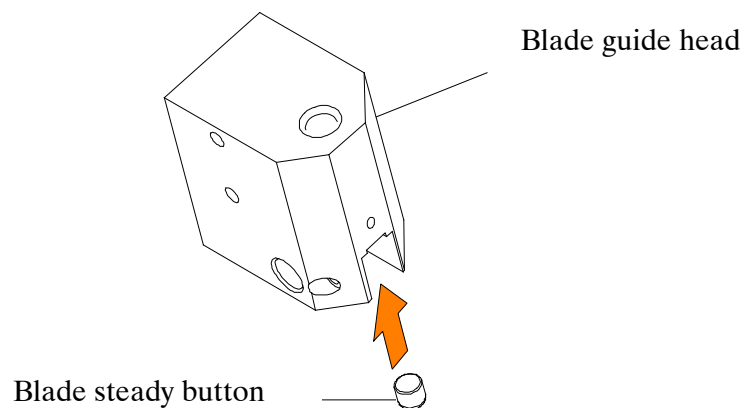
Band saw blades offer enormous advantages to cutting applications, without requiring any special skills by the operator. A description follows of the blade guide adjustments required to ensure correct operation of the saw.

Blade guide heads

The first blade adjustment involves adjustment of the heads. The blade guide heads comprise the blade guide plates which ensure correct longitudinal alignment, the blade steady buttons which control vertical blade flexure, and the coolant supply cocks.

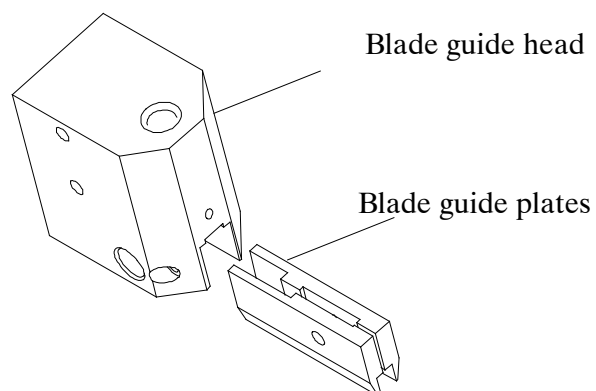
Blade steady buttons

The blade steady buttons prevent upward blade flexure caused by the vertical action of the cutting force. These buttons are fitted on both the front and rear heads, and need no adjustment.



Blade guide plates

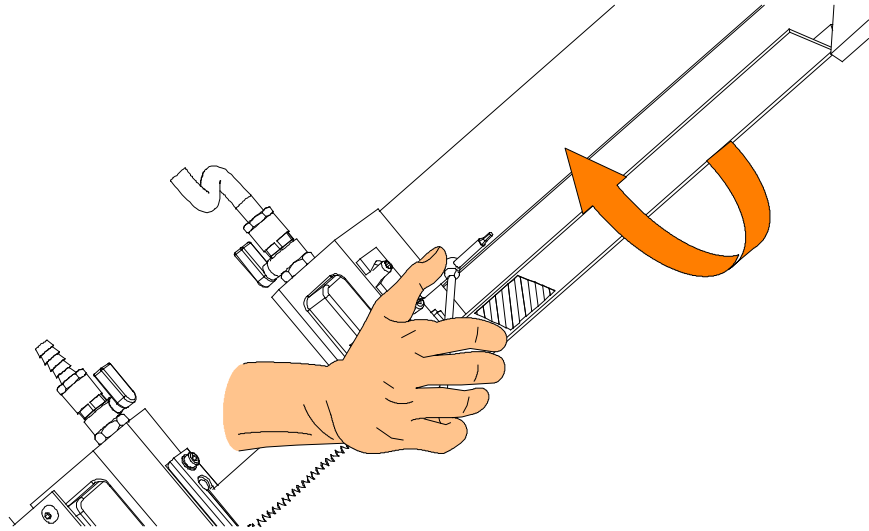
The plate contact points feature widia inserts which guide the blade longitudinally. A small amount of play must exist between the plates and blade to ensure that the blade runs smoothly and perpendicular to the work table.



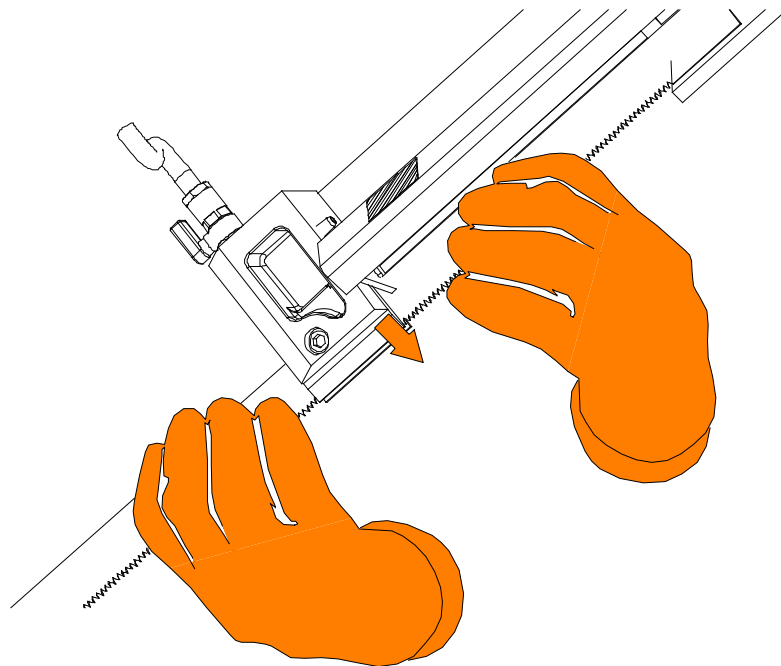
Thanks to the widia inserts, the working life of the guide plates is practically the same as that of the machine itself. However, if due to wear or the assembly of a new blade with a different thickness, the amount of play between the plates and blade changes, the plates must be adjusted as follows:

- disconnect the machine from the power supply;

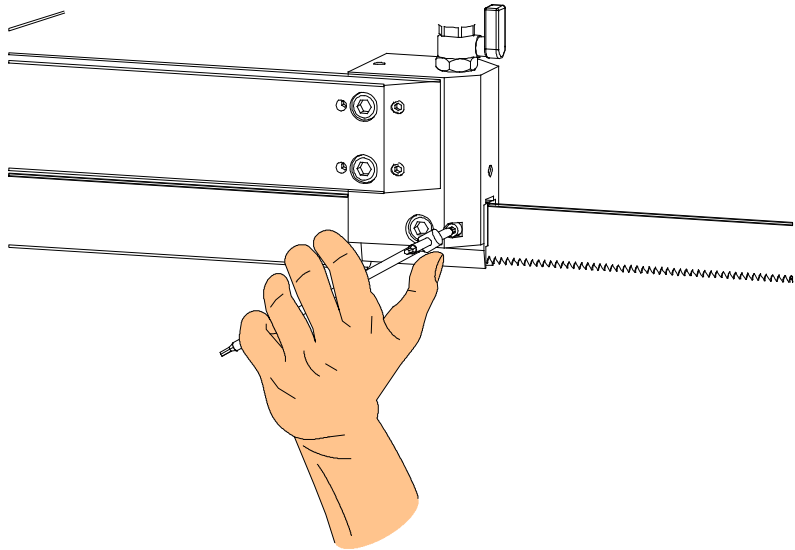
- ▶ slacken the blade tension using the handwheel;
- ▶ open the front blade guard by undoing the fixing screw and rotating it as illustrated in the figure below;



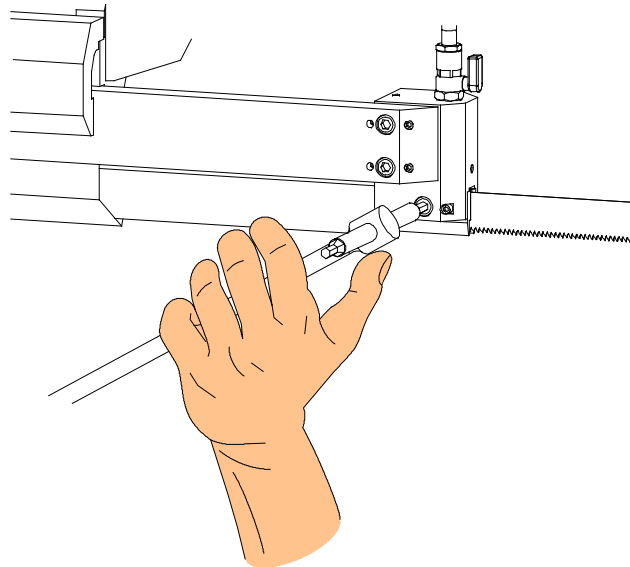
- ▶ wear protective gloves when making this adjustment;
- ▶ make sure there is a small amount of play between the blade and guide plate inserts;



- ▶ if the amount of play is not sufficient for the blade to run smoothly, adjust the locking torque of the two grub screws with an Allen key;



- ▶ replace any worn plates by removing the plate fixing screw;



- ▶ repeat the above sequence of steps on the rear blade guide head;
- ▶ refit the front blade guard;
- ▶ tension the blade and power up the machine again.

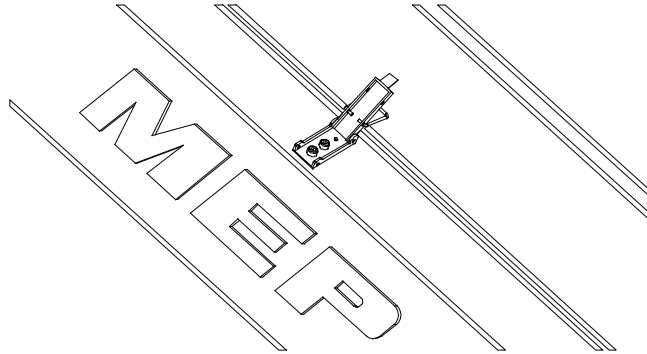
Blade

The adjustments required to ensure correct operation of the blade are described below. For further information about band saw blades, refer to Chapter 9 which provides a more detailed description of the different types of blade.

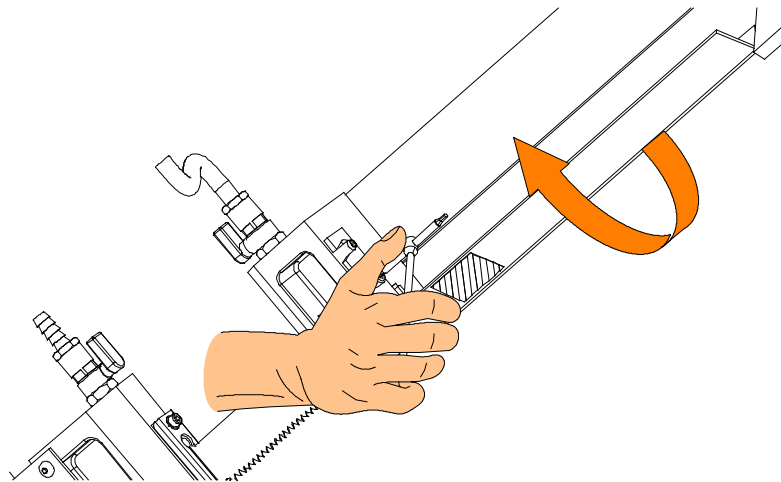
Tool change

Optimum working conditions both enhance operator safety and extend the tool's service life. The cutting tool should in any case be replaced when poor cutting performance starts to affect productivity. The tool changeover procedure is described as follows:

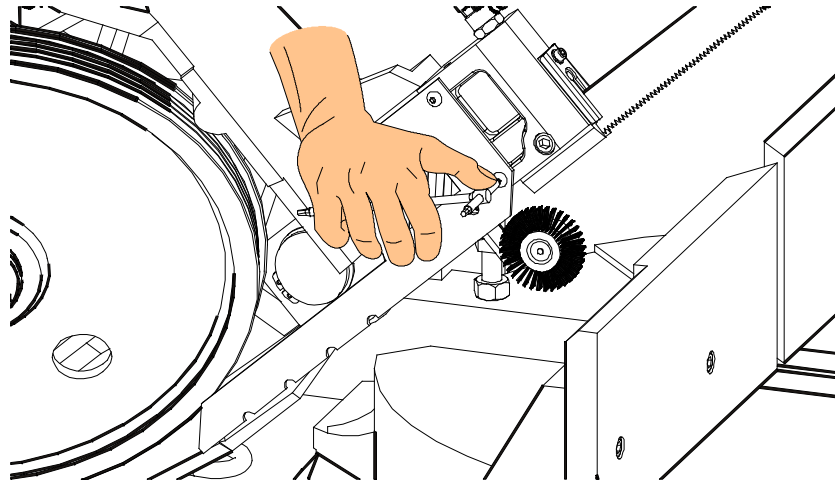
- ▶ disconnect the machine from the power supply;
- ▶ slacken the blade tension using the handwheel;
- ▶ open the cutting head cover by unscrewing the two knobs and hooking it onto the galvanised lever on the back of the head;



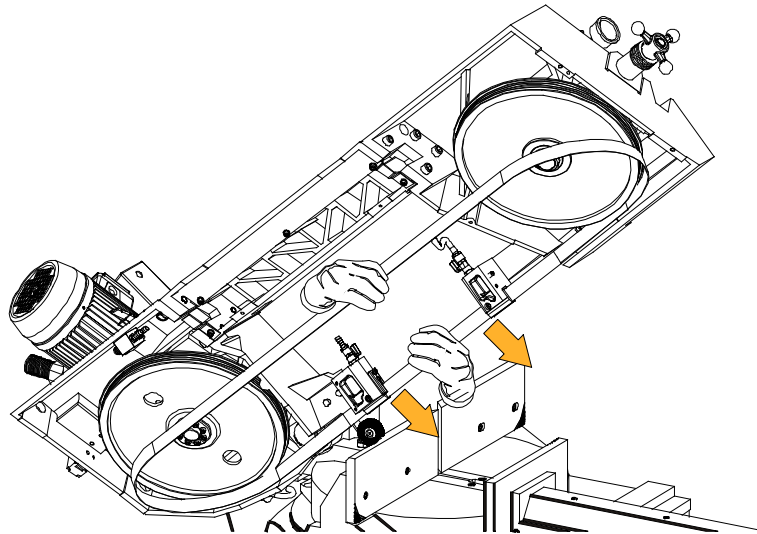
- ▶ open the front blade guard by undoing the fixing screw and rotating it as illustrated in the figure below;



- ▶ remove the rear blade guard by undoing the two fixing screws using an Allen key;



- ▶ wear protective gloves when changing the blade;
- ▶ remove the worn blade by sliding it off the flywheels and front and rear heads;
- ▶ fit the new blade into the front blade guide head;
- ▶ make sure the back of the blade is facing the flywheel stop and that the teeth along the lower part of the blade are inclined towards the head pivot.
- ▶ Make sure there is a small amount of play between the blade and guide plate inserts;



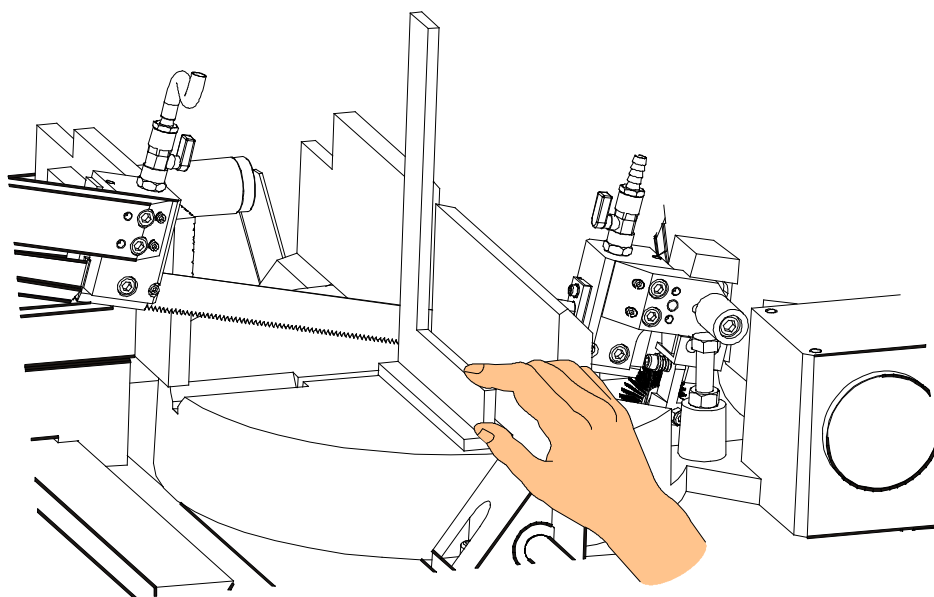
- ▶ repeat the above sequence of steps on the rear blade guide head;
- ▶ fit the blade on the flywheels and remount the front and rear blade guards;
- ▶ close the cutting head cover, correctly tension the blade and power up the machine.

Blade perpendicularity

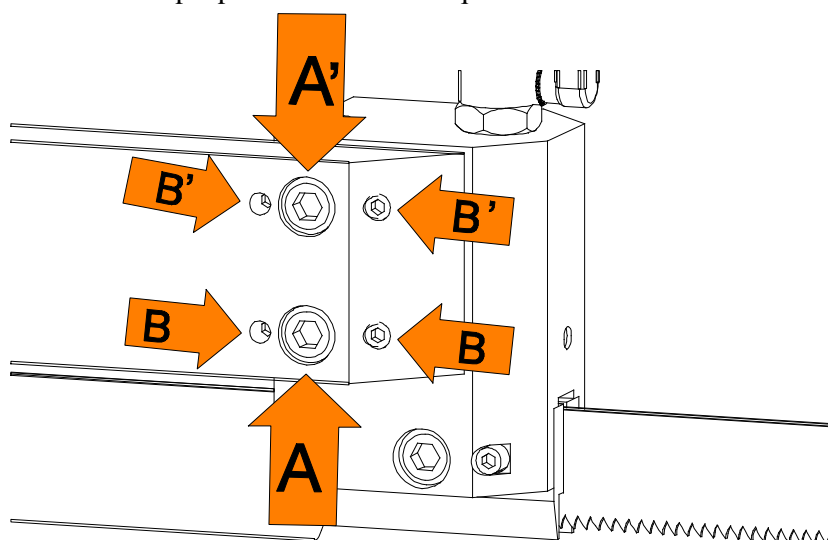
The perpendicularity of the blade to the work surface, and also the blade tension, are vital for achieving straight cuts. This adjustment is carried out with the help of a workshop square, which should be placed adjacent to the blade resting on the work surface.

- ▶ Position the square on the cleaned work surface and rest it against the blade,

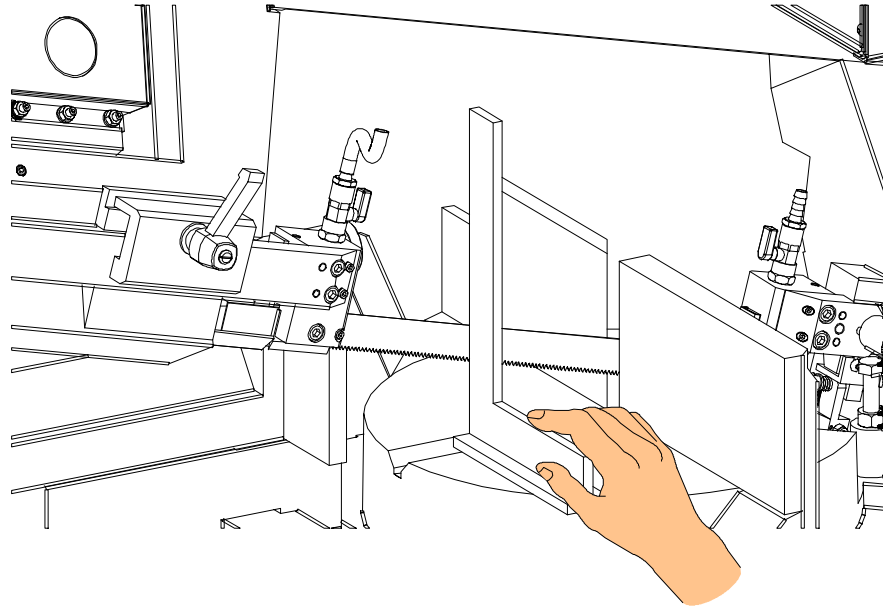
close to the right vice jaw at a point where the blade teeth do not prevent contact.



- Slacken the TCEI head fixing screw (A) and adjust the two grub screws (B) if the blade touches the square at its lower part. If the point of contact is at the upper part, slacken the TCEI screw (A') and tighten grub screws (B') equally until the blade is perpendicular to the square.



- Position the square on the work surface close to the front head.



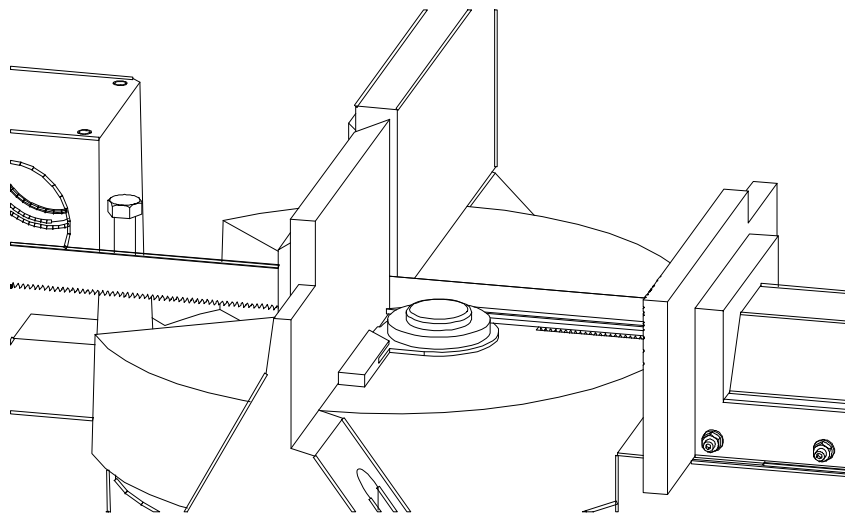
- Repeat the squaring operations as for the rear head.

Orthogonality of the blade

The procedure for correcting and adjusting the blade to 0° and 45° right and 45° and 60° left in order to make cuts at right angles to the fixed vice jaw is described below.

To make orthogonal adjustments at 0° , use a workshop goniometer or a simple 90° square. Operation sequence:

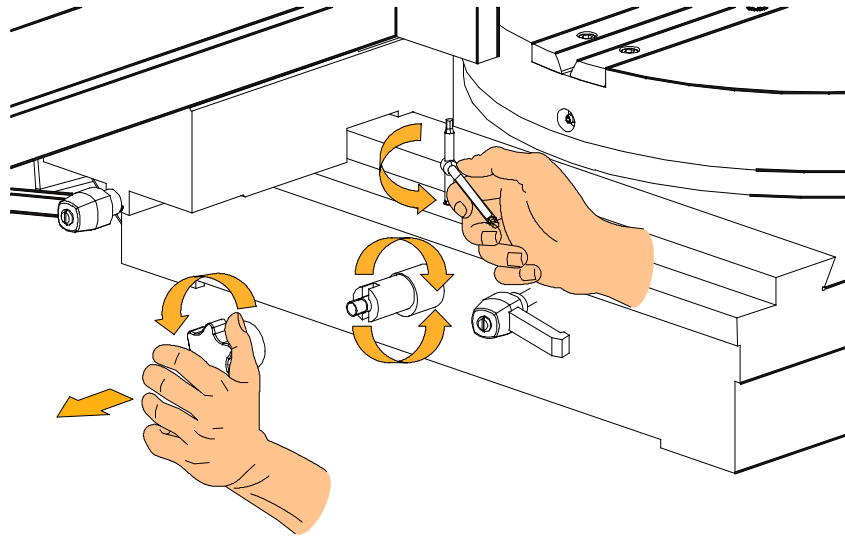
- lower the head;
- position the goniometer or square, resting it on the fixed vice jaw adjacent to the blade;



- slacken the turntable lock lever;
- remove the knob illustrated in the figure below controlling the eccentric lock pin;

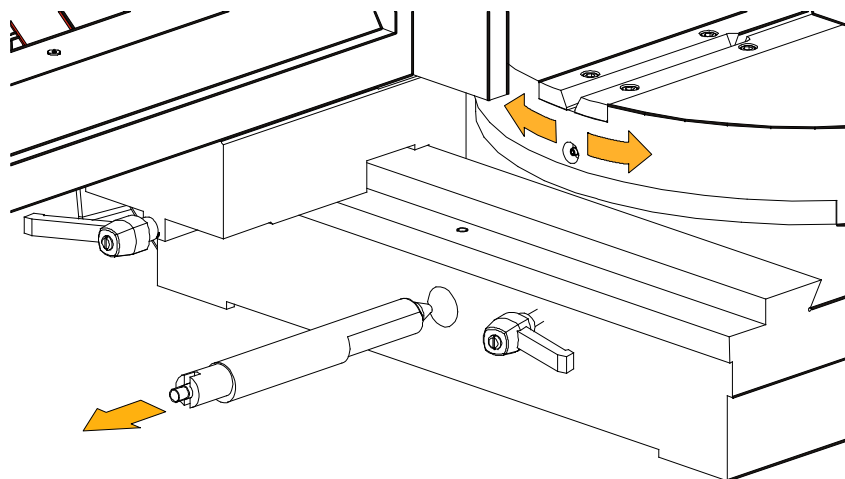
If the degree of error read on the goniometer is equal to or less than 1 degree, proceed as follows:

- ▶ using an Allen key, slacken the eccentric pin grub screw and rotate it until the error is corrected;



If instead, the degree of error read on the goniometer is greater than 1 degree, proceed as follows:

- ▶ remove the eccentric pin completely;
- ▶ turn the head until the error is corrected;



- ▶ refit the eccentric pin, tighten down the grub screw and remount the knob;
- ▶ lock the turntable using the lever.

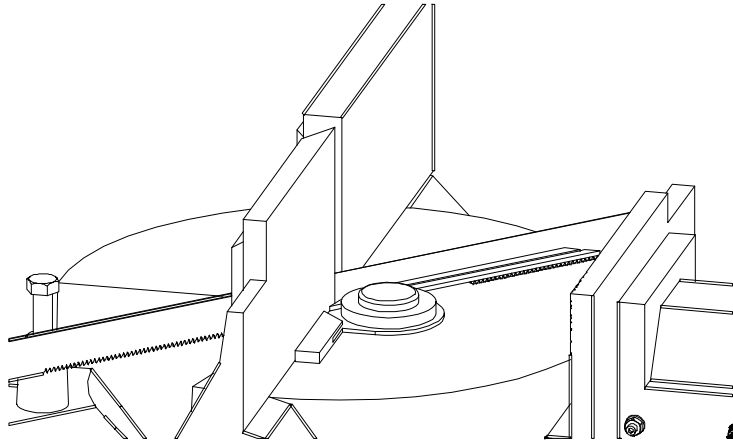
Warning

To adjust the 45° and 60° fixed points, you will need a workshop goniometer or an instrument that can measure the exact angle of the blade. This operation can also be performed to adjust the blade to 45° right, since a head angle control pin is also mounted on the left hand side of the work table.

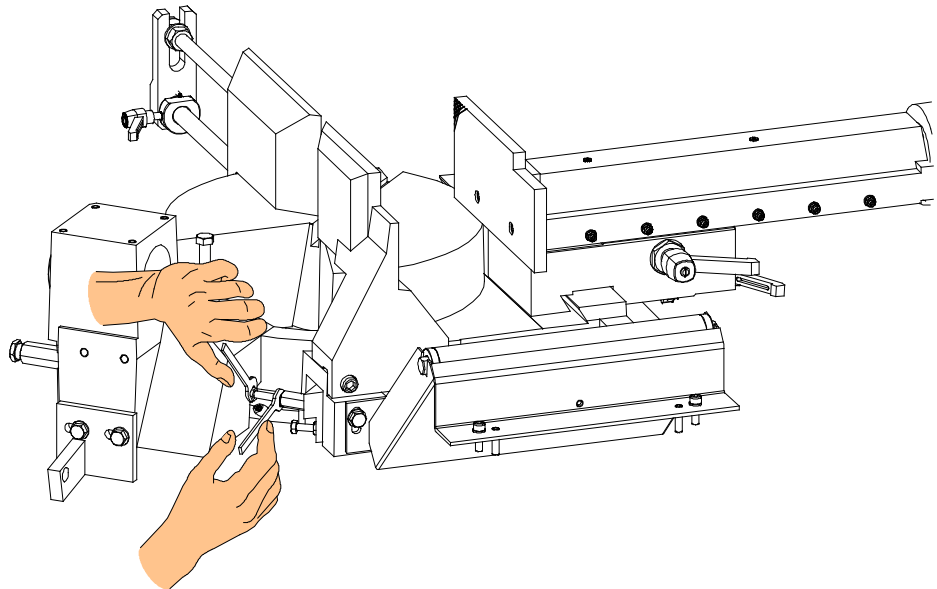
Operation sequence for blade adjustment to 45 degrees:

- ▶ slacken the turntable lock/release lever;
- ▶ turn the head to 45 degrees (left or right);

- ▶ position the goniometer on the work table and measure the angle between the vice jaw and blade;

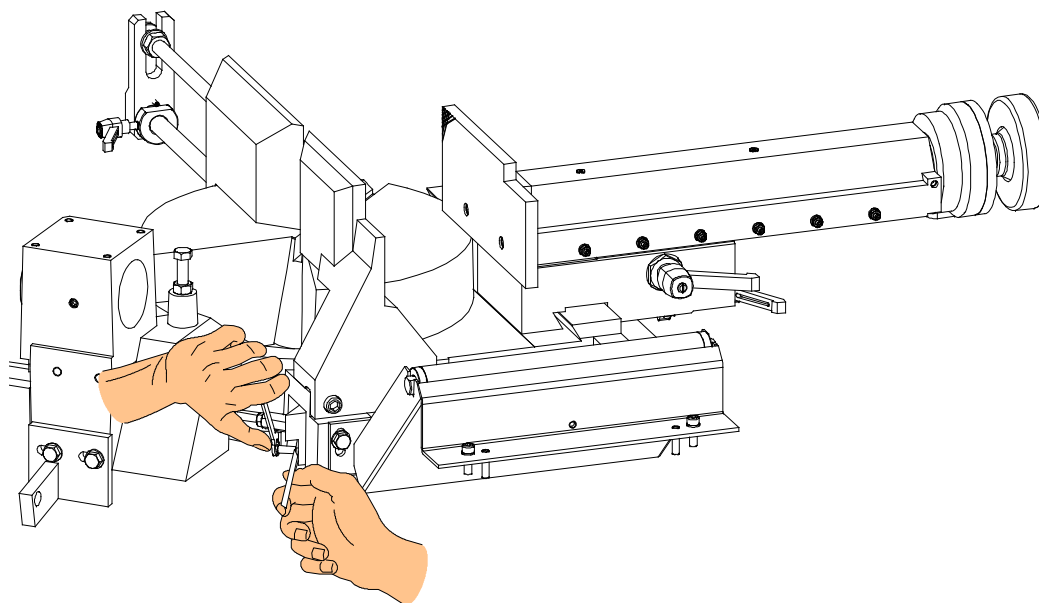


- ▶ once you have identified the degree of error, adjust the pins by gripping the pin with an Allen key and slackening the lock nut with a normal wrench;
- ▶ this done, adjust the depth of the pin inside the turntable until the error is corrected;



- ▶ relock the nut, while gripping the grub screw.

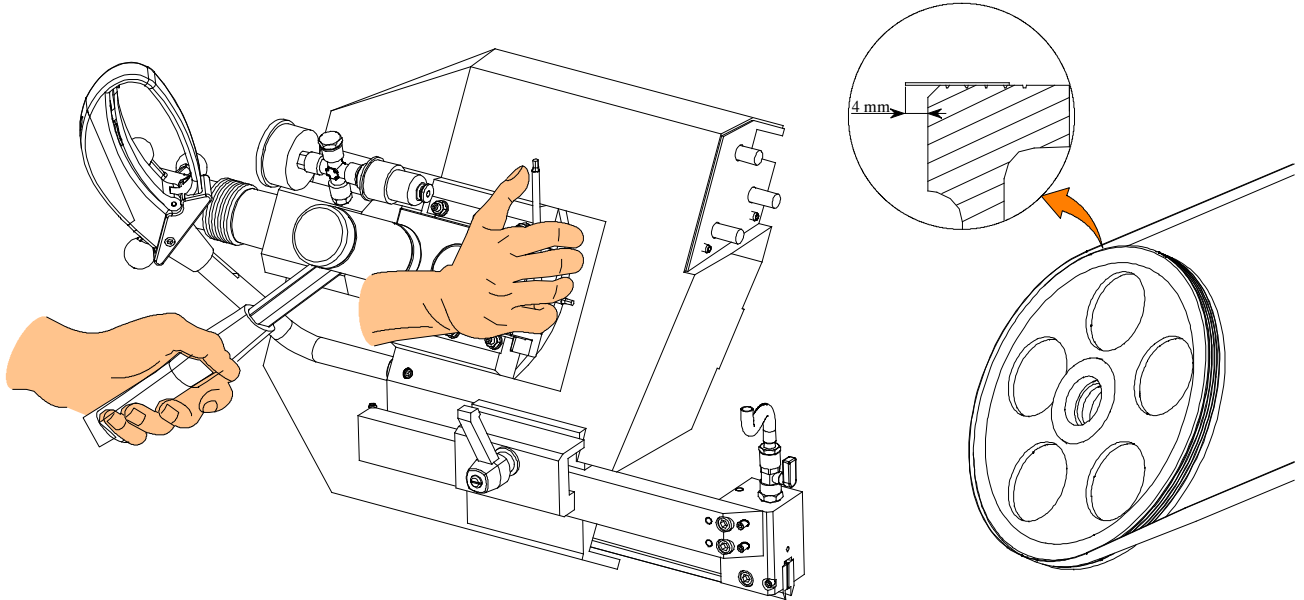
To adjust the blade to **60 degrees left**, proceed as described above for a 45 degree angle, this time however, adjusting the stop indicated in the drawing below.



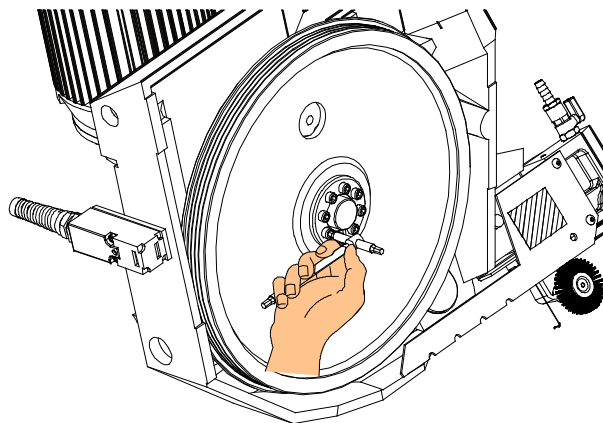
Rotation axis control

Pulleys must be adjusted in their coplanarity. The adjustment is aimed at ensuring the belt rotation, keeping approx. 4 mm of distance from the point of the belt teeth to the pulley machined surface. This prevents an early wear of the belt.

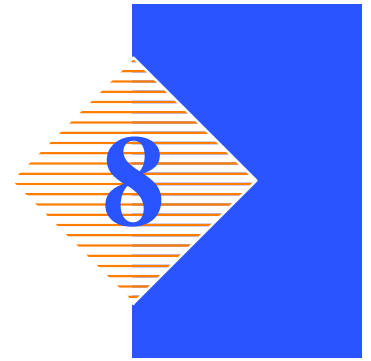
- ▶ Slacken the blade tension and open the cutting head cover;
- ▶ slacken the grub screw and, using a mallet, tap the shaft in or out;
- ▶ finally, close the cover and set the blade in motion;
- ▶ check the distance between the blade and edge of the wheels;



- ▶ if necessary, repeat the operation till getting the correct position. Rear flywheel alignment is closely linked to adjustment of the front flywheel.
- ▶ Adjust by loosening all pulley locking screws and moving the pulley manually inwards or outwards according to the distance of the blade from the pulley machined surface. Tighten the screws again and check the coplanarity making the belt turn a few times.



Maintenance and choice of consumables



DM10P is built to be sturdy and long-lasting. It has no need of any special maintenance, though, like all other tools, it needs adjusting from time to time, especially if not regularly looked over or used without due care.

This chapter, therefore, is intended as a guide for those who want to look after the machine and get the most out of it for as long as possible.

The role of the operator

The person operating and maintaining the machine must follow these instructions for his own safety, as well as for the safety of other personnel, and in the interests of machine productivity:

- check that his own work and that of the other operators of the machine always complies with the relevant safety standards. Therefore, check that the safety devices are in position and work perfectly and that personal safety requirements are complied with.
- Ensure that the working cycle is efficient and guarantees maximum productivity, checking:
 - ✓ the functions of the main components of the machine;
 - ✓ the sharpness of the blade and coolant flow;
 - ✓ the optimum working parameters for the type of material.
- Check that the quality of the cut is that required and that the final product does not have any machining defects.

Maintenance requirements

- All ordinary and extraordinary maintenance must be carried out with the power switched off and the machine in emergency condition.
- To guarantee perfect operation, all spare parts must be MEP S.p.A originals.
- On completion of maintenance works, ensure that the replaced parts or any tools used have been removed from the machine before starting it up.
- Any behaviour not in accordance with the instructions for using the machine may create risks for the operator.
- Therefore, read and follow all the instructions for use and maintenance of the machine and those on the product itself.

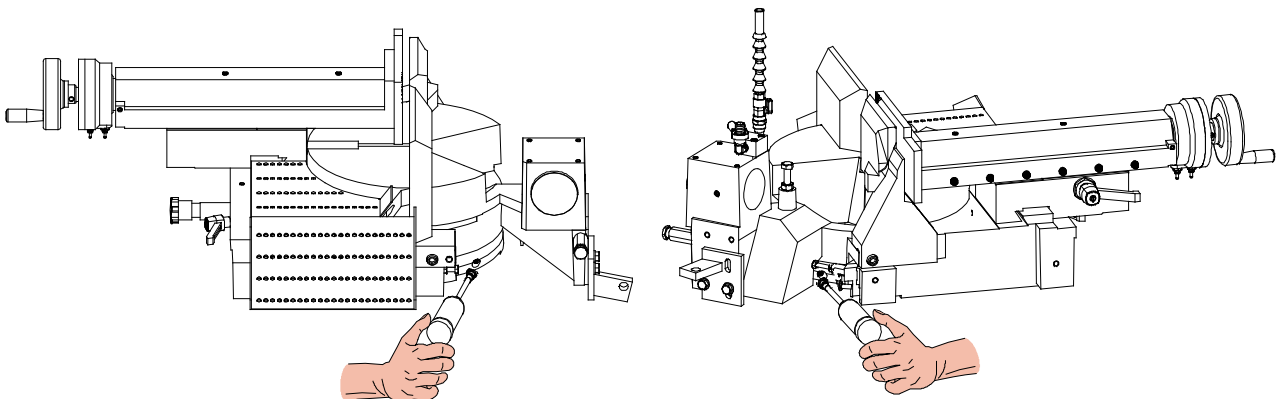
General maintenance

Daily

- ▶ remove all swarf from the machine (preferably with a non- fibrous cloth);
- ▶ empty the swarf drawer (this is located on the right side of the base);
- ▶ top up the lubricant/coolant level;
- ▶ check state of blade wear and replace if necessary;
- ▶ check the blade cleaning brush, clean and relocate; if worn, replace;
- ▶ at the end of the working day, slacken the blade to 5 Bar (70 Kg) tension to prevent unnecessary and damaging stress on the machine.

Weekly

- ▶ remove all swarf;
- ▶ clean the vice and lubricate all joints and sliding surfaces with a good quality oil;
- ▶ check vice sliding; if it is not precise and has transversal play, adjust as instructed in Chapter 7.
- ▶ Top up the lubrication circuit inside the turntable by means of the ball- type lubricator located at the front.



- ▶ check the oil level in the hydraulic power pack and, if necessary, top up. Check for oil leaks in the hydraulic hose connections and make sure the hoses are free of kinks.

Monthly

- ▶ check the perpendicularity of the blade to the work surface; if it is necessary to adjust the blade setting, follow the instructions set out in Chapter 7;
- ▶ check on blade orthogonality with respect to the workpiece rest shoulder; if adjustment is necessary, proceed as instructed in Chapter 7;
- ▶ check that the 0° notch on the work table is in line with the graduation on the turntable; if not, readjust by regulating the 0° stop; then re- check that the blade is perpendicular and orthogonal;
- ▶ check the precision of the 45° and 60° left stops; if out- of- set, adjust following the steps indicated in Chapter 7;
- ▶ check the state of the widia inserts and the blade steady button; replace if worn or chipped; check their positions and adjust if necessary (see Chapter 7);
- ▶ thoroughly clean the bottom of the water tank and the electropump filter.

Maintenance of working parts

The machine maintenance operator must pay special attention to the sliding mechanical systems and to the hydraulic circuit power pack. No maintenance intervention is required for the worm screw reducer installed on the machine.

Consumable materials

It is essential to use specific oils for the pneumatic and lubricant/coolant circuits. The oils suitable for each of these circuits are listed below.

Oil for transmission box

The machine can be equipped with a worm gear which is permanently lubricated and therefore maintenance- free.

Otherwise, the machine can be equipped with a worm gear having filler cap, level checker and drain to top the oil up if necessary. Below, there is a short list of synthetic oils for permanent lubrication:

BP Energol SG XP220 - KLUBER Syntheso D220EP - ESSO Glycolube Range 220 - IP CT614 - FINA Girans.

- transmission box capacity Lt. 0.320

Oils for hydraulic circuit

The machine is supplied with FOX YE 32 oil. This oil is used by the head cylinder and hydraulic power packs. The following oils may also be regarded as compatible or having equivalent specifications: The machine is supplied with FOX YE 32 oil. This oil is used by the head cylinder and hydraulic power packs. The following oils

may also be regarded as compatible or having equivalent specifications:

API Cis 22 - ARAL Dural SR 22 - CASTROL Hyspin AWS 22 - ESSO Spinesso 22 - IP Hydrus oil 22 - TOTAL Azolla ZS 22 - VALVOLINE ETC 22 - MOBIL Velocite oil D - Mobil DTE 22 - MOBIL ATF 220 - OLIO FIAT HTF 22 - Q8 Haydn 22 - SHELL Tellus oil 22 - BP AUTRAN GM- MP.

- reservoir capacity 2,5 litres

Oil for lubricant/coolant fluid

The oil used for the machine lubricant/coolant fluid is CASTROL Syntolin TFX. Though there are no specific standards for these types of oils, MEP considers that the above product has the best price/quality rapport. The following oils can also be said to have similar characteristics and are therefore compatible:

AGIP NB 200 - SHELL Lutem TT - IP Utens Fluid- F

Finally, a lubricant/coolant guaranteed and distributed by a band saw manufacturer (LENOX) is BAND- ADE SAWING FLUID LENOX.

- tank capacity	Lt.13
- oil concentration	5- 6 %

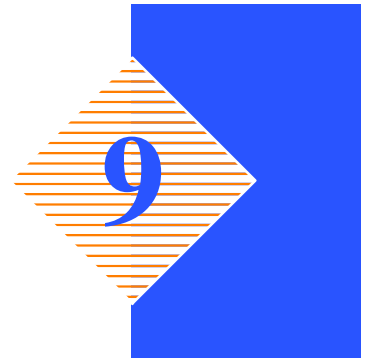
Oils for spray mist system (optional)

The oil type used for the machine spray mist system is the cutting oil: Blaser Vascomill F 22.

Though there are no specific standards for these types of oils, MEP considers that the above product has the best price/quality rapport. The following oils can also be said to have similar characteristics and are therefore compatible:

SHELL MACROM 401 F22 - AGIP ESTRAMET F20

Cutting speed and choice of tools



The cutting speed is determined by the blade speed and the head feed speed. While the head speed is provided by the downstroke movement of the head, the blade rotation speed can either be fixed or variable. This chapter describes the cutting speeds the machine can operate at in the standard version, as well as the speeds for which the optional electronic speed controller (inverter) is necessary.

When using the **DM10P**, it is important to select the correct type of blade for the material to be cut. This chapter explains the limitations and specific applications of the different types of blades.

Cutting speed

Standard machine

The basic version with 2/4 pole motor, is provided with the following cutting speeds:

- 1st speed = 36m/min. = 11.21 ft./min (4 pole)
- 2nd speed = 72 m/min. = 22.43 ft./min (2 pole)

These speeds are selected using the polarity change switch situated on the control panel.

Machine with 4/8 pole motor (optional)

The machine can be provided with the optional 4/8 pole spindle motor, which supplies the following cutting speeds:

- 1st speed = 18 m/min. = 5.61 ft./min (8 pole)
- 2nd speed = 36 m/min. = 11.21 ft./min (4 pole)

Machine with Inverter (optional)

The inverter is an electronic instrument fitted to the **DM10P** for varying spindle motor rpm. The inverter makes life easier for the operator carrying out special cutting tasks by enabling a changing of rotation speed to suit the kind of material being cut. Blade use can thus be optimised, inasmuch as a blade not especially suitable for cutting a certain material can be adjusted all the same to the task, and premature wear is avoided.

The instruments features are shown below.

- 1st speed from 20 to 45 m/min (from 6.23 to 14.02 ft./min)
- 2nd speed from 35 to 90 m/min (from 10.9 to 28.04 ft./min)

Inverter technical specifications	
Protection rating	IP 31
Vibration and shock resistance (EN50178)	0.6 gn from 10 to 50 Hz 2 gn from 50 to 150 Hz
Max. relative humidity	93% without condensation or drop-forming
Acceptable Temperature Range (EN 50178)	For warehouse storing: from -25° C to +65° C For operating purposes: from -10° C to +40° C
Max. altitude	1000mt. with no derating
Supply	- single phase: 200V - 15% to 240V + 10%
	- three phase: 200V - 15% to 230V + 10% 380V - 15% to 460V + 10%
Frequency	50/60 Hz \pm 5%
Output voltage	Maximum voltage equal to the supply voltage
Output frequency range	0,5 przy 320 Hz
Max. transients	150% of electronic speed control rated current for 60 secs.
Frequency resolution	- Display: 0.1 Hz - Analog inputs: 0.1 Hz per 100 Hz max.
Switching frequency	Adjustable from 2.2 to 12 Hz max.
Electronic speed control protection and safety devices Motor protections Motor protections	Galvanic insulation between power and control panel
	Short circuit protection: - of available internal supplies; - between U- V- W output phases between phase and earth for calibres from 5.5 to 15Kw
	Thermal protection against overheating and overcurrents
	Protection integrated in the electronic speed control with I^2t calculation
	Protection integrated in the electronic speed control with I^2t calculation
Motor protections	Protection integrated in the electronic speed control with I^2t calculation

Choice of blade

When using band saws to cut metals, an important factor is the choice of pitch, i.e. the number of teeth per inch (25.4 mm.), which must be suitable for the workpiece material. The following recommendations may be taken as general guidelines:

- thin-walled materials, such as sheet steel, tubes and profiles require a fine pitch frequency. 3 to 6 teeth should be engaged in the breadth of the material at any one time;
- large section cutting requires a coarse pitch to cope with the higher volume of swarf and optimal tooth penetration;
- soft materials (aluminium alloys, soft bronze etc.) also require a coarse tooth pitch.

Saw tooth pitch

The choice of teeth per inch, therefore, depends on various factors:

- the size of the section;
- the hardness of the material;
- workpiece wall breadth.

Very large dimensions require coarse teeth, while small dimensions require finer teeth. Whatever the case, ensure that there are always at least six teeth engaged in the cut, with reference to the thinnest vertical walls positioned transversally to the blade.

Concerning the type of Shark machine, a first broad distinction can be made according to the hardness of materials:

	Mild steels < 61 HRB < 55 Kg/mm ²	Hard steels > 65 HRB > 65 kg/mm ²
	NR. TEETH/INCH	NR. TEETH/INCH
MINIMUM	3 / 4	5 / 8
OPTIMUM	4 / 6	6 / 10
MAXIMUM	8 / 12	10 / 14

Cutting speed and downstroke speed

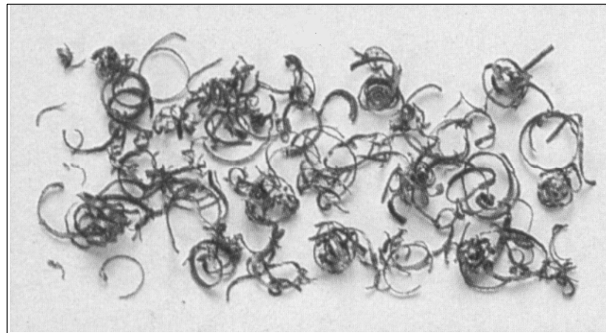
The cutting speed (m/min) and the downstroke speed (cm²/min) are limited by the heat generated around the points of the teeth. If the downstroke speed is too high, the cut will not be straight, either vertically or horizontally.

The cutting speed depends, as indicated above, on the tensile strength of the material (kg/mm²), its hardness (HRB) and the thickness of largest sections. The downstroke speed depends on the material thickness. Therefore, large- section, solid or thick- walled materials ($s > 5$ mm), can be cut at high speeds, providing there is sufficient swarf removal from the blade; thin- walled materials, such as slim piping or profiles, must be cut using low and especially constant downstroke speeds.

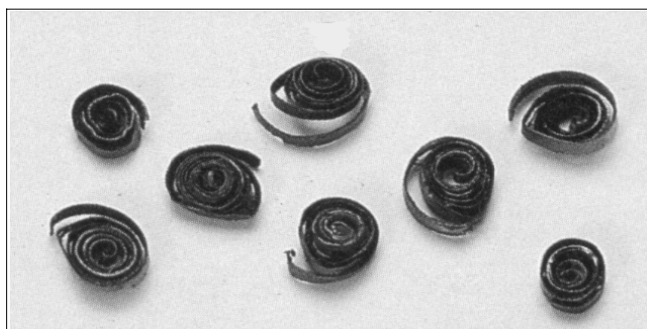
A new blade must be worn in, which in effect means lowering the downstroke speed to about half that of normal (from 60 to 70 cm²/min on normal steels), equal to a removed surface area of about 300 - 600 cm².

Types of swarf:

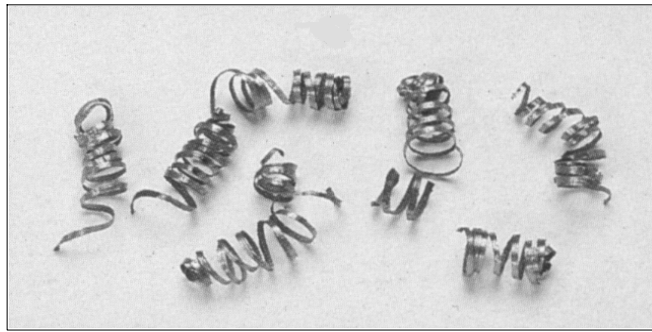
- Very fine or fragmented swarf indicates that the downstroke speed and/or cutting pressure is too low.



- Thick and/or blue swarf indicates that the blade is overloaded.

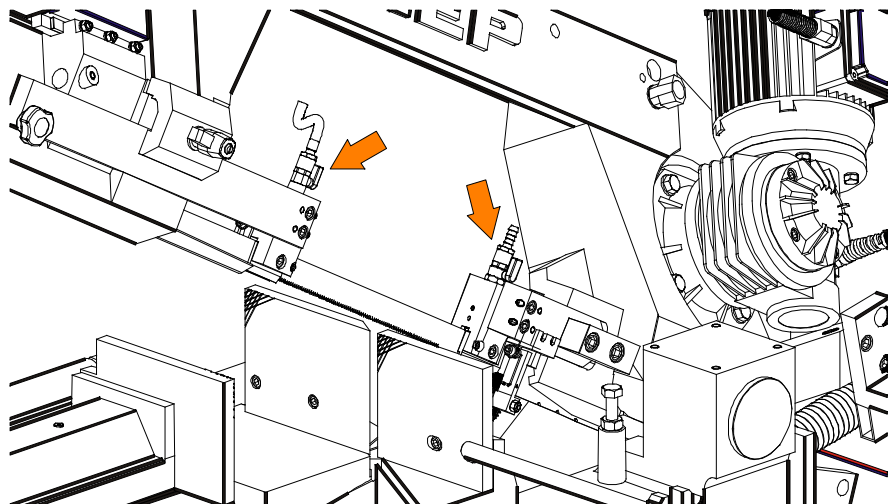


- Long coils of swarf indicate ideal cutting conditions.



Lubricant/coolant fluid

The lubricant/coolant fluid must ensure so that neither the saw teeth nor the work piece material in the cutting zone overheat. Furthermore, there must be a sufficient quantity and pressure of lubricant/coolant to remove swarf from the cutting zone. The lubricant/coolant fluid must be of the highest quality in order to prevent tooth abrasion and welding of swarf to the teeth themselves (seizing).

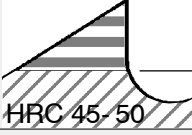
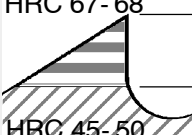


Blade structure

The most commonly used blades are the bimetal types, i.e. manufactured with a silicon steel body and having a high fatigue strength, and super high- speed steel teeth; the two parts are welded by electronic or laser- welding.

Standardised teeth types are termed M2 and M42; the difference being that M42 teeth are harder due to the addition of cobalt to the steel used to make the teeth.

Key									
Mo	Molybdenum	Ni	Nickel	Si	Silicon	V	Vanadium	W	Tungsten
Al	Aluminium	C	Carbon	Co	Cobalt	Cr	Chromium	Mn	Manganese

TYPE OF BLADE	C	Mn	Si	Cr	W	Mo	V	Ni	Co	Al	HRC
	0,47	0,75	0,22	1,00		1,00	0,12	0,52		0,08	45- 50
HSS M2 HRC 65- 66  HRC 45- 50	0,85	0,25	0,30	4,15	6,37	5,00	1,92				64- 66
HSS M42 HRC 67- 68  HRC 45- 50	1,07	0,25	0,20	3,75	1,50	9,50	1,15		8,00		67- 69

N.B. The numbers in the columns indicate the % content of the element in the steel.

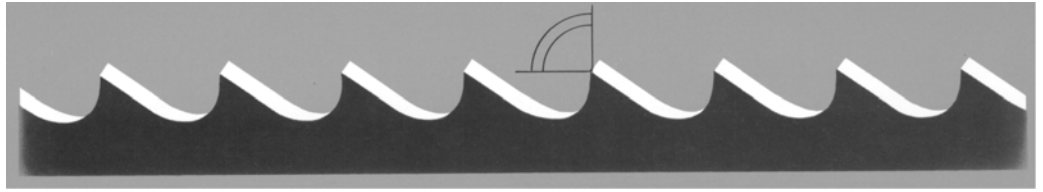
Blade types

The blades mounted on the **DM10P** are 2.950 x 27 x 0,9 mm. (116.14x1.06x0.03 in); the length can vary between 2.990 mm. (116.53 in) and 2.920 mm. (114.96 in), thanks to the blade tensioner device. The blades, however, apart from size and tooth pitch, are differentiated by other geometrical characteristics which determine their specialised uses:

- tooth cutting angle (rake), can be 0° or positive;
- the tooth pitch can be constant or variable;
- the set, i.e. the various teeth alignments, have many possible configurations.

Conventional rake

Cutting angle 0° , constant pitch.

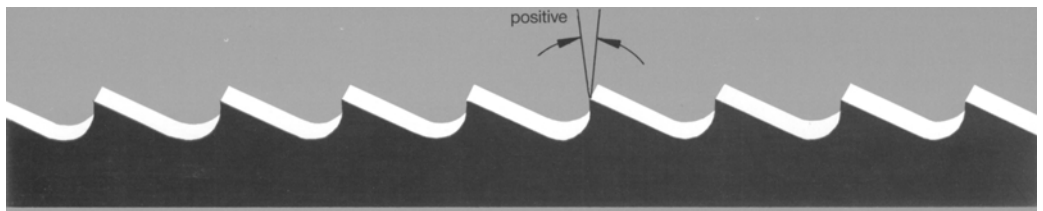


In general use, for small or medium section cast iron or steels and rolled materials, for straight or angled cuts.



Positive rake

Positive cutting angle $9-10^\circ$, constant pitch.

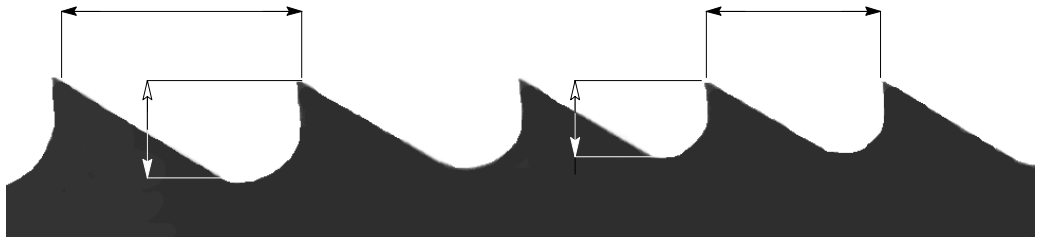


Can be used for cutting all types of materials, and is particularly suited to low- carbon and non- ferrous steels. Used for cutting very large sections and diameters.



Variable pitch

These blades have groups of teeth having different pitches and, as a consequence, have various tooth dimensions and differing relief angles. These are also available in M2 and M42 types with zero and positive rakes. The alternation of the different types of teeth helps to prevent vibration and noise. Elimination of vibration increases the useful life of the tool and improves the cut surface finish.

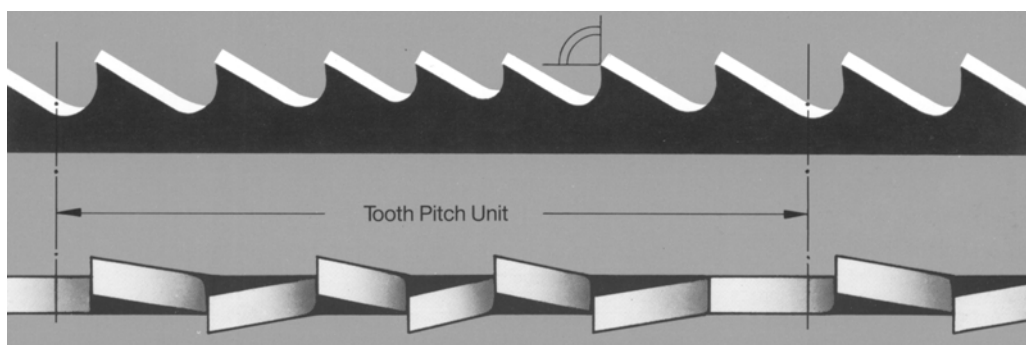


A further advantage in using these types of blades lies in the fact that a wide range of different material types and dimensions can be cut with the same blade.



Variable pitch blades with 0° cutting angle

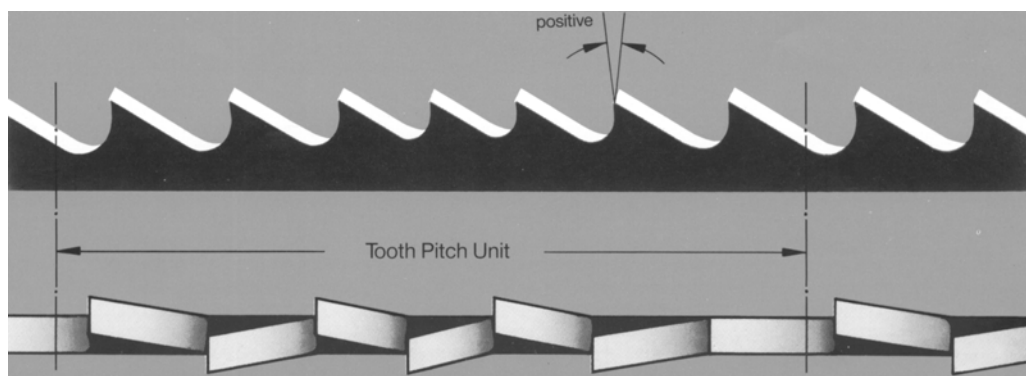
This type of tooth formation is ideal for cutting single pipes or medium size bundles, in accordance with the capacity of the machine.



Pitches available: 3- 4 / 4- 6 / 5- 7 / 5- 8 / 6- 10 / 8- 12 / 10- 14.

Variable pitch with positive rake (from 9 to 10 degrees)

This toothing type is the most suitable for cutting large dimension pipes and profiles, including large sections, as well as for cutting solid sections up to the machine capacity limit.



Pitches available: 3- 4 / 4- 6.

Set:

The term set refers to the section of material removed by the blade during the cutting operation, i.e. relating to width of cut and the offset position of the teeth with respect to the blade back.

Standard or played set

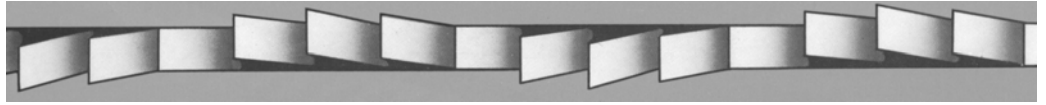
This term is used to describe an alternated angling of the teeth: one to the right, one to the left and one straight.



For general use on materials over 5 mm. thick. Suitable for cutting steels, castings and non-ferrous hard materials.

Undulated set

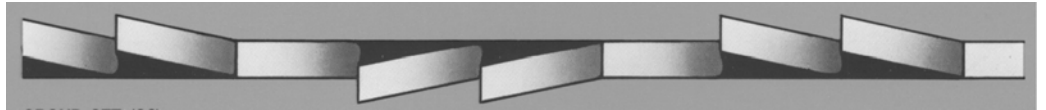
Used to describe groups of teeth undulating alternatively to the right and left.



This type of set is used with very fine teeth for cutting thin pipe walls and small- section profiles (from 1 to 3 mm).

Alternating grouped sets

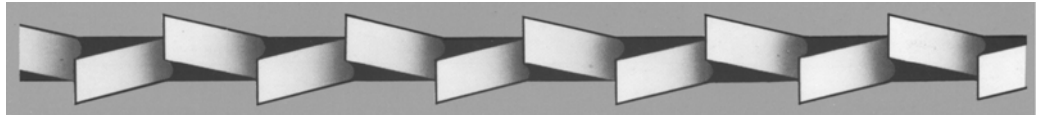
These are groups of teeth angled to the right, one straight tooth, then a further group angled to the left.



This set is used for very fine teeth for cutting very thin sections (less than 1 mm).

Alternating set

This set is one tooth to the right followed by one to the left.



This set is used for soft non-ferrous materials, plastics and wood.

Blade selection table relating to cutting speed and downstroke speed

		Dimensions of the cutting section S (mm)									
		S10	10S30	30S50	50S80	80S120	120S230	Lubrication	sq. mt./min. cut		
Cutting material	Cutting speed mt./min										
	50 / 70	14 10 / 14	10 10 / 14	8 6 / 10	6 5 / 8	4 4 / 6	3 3 / 4	Emulsible oil	60 - 70		
	40 / 50	14 10 / 14	10 10 / 14	8 6 / 10	6 5 / 8	4 4 / 6	3 3 / 4	Emulsible oil	50 - 60		
	30 / 40	14 10 / 14	10 10 / 14	8 6 / 10	6 5 / 8	4 4 / 6	3 3 / 4	Emulsible oil	15 - 20		
Stainless steel	30 / 40	14 10 / 14	10 10 / 14	8 6 / 10	6 5 / 8	4 4 / 6	3 3 / 4	Emulsible oil	15 - 20		
Nodular cast iron	30 / 40	14 10 / 14	10 10 / 14	8 6 / 10	6 5 / 8	4 4 / 6	3 3 / 4	Emulsible oil	75 - 90		
Copper	90 / 150	14 10 / 14	10 10 / 14	6 5 / 8	4 4 / 6	3 3 / 4	3 3 / 4	Emulsible oil	80 - 90		
Soft bronze	90 / 300	14 10 / 14	10 10 / 14	6 5 / 8	4 4 / 6	3 3 / 4	3 3 / 4	Emulsible oil	25 - 40		
Brass	90 / 300	14 10 / 14	10 10 / 14	6 5 / 8	4 4 / 6	3 3 / 4	3 3 / 4	Emulsible oil	70 - 80		
Hard bronze	20 / 40	14 10 / 14	10 10 / 14	6 5 / 8	4 4 / 6	3 3 / 4	3 3 / 4	Emulsible oil	80 - 90		
Aluminium	80 / 800	14 10 / 14	6 10 / 14	4 4 / 6	3 3 / 4	3 3 / 4	3 3 / 4	Emulsible oil			
Plastics	90 / 400	14 10 / 14	6 10 / 14	4 4 / 6	4 4 / 6	3 3 / 4	3 3 / 4	Emulsible oil			
		Blade pitch						Number of teeth per inch			

Classification of steels

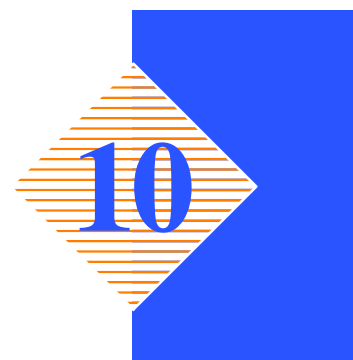
This page provides a table giving the user specific information on the cutting materials, in order that they can be classified on the basis of their hardness, and thus the correct tool can be selected for the task in hand.

Types of steel				Hardness		
UNI	DIN	BS	AISI	Brinell HB	HRB	kg/mm2
C 22 - C 35	CK 22 - CK 3	En 2 C - En 6	1022 - 1035	160 - 170	34 - 87	55 - 59
C 45	CK 45	En 8	1040	160 - 180	84 - 89	55 - 61
C 10 - C 15	CK 10 - CK 15	En 32 A - En 328	1010 - 1015	150 - 175	81 - 87	51 - 59
C 60	CK 60	En 9	1060	160 - 180	84 - 89	55 - 61
		4360 - 50 A		160 - 180	84 - 89	55 - 61
	17100	3706 - 1.2.3.	ASTMA - 36/68	160 - 180	84 - 89	55 - 61
45 Cr Si 9	17115	4360		160 - 180	84 - 89	55 - 61
		En 20 A		190 - 215	91 - 97	64 - 73
34 Cr Mo 5	17221	970 - 1955	1065	180 - 205	89 - 94	61 - 69
		En 18 B	5135 - 5145	180 - 200	89 - 93	61 - 67
35 Cr Mo 4	34 Cr Mo	En 19 B	4135	200 - 230	93 - 99	67 - 77
	36 Ni Cr 6	En 111	3135	190 - 230	91 - 99	64 - 77
		En 36	3310 - 3315	200 - 230	93 - 99	67 - 77
20 Nc Cr Mo 2		En 362	4315	200 - 225	93 - 98	67 - 75
		En 100 D	8645	190 - 220	91 - 97	64 - 74
	1880 X C 95	DX	W 1	150 - 190	80 - 91	51 - 64
100 Cr 6	100 Cr 6	En 31	52100	210 - 230	96 - 99	71 - 77
		B 2	L 6	190 - 230	91 - 99	64 - 77
52 Nc Cr Mo KU	56 Ni Cr Mo V 7			217 - 248	97 - 102	73 - 83
	2750 (280W18)	18 % W	T 1	217 - 248	97 - 102	73 - 83
		1507 - 825	1310	160 - 220	84 - 91	55 - 64
		A 2	M 13	200 - 230	93 - 99	67 - 77
	210 Cr 46	A 1	D 3	215 - 240	97 - 101	73 - 81
	4845	En 58 G	309 S	150 - 200	80 - 93	51 - 67
X 12 Cr 13	4001	En 56 A	410	150 - 200	80 - 93	51 - 67
X 6 Cr Ni 1810	4301	En 58 E	304	130 - 170	74 - 86	45 - 58
X Cr Ni 1910						
X 8 Cr Ni Mo 1713	4401	1501 - 845	316	160 - 200	84 - 93	55 - 67
Phosphor bronze				60 - 100	56,5	36
Aluminium bronze				70 - 90	49	32
Manganese bronze				95 - 120	51 - 69	34 - 42
Silicon bronze				70 - 100	56,5	36

Classification of steels

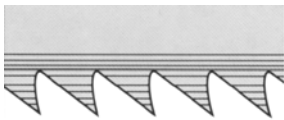
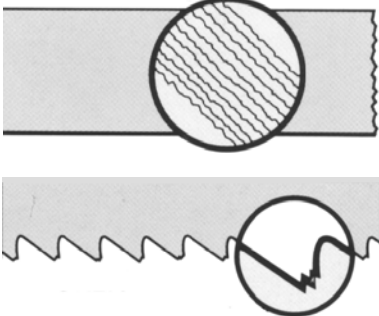
Material	SS Sweden	AISI U.S.A.	DIN Germany	BS Great Britain	UNI Italy	AFNOR France
Carbon steels	1311 1572	1015 - 1035	C 22 - C 35 20 Mn 5 - 28 Mn 6 CK 22 - CK 50	050 A 20 080 M 46 - 50 120 M 19 150 M 28	C 15 - C 35 C 22 Mn C 28 Mn	XC 18 XC 38 H 1 20 M 5
	1650 1880	1040 - 1064 1770 - 1880	CK 60 - CK 101 36 Mn 5 Cm 45 - Cm 55	060 A 40 - 060 A 96 070 M 55 080 A 40 - 080 A 62	C 45 - C 60	XC 60 - XC 75 40 M 5 XC 42 H 1 XC 55 H 1
Alloy steels	2120 2255	1335 - 1345 4130 - 4140	25 Cr Mo 4 - 42 Cr Mo 4	1717 CDS 110 708 A 37 708 M 40	25 Cr Mo 4 - 42 Cr Mo 4	25 CD 4 42 CD 4
	2541 2230 2258	4337 - 4340 50100 - 52100 6145 - 6152 8630 - 8645	40 Ni Cr Mo 6 40 Ni Cr Mo 73 34 Cr Ni Mo 6, 100 Cr 6	735 A 50, 534 A 99 817 M 40 311 tipo 6 e 7	40 Ni Cr Mo 2 - 40 Ni Cr Mo 7 30 Ni Cr Mo 8 - 35 Ni Cr Mo 6 KB 50 Cr V 4, 100 Cr 6	35 NCD 6 50 CV 4 100 C 6
Tool steels	2310 - 12 2754 - 55	D - 2, D - 3	X 210 Cr 12 X 155 Cr V Mo 121	BD 2, BD 3	X 205 Cr 12 KU X 155 Cr V Mo 121 KU	Z 160 CVD 12 Z 200 C 12
	2550 2710	S - 1	60 W Cr V 7 55 Ni Cr Mo V 6	BS 1	55 W Cr V 8 Ku 55 Ni Cr Mo V 6	55 NCVD 7
Stainless steel	2324 2333	201, 202 302, 304	X 2 Cr Ni 189 X 5 Cr Ni 189 G - X 2 Cr Ni 189	304 S 15 304 C 12 304 S 12	X 2 Cr Ni 18.11 X 5 Cr Ni 18.10 G - X 2 Cr Ni 19.10	Z 2 CN 18.10 Z 6 CN 18.09 Z 3 CN 19.10
	2343 2353	314, 316 317	X 15 Cr Ni Si 2520 X 5 Cr Ni Mo 1812 X 5 Cr Ni Mo 1713	316 S 16 317 S 16	X 16 Cr Ni Si 2520 X 5 Cr Ni Mo 1713 X 5 Cr Ni Mo 1815	Z 12 CNS 25.20 Z 6 CND 17.12


Troubleshooting

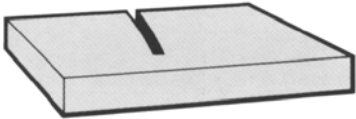
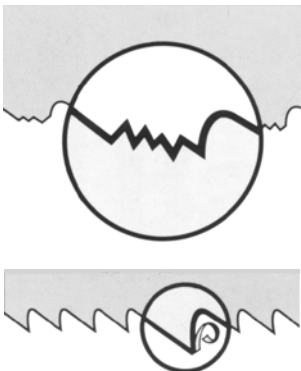


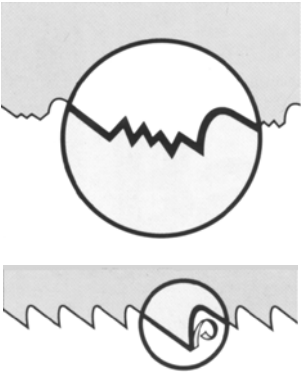
This chapter describes the inspection and troubleshooting procedures for the **DM10P**. Regular inspections and efficient maintenance are essential to ensure your machine gives you a long, trouble- free service life. The chapter is divided into two sections: the first being dedicated specifically to **TROUBLESHOOTING BLADE AND CUTTING PROBLEMS**, while the second **TROUBLESHOOTING** section concerns troubleshooting general machine operating faults. Taken together they form a comprehensive troubleshooting guide which will enable you to follow a methodical procedure for solving any problem.

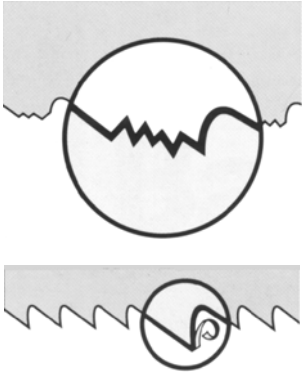
Troubleshooting blade and cutting problems

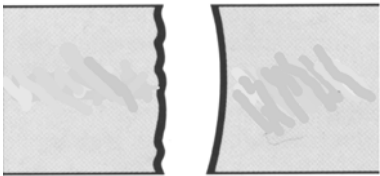
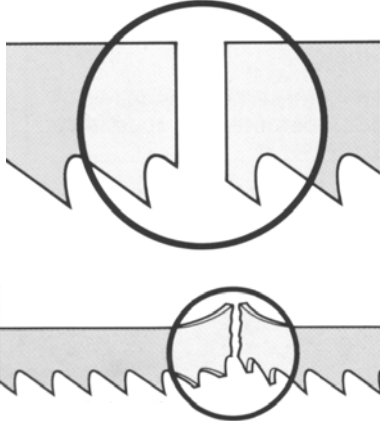

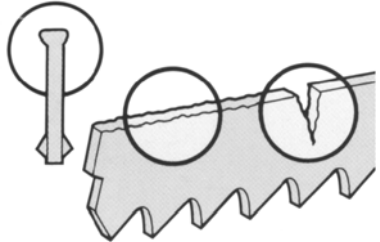
PROBLEM	PROBABLE CAUSE	SOLUTION
Blade scored or scratched 	♦ Widia inserts chipped or worn	✍ Replace
	♦ Widia inserts loose or tight	✍ Adjust
	♦ Widia inserts dirty	✍ Clean and re- adjust correctly
Cutting surfaces scored 	♦ Blade teeth worn	✍ Replace blade
	♦ Head downstroke speed too fast	✍ Reduce downstroke speed
	♦ Cutting speed too slow	✍ Increase cutting speed
	♦ Blade teeth too wide	✍ Change for wider teeth
	♦ Free blade guide head too far away	✍ Move blade guide head closer so as to leave only that part of the blade free which is needed to effect the cut
	♦ Blade tension low	✍ Reset tension to rated tension
	♦ Broken teeth on blade	✍ Check and replace blade

PROBLEM	PROBABLE CAUSE	SOLUTION
Rapid tooth wear 	<p>▶ Teeth pointing in the wrong direction</p>	<p>☞ Set teeth in correct direction</p>
	<p>▶ Blade worn in wrongly</p>	<p>☞ With a new blade cutting should be done at half- speed and with downstroke speed also at half normal speed. After the blade has been worn in (about 300 cm² of work for hard cutting materials and about 1000 cm² for soft cutting materials) the cutting and downstroke speeds can be brought up to rated levels</p>
	<p>▶ Material too hard</p>	<p>☞ Check cutting speed, downstroke speed and blade pressure, as well as type of band saw being used</p>
	<p>▶ Material defective</p>	<p>☞ Surface defects: oxides, sand, surface hardening. Hardened inclusions in section. Reduce cutting and downstroke speeds or clean surface.</p>
	<p>▶ Cutting speed too high</p>	<p>☞ The teeth slide on the material without cutting: reduce cutting speed</p>
	<p>▶ Head downstroke speed too slow</p>	<p>☞ The band saw runs over the material without removing it: increase downstroke speed</p>
	<p>▶ Insufficient coolant</p>	<p>☞ Check coolant level and clean pipes and jets</p>
	<p>▶ Incorrect fluid concentration</p>	<p>☞ Check and use the correct concentration</p>
	<p>▶ New blade inserted into a partially- made cut</p>	<p>☞ The cutting surface might have been subject to a localised heat- induced alteration, making it harder: recommence cut using a slower cutting and downstroke speed. There may be a broken tooth from the old blade lodged in the cut: check and remove before recommencing work</p>
	<p>▶ Flutter</p>	<p>☞ Blade tension too low: tighten. Tooth shape or pitch unacceptable: change type of blade used. Widia blade steady buttons too far from the blade back: adjust guide heads, rotating them slightly to bring them closer to the blade back.</p>

PROBLEM	PROBABLE CAUSE	SOLUTION
Cuts not orthogonal or inclined 	♦ Head downstroke speed too fast	☞ Reduce head downstroke speed
	♦ Widia inserts worn	☞ Replace
	♦ Inserts loose	☞ Adjust width
	♦ Blade guide head positioned wrongly	☞ Move mobile head up to the workpiece using the guide plate to leave free only that part of the blade actually needed to make the cut
	♦ Orthogonality of blade to workpiece rest shoulder	☞ Check and realign the blade guide heads, then reset the blade orthogonality with the shoulder using the adjustment pin at 0°; then set the stops at 45° right and left by means of the appropriate screws
	♦ Perpendicularity of the blade to the work surface	☞ Check and realign the blade guide heads then adjust the blade using the appropriate screws so that it is perpendicular to the work surface
	♦ Blade tension incorrect	☞ Bring pressure up to 60 Bar
	♦ Blade worn	☞ Replace blade
	♦ Tooth pitch unsuitable	☞ Probably a blade with too many teeth per inch is being used; change for a coarser blade
	♦ Cutting speed too slow	☞ Increase the cutting speed
Broken teeth 	♦ Cutting speed too high	☞ Reduce cutting speed
	♦ Downstroke speed too high	☞ Reduce downstroke speed

PROBLEM	PROBABLE CAUSE	SOLUTION
Broken teeth 	<p>▶ Cutting pressure too high</p>	<p>☞ Check and set to correct pressure</p>
	<p>▶ Tooth pitch unsuitable</p>	<p>☞ Teeth too close together: change blade for one with a coarser tooth pitch</p>
	<p>▶ Swarf welded to teeth and gullets</p>	<p>☞ Check blade- cleaning coolant jets. Check the blade- cleaning brush. If the swarf is not removed from the blade it will be drawn back into the cut and weld to the teeth, causing tooth breakage</p>
	<p>▶ Swarf welded to teeth and gullets</p>	<p>☞ Check blade- cleaning fluid jets. Check blade- cleaning brush. If the swarf is not removed from the blade it will be drawn back into the cut and weld to the teeth, causing the teeth to break.</p>
	<p>▶ Material defects</p>	<p>☞ The material may have altered surface areas, such as oxides or sand, or subcooled inclusions in the section. These areas are much harder than the blade and will cause the teeth to break: scrap or clean these materials.</p>
	<p>▶ Workpiece not clamped</p>	<p>☞ The blade may break if the workpiece moves during cutting: check the vice, jaws and clamping pressure</p>
	<p>▶ The blade stops in the cut</p>	<p>☞ Cutting pressure too high: check and restore to rated pressure. Downstroke speed too fast: reduce speed. Cutting speed too slow: increase. The blade slips on the flywheels: either the wheels are worn and need to be replaced or the blade tension is incorrect (too low) and must be re- adjusted.</p>
	<p>▶ New blade inserted in a partially made cut</p>	<p>☞ The cutting surface may have been subjected to a localised heat- induced alteration, making it harder: recommence cut using a slower cutting and downstroke speed. A tooth from the old blade may be left in the cut: check and remove before restarting work.</p>

PROBLEM	PROBABLE CAUSE	SOLUTION
Broken teeth 	<p>◆ Widia inserts positioned incorrectly</p>	<p>☞ Adjust the position of the inserts, especially the width, since blade thicknesses can exceed the manufacturer's declared tolerance ratings</p>
	<p>◆ Widia blade steady buttons</p>	<p>☞ Two widia blade steady buttons are located in the top of the blade guide heads which press on the back of the blade to transmit cutting pressure. If these buttons are too far from the blade, the blade may be prone to an up and down undulating action or abnormal vibrations, liable to cause the teeth to break: adjust the position of the heads by rotating them downwards so as to bring the blade steady buttons up against the back of the blade</p>
	<p>◆ Sections with large thickness variations</p>	<p>☞ The cutting speed and downstroke speed must be chosen to suit the most critical part of the cut</p>
	<p>◆ Teeth angled in the wrong direction</p>	<p>☞ Fit blade so that teeth point in the right direction</p>
	<p>◆ Blade run in wrongly</p>	<p>☞ When using a new blade, the cutting and downstroke speeds must be reduced to half the normal operating speed. After the blade has been worn in (about 300 cm² for hard materials and about 1000 cm² for soft materials) the cutting and downstroke speeds may be returned to their rated levels</p>
	<p>◆ Insufficient coolant</p>	<p>☞ Check coolant level and clean fluid lines and jets</p>
	<p>◆ Incorrect fluid concentration</p>	<p>☞ Check and use the correct concentration</p>
	<p>◆ Blade tension too high or too low</p>	<p>☞ Check and reset to rated tension</p>

PROBLEM	PROBABLE CAUSE	SOLUTION
Blade path fault 	▶ Front flywheel position incorrect	☞ Check that the band saw is correctly positioned on the flywheel. Adjust the position of the flywheel under the blade, moving the shaft of the flywheel
	▶ Flywheels worn	☞ Replace
	▶ Gaps full of swarf	☞ Clean inside machine using blown air.
	▶ Blade guide head alignment	☞ Check and adjust
Blade broken   	▶ Cutting speed too high	☞ Reduce cutting speed
	▶ Head downstroke too fast	☞ Reduce head downstroke speed
	▶ Cutting pressure too high	☞ Check and set to correct pressure
	▶ Tooth pitch unsuitable	☞ Teeth too close together: change the blade for one with coarser tooth spacings
	▶ Workpiece not clamped properly	☞ The blade may break if the workpiece moves during cutting: check the vice, jaws and clamping pressure.
	▶ Widia inserts positioned incorrectly	☞ Adjust inserts position, especially the width, since blade thickness can exceed the manufacturer's declared tolerance ratings
	▶ Widia blade steady buttons	☞ Can have a milling action on the back of the blade if worn or chipped, causing cracks from the back towards the teeth.
	▶ Position of blade on flywheels incorrect	☞ The blade may be scraping on the edges of the flywheels: this problem is generally caused by blades which are deformed or wrongly welded (conical) Adjust the position of the front flywheel by moving the pin, or change the blade
	▶ Blade tension incorrect	☞ If the blade tension is too high or too low, the blade will be subjected to abnormal stress: set the tension back to the rated value.

PROBLEM	PROBABLE CAUSE	SOLUTION
	◆ Blade weld fault	✎ The point at which a blade is welded is its most critical point; problems could be caused by welds which are not aligned perfectly or have inclusions or blowholes
	◆ Free blade guide head	✎ The head is too far away from the workpiece: move the head closer, leaving free only that part of the blade actually needed to make the cut
	◆ Teeth in contact with the material before starting the cut	✎ Always check the position of the blade before starting a new job, especially for the semi- automatic cycle
	◆ Widia inserts	✎ If worn, the inserts can score the blade, weakening it even to breaking point. If the inserts are too far apart, the blade will whip, striking both the inserts and the material. Replace or adjust
	◆ Insufficient coolant	✎ Check coolant fluid level; clean pipes and jets
	◆ Incorrect fluid concentration	✎ Check and use the correct concentration
	◆ The blade stops in the cut	✎ Cutting pressure too high: check pressure and reset to rated pressure. Head downstroke speed too fast: reduce. Head downstroke speed too slow: increase. The blade slips on the flywheels: incorrect or low blade tension; readjust or increase.

Troubleshooting

This section deals with the problems which may occur during machine operation. The MEP 30 controller allows you to test all the machine's electric and electronic devices by checking the status of the input and output signals on the IUD/IUV card (see Chapter 6).

The board IUD/IUV is inside the electric board.

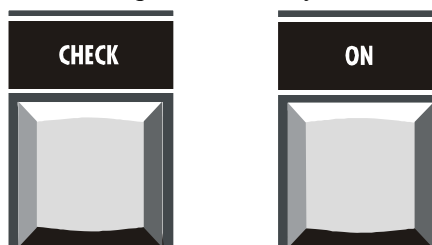
Displaying the diagnostics menu

- Power the machine rotating the main switch on the left side of the control

board;



► press simultaneously and in sequence the keys CHECK and ON;



Once you have opened the diagnostics menu, a set of characters, each corresponding to an OUTPUT signal on the MEP 30 controller, is displayed. For further information about the machine's outputs, refer to the electrical and electronic diagrams illustrated in Chapter 6 of this manual.

Testing the control console keyboard

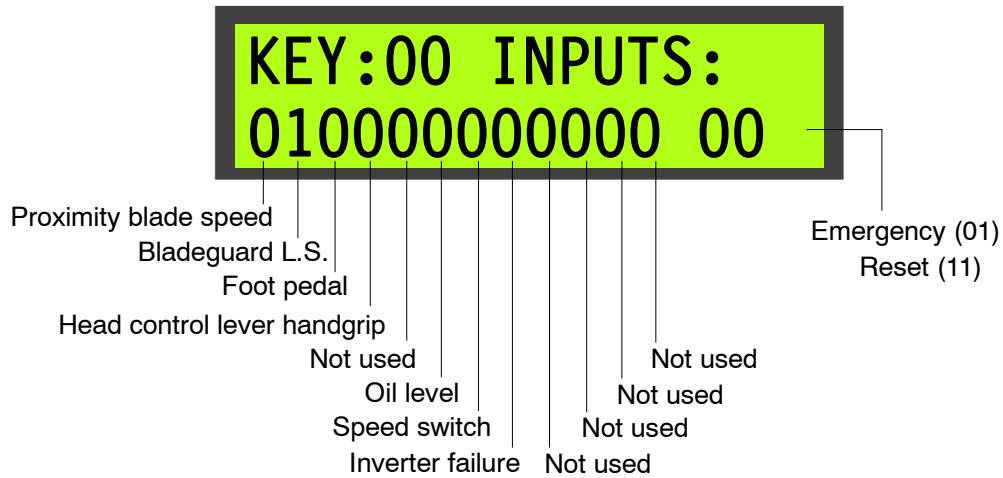
Each console key has an identification number which is displayed on the diagnostics screen after the letter "K", when the key is pressed. For example, when pressing the key for the manual cycle (HAND key), the figure 12 is displayed next to the letter "K":



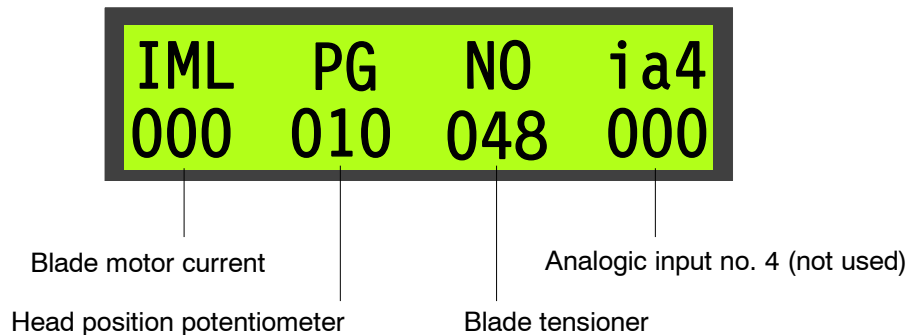
if the figure K does not change pressing the key HAND, the probable malfunctioning is due to the console key that does not deliver power when closed.

List of IUD-IUV card INPUTS

- the digits 0 and 1 shown in the display lower line indicate the status OFF (0) or ON (1) of each single input;

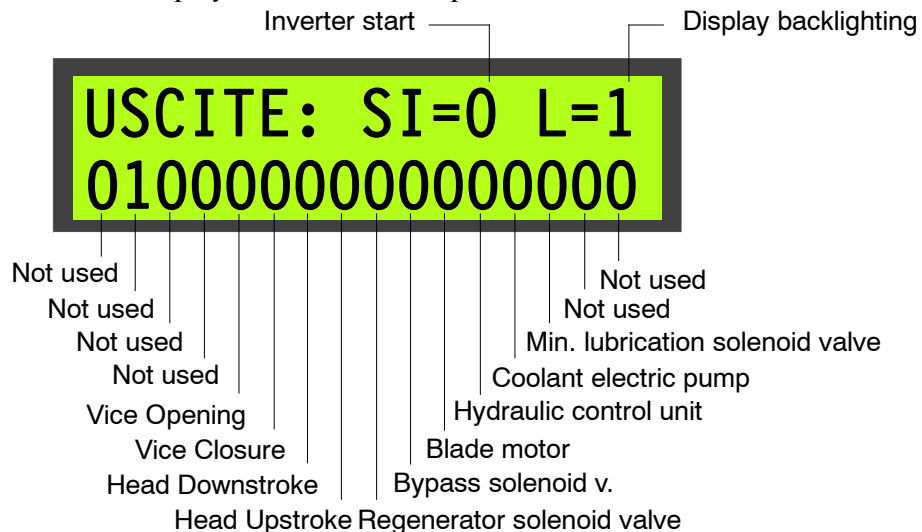
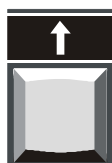


- Starting from the video page of the digital inputs, press the key “arrow up” once to display the list of the analogic inputs of the board IUD/IUV:

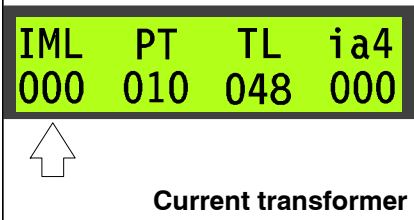
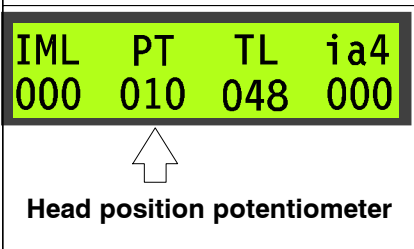
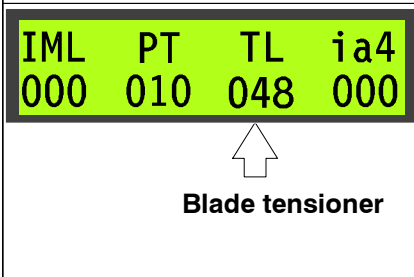
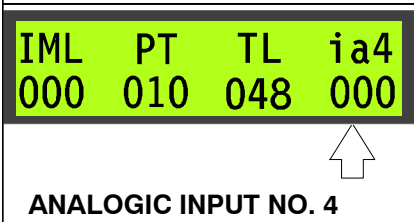


List of IUD-IUV card OUTPUTS

- Starting from the video page of the digital inputs, press the key “arrow up” once to display the list of the outputs of the board IUD/IUV:



- the digits 0 and 1 shown in the display lower line indicate the status OFF (0) or ON (1) of each single output. Pressing the ► or ◀ key it is possible to move the cursor till selecting the output to be checked. Pressing the ▲ key it is activated or deactivated.

 <p>Current transformer</p>	<p>AMMETER TRANSFORMER FOR CHECKING BLADE MOTOR ABSORPTION</p> <p>If the display of blade motor absorption doesn't visualise the current values any longer, it's possible to check if the fault is relative to "AMMETER TRANSFORMER", to visualisation, to wiring, or to input of IUUV board.</p>
 <p>Head position potentiometer</p>	<p>POTENTIOMETER OF HEAD CYLINDER TRANSDUCER (CUTTING HEAD POSITION)</p> <p>If, by moving the head upwards or downwards, the value visualised doesn't change, you can check if the problem is due to the transducer potentiometer, to connections or to problems of the IUUV. Move the head manually and check that the value changes on the display.</p>
 <p>Blade tensioner</p>	<p>STRAIN GAUGE FOR BLADE TENSIONING TRANSDUCER (ELECTRONIC BLADE TENSIONER)</p> <p>In case, by rotating blade tensioning handwheel, blade tensioning value doesn't give any indication, you can check if the problem is due to tensioning device, to visualisation, or to IUUV board. So as to be able to carry out checking, tension and release the blade and verify if the value changes on the display.</p>
 <p>ANALOGIC INPUT NO. 4</p>	<p>ANALOGIC INPUT NO. 4</p> <p>Available for connecting optional instruments.</p>

Machine alarms and emergencies

The machine's MEP 30 controller notifies the operator of any alarm or emergency condition which may occur during production by way of acoustic and visual signals. This section lists the messages shown on the display.

<p>PRESS RESET</p>	<p>This message is displayed during the initialisation phase after pressing the ON key</p>
<p>PRESS RESET</p>	<p>This message is displayed when the cutting start position is lower than the previous position saved for the cutting end position.</p> <p>► Save both the FCTI and FCTA positions again.</p>

HEAD NOT AT FCTI PRESS RESET	<p>This message is displayed if the head is not positioned at the FCTI position when the cycle is STARTED.</p> <p>➤ Return the head to the FCTI position before resuming the cycle</p>
SELECT SPEED PRESS RESET	<p>This message is displayed if the cycle is STARTED without having first selected the cutting speed.</p> <p>➤ Return the head to the FCTI position before resuming the cycle</p>
STOP BUTTON PRESSED PRESS RESET	<p>This message is displayed if an operation is activated before releasing the MUSHROOM HEAD EMERGENCY STOP button.</p> <p>➤ Release the EMERGENCY STOP button and press RESET.</p>
EMERGENCY BLADE GUARD OPEN	<p>This message is displayed if the blade guard is opened, for example, to change the blade.</p> <p>➤ Make sure the blade guard is closed.</p> <p>➤ Check the safety limit switch.</p> <p>➤ Check the connections.</p>
EMERGENCY INVERTER FAILURE	<p>This message is displayed if the machine is equipped with an INVERTER (optional). Press RESET to test the manual commands.</p> <p>➤ Check the inverter contactor.</p> <p>➤ Check the power supply voltage.</p> <p>➤ Check the power phases and supply voltage of the blade motor.</p> <p>➤ Check the connections.</p>
EMERGENCY BLADE STOPPED	<p>Displayed when the blade is jammed while cutting:</p> <p>➤ Press RESET</p>
EMERGENCY AIR PRESSURE	<p>It is displayed when the air pressure from the network fails.</p> <p>➤ Press RESET</p>
EMERGENCY BLADE MOT I OVERC.	<p>It is displayed when there is an overcurrent at the blade motor</p> <p>➤ Press RESET</p>
EMERGENCY BLADE TENSION	<p>This message indicates a mechanical or electric/electronic fault affecting the blade tensioning unit.</p> <p>➤ Check the blade tension.</p> <p>➤ Check the operation of the tensioning slide.</p> <p>➤ Make sure the blade is correctly positioned on the flywheels.</p> <p>➤ Check the STRAIN GAUGE input on the IUV card.</p> <p>➤ Check the condition of the blade.</p> <p>➤ Check the connections.</p>

EMERGENCY ERROR CODE: 01	RESETS OR INTERRUPTS NOT JUSTIFIABLE
EMERGENCY ERROR CODE: 02	EEPROM NOT AVAILABLE
EMERGENCY ERROR CODE: 03	RAM TEST FAILED
EMERGENCY ERROR CODE: 04	ROM TEST FAILED
EMERGENCY ERROR CODE: 05	STATUS OR TEMPLATE NON- EXISTENT
EMERGENCY ERROR CODE: 06	CUTTING CYCLE PHASE NON- EXISTENT
EMERGENCY ERROR CODE: 07	EMERGENCY NOT DEFINED
EMERGENCY ERROR CODE: 07	SERIAL 485 FAILURE
EMERGENCY ERROR CODE: 07	SERIAL 422 FAILURE
EMERGENCY ERROR CODE: 08	UNSTABLE DIGITAL INPUTS
EMERGENCY ERROR CODE: 09	UNSTABLE BLADE (ch0) MOT ABSORB ANAL. INPUT
EMERGENCY ERROR CODE: 10	UNSTABLE HEAD (ch1) POSIT. P. ANAL. INPUT
EMERGENCY ERROR CODE: 15	POWER FAILURE

Accessory Installation



This chapter provides a list of the available accessories that can be fitted to this machine, along with assembly instructions.

Optional

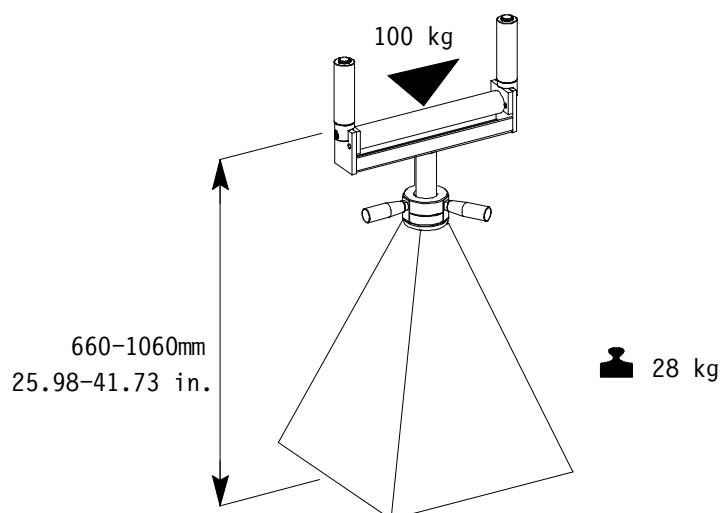
Blade

The blades that can be used on this machine include:

- 2.950 x 27 x 0,9 (116.14x1.06x0.03 in.) bimetal blade for solid and section materials;

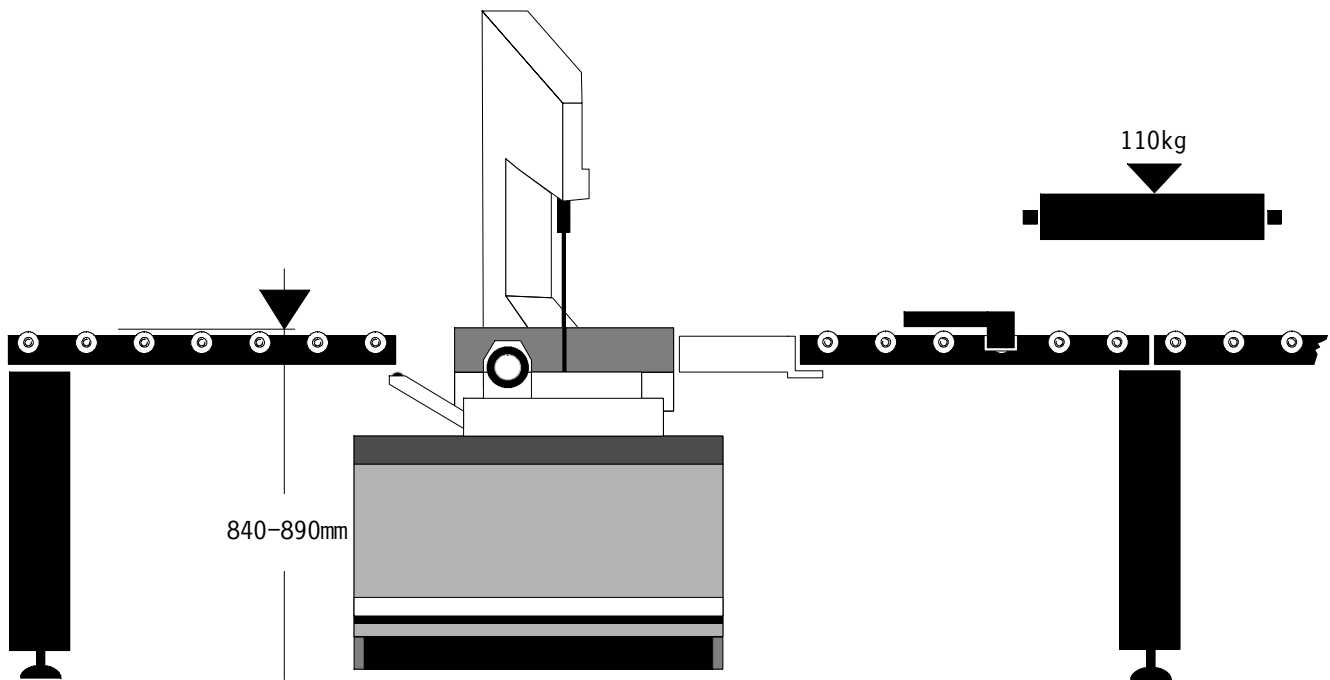
Bar support

This device is used to increase the load- bearing strength of the roller table, both during feeding and discharge. The steps which should be followed to assemble it are illustrated below.



Roller table

- K110 roller table module for feed side, 1500 mm (59.05 in. ÷ 236.22 in.);



- K110 roller table for discharge side, 1500÷6000 mm (59.05 in. ÷ 236.22 in.);
- measuring stroke R1/R2/R3 1500- 6000 mm (59.05 in. ÷ 236.22 in.);
- pair of vertical rollers.

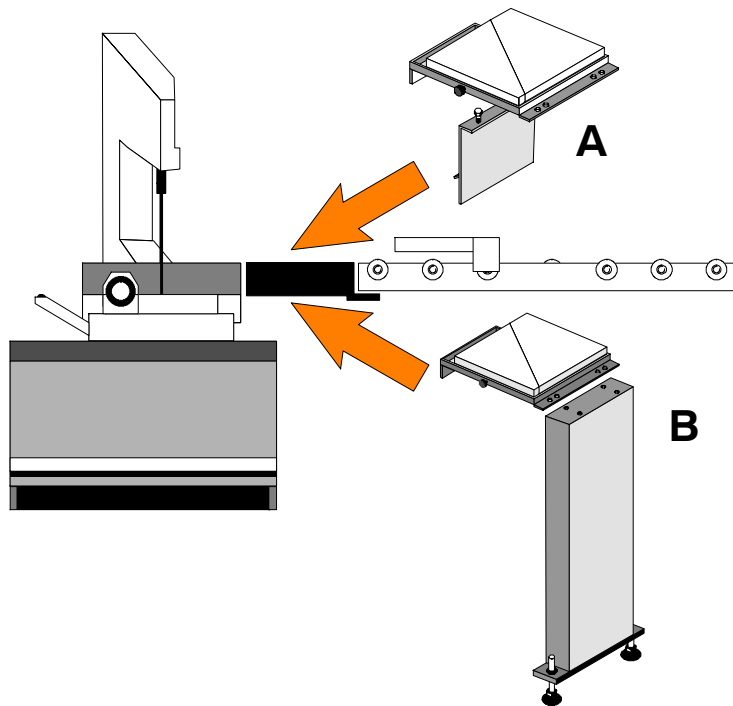
Can of emulsible oil

5 l can of emulsible oil.

Discharge side roller table adaptor

Two adaptors are available for this model of machine that differ in terms of the load capacity. The installation operations are given below:

- ▶ remove the two TE screws from the right side of the slideway;
- ▶ install adaptor “A”, fixing the plate to the fixed platform after having removed the bolts, and fit the support under the plate, resting it on the machine base;
- ▶ install adaptor “B”, fixing the plate to the fixed platform after having removed the bolts, and fit the support to the end of the plate, using two of the four holes in the upper part of the support, leaving the other two free for attaching the roller- way.

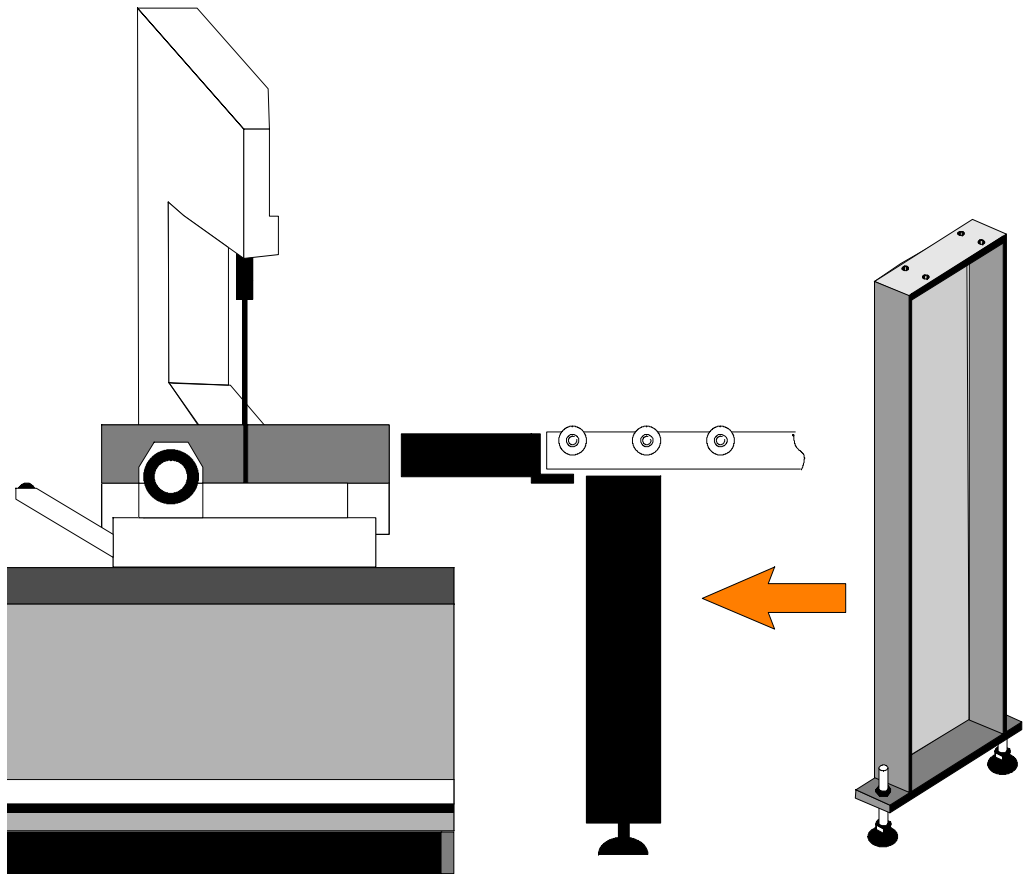


- ▶ Attach the outfeed rolling deck by fixing it with the screws supplied.

Feed side roller table support

This device is used to increase the load-bearing strength of the roller table, both during feeding and discharge. The steps which should be followed to assemble it are illustrated below.

- ▶ disconnect the table from the adapter (on the discharge side, for example);



- ▶ Position the support to correspond with the holes on the base of the trailer and reconnect to the adapter.

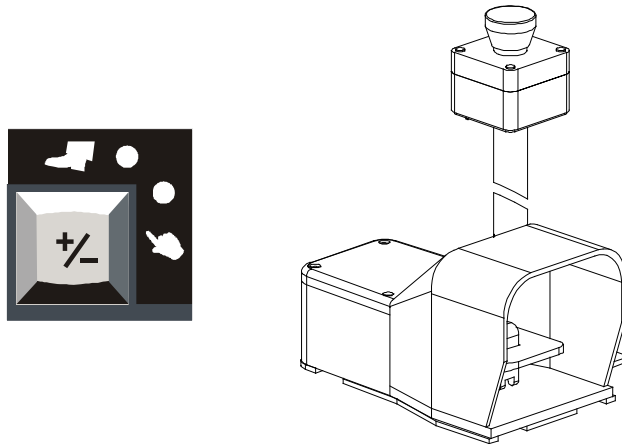
Minimal lubrication system

This device was designed to improve lubrication of the tool during cutting.

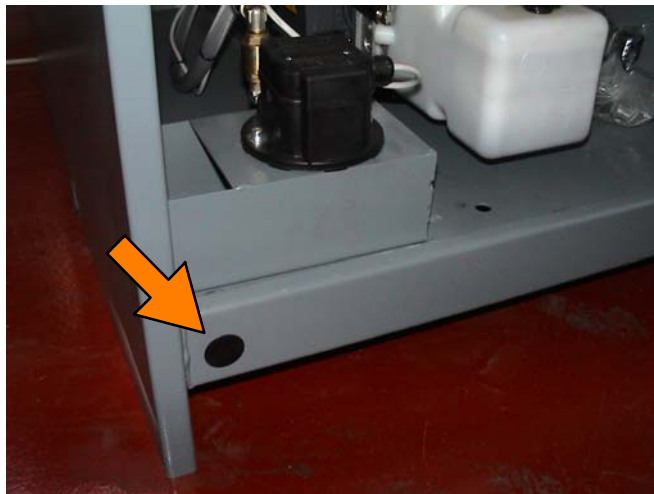
- ▶ An instruction book is supplied with the kit to explain how to install this optional unit.

Additional pedal control with emergency device

It is possible to select the start mode on the machine with foot pedal. The machine can be activated from the control panel (START) or foot pedal.



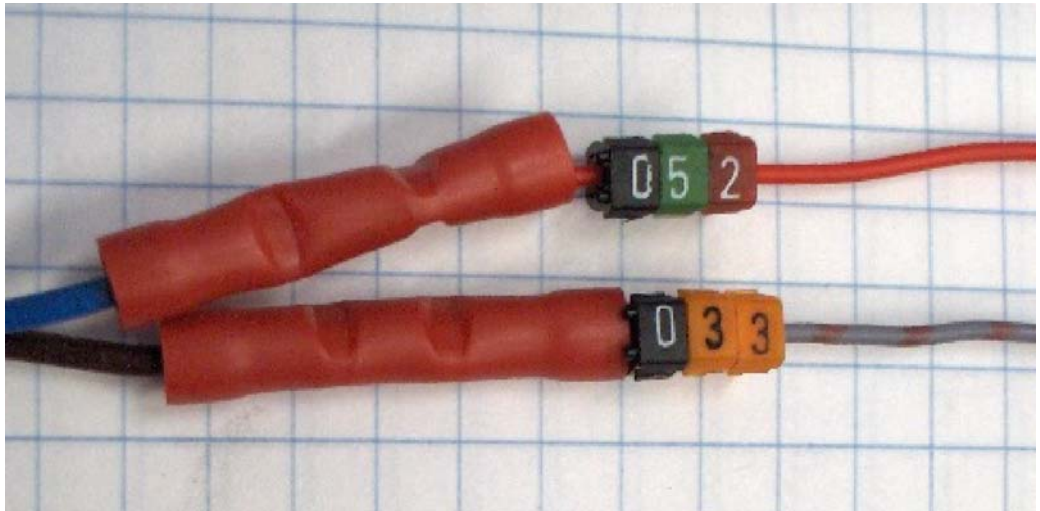
- Pass the cables through the hole that is under the door of the base, as shown in the figure.



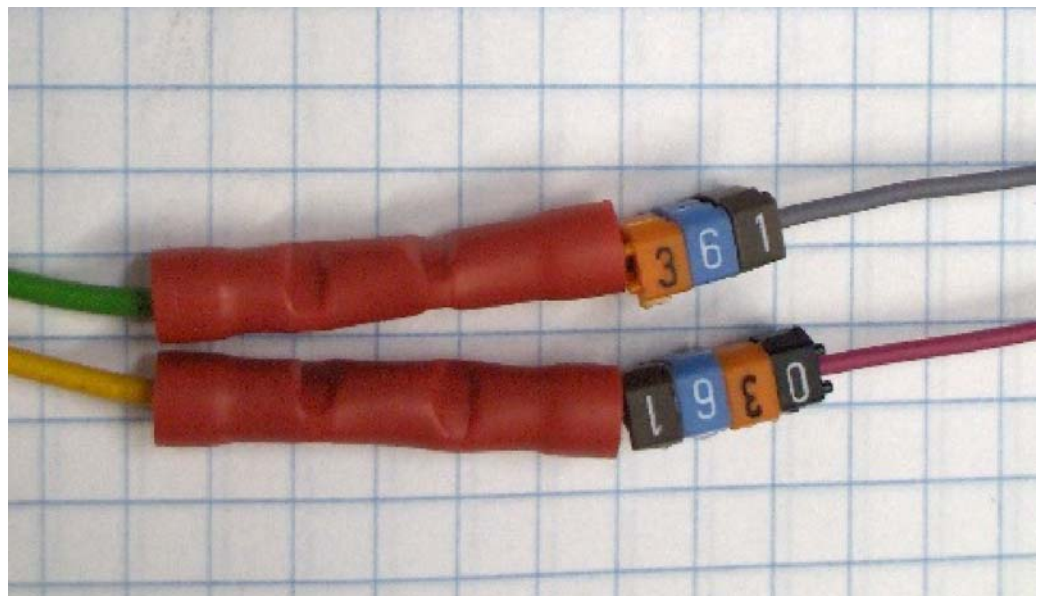
- The cables to be connected to the pedal control are inside the sheath of the control unit cable.



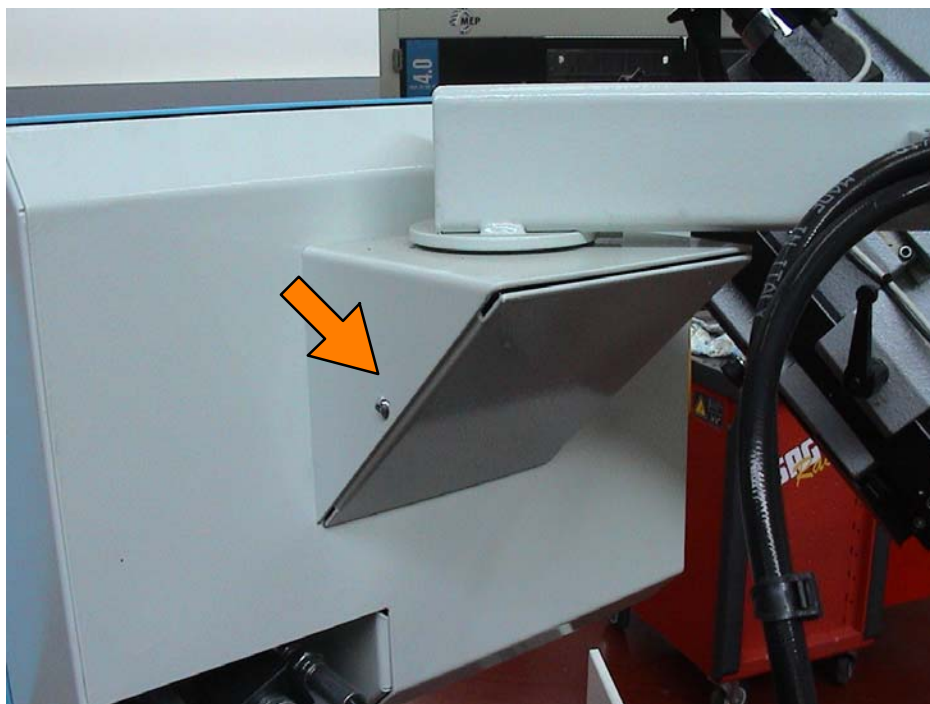
- ▶ Cables to be connected to the control pedal:
 - the pedal cable is 2x0.50 mm .
 - Connect the blue and brown wires of the cable 2x0.50 mm of the pedal control with the cables numbered 052 (red) and 033 (grey/pink) on the sawing machine.



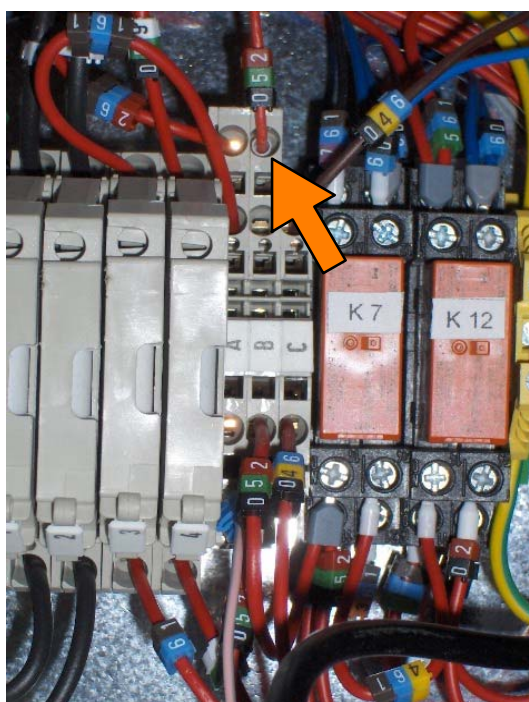
- ▶ Cables to be connected with the pedal emergency contact.
 - The emergency mushroom cable is 4x0.50 mm.
 - Connect the yellow and green wires of the cable 4x0.50 mm of the emergency mushroom with the cables numbered 0361 (purple) and 361 (grey) on the sawing machine.



- ▶ Open the cover, take the wire no. 052 and lead it inside the electric cabinet.



- Connect the wire no. 052 to the terminal B (where other wires with the same number are present already).



Warranty

Hydmech Group warrants each new sawing machine to be free from failure resulting from defective material and workmanship under proper use and service for a period of two years following the date of shipment to the user.

Hydmech's sole obligation under this warranty is limited to the repair or replacement without charge, at Hydmech's factory, warehouse, or approved repair shop, of any part or parts which Hydmech's inspection shall disclose to be defective. Return freight must be prepaid by the user.

This warranty, in its entirety, does not cover maintenance items, including but not limited to lubricating grease and oils, filters, V- belts, saw blades, etc, nor any items herein which show sign of neglect, overloading, abuse, accident, inadequate maintenance or unauthorized altering.

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