

## USE AND MAINTENANCE MANUAL

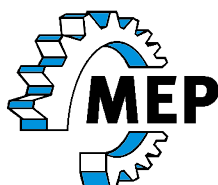
**EN C350-2 S**

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 circular sawing machine:

Machine Type:	SAWING MACHINE
Machine model:	C350-2S
Serial number:	
Year of manufacture:	

is in specification with the following directives:

- DIRECTIVE EEC MACHINES DIRECTIVE 2006/42/CE
- DIRECTIVE EEC "CE LVD"
- DIRECTIVE 2004/10/CE "EMC"
- D. L. 7/2010

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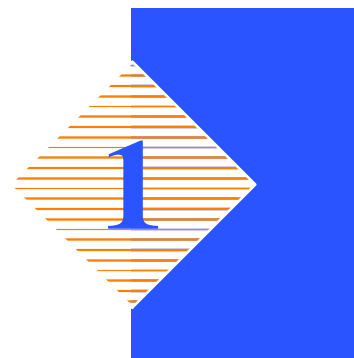
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# Introduction and technical specifications



## Foreword

We have decades of experience in the construction of the best metal- cutting machines. Our experience, our knowledge of our customers and constant technological development of design and production equipment allow us to offer a specific solution for every type of cutting need.

This work tool has been designed as a simple and reliable answer to the wide range of cutting needs of the modern workshop.

**C350- 2S** is a 4-speed vertical shearing machine and can perform mitre cuts of 60° on the left and 45° on the right.

These features, together with its good cutting capabilities, result in a very versatile machine.

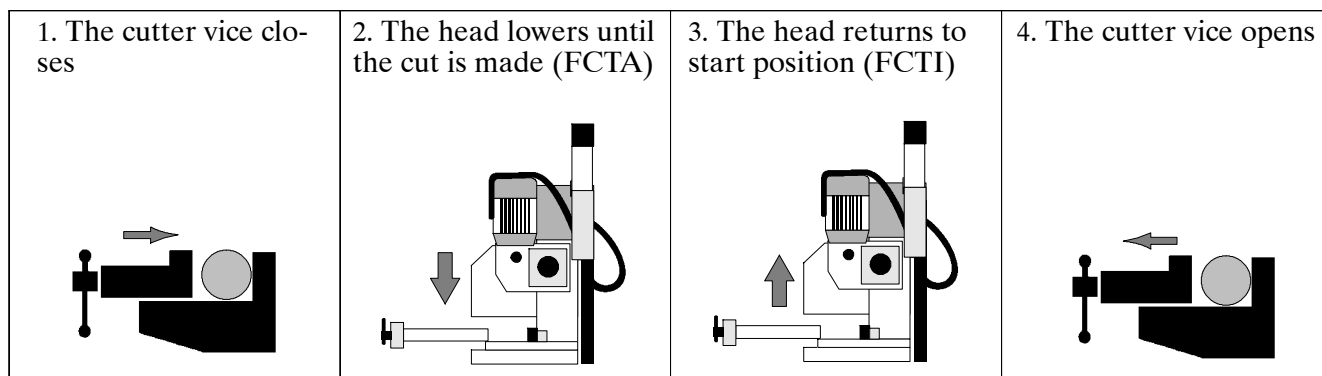
Congratulations for having chosen this product which, by following the instructions contained in this user and maintenance handbook, will guarantee you years of dependable service.

### Warning

This band saw has been exclusively designed to cut metals.




## Machine presentation

The machine can operate 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.



## 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		
Speeds 1/2/3/4 (standard speed)	rpm	15/30/45/90
Speeds optional 1/2/3/4	rpm	30/60/90/180

### Warning

All models can be equipped with the Inverter, an optional device, which offers a range of speeds comprised between **15 ÷ 150 rpm**. 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.

BLADE		
External disc diameter	mm in	350 13.78
Internal hole diameter	mm in	32 1.26
Blade thickness	mm in	2,5 0.10

RATED ELECTRICAL POWER		
Standard three phase head spindle motor	kW hp	2,6/1,8 3.5/2.4
Optional three phase head spindle motor	kW hp	3/2,2 4/2.9
Electric coolant pump motor	kW hp	0,1 0.13
Max installed power	kW hp	3,1 4.15

<b>WORKING PRESSURE</b>		
Max. working pressure for opening/closing vice	Bar	6
Air consumption for a complete cycle	Nl/min	7,35

**N.B.** The "air consumption for vice" value refers to standard conditions (temperature 0° and pressure 1.013 bar, i.e. density  $1.3 \times 10^{-3}$  Kg/l) where 1 Kg/min. = 772 Nl/min.

<b>LUBRICANT/COOLANT FLUID AND OIL</b>		
Lubricant/coolant fluid (oil concentration 5- 6%)	capacità Lt.	20
Oil for transmission box	capacità Lt.	4,8

<b>VICE</b>		
Vice max. opening	mm in	190 7.48

<b>SPINDLE MOTOR (STANDARD)</b>				
No.of poles	Current (Volts)	Absorption (Amps)	Power (Kw) (hp)	rpm
4	230/400	14,5/8	2,6 3.48	1.440
8	230/400	10/5,7	1,8 2.41	715
Stator wound with enamelled copper wire, class H 200° C.				
Class F insulation (limit temperature TL 155° C).				
IP 54 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  $\Delta T$ ).

<b>SPINDLE MOTOR (OPTIONAL)</b>				
No.of poles	Current (Volts)	Absorption (Amps)	Power (Kw)	rpm
2	230/400	15/6,1	3 2.24	2875
4	230/400	9,8/4,6	2,2 2.95	1440
Stator wound with enamelled copper wire, class H 200° C.				
Class F insulation (limit temperature TL 155° C).				
IP 54 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.				




**ELECTROPUMP MOTOR**

Voltage (Volts)	Absorption (Amps)	Power (Kw)	rpm
230	0,53	0,1 0.13	2800
400	0,34	0,1 0.13	2800



Protection rating IP 55.

Conforming to CEI norms, publication: IEC 34 of 01/07/1985.

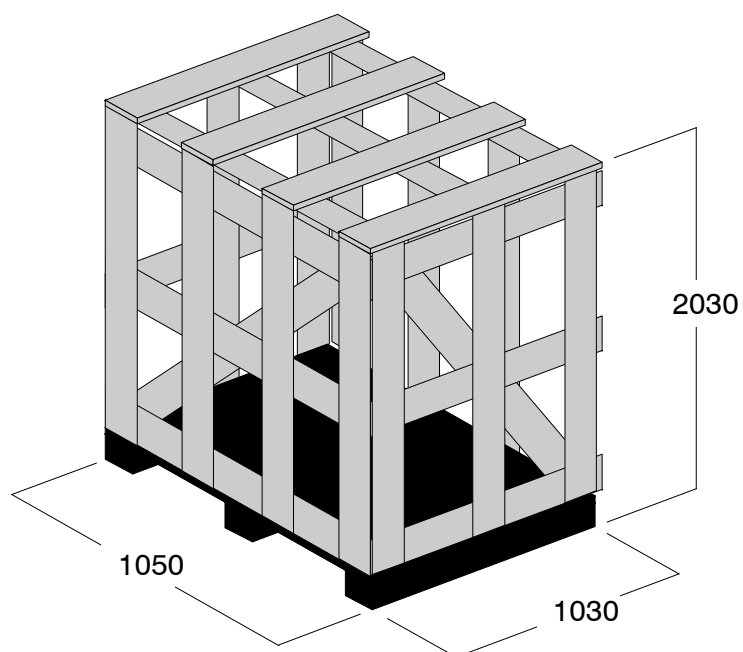
**CUTTING CAPACITY for HOLLOW sections**

Section			
0°	115 4.53	95 3.74	180 x 95 7.08 x 3.74
45° ➡	110 4.33	95 3.74	125 x 95 4.92 x 3.74
45° ⬅	110 4.33	95 3.74	125 x 95 4.92 x 3.74
60° ⬅	90 3.54	80 3.15	90 x 95 3.54 x 3.74

**CUTTING CAPACITY for SOLID sections**

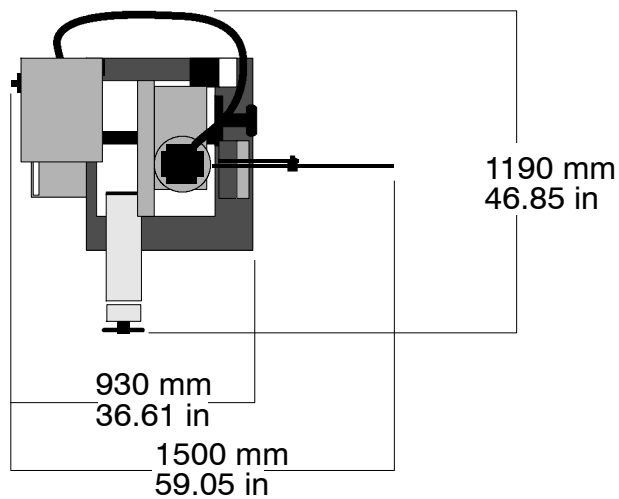
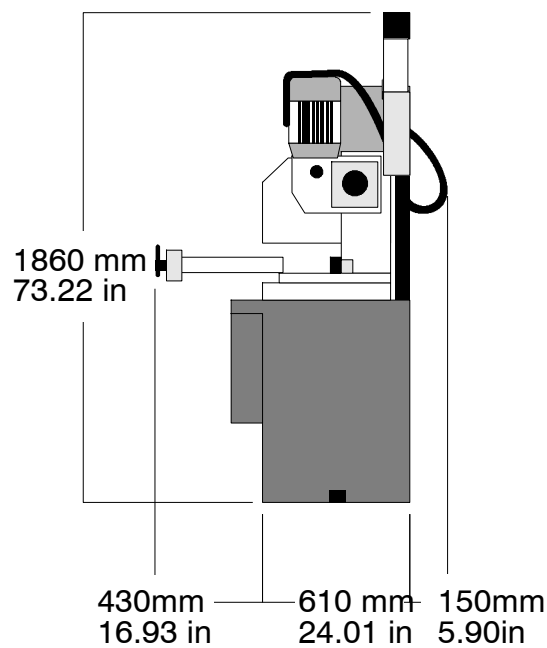
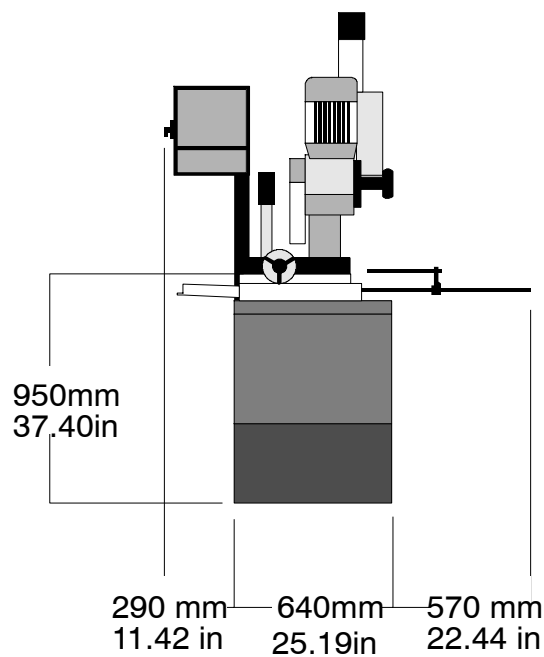
Section		
0°	90 3.54	
45° ➡		64 x 90 2.52 x 3.54
45° ⬅		64 x 90 2.52 x 3.54
60° ⬅		45 x 90 1.77 x 3.54

PACKED WEIGHT		
Wooden cage and pallet	kg lbs	70 154
Wooden pallet	kg lbs	20 44



Dimensions

MACHINE INSTALLED		
Work table height	mm	950
	in	37
Weight	kg	425
	lbs	935

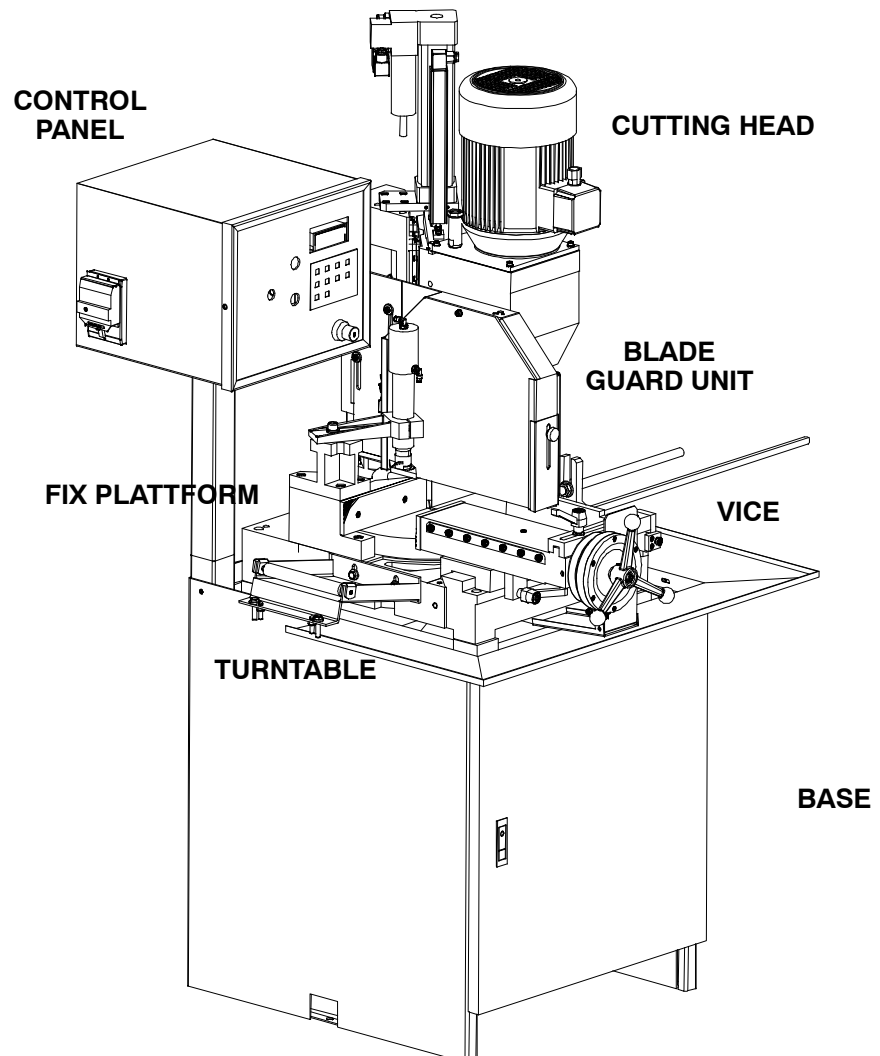


# Functional parts

2

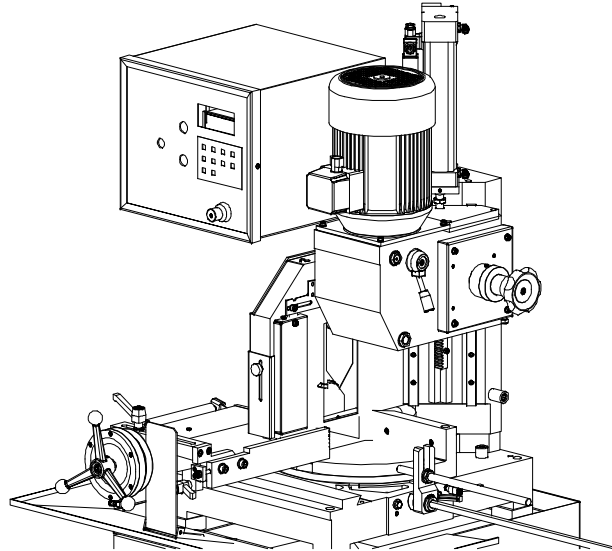
## C350-2S model

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.



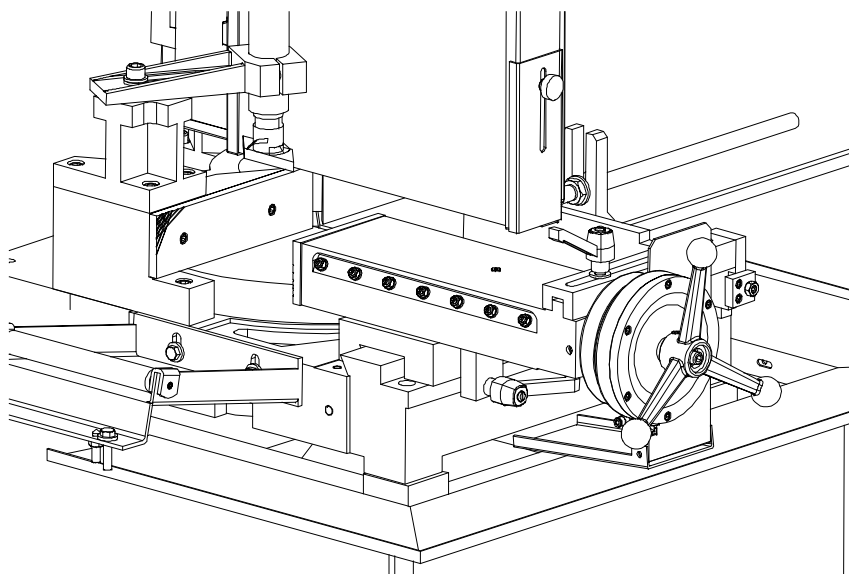
## Cutting head

The cutting head is the unit that cuts the material. It consists of a cast iron head on which the following are mounted: the band saw, the blade guide components, the blade tensioner components, the transmission box and the spindle motor. The operating head runs on linear guides with ball- recirculating pre- charged slides and makes a vertical stroke from the up position to the down one; this stroke can be programmed through the control board.



## Vice

The vice is the unit that clamps 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 slideway on which the mobile jaw is mounted. The vice is controlled by the vice opening and closing button. The vice approaching movement is manual and the closing is operated by a pneumatic cylinder.

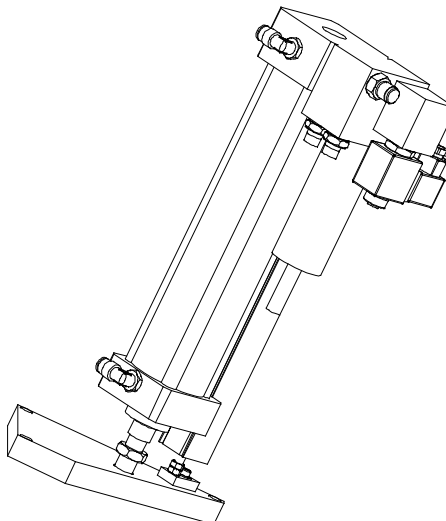




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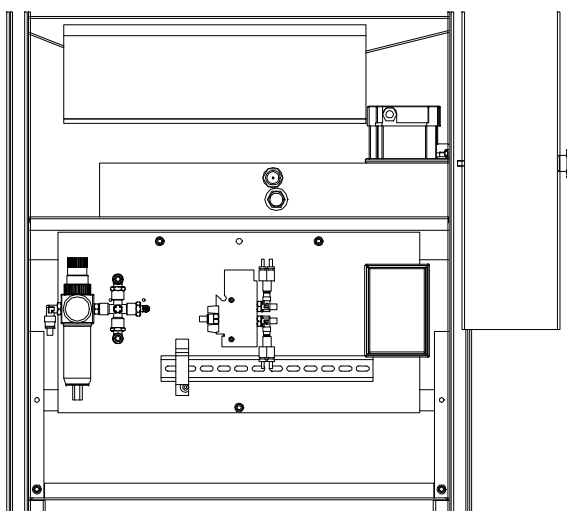
## Oil pneumatic unit

This unit drives and regulates the upward and downward movement of the cutting head and consists of a hydro- pneumatic cylinder and recovery electro- valves. The head descent regulator on the control panel can be used to regulate the quantity of oil that flows into the cylinder and naturally the downward movement speed of the cutting head. To facilitate the upward movement of the head, the **C350- 2S** has a spring located in the cutting head.



## Electro- pneumatic unit

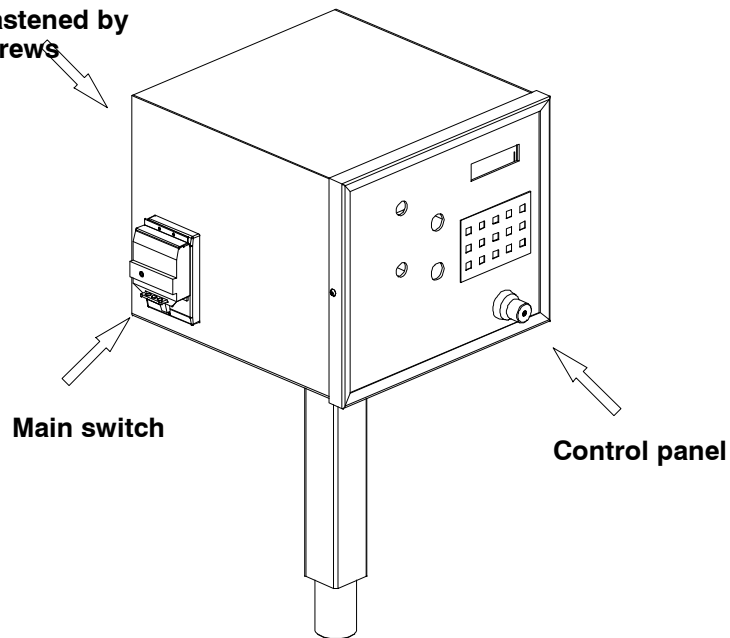
The panel shown in the diagram below is the electro- pneumatic unit. It consists of an air treatment unit (1) and an electro- valve (2); the unit serves to filter the air entering the circuit. The box above the air treatment unit is for the coolant and its electric pump (3).



## Control Panel

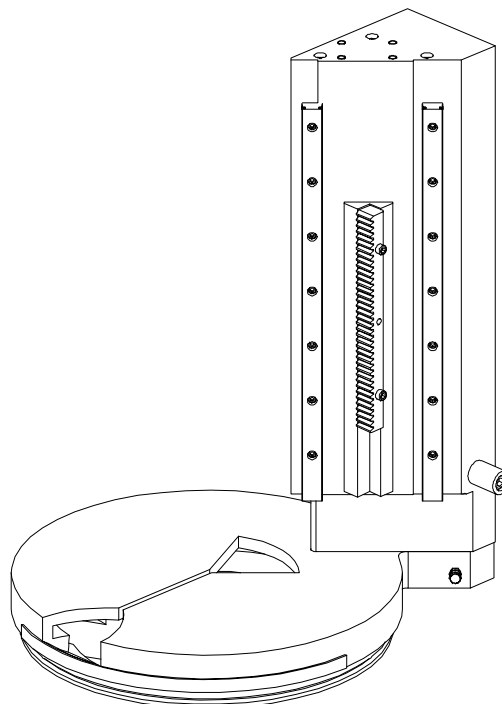
The control panel has a protection rating of IP 54 and contains the electrical equipment. Access is gained by removing a few screws, while the operator's safety is guaranteed by a key-operated safety switch, designed to prevent any intentional interference with the unit. In fact, removing the control panel from its mounting simultaneously extracts the key from the switch, thus cutting off the electricity supply to the machine.

**Panel fastened by screws**



## 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.



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# Safety and accident prevention



The **C350- 2S** 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 **C350- 2S** circular saw is designed to cut exclusively ferrous and non-ferrous profiles and solid metal sections.

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***

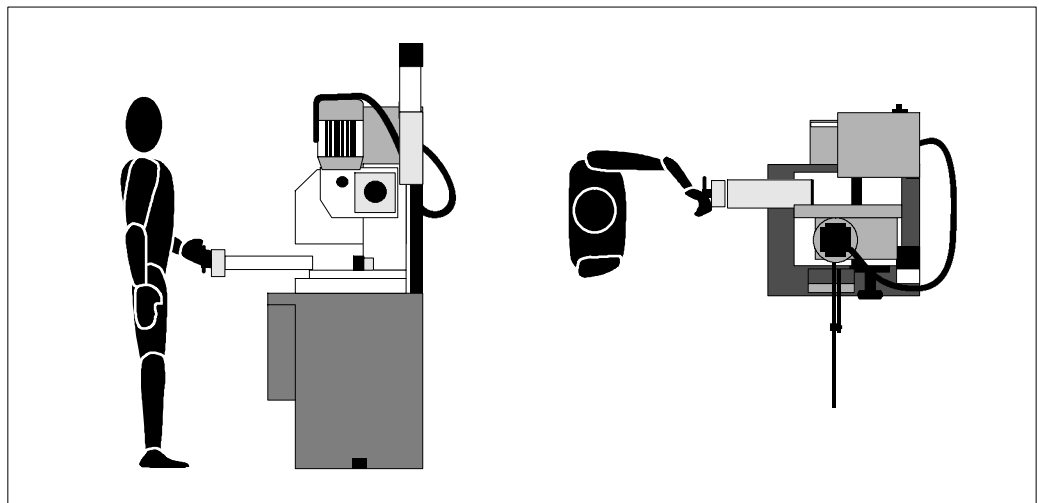
Check that the power supply cables and pneumatic feed systems comply with the maximum machine absorption values listed in the “Machine Specification” tables; replace if necessary.

### ***EARTHING***

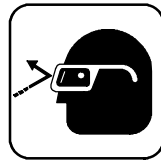
The installation of the earthing system must comply with the requirements set out in EN STANDARD 60204- 1:2010.

### ***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.



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



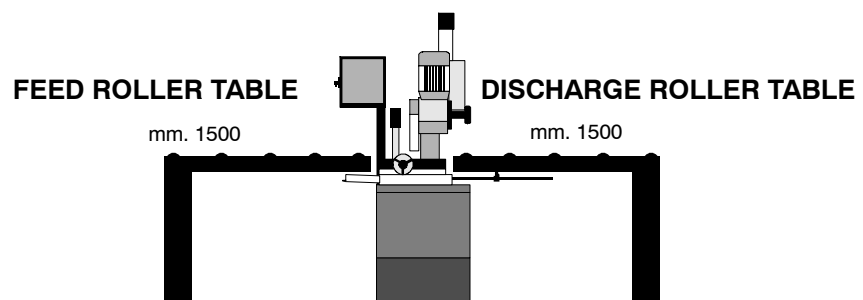
Do not wear oversize clothing with long sleeves, oversize gloves, bracelets, necklaces or any other object that may become entangled in the machine during working; long hair must be tied back and bunched.



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.



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.



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 those not required for the machining in course (e.g. remove swarf or metal shavings from the machine while cutting).



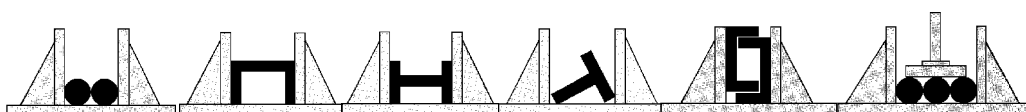
Remove equipment, tools or any other objects from the cutting zone; always keep the working area as clean as possible.



Do not use the machine for cutting pieces which exceed the cutting capacity described in the technical specifications or are less than 5 mm



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 the different profiles correctly in our machines are shown below.



Never move the machine while it is cutting.



Do not use blades of different sizes to those recommended in the machine's 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 using the pneumatic vice (version MA) check that the jaws actually move right up to and effectively block the piece, as the maximum travel is only 6 mm, and check that the clamping pressure is correct.



When working on the bandsaw, only wear gloves when handling materials and tool change or adjustment operations. Only carry out 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 pushbutton immediately. If this does not free the blade, slowly release the vice, remove the piece and check that the blade or its teeth for damage, if need be replace the blade.



Before carrying out any repair works on the machine, consult the Technical Service; this can also be done through an agency in the country in which the machine is being used.

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## 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 **C350- 2S** band saw.

### Reference standards

#### ***MACHINE SAFETY***

- EEC MACHINES DIRECTIVE 2006/42/CE ;
- EEC directive no. 2004/108/CE “EMC - Electromagnetic Compatibility”;
- EEC Directive No. 2006/95/CE known as “Low voltage directive”.
- EN 13898:2003+A1:2009 Machine tools - Safety - Sawing machines for cold metal

#### ***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***

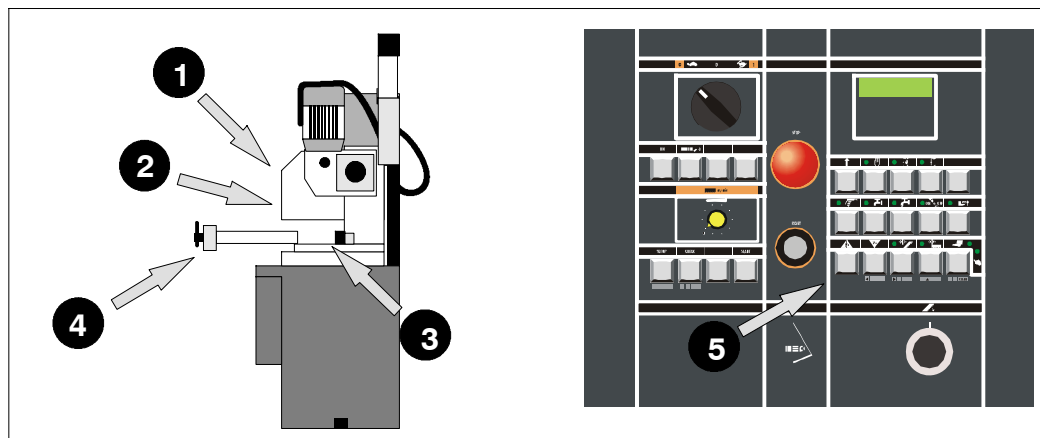
- EEC Directive No. 89/656 and No. 89/686 on the use of personal protection devices.

#### ***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 disc guard fixed to the upright section that guides the movement of the head. The height of this guard can be regulated so that the only part of the blade exposed is that used for the actual cutting in accordance with DPR 547/55 art. 108;
2. Steel sheet guard of adjustable height located on the part of the blade guard between the operator and disc and used as splash guard;
3. vertical pneumatic vice and vice with rag prevention device and double clamping for improved hold on workpiece (optional double pneumatic vice);
4. the cutting vice is operated pneumatically via a button on the control panel and has a maximum travel of 8 mm. The jaw that clamps the material must be moved to within a distance of  $2 \div 3$  mm of the workpiece;
5. blade approaching device to the piece to be changed: the operator can approach, through the head lifting and lowering buttons, the blade to the piece to be cut, to clear only the stroke sufficient and necessary for this operation.



### Electrical equipment

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

- access to electrical board limited by screws and automatic electro-thermal main switch with Minimum Voltage Coil;
- 24 Vac Control voltage for actuators, in accordance with chapter 6 of European Standard "Control and indication circuits" paragraph 2 "Control Circuits" sub-section 1 "Preferential voltage values for control circuits".
- Plant protected against short circuits by quick blowing fuses and earthing of all work and accidental contact parts.
- Protection from accidental start-up by a minimum voltage relay in the case of power failure.



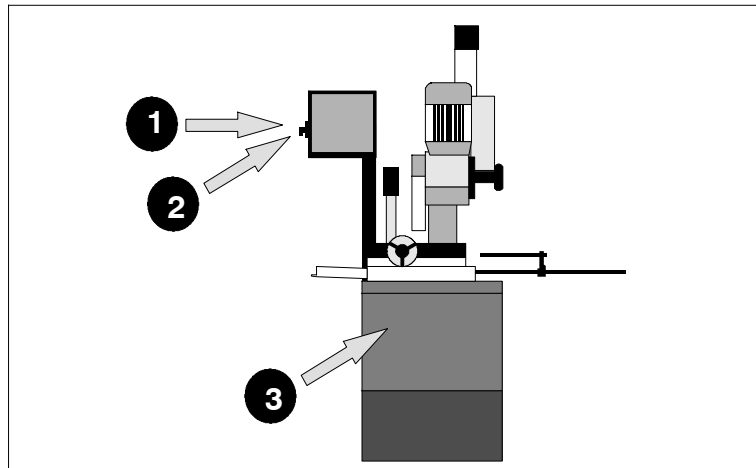
## Emergency devices

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».

### ...Emergency devices applicable to the C350- 2S:

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. **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.
3. **Pressure contact (pressure switch):** this device inhibits all functions of the machine immediately, when pressure in the compressed air system drops below 3 Bar.



## 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 MACHINES 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 12001:2010 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	C350- 2S
Reference standard	ISO 3746

Results		
Test 1st	Description	Ø 100 mm pipe in FE37 steel Disc blade HSS- DMO5 0 350 T6
	Results	Mean sound level ( $L_{eq}$ ) 76,42 dB (A) Environmental correction (K) 2.97 dB(A) Peak sound power ( $L_w$ ) 87,34 dB(A)
Test 2nd	Description	Ø 80 mm solid tube in C40 steel. Disc blade HSS- DMO5 0 350 T6
	Results	Mean sound level ( $L_{eq}$ ) 76,50 dB(A) Environmental correction (K) 2.97 dB(A) Peak sound power ( $L_w$ ) 87,42 dB(A)
Test 3rd	Description	40x70 mm solid tube in C40 steel. Disc blade HSS- DMO5 0 350 T6
	Results	Mean sound level ( $L_{eq}$ ) 76,19 dB(A) Environmental correction (K) 2.97 dB(A) Peak sound power ( $L_w$ ) 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  $2.5 \text{ m/s}^2$

## 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 2004/108/CE, 2006/95/CE and 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 **C350- 2S**; Test report no. 170201.

### **Emissions**

- CEI EN 61000-6-4 (2002) Electromagnetic Compatibility (EMC) - Generic standard regarding emissions. Part 6-4: Industrial Environment.
- EN 55011 (1999) Industrial, scientific, and medical radio frequency appliances (ISM). Characteristics of radio frequency disturbance - Limits and methods of measurement.
- EN 55014-1 (2002) Electromagnetic Compatibility - Prescriptions for domestic appliances, electric power tools, and similar equipment. Part 1: Standard Emission in relation to product family.

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	

CONDUCTED EMISSIONS - ANALYSIS OF INTERMITTENT DISTURBANCES	
Gate	Result
A.C. power supply input	Not applicable

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

### ***Immunity***

- CEI EN 61000-6-2 (2000) Electromagnetic Compatibility (EMC) - Generic standard on immunity. Part 6-2: Industrial Environment.
- EN 61000-4-2 + A1 (1996-1999) Electromagnetic Compatibility (EMC) - Part 4: Test and measurement techniques - Section 2: Electrostatic discharge immunity tests - Basic publication.
- EN 61000-4-3 Electromagnetic Compatibility (EMC) - Part 4: Test and measurement techniques - Section 3: Radiated radio-frequency electromagnetic field immunity tests. EN 61000-4-3 Electromagnetic Compatibility (EMC) - Part 4: Test and measurement techniques - Section 3: Radiated radio-frequency electromagnetic field immunity tests.
- EN 61000-4-4 (1996) Electromagnetic Compatibility (EMC) - Part 4: Test and measurement techniques - Section 4: Fast transients/bursts immunity tests - Basic publication.
- EN 61000-4-5 (1997) Electromagnetic Compatibility (EMC) - Part 4: Test and measurement techniques - Section 5: Pulse magnetic field immunity tests.
- EN 61000-4-6 (1995) Electromagnetic Compatibility (EMC) - Part 4: Test and measurement techniques - Section 6: Immunity to conducted interference, induced by radio frequency fields.
- EN 61000-4-11 (1977) Electromagnetic Compatibility (EMC) - Part 4: Test and measurement techniques - Section 11: Voltage dips, short interruptions and voltage variations immunity tests.

#### **IMMUNITY TO ELECTROSTATIC DISCHARGES**

<b>Gate</b>	<b>Test levels</b>	<b>Evaluation criterion</b>	<b>Result</b>
Enclosure	contact 4 kV steel plate 4 kV in air 8 kV	B	Complies

#### **IMMUNITY TO VOLTAGE (BURSTS)**

<b>Gate</b>	<b>Test levels</b>	<b>Evaluation criterion</b>	<b>Result</b>
A.C. power supply input	2 kV	B	Complies

#### **IMMUNITY TO CONDUCTED ELECTROMAGNETIC FIELDS**

<b>Gate</b>	<b>Test levels</b>	<b>Evaluation criterion</b>	<b>Result</b>
A.C. power supply input	10V	A	Complies

#### **IMMUNITY TO IRRADIATED ELECTROMAGNETIC FIELDS**

<b>Gate</b>	<b>Test levels</b>	<b>Evaluation criterion</b>	<b>Result</b>
Enclosure	10 V/m	A	Complies

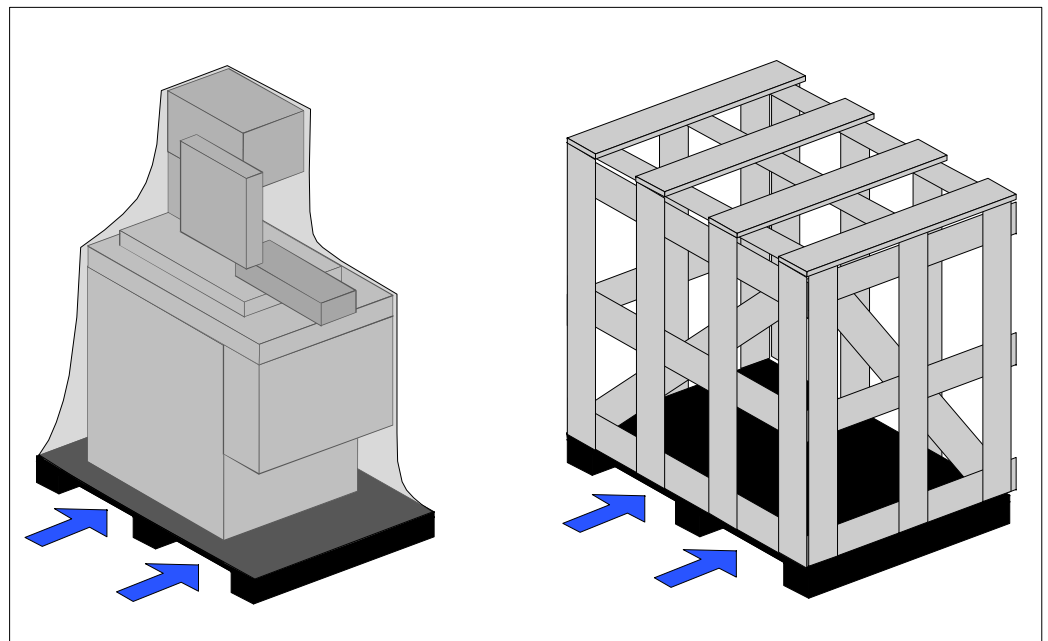
# Machine installation

4

## Packaging and storage

Hyd- Mech 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

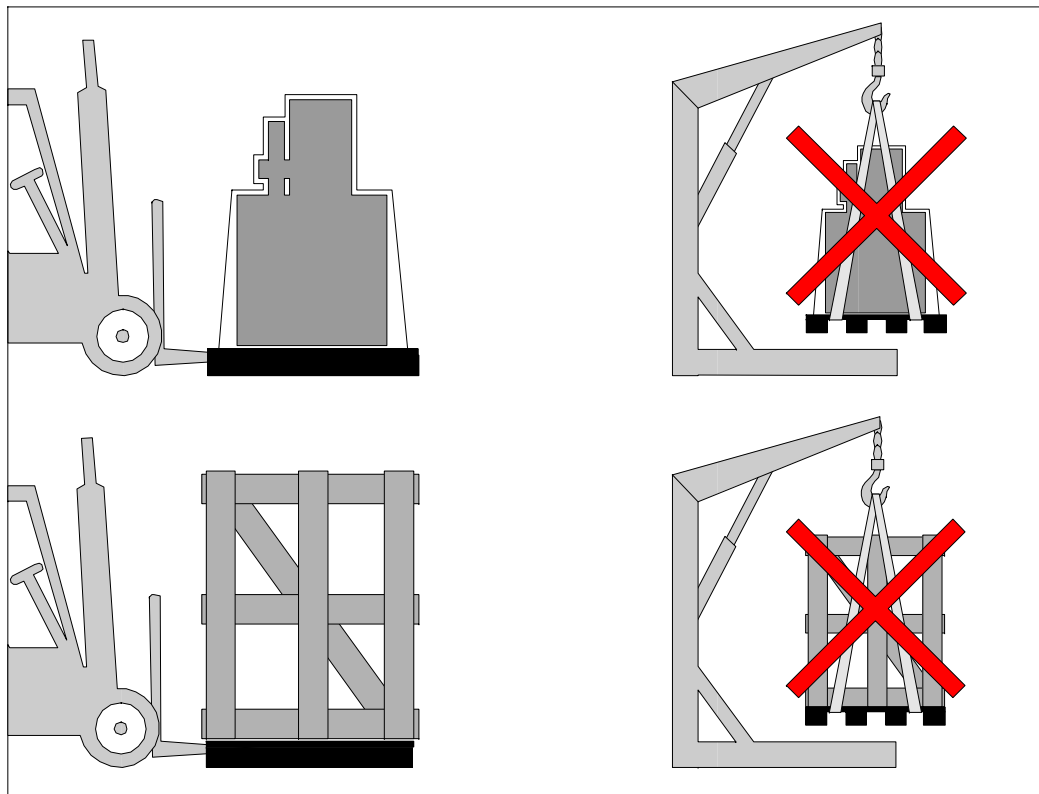
In both cases, for correct balancing the machine must be handled using a fork- lift truck, inserting the tines at the points indicated by the arrows, using the reference marks on the crate itself.

### 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.

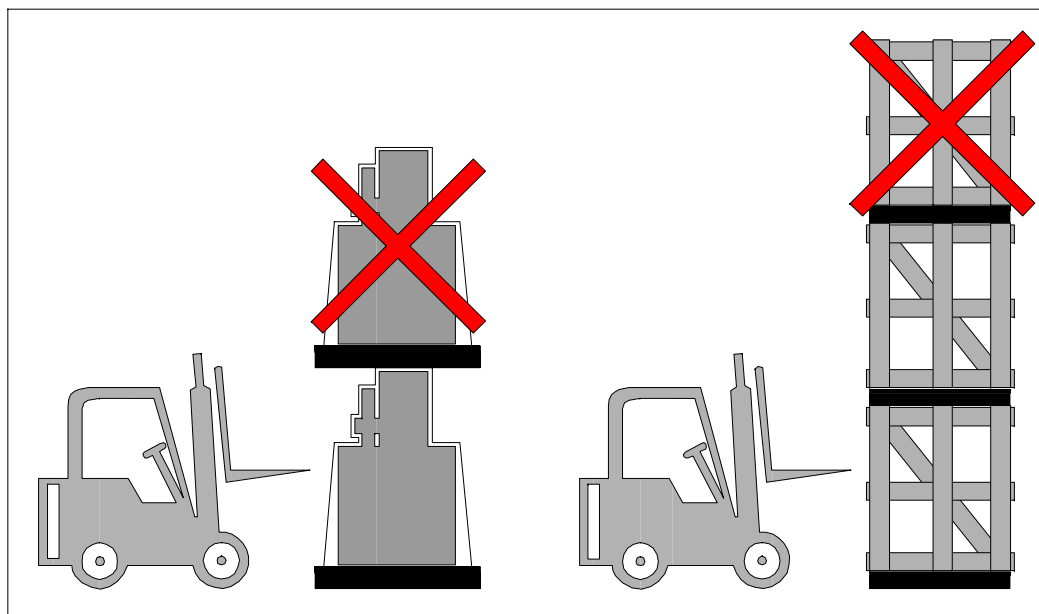
**Attention**

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.

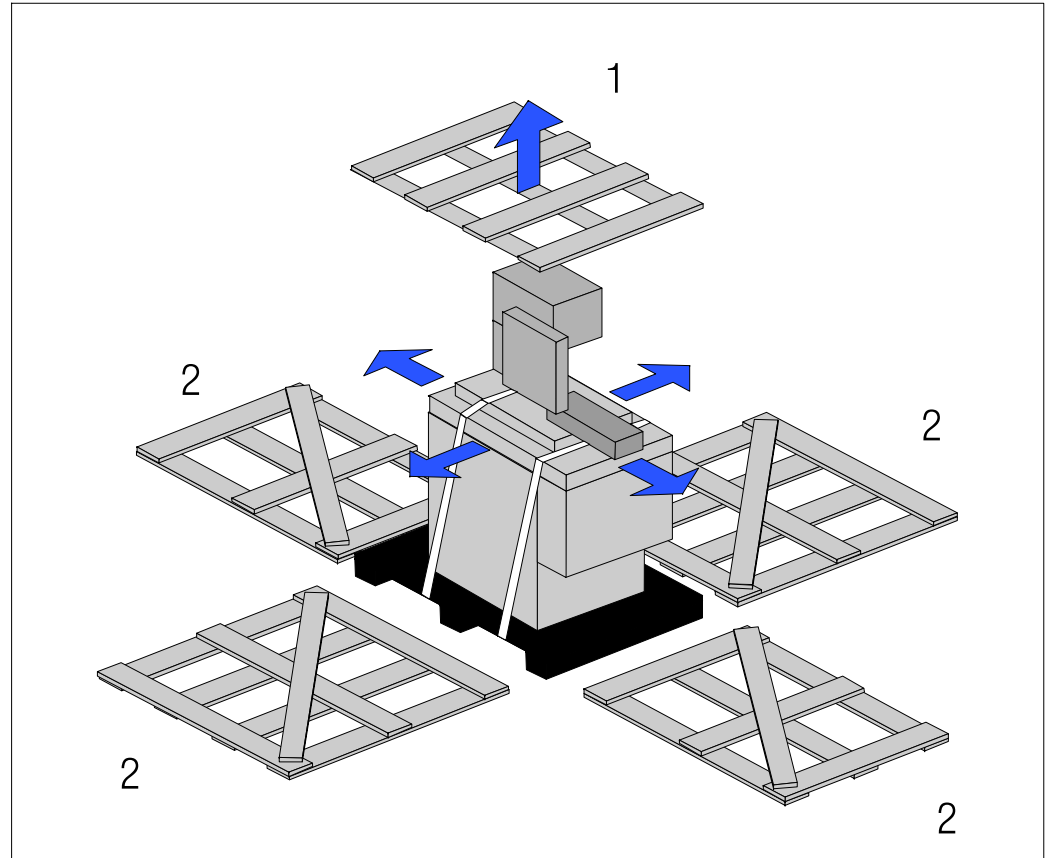


To install the machine, first remove the packing, paying particular attention not to cut any electric wires or hydraulic hoses; if necessary use pliers, a hammer and a cutter.

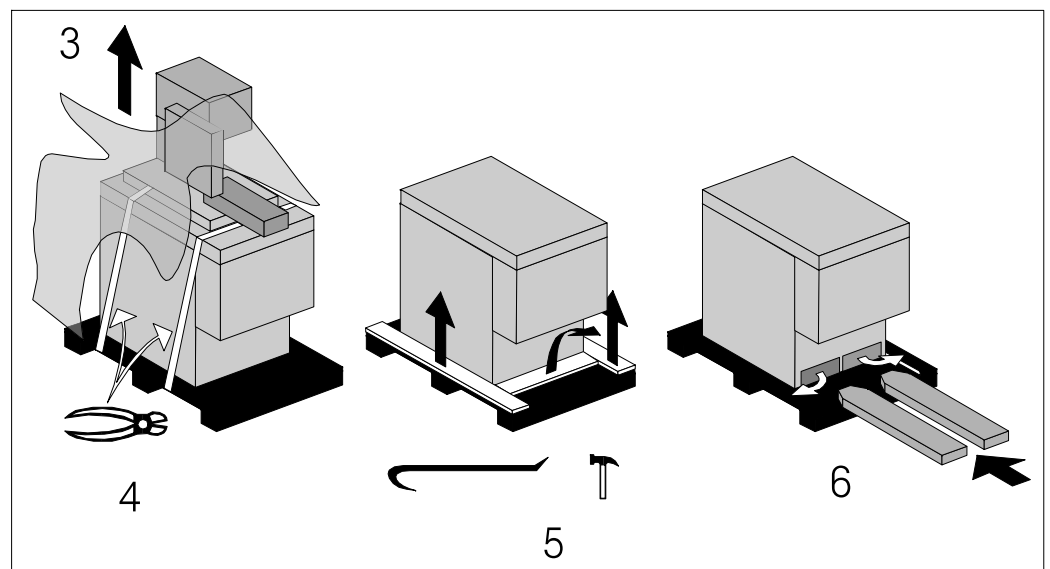
Open crate in the illustrated order:

1. remove nails and lift the top of the cage;

2. remove nails and lower walls;



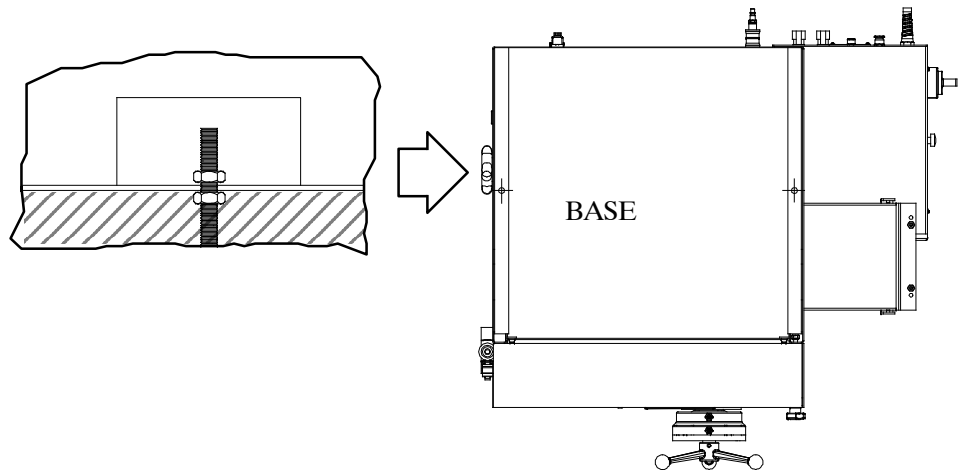
3. remove heat-shrink covering;
4. remove the straps;
5. remove nails from pallet securing planks and remove planks;
6. remove the front panel and insert fork tines.



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 **C350- 2S 4- SPEED** machine is supplied complete with:

CHARACTERISTICS	STANDARD	OPTIONAL
Machine with microprocessor with one controlled axis, with latest generation controller exclusively designed by Hyd- Mech for its semi- automatic sawing machines	✓	
Display at 16 characters read on 2 lines to visualize technological parameters: number of cuts, cutting time, amperometer, diagnostics and/or caution messages (more than 100) visualized in the language of use	✓	
Displaying and recording of alarms and errors with possibility of displaying the event log	✓	
The head stroke is set directly from the control panel according to the dimensions of the bars to be cut	✓	
Four- speed blade rotation 15/30/45/90 rpm	✓	
Coaxial cylinder with by- pass valve for the fast movement and linear potentiometric transducer for reading the head position	✓	
Rotating platform turning on a central pin with axial bearing for a better accuracy on the set cutting angles	✓	
Chromium- plated steel rod for customized cut with etched millimetric scale and tilting stroke	✓	
Preset to be equipped with the spray mist system, as well as with the standard- delivered traditional lubrication with emulsible oils		✓
Pedestal with removable swarf collecting drawer and removable tank for coolant	✓	
Electric pump for lubrication/cooling of disc	✓	
Vice with rag prevention device and double workpiece clamping feature	✓	
Possibility of making angled cuts from 0° to 45° right and 60° left	✓	
Double set of gears to obtain a high cutting output	✓	
Head with vertical sliding on linear guides and ball- recirculating pre- charged slides	✓	
Blade cleaning brush	✓	
Electric control panel: totally identifiable cabling, stand- by, main switch with lockable panel- closing device, speed switch, emergency device, thermal- magnetic overload cutout, minimum voltage relay, voltage drop protection, 24 V low- voltage plant	✓	
Pneumatic vertical vice	✓	
Circular blade HSS DMo5/M2 D.350x32x2.5 for solid sections and profiles		✓
Set up for movement with transpallets	✓	
Pneumatic supplementary vice		✓
Supplementary pedal control*		✓
Bar support		✓
K40 roller table module for feed side, 1500 mm		✓
Feed side roller table support		✓
Discharge side roller table adapter		✓
K40 roller table for discharge side, 1500 mm		✓
K40 roller table for discharge side, 3000 mm		✓
K40 roller table for discharge side, 4500 mm		✓
K40 roller table for discharge side, 6000 mm		✓

CHARACTERISTICS	STANDARD	OPTIONAL
5 l can of emulsible oil		✓
15/30 rpm spindle*		✓

#### \*ACCESSORIES AVAILABLE ON REQUEST

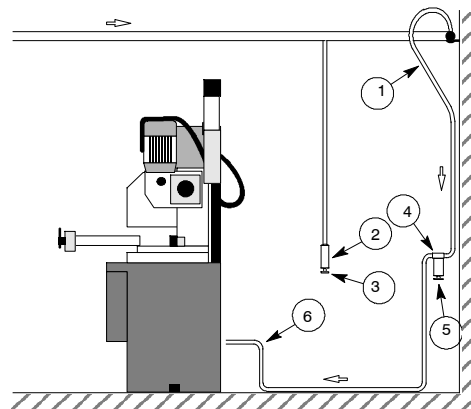
The bag of accessories is enclosed in the machine before being packed and contains:

- 3, 4, 5, 6, 8 and 10 mm Allen keys;
- 19 mm double open-ended and box wrenches;
- 20 mm Ø rod for cuts to measure with an 8 mm Ø ratchet fork and lever + VCE M8x35 Allen grub screw;
- arm with roller on which the bars to be cut rest and for fitting the feed side roller tables;
- this Use and Maintenance Manual.

## Connection to the compressed air

To ensure perfect operation and a long service life, it is recommended that the machine is connected to a compressed air system having the characteristics reported in the diagram below.

- KEY
- 1 - DOWN PIPE
  - 2 - CONDENSATE COLLECTOR
  - 3 - DRAIN COCK
  - 4 - AIR FILTER
  - 5 - DRAIN COCK
  - 6 - CONNECTING HOSE



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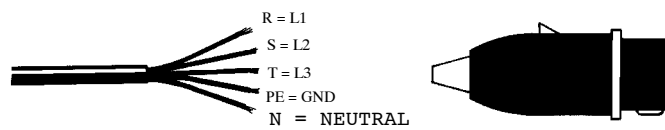
## Connection to the power supply

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.

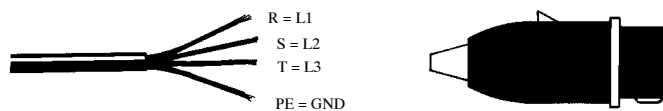
To connect the machine to the power supply, proceed as follows:

- 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



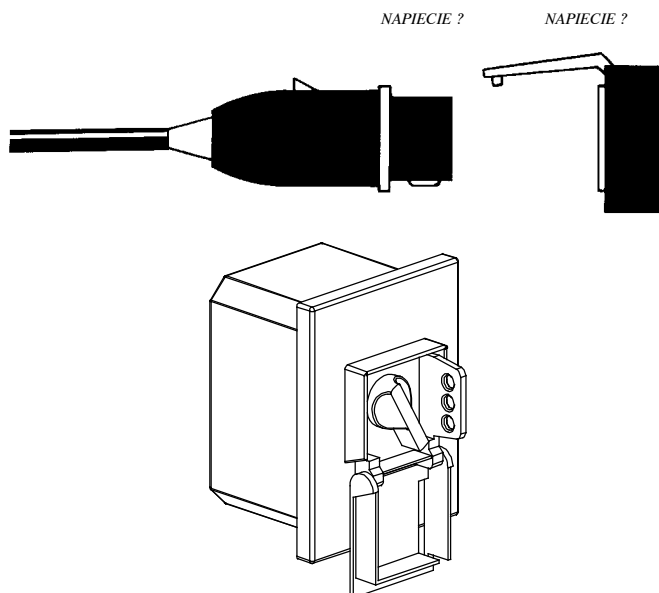
CONNECTION FOR "4-CORE" WIRE SYSTEMS WITH NEUTRAL



**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**.

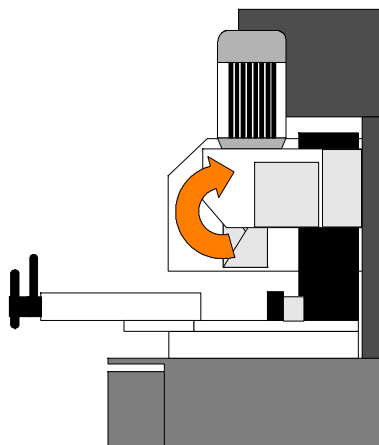
- Insert the plug in the socket, ensuring that the mains voltage is the same as that for which the machine has been setup.



- 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's 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.

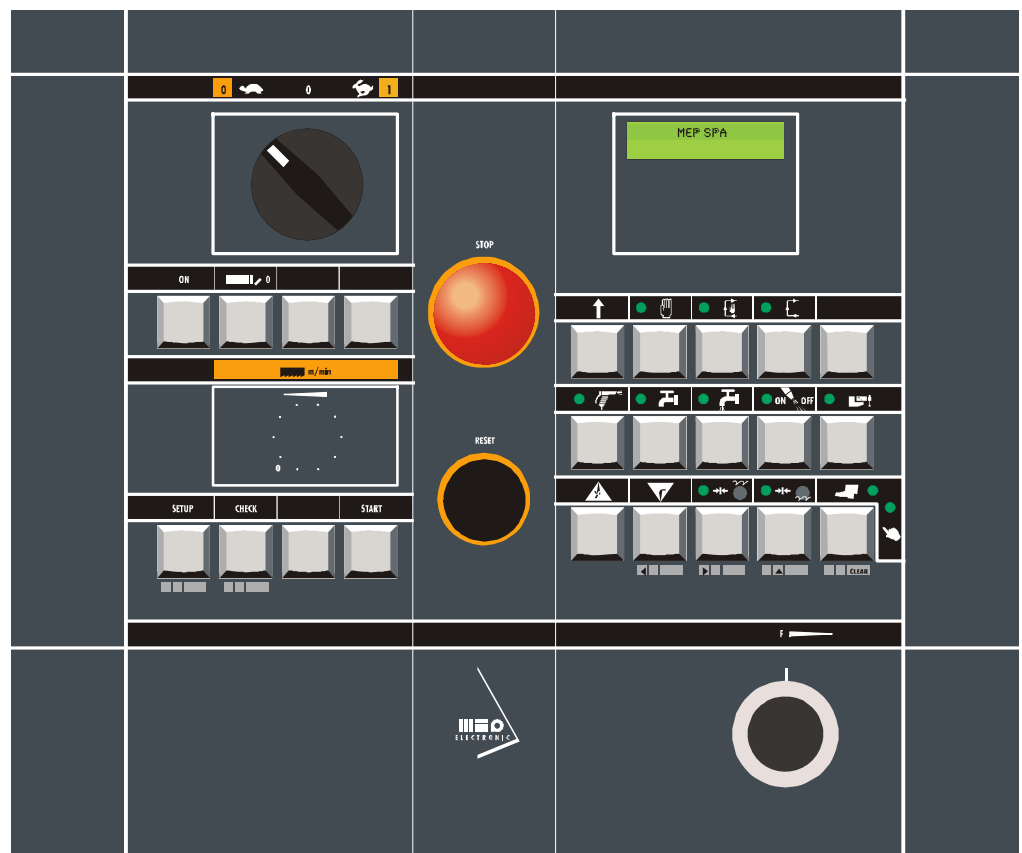
# Description of machine operation



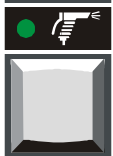
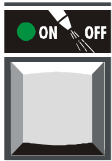

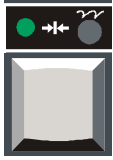
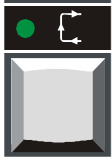
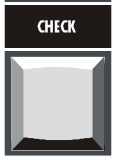

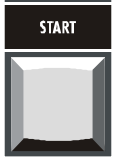
This chapter analyses all the machine functions. We begin with a description of the pushbuttons and other components on the control panel.

## 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 **C350- 2S** 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)
	Nonoperating		Vice opening/closing
	Nonoperating		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



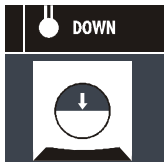
Nonoperating



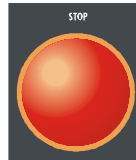
Hydraulic adjuster for choosing the head lowering speed



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.



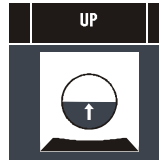
Button to stop the cutting head at the FHLS point when it reaches the cut end in the semiautomatic and semiautomatic- dynamic machining cycle.



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

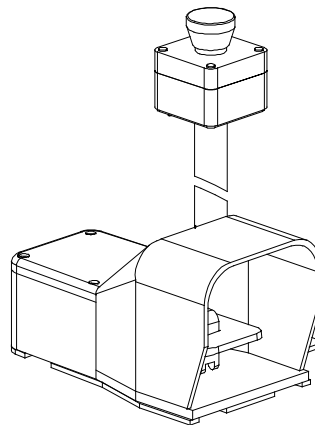


Key for displaying the machine parameters for performing a machining cycle: TL blade tension, PT head position, VL blade speed, T cutting time, PZ cut piece number, I motor absorption



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.

### **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).

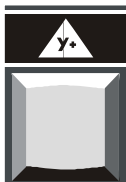
### **THERMAL- MAGNETIC CIRCUIT- BREAKER WITH UNDERVOLTAGE COIL AND DOOR LOCKING DEVICE**

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

### Cutting head movement

The cutting head can be moved by the head lifting and lowering buttons, described in the key to the control console keyboard in this chapter, enabled in the working mode with SEMI- AUTOMATIC cycle.

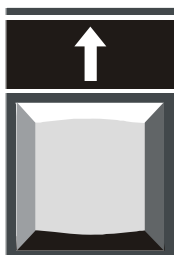


Head “down” key



Head “up” key

**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**

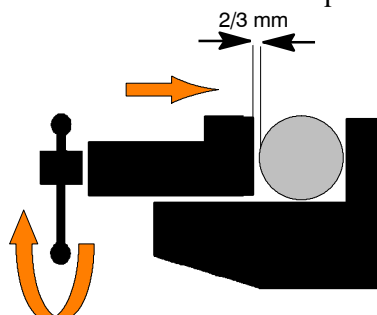
**TOTALIZ=00000:00**

**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 closure button;



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

**N.B.**

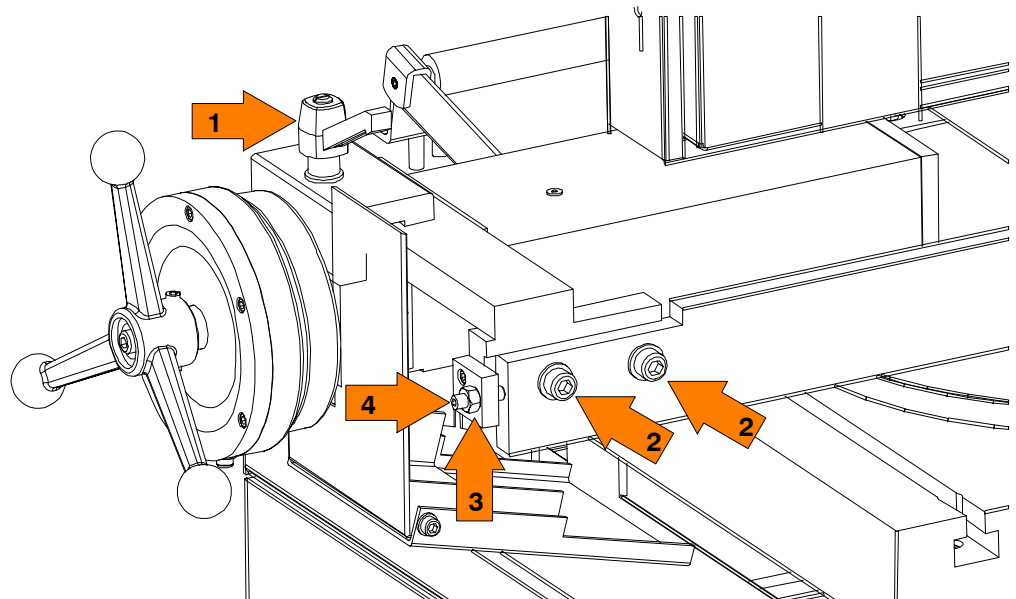
If the vice was already closed by the pneumatic piston, it may not block the piece. In this case it is necessary to repeat the operation, i.e.: open the vice by pressing the specific button, bring the moving jaw near to the piece and block it again with the closing button, bearing in mind that the stroke of the pneumatic piston is approx. 6 mm.

### Width of cut

The machine is fitted with barriers which adjust to suit the cross- section of the workpiece.

The vice is fitted as standard with a rag prevention device that serves to support the material and prevent the formation of ragged edges at the end of the cut. To adjust the rag prevention device transversely:

- loosen the release lever located above the vice slide (1);



- movement the rag prevention device arm to the right or left;
- tighten the release lever.

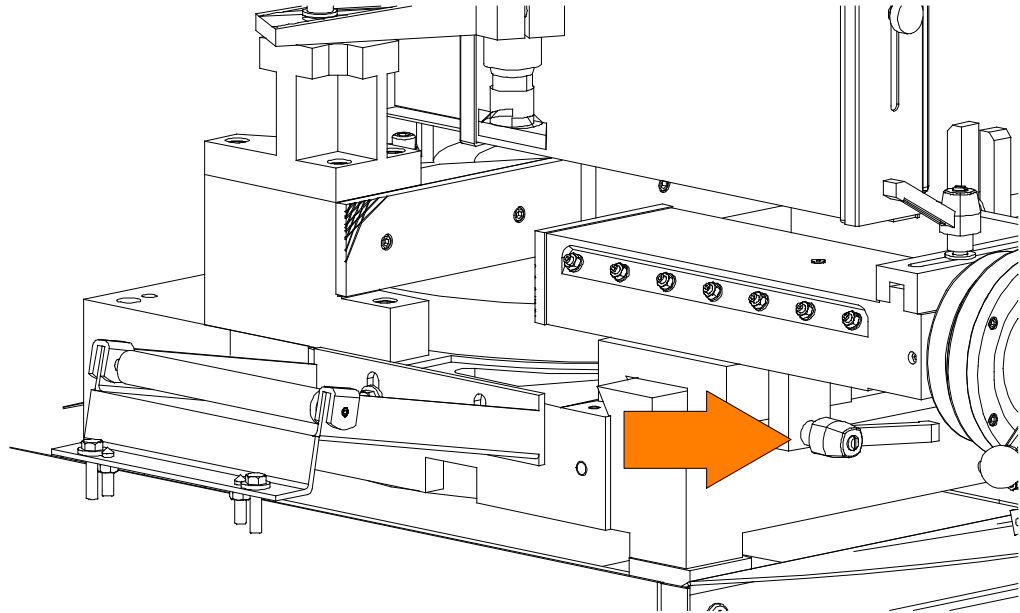
To adjust the longitudinal position of the vice jaw, proceed as follows:

- tighten the cutting vice completely;
- slacken the two screws located to the side of the rag prevention device (2);
- slacken the nut that locks the grub screw (3);
- adjust the longitudinal position of the rag prevention vice jaw by slackening or tightening the grub screw (4) until the position of the rag prevention jaw is aligned with that of the cutting jaw;
- hold the grub screw steady using the Allen key and tighten the locking nut.

### Transverse position of the vice

Position the cutting vice as close as possible to the cutting zone to ensure that vibrations are cut down and that the cutting zone is provided with greater cover. To move the vice body transversely, proceed as follows:

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



### Preliminary check list for cutting operation

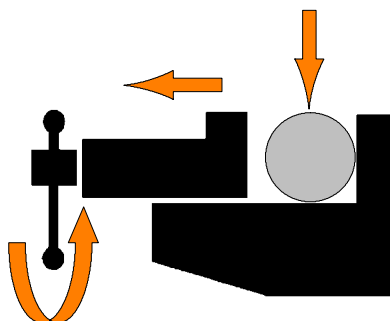
To guarantee complete safety during cutting cycles, the operator should work through a check list of the entire apparatus, checking:

- ▶ ensure that the guard is free to slide;
- ▶ ensure that the cutting angle is correct and that the rotary platform is blocked;
- ▶ 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 the blade downstroke speed and the cutting pressure are correct.
- ▶ the level of lubricant/coolant and that the electropump is activated;
- ▶ that all protections are in place and correctly locked.

## Semi-automatic operating cycle

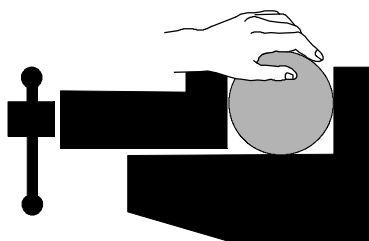
Sequence of operations for performing a cut:

- ▶ power up the machine by pressing the reset button;
- ▶ position the workpiece in the vice and calculate the length of cut (using the measuring rod for cuts to measure).



- ▶ secure the piece in the cutter vice; manually move vice towards the workpiece leaving a minimum distance of 2÷3 mm, lock the vice with the open/close button on the base or with the foot pedal if fitted;
- ▶ Make sure the workpiece is securely clamped in the vice by trying to move it manually.

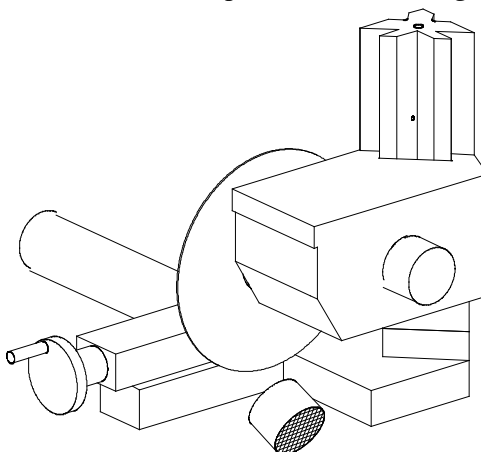
**N.B.** If the vice was already closed by the pneumatic piston, it may not block the piece. In this case it is necessary to repeat the operation, i.e.: open the vice by pressing the specific button, bring the moving jaw near to the piece and block it again with the closing button, bearing in mind that the stroke of the pneumatic piston is approx. 6 mm.



- ▶ select the cooling lubricant delivery mode;
- ▶ Select the cutting speed on the “Polarity change switch” in accordance with the type of material to cut (shape, thickness, hardness, etc.).



- ▶ set the Head Back Limit (FCTI) and the Head Forward Limit (FCTA), as described above;
- ▶ press the start button to start the cycle, after making sure you reset the head downstroke speed regulator, to avoid sudden downward movement of the head;
- ▶ The motor starts up and starts the blade moving, at the same time starting the lubricant/coolant pump.
- ▶ increase the head downstroke speed until reaching an optimum value;

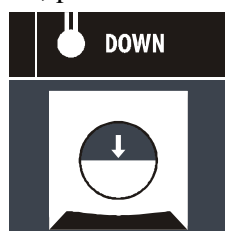


- ▶ on completing the cut the head will return automatically to the Head Back Limit (FCTI), ready for a new cut cycle;
- ▶ Free the workpiece from the vice by pressing the open/close vice button on the control panel.

### 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.

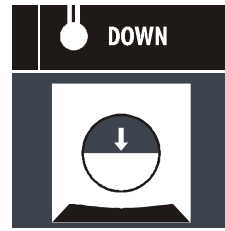
- ▶ Select the semiautomatic cycle, press the DOWN button.



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.

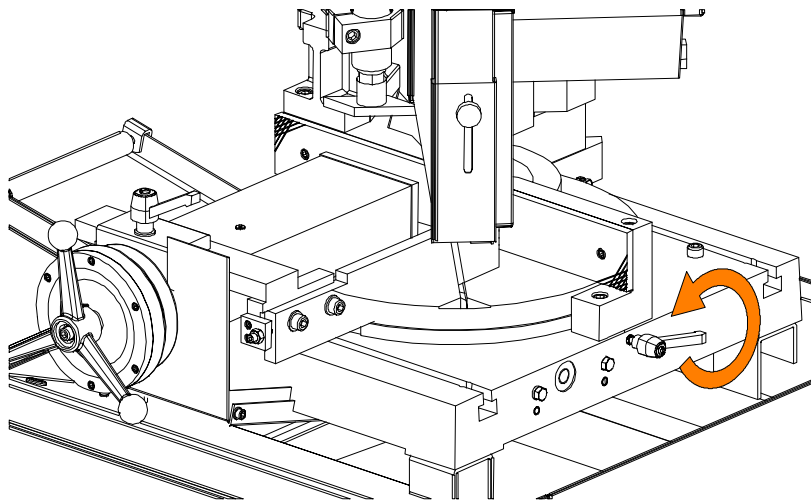
- **Press the Down button to deactivate this function.** Press the Down button to deactivate this function.

## 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° and 60° to the left

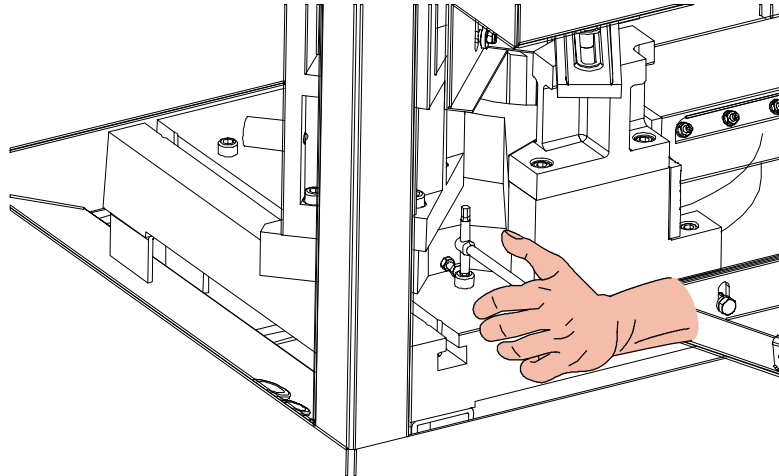
- Loosen the ratchet lever located at the right of the slideway;
- rotate the tool head until it's tight against the stop, and check that it's at 45° on the scale on the slideway;



- tighten the ratchet lever and cut the part.

If the cut has to be done at an angle of 60° left, the stop on the back of the slideway must be removed:

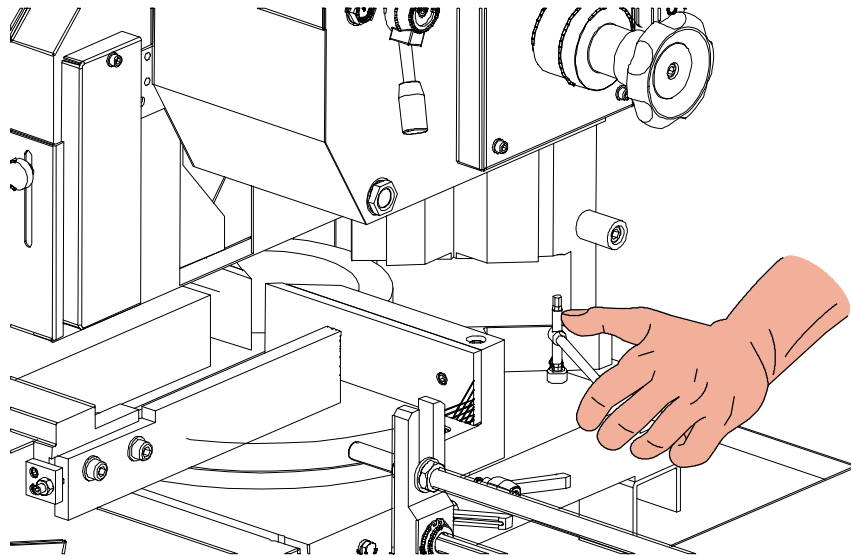
- remove the stop at 45° left;



- rotate the tool head to 60° left, clamp the turntable and cut the part.

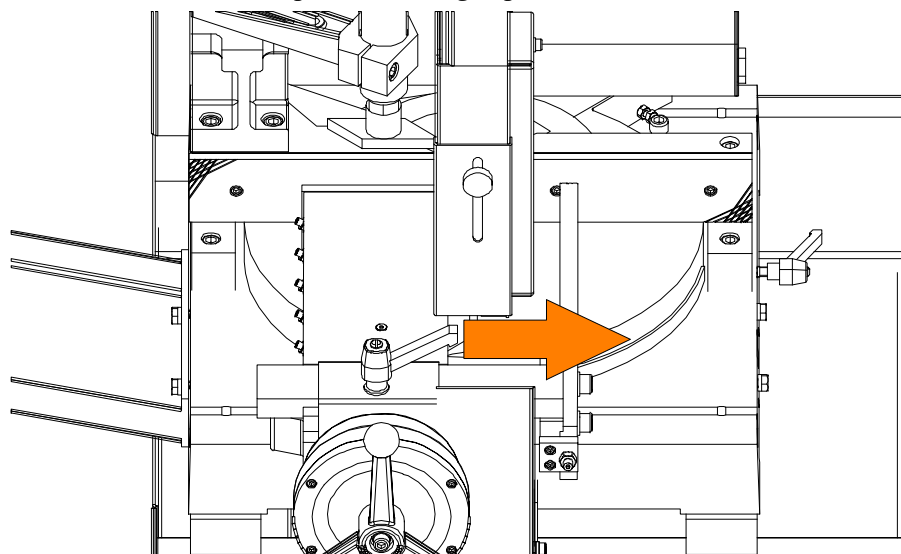
### **Angled cuts 45° to the right**

- Loosen the ratchet lever located at the right of the slideway;
- Remove the cutting stop at 0°;

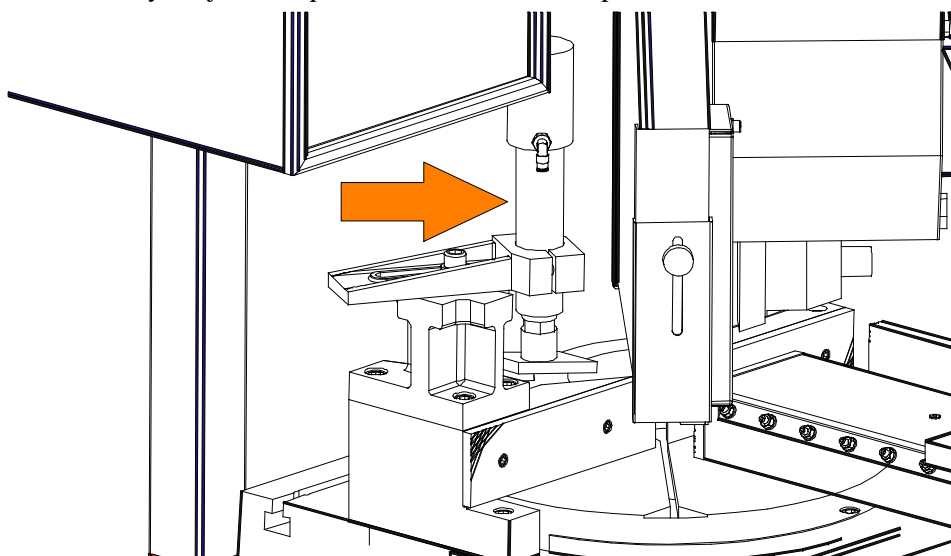


- lift the tool head up and rotate it, making sure that the cutter disk does not collide with the vice;

- ▶ move the vice from left position to right position



- ▶ if mounted, remove the cut- to- size rod.
- ▶ if necessary, adjust the position of the vertical pneumatic vice;



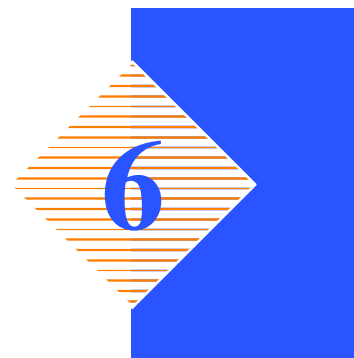
- ▶ Lock the turntable and cut the part.





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# Diagrams, exploded views and replacement parts

































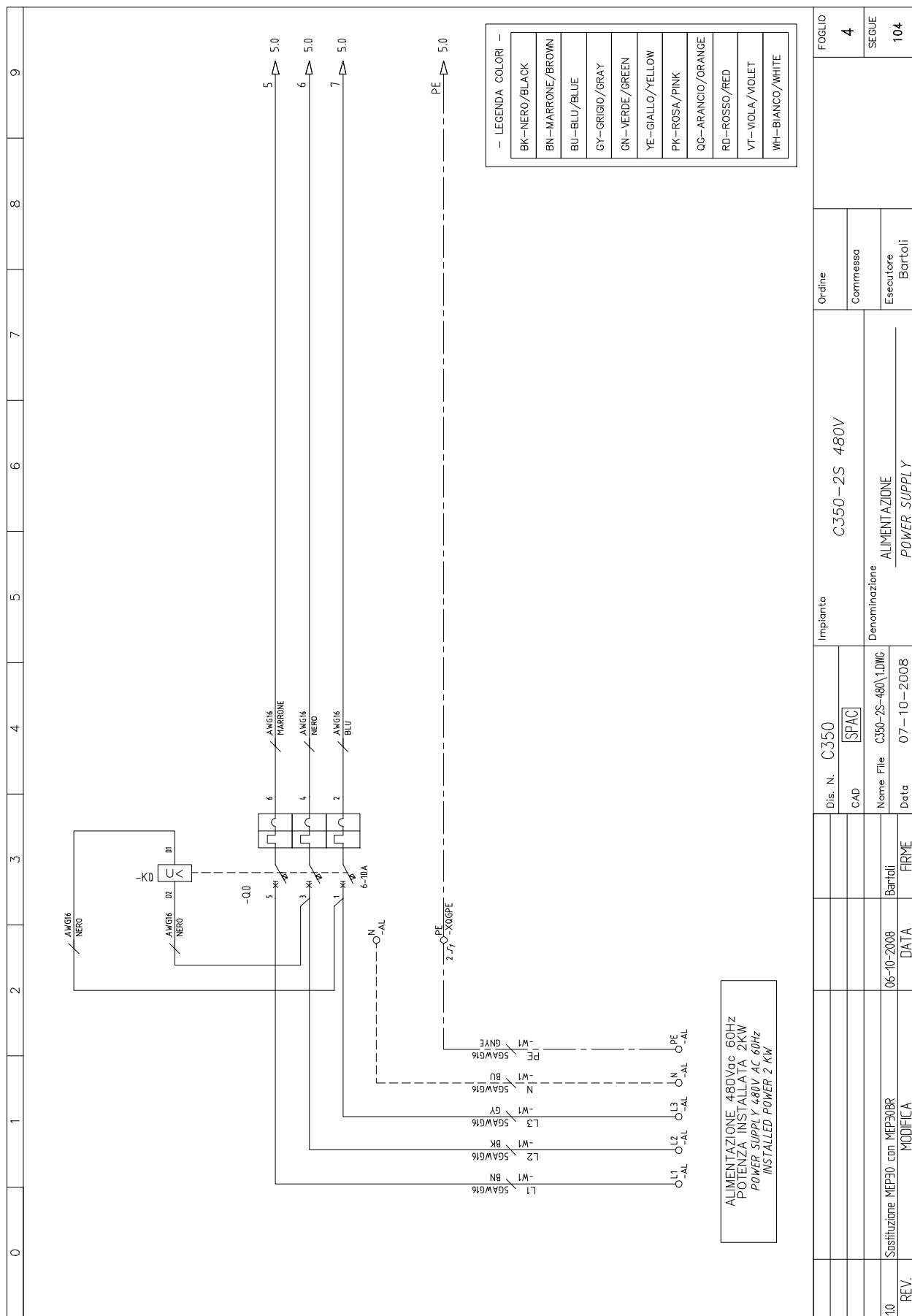
This chapter contains functional diagrams and exploded views of the **C350- 2S**. This document is intended to help in identifying the location of the various components making up the machine, giving information useful in carrying out repair and maintenance operations; This chapter will also enable the user to order replacement parts with no risk of misunderstanding, as all parts are given codes.

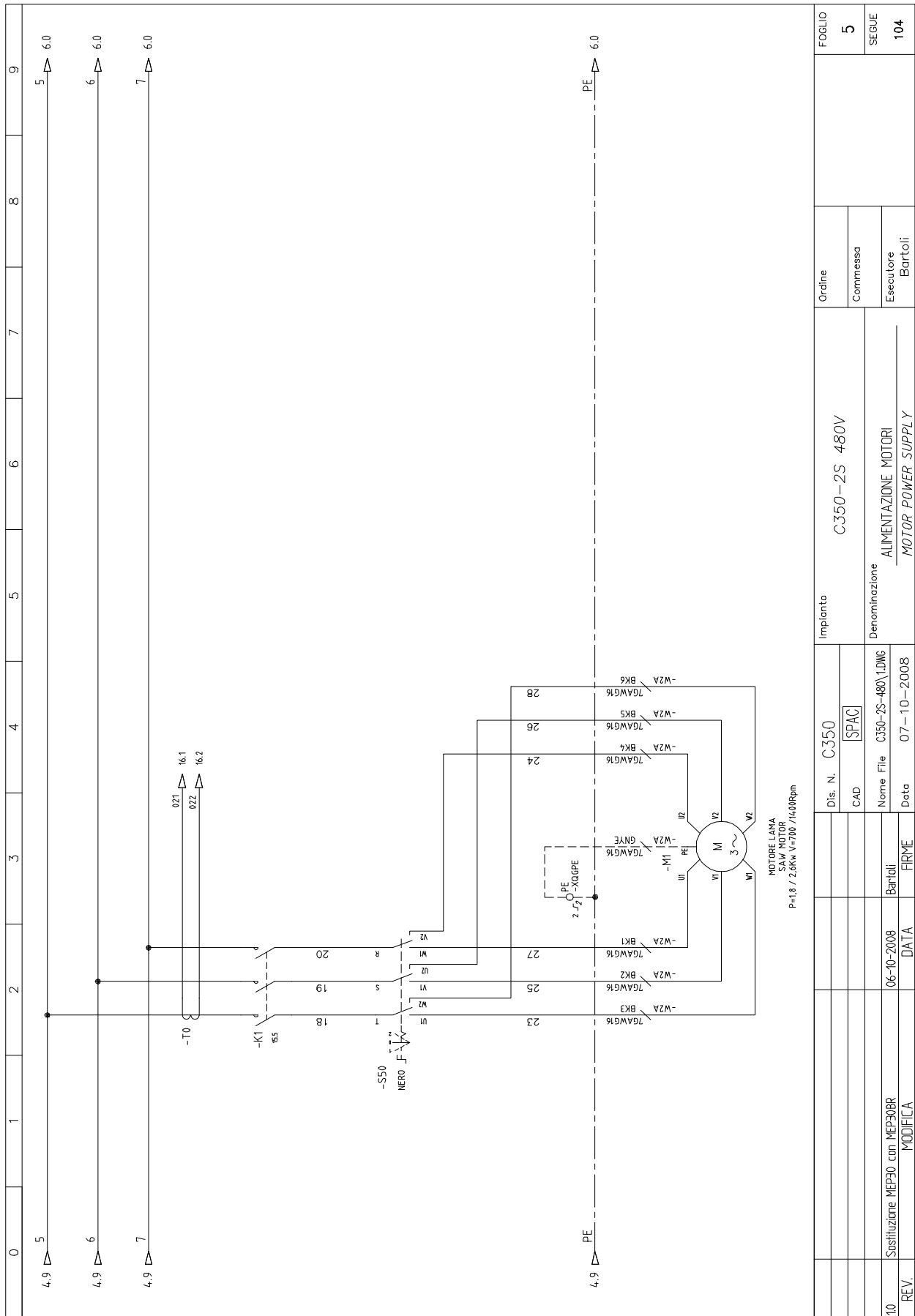
Standardised Wiring Diagrams (CENELEC Standard)

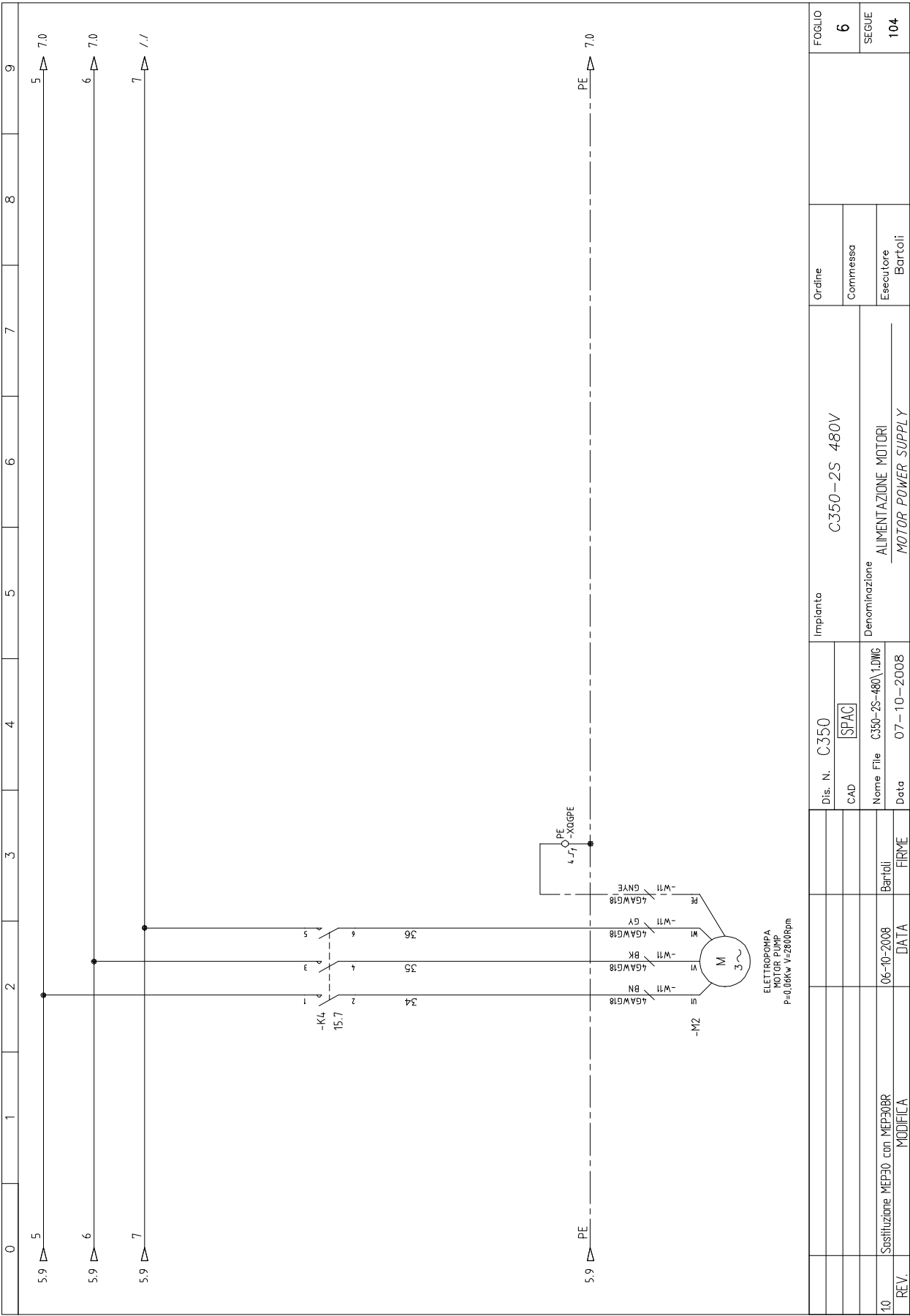
LISTA FOGLI \ INDEX											
Foglio Sheet	Descrizione Description	Revisione \ Revision									
		0	1	2	3	4	5	6	7	8	9
1	INDICE CONTENUTI										
	CONTENT INDEX										
2	INDICE CONTENUTI										
	CONTENT INDEX										
3	LEGENDA SIMBOLI										
	SYMBOL KEY										
4	ALIMENTAZIONE										
	POWER SUPPLY										
5	ALIMENTAZIONE MOTORI										
	MOTOR POWER SUPPLY										
6	ALIMENTAZIONE MOTORI										
	MOTOR POWER SUPPLY										
7	ALIMENTAZIONE TRASFORMATORI										
	TRANSFORMER POWER SUPPLY										
8	ALIMENTAZIONE AUSILIARI										
	AUXILIARY CIRCUIT POWER SUPPLY										
9	EMERGENZA E PRESSOSTATO										
	EMERGENCY AND PRESSURE SWITCH										
10	MEP30										
	MEP30										
11	LISTA INPUT/OUTPUT										
	INPUT/OUTPUT LIST										
12	INGRESSI MEP30										
	MEP30 INPUTS										
13	INGRESSI MEP30										
	MEP30 INPUTS										
Note :											
				Dis. N. C350		Impianto		C350-2S 480V		Foglio	
				CAD		SPAC		Commissa		1	
				Nome File		C350-2S-480\1.DWG		Denominazione		SEGUE	
10	Sostituzione MEP30 con MEP30BR	06-10-2008	Bartoli	Data		07-10-2008		INDICE CONTENUTI		104	
REV.	MODIFICA	DATA	FIRME	Data		07-10-2008		CONTENT INDEX		Bartoli	

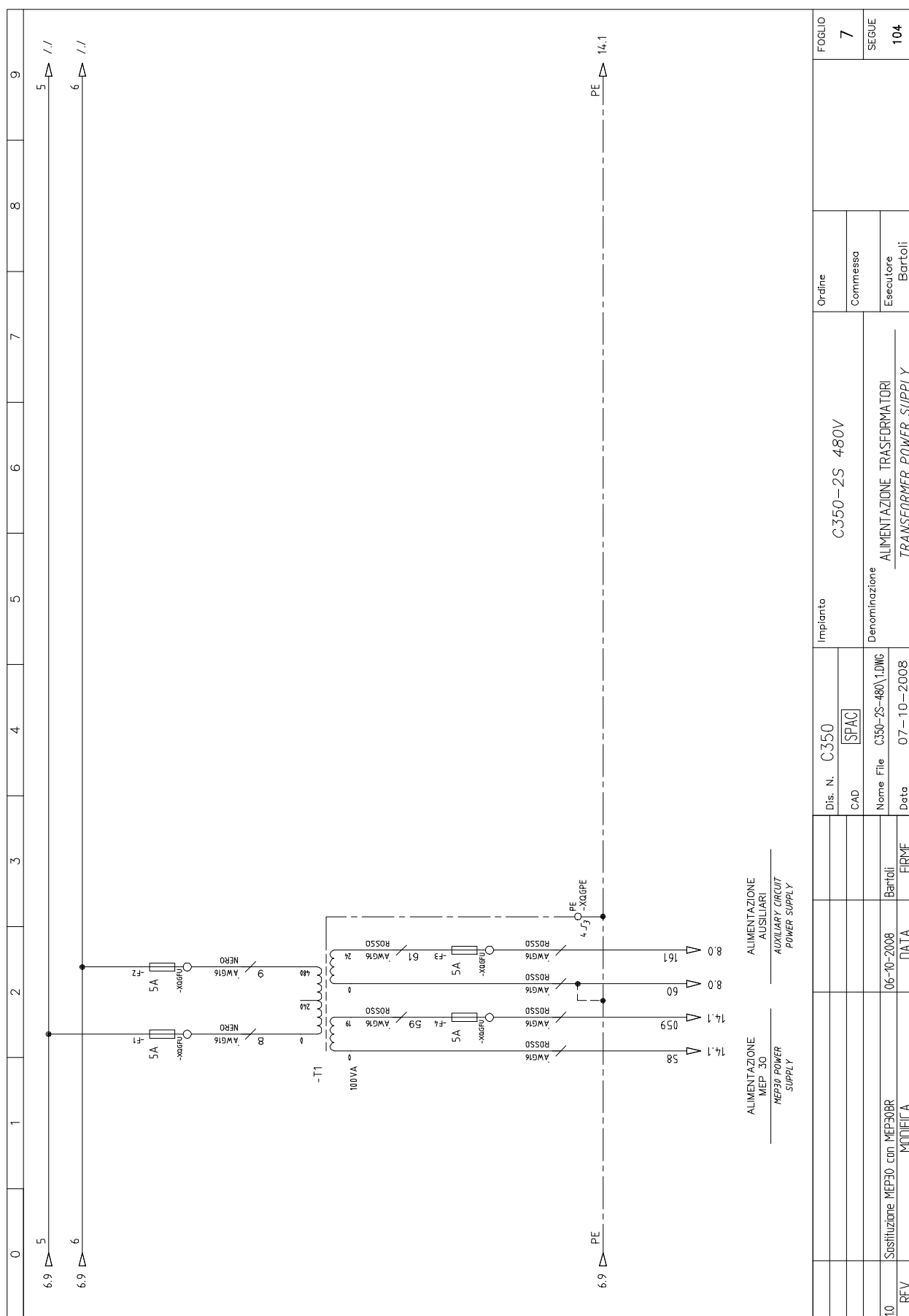
LISTA FOGLI / INDEX

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Sim.\Sym	File	Descrizione\Description		Sim.\Sym	File	Descrizione\Description		Sim.\Sym	File	Descrizione\Description
	M2	Motore asincrono trifase THREE-PHASE INDUCTION MOTOR			T1	Trasformatore di corrente CURRENT TRANSFORMER			BLK50	Guaina termorestringente Ø26mm SHEATH Ø26mm
	Q136D	Int. automatico magnetotermico sezionatore tripolare THREE-PHASE AUTOMATIC SWITCH			Y1	Elettrovalvola aperta (in chiusura) SOLENOID VALVE			BLK57	Guaina termorestringente Ø10mm SHEATH Ø10mm
	R6	Potenziometro POTENTIOMETER			KA1	Bobina rele' Aux AUXILIARY RELAY COIL			BLK55	Flangia di passaggio LOOSE FLANGE
	R60	Potenziometro POTENTIOMETER			KM1	Bobina contattore CONTACTOR COIL			BLK56	Terminale a puntale TERMINAL
	S2	Comando a Pulsante NO PUSH BUTTON NO			BLK26	Connettore EV in AC SV AC CONNECTOR			BLK57	Filo unipolare WIRE
	S4C	Pulsante di emergenza NC EMERGENCY PUSH BUTTON NC			BLK41	Raccordo SX CONNECTOR SX			BLK58	Fascette plastiche di fissaggio CLAMP
	S5	Comando rotativo a due posizioni NO ROTARY SELECTOR TWO POSITION			BLK42	Raccordo DX CONNECTOR DX			BLK60	Terminale a occhio TERMINAL
	S7	Comando a pedale NO CONTROL PEDAL NO			BLK43	Tubo corrugato CORRUGATED PIPE			BLK66	Sacchetto portafusibile BAG FUSE
	S8	Comandato dalla pressione (pressostato) NO PRESSURE SWITCH			BLK44	Riduzione PG PG ADAPTER				
	S15C	Comandato dal livello di un fluido (livellostato) NC WATER GAUGE NC			BLK51	Dado PG NUT PG				
	S24C	Pulsante di emergenza a posizione stabile NC EMERGENCY PUSH BUTTON NC			BLK49	Pressa-cordone PG FAIR LEAD				



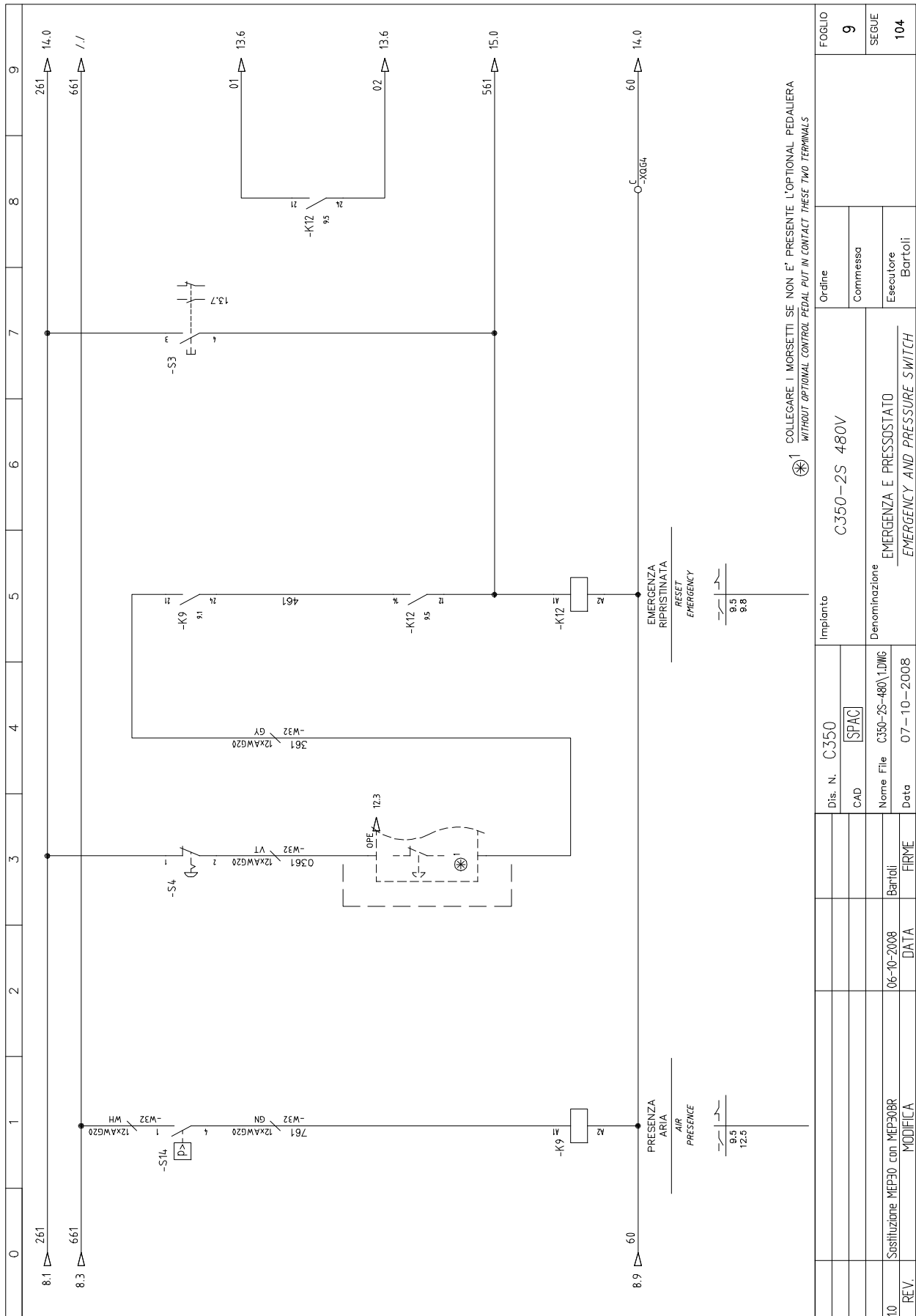


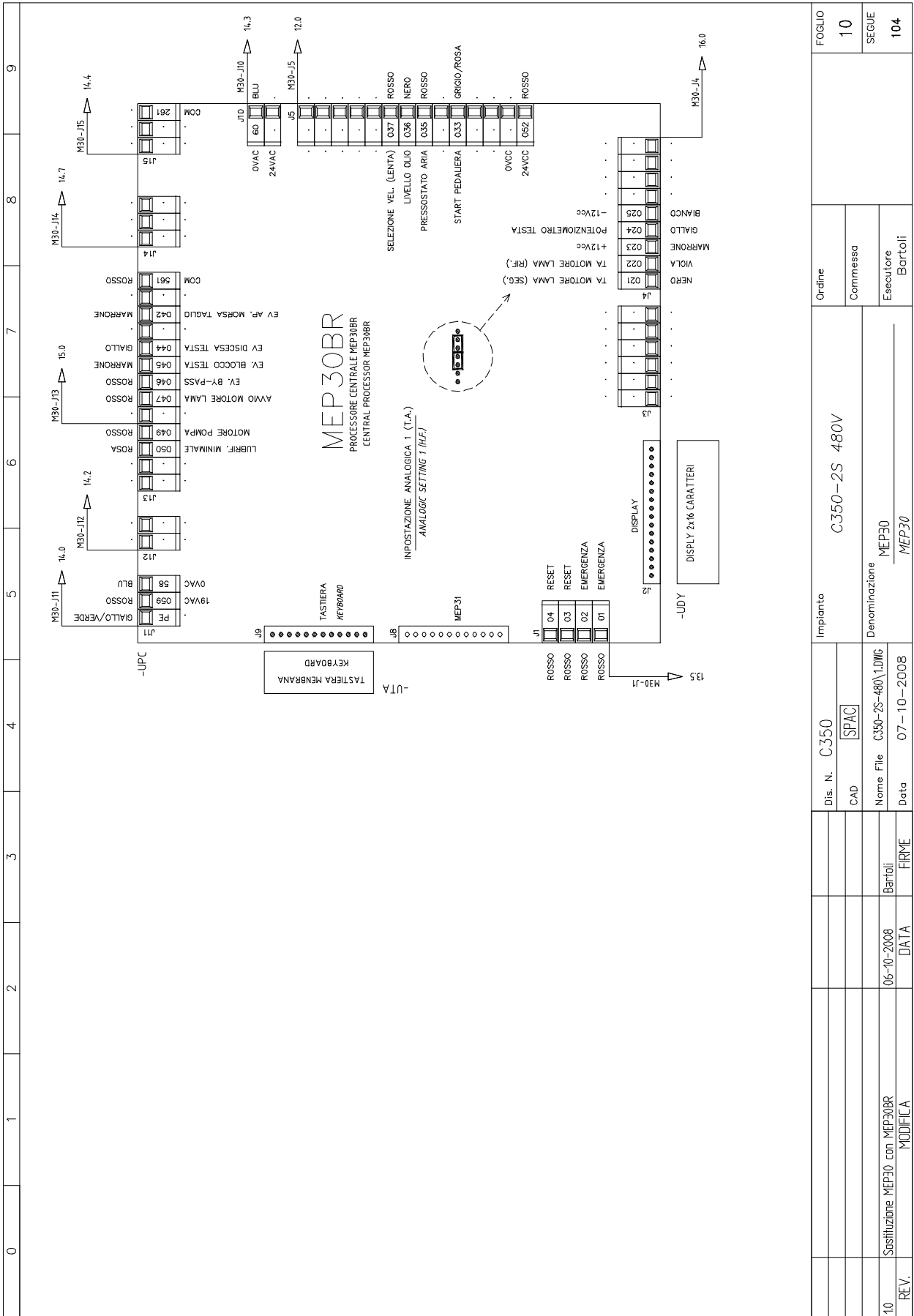












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J1 4PIN

EMERGENZA/RESET

EMERGENCY/RESET

ROSSO

RED

01

EMERGENZA

EMERGENCY

ROSSO

RED

02

EMERGENZA

EMERGENCY

ROSSO

RED

03

RESET

RESET

ROSSO

RED

04

RESET

RESET

J2 16PIN

DISPLAY

DISPLAY

J4 9PIN

INGRESSI ANALOGICI

ANALOG INPUT

ROSSO

RED

021

TA. MOTORE LAMA. (SEG.)

BLADE MOTOR HF (SEG)

ROSSO

RED

022

TA. MOTORE LAMA. (RIF.)

BLADE MOTOR HF (RIF.)

MARRONE

BROWN

023

ALIMENTAZIONE POT.(+12V)

POT. POWER SUPPLY (+ 12 V)

GIALLO

YELLOW

024

POTENZIOMETRO TESTA

HEAD POTENTIOMETER

BIANCO

WHITE

025

ALIMENTAZIONE POT. (0V)

POT. POWER SUPPLY (0 V)

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J5 14PIN

INGRESSI DIGITALI MEP. 30

MEP 30 DIGITAL INPUTS

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033

GRIGIO/ROSA

START DA PEDALIERA

GREY/PINK

START BY PEDAL CONTROL

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NC

NC

035

ROSSO

PRESSOSTATO ARIA

RED

AIR PRESSURE SWITCH

NERO

BLACK

036

LIVELLO OLIO

OIL LEVEL

ROSSO

RED

037

SELEZ. VELOCITA

SPEED SELECTION

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J8 12PIN

MEP 31

MEP31

TASTIERA

KEYBOARD

J10 2PIN

ALIMENTAZIONE USCITE

OUTPUT POWER SUPPLY

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J5 14PIN

INGRESSI DIGITALI MEP. 30

MEP 30 DIGITAL INPUTS

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GRIGIO/ROSA

START DA PEDALIERA

GREY/PINK

START BY PEDAL CONTROL

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ROSSO

PRESSOSTATO ARIA

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AIR PRESSURE SWITCH

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LIVELLO OLIO

OIL LEVEL

ROSSO

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SELEZ. VELOCITA

SPEED SELECTION

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MEP 31

MEP31

TASTIERA

KEYBOARD

J10 2PIN

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OUTPUT POWER SUPPLY

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INGRESSI DIGITALI MEP. 30

MEP 30 DIGITAL INPUTS

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SPEED SELECTION

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ROSSO

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SPEED SELECTION

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GRIGIO/ROSA

START DA PEDALIERA

GREY/PINK

START BY PEDAL CONTROL

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ROSSO

PRESSOSTATO ARIA

RED

AIR PRESSURE SWITCH

NERO

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LIVELLO OLIO

OIL LEVEL

ROSSO

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SELEZ. VELOCITA

SPEED SELECTION

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TASTIERA

KEYBOARD

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OUTPUT POWER SUPPLY

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J5 14PIN

INGRESSI DIGITALI MEP. 30

MEP 30 DIGITAL INPUTS

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OIL LEVEL

ROSSO

RED

037

SELEZ. VELOCITA

SPEED SELECTION

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J8 12PIN

MEP 31

MEP31

TASTIERA

KEYBOARD

J10 2PIN

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OUTPUT POWER SUPPLY

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J5 14PIN

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MEP 30 DIGITAL INPUTS

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SPEED SELECTION

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24VCC

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037

SELEZ. VELOCITA

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ALIMENTAZIONE USCITE

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SELEZ. VELOCITA

SPEED SELECTION

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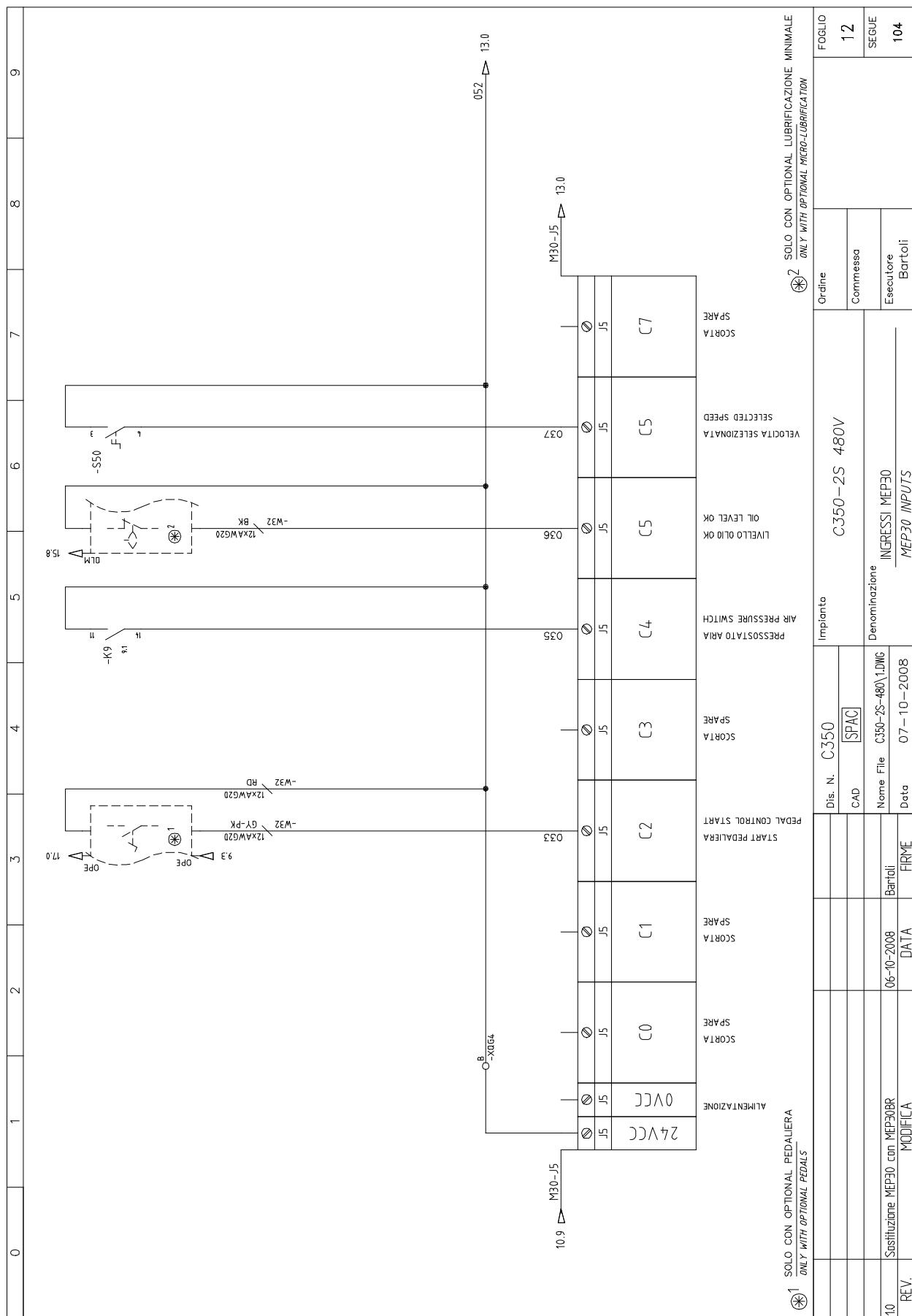
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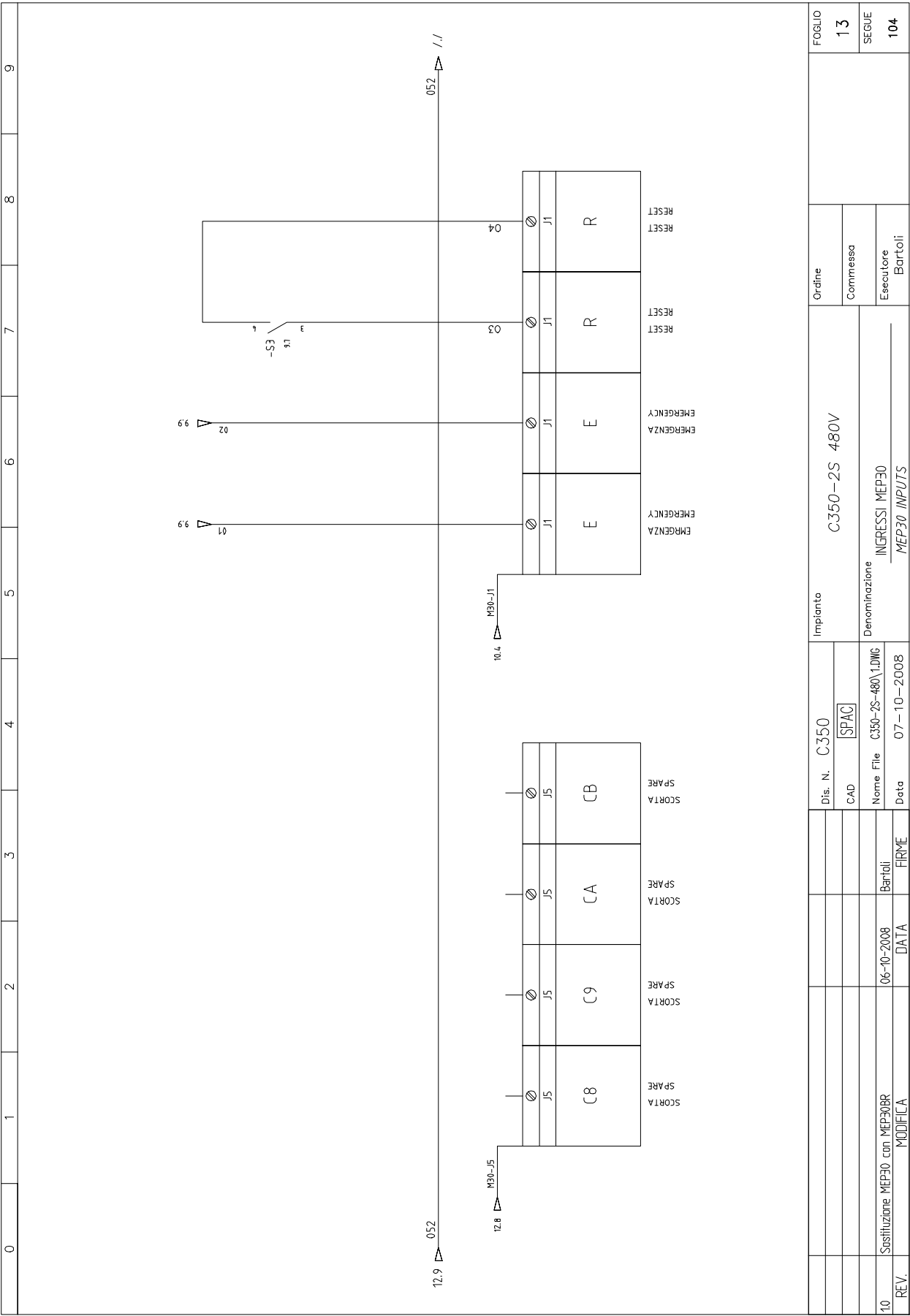
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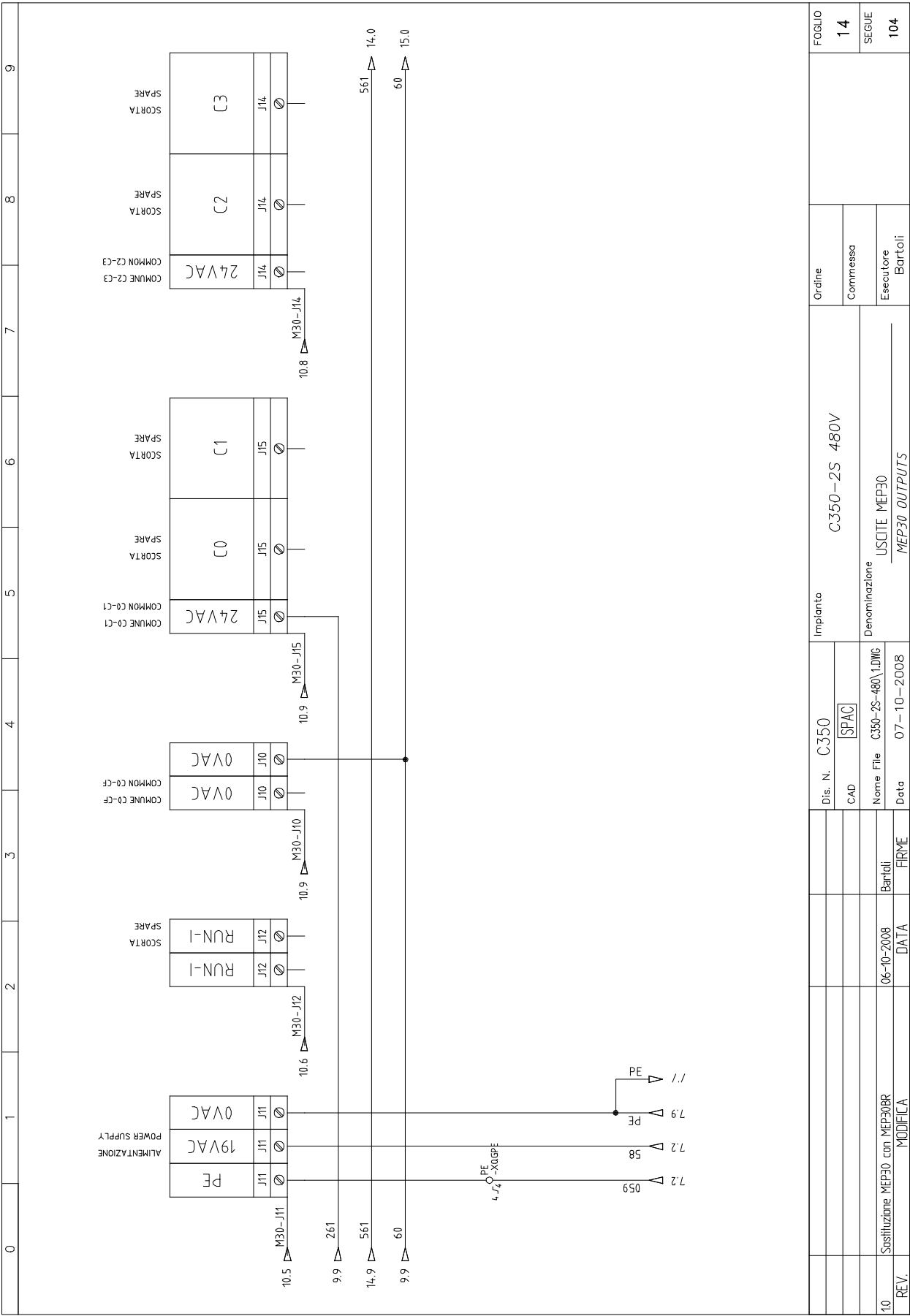
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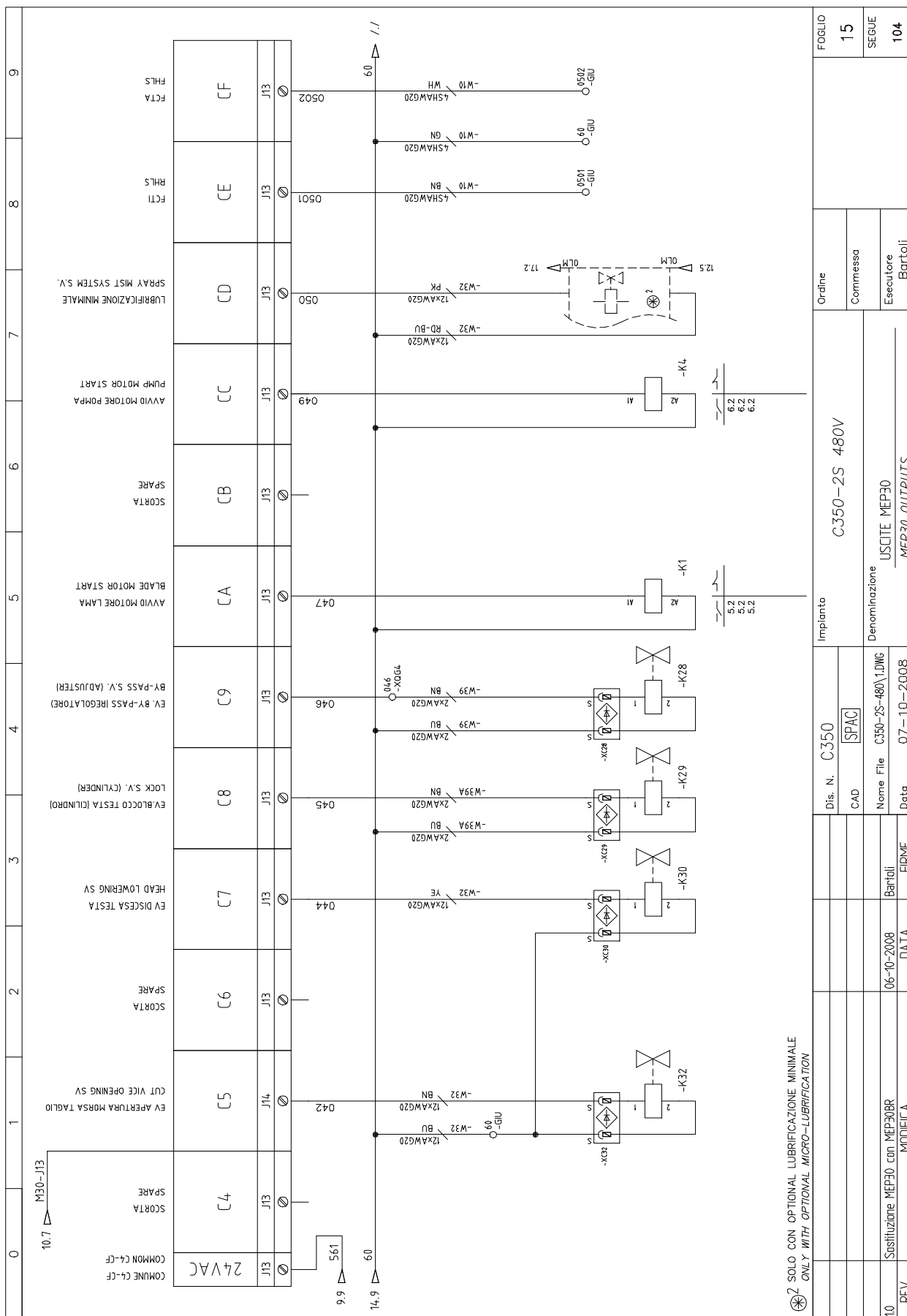
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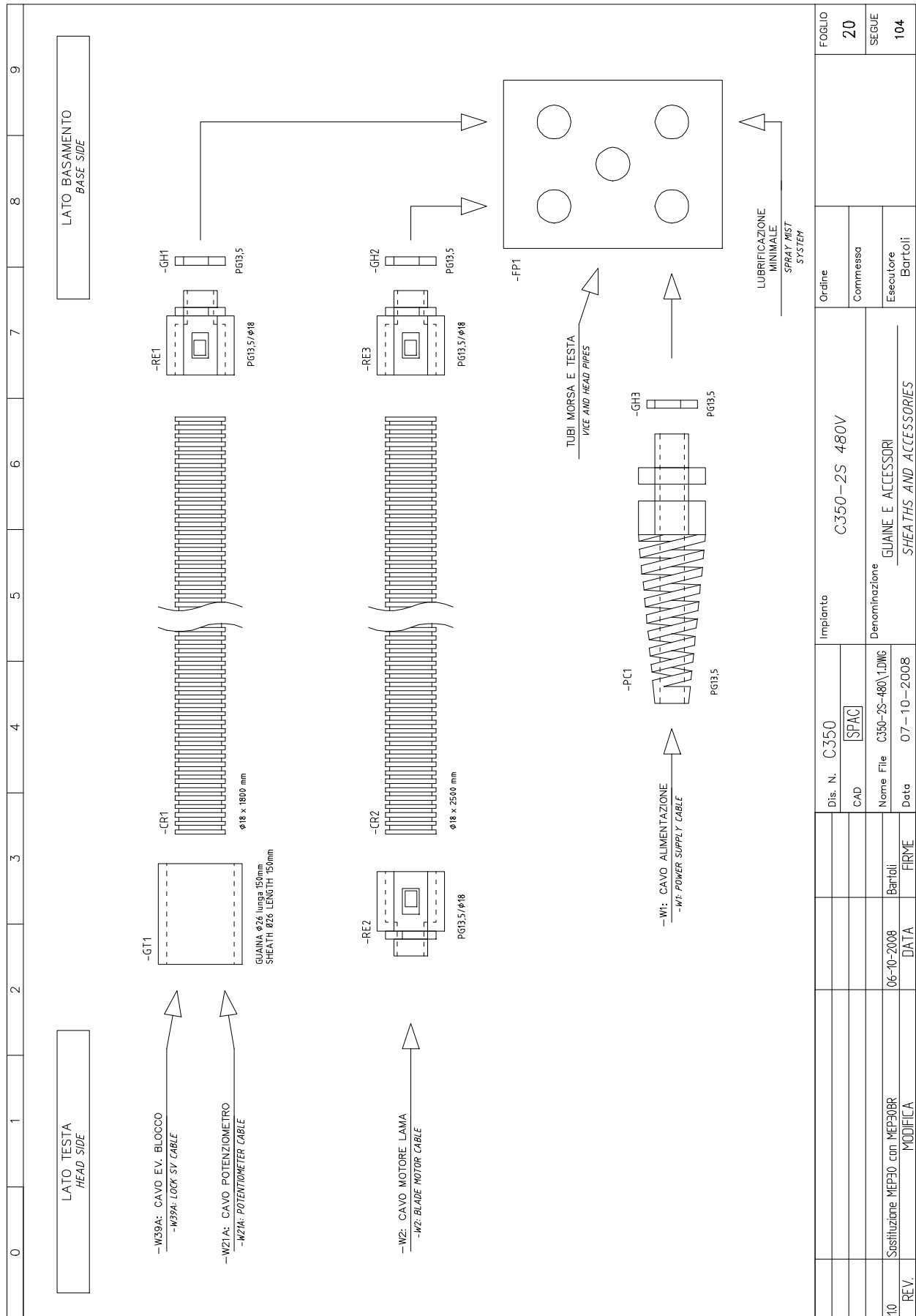


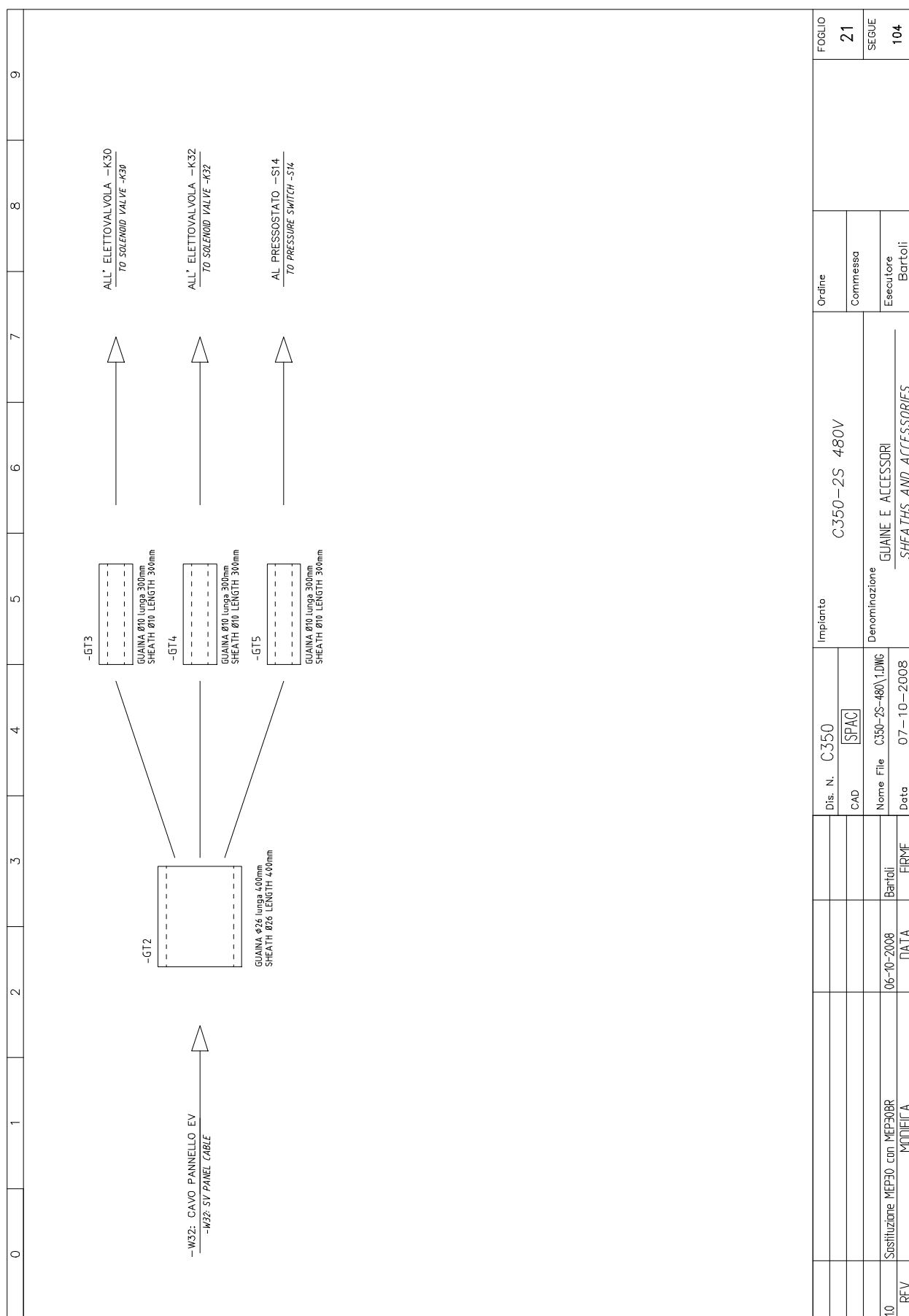


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				Dis. N.	C350		Impianto		C350-2S 480V	Ordine						
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				Nome File	C350-2S-480\1.DWG		Denominazione		OPTIONAL	Esecutore						
				Data	07-10-2008				OPTIONAL	Bartoli						
10	Sostituzione MEP30 con MEP30BR			06-10-2008	Bartoli		FIRME									
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CAVI ESTERNI \ EXTERNAL CABLES

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CAVI ESTERNI \ EXTERNAL CABLES											
QUADRO \ BOARD			ID SUL CAVO ID IN CABLE				DESTINAZIONE \ LOCATION				
QUADRO BOARD	FOGLIO SHEET	NR. MORSETTO TERMINAL NO.	NR. FILO CONDUCTOR NO.	CAVO CABLE	LUNGHEZZA LENGHT [ mt ]	DISTURBO NOISE LEVEL	ID SUL CAVO ID IN CABLE	NR. FILO CONDUCTOR NO.	NR. MORSETTO TERMINAL NO.	FOGLIO SHEET	QUADRO BOARD
C4 =QgCv -XQG4	14/6	J15	045	-W39A 022.0160 2xAWG20 Cavo coll. EV blocco	4,5Mt		BN	045		14/6	=BmCv
	9/8	C	60				BU	60	14/5	=BmCv	
=QgCv -K4 =QgCv -K4	6/2	2	34	-W4B 022.1904 3GAWG16 Cavo aliment. elettropompa	4Mt		BN	34		6/2	=BmMep -M2
	6/2	4	21				BK	21	400	6/2	=BmMep -M2
=QgCv -XQGE	6/3	4_1	PE				GY				
							GNYE	PE	PE	6/3	=BmMep -M2
=BmCv -XS5 =BmCv -XS5	16/3	1	023	-W21A 022.0141 4SHAWG20 Cavo coll. potenziometro testa	5Mt		BN	023			AN2
	16/3	2	024				YE	024	J3	16/3	AN2
=BmCv -XS5	16/3	3	025				WH	025			AN2
							GN		J3	16/4	

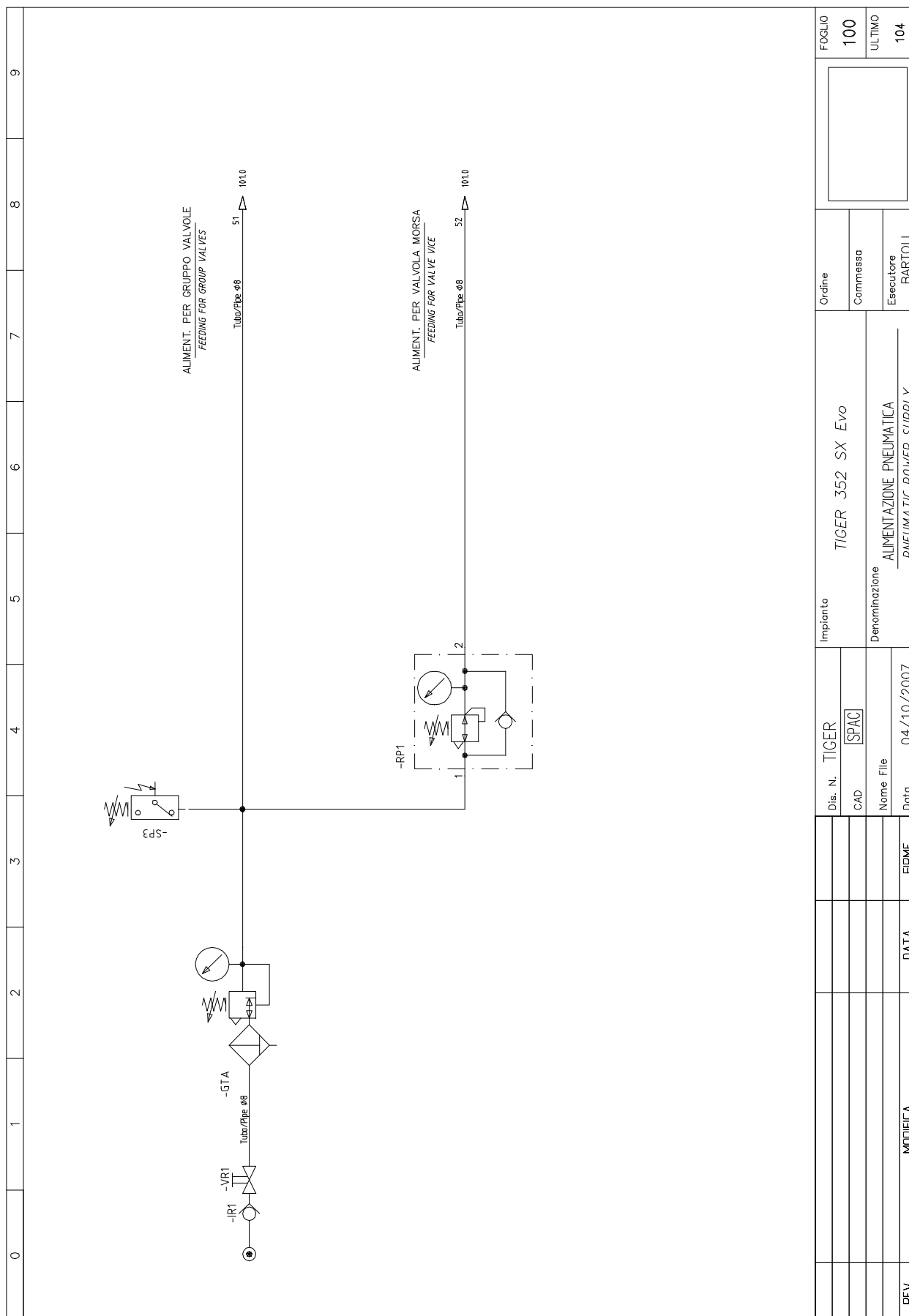


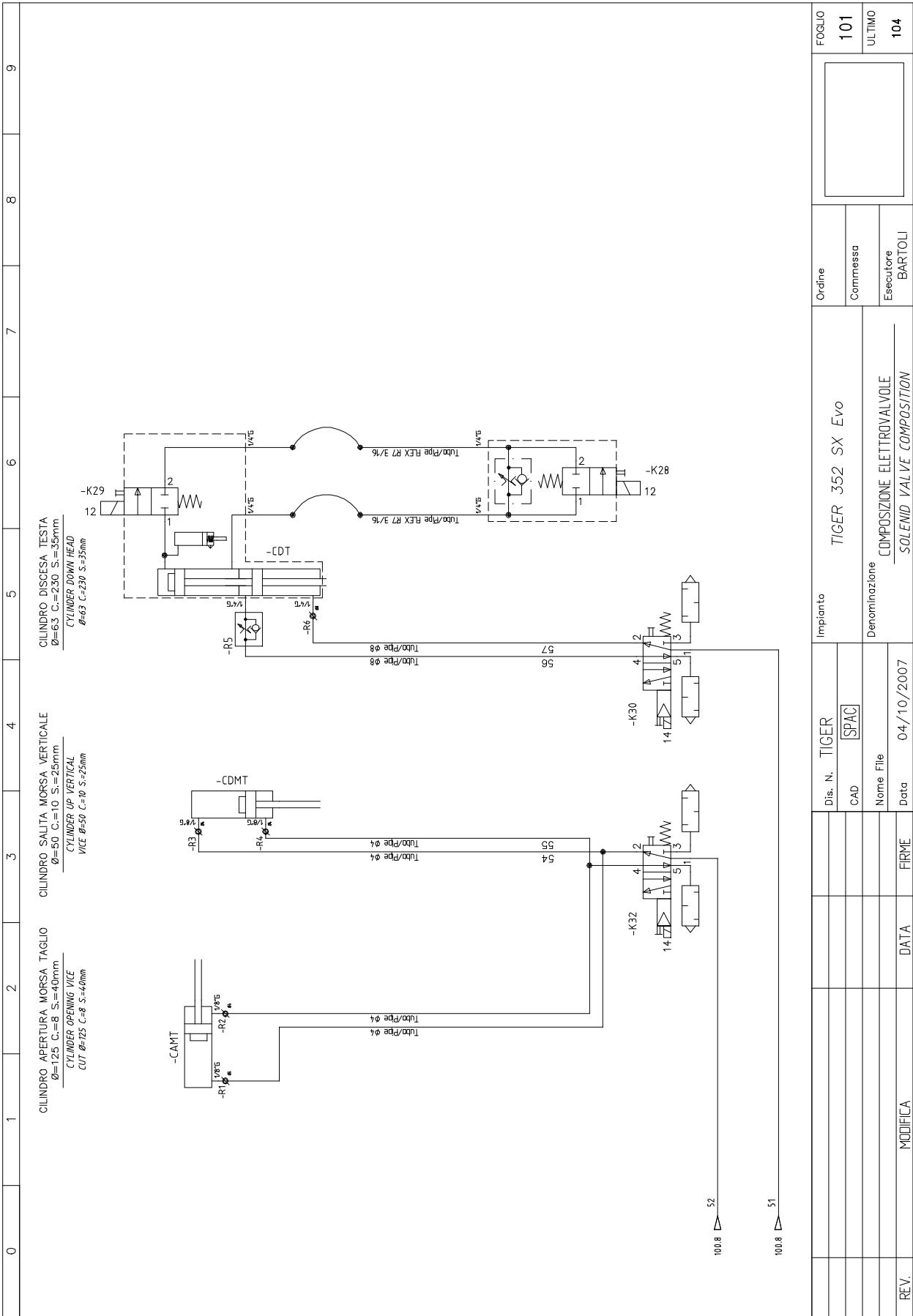
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'-GT2		'=BmCv							
'-GT3	'022.0181	Guaina termoretraibile 26mm							
'-GT4		'=BmCv							
'-GT5		Guaina termoretraibile 10mm							
'-GT6		'=BmCv							
'-GT7		Guaina termoretraibile 10mm							
'-GT8		'=BmCv							
'-RE2	'022.0211	Raccordo rapido dritto SEM PG13,5/Ø19							
'-RE3		'=BmCv							
'-RE1		Raccordo rapido dritto SEM PG13,5/Ø19							
'-PC1	'022.0234	Pressacordone 3246 nero PG13,5							
'-GH1	'022.0244	Dado grigio PG13,5							
'-GH2		'=BmCv							
'-GH3		Dado grigio PG13,5							
'-XS5	'022.0378	Connettore AC 3 poli per valvola DC							
'-R5	'022.1801	Potenziometro lineare corsa 250mm							
'-CR1	'022.2602	Guaina POLIFLEX NW 14-1200143 (corrugato diam. 18)							
'-CR2		'=BmCv							
'-EP1	V.d.M.	Flangia passaggio cavi TI372SxEvo							
'-OLM	'090.1601	Gruppo lubrificazione mininale SHARK							
'-M1	'019.1904	Motore KW 2,6/1,84 3K112MB8/4 B14 V. 380							
'-M2	'028.0270	Elettropompa EZ/C monofase 230/400V 50/60Hz							
'-S14	V.d.P.	Vedi distinta pneumatica							
'-OPE	'090.0672	Comando supplementare a pedaliera							
'-K32	V.d.P.	Vedi distinta pneumatica							
'-K30		'=PpCv							
'-K29		Vedi distinta pneumatica							
'-K28		'=PpCv							
'-QD1	'016.0722	Carpenteria quadro TI372 SX Evo							
'-F51	'019.5353	Fascetta in plastica 135x2,5							
'-T0	'022.0069	Trasformatore amperometrico 500/1A							
'-Q0	'022.0124	Custodia isolante E-PKZ0-GR con manopola rossa							
'-Q0	'022.0125	Blocco lucettabile SBV-PKZ0-E cod.35127							
'-Q0	'022.0126	Barretta per neutro N-PKZ0 cod. 82160							
'-FL1	'022.0171	Condirella unipolare 1 X 0,5							
'-FL2	'022.0172	Condirella unipolare 1x1,50							
'-NM1	'022.0290	Etichetta segnafile							
'-NM2		'=QgCv							
		C350-2S 480V							
		DISTINTA MATERIALI							
		MATERIAL LIST							
		FOGLIO							
		24							
		SEGUE							
		104							
10	Sostituzione MEP30 con MEP30BR MODIFICA	06-10-2008	Bartoli	Nome File	C350-2S-480\1.DWG				
REV.		DATA	FIRME	Data	07-10-2008				

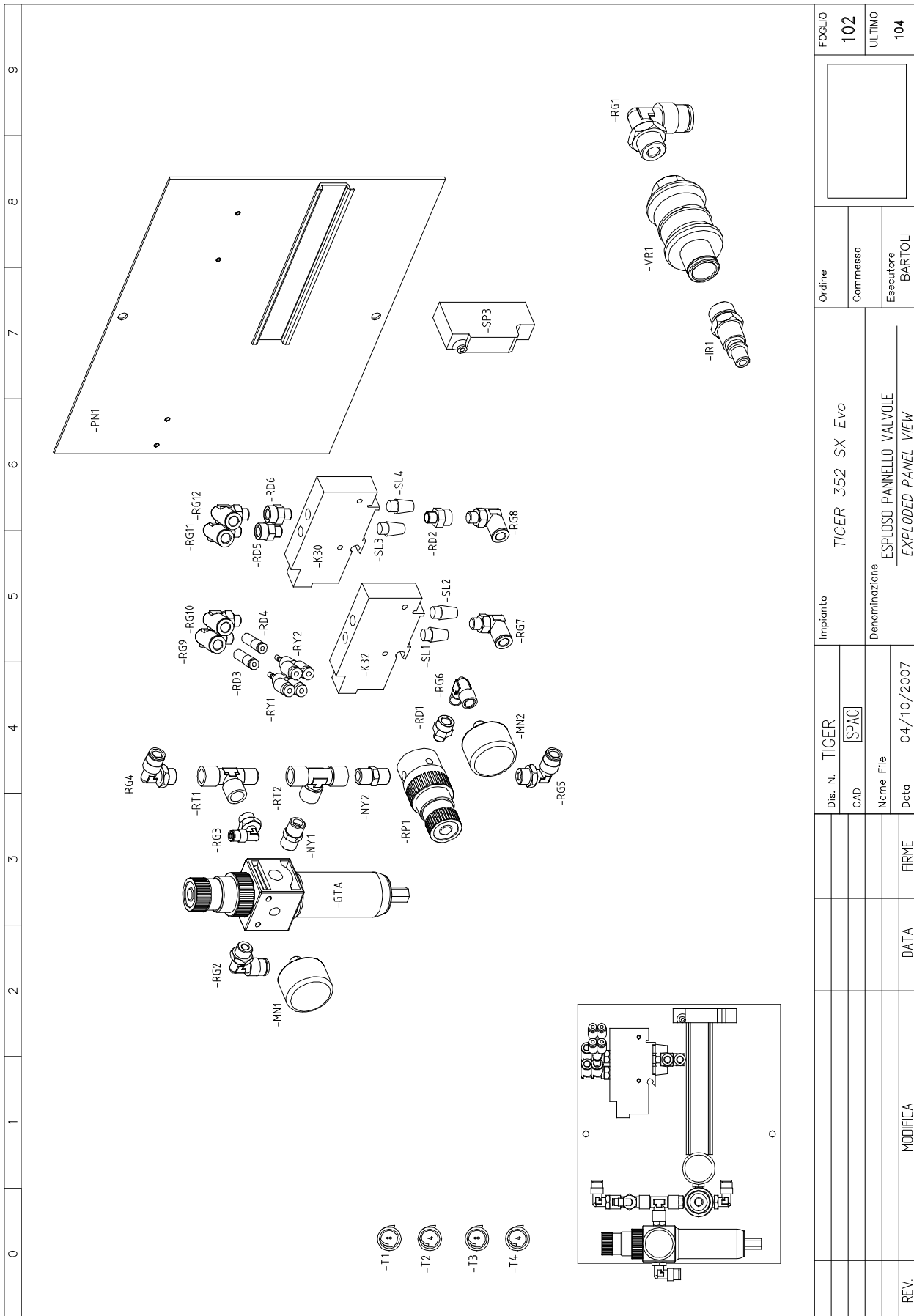
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NOME/ITEM		TIPO/TYPE		DESCRIZIONE/DESCRIPTION			QUADRO/BOARD			FG/SH	Q.TA/Q.TY
'-UTA		'031.2030		Consolle di programmazione SX EVO			'=QgCv			10	1
'-TF1		'031.2622		Targa sostituzione fusibili			'=QgCv			19	1
'-SF1		'04.7.0182		Sacchetto porta fusibili			'=QgCv			19	1
TIPO/TYPE		DESCRIZIONE/DESCRIPTION			FORMAZ./FORMAT.			LUNGH./LENGHT			
'022.0141		Cavo schermato 4x0,5			4SH0.5			9.50			
'022.0154		Cavo 7x1.5mmq			7G15			5.00			
'022.0158		Cavo 5x1.5mmq			5G15			4.50			
'022.0160		Cavo 2x0.5mmq			2x0.5			6.00			
'022.0161		Cavo 12x0.50mmq			12x0.5			5.00			
'022.1904		Cavo 3x0.75mmq			3G0.75			4.00			

### Pneumatic diagram





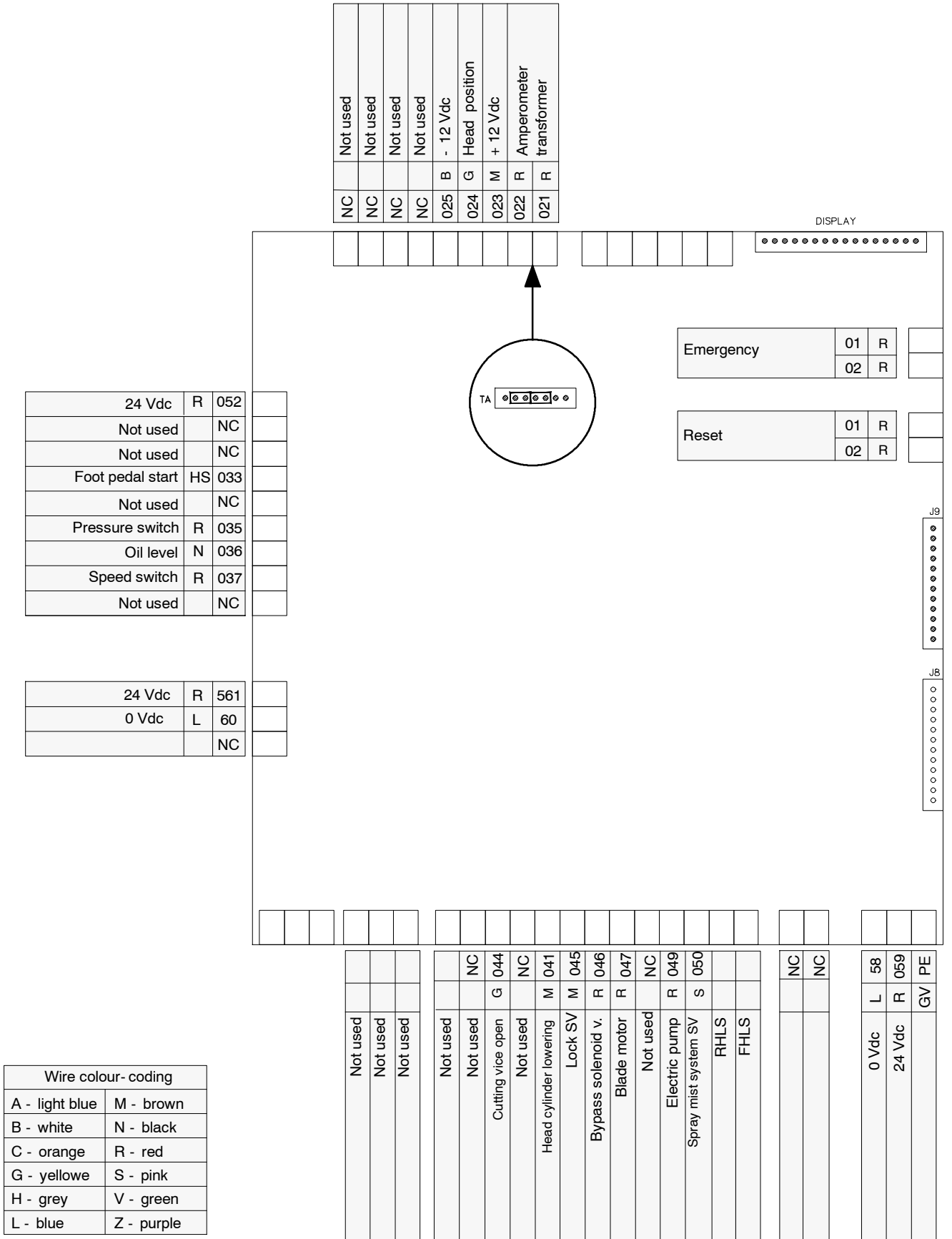


0	1	2	3	4	5	6	7	8	9
NOVE/ITEM	TIPO/TYPE	DESCRIZIONE/DESCRIPTION							
'-R1	'04.3.0199	Raccordo a gomito da 1/8"G a Ø4mm							
'-R2		Raccordo a gomito da 1/8"G a Ø4mm							
'-R3		Raccordo a gomito da 1/8"G a Ø4mm							
'-R4		Raccordo a gomito da 1/8"G a Ø4mm							
'-RG1	'04.3.0204	Raccordo a gomito da 1/4"G a Ø8mm							
'-R6		Raccordo a gomito da 1/4"G a Ø8mm							
'-IR1	'04.3.0290	Innesto rapido ghiozzo 1/4"G 13/A							
'-T3	'04.3.0301	Tubo nilsan 8X6 NERO COD.17257181							
'-T4	'04.3.0302	Tubo nilsan 4X2.7 NERO C.17257162							
'-R5	'04.3.0453	Regolatore di flusso SCU 606 da 1/4"G							
'-VR1	'04.3.0601	Valvola VMS 114-1/4 08							
'-PN1	'034.0747	Pannello pneumatico TI-CB-SX-NC con barra omega							
'-SP3	'04.3.0143	Pressostato pneumatico montag. barra PSIP1091 Parker							
'-RG3	'04.3.0198	Raccordo a gomito da 1/4"G a Ø4mm							
'-RG2	'04.3.0204	Raccordo a gomito da 1/4"G a Ø8mm							
'-RG4		Raccordo a gomito da 1/4"G a Ø8mm							
'-RG5		Raccordo a gomito da 1/4"G a Ø8mm							
'-RG7	'04.3.0208	Raccordo a gomito da 1/8"G a Ø8mm							
'-RG8		Raccordo a gomito da 1/8"G a Ø8mm							
'-RG9		Raccordo a gomito da 1/8"G a Ø8mm							
'-RG10		Raccordo a gomito da 1/8"G a Ø8mm							
'-RG11		Raccordo a gomito da 1/8"G a Ø8mm							
'-RG12		Raccordo a gomito da 1/8"G a Ø8mm							
'-RT2	'04.3.0216	Raccordo a "T" FFF da 1/4"G							
'-RT1	'04.3.0219	Raccordo a "T" MFF da 1/4"G							
'-RD3	'04.3.0225	Riduzione M/F da tubo Ø8/Ø4mm							
'-RD4		Riduzione M/F da tubo Ø8/Ø4mm							
'-RD1	'04.3.0231	Riduzione diritta M/F da 1/8"G							
'-RD2		Riduzione diritta M/F da 1/8"G							
'-RD5		Riduzione diritta M/F da 1/8"G							
'-RD6		Riduzione diritta M/F da 1/8"G							
'-RY1	'04.3.0235	Giunto a "Y" Ø4mm							
'-RY2		Giunto a "Y" Ø4mm							
'-RG6	'04.3.0251	Riduzione gomito M/F da 1/8"G							
'-NY1	'04.3.0275	Nipplo da 1/4"G							
REV.	MODIFICA	DATA	FIRME						
				Impianto		TIGER		TIGER 352 SX Evo	
				Dis. N.		CAD		SPAC	
				Denominazione		DISTINTA MATERIALE PNEUMATICO		PNEUMATIC MATERIAL LIST	
				Nome File		Data		04/10/2007	
				Ordine		Commessa		Esecutore	
								BARTOLI	
				Foglio		103		ULTIMO	
								104	

[illegible]



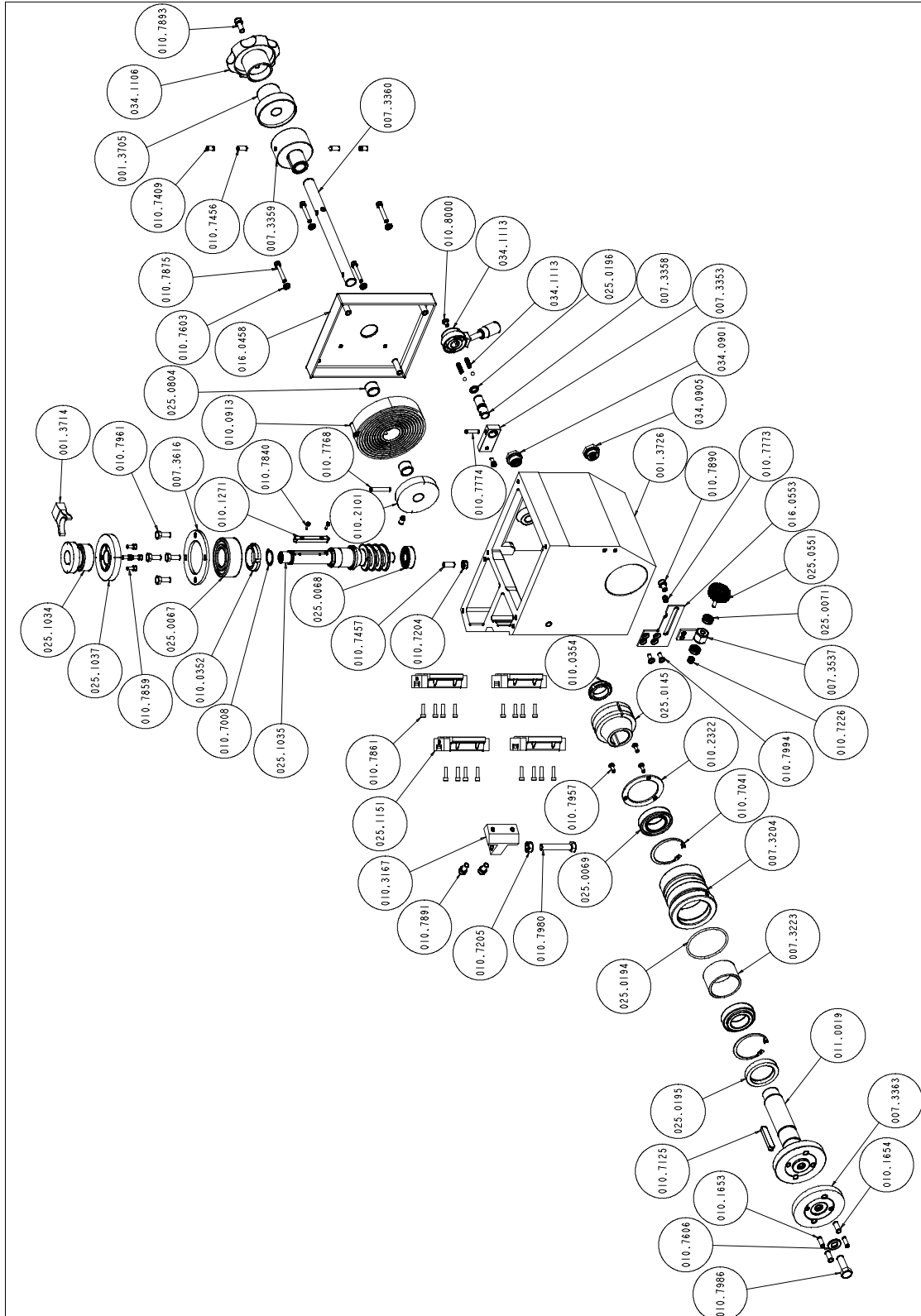
## IUD/IUV card



## Exploded views

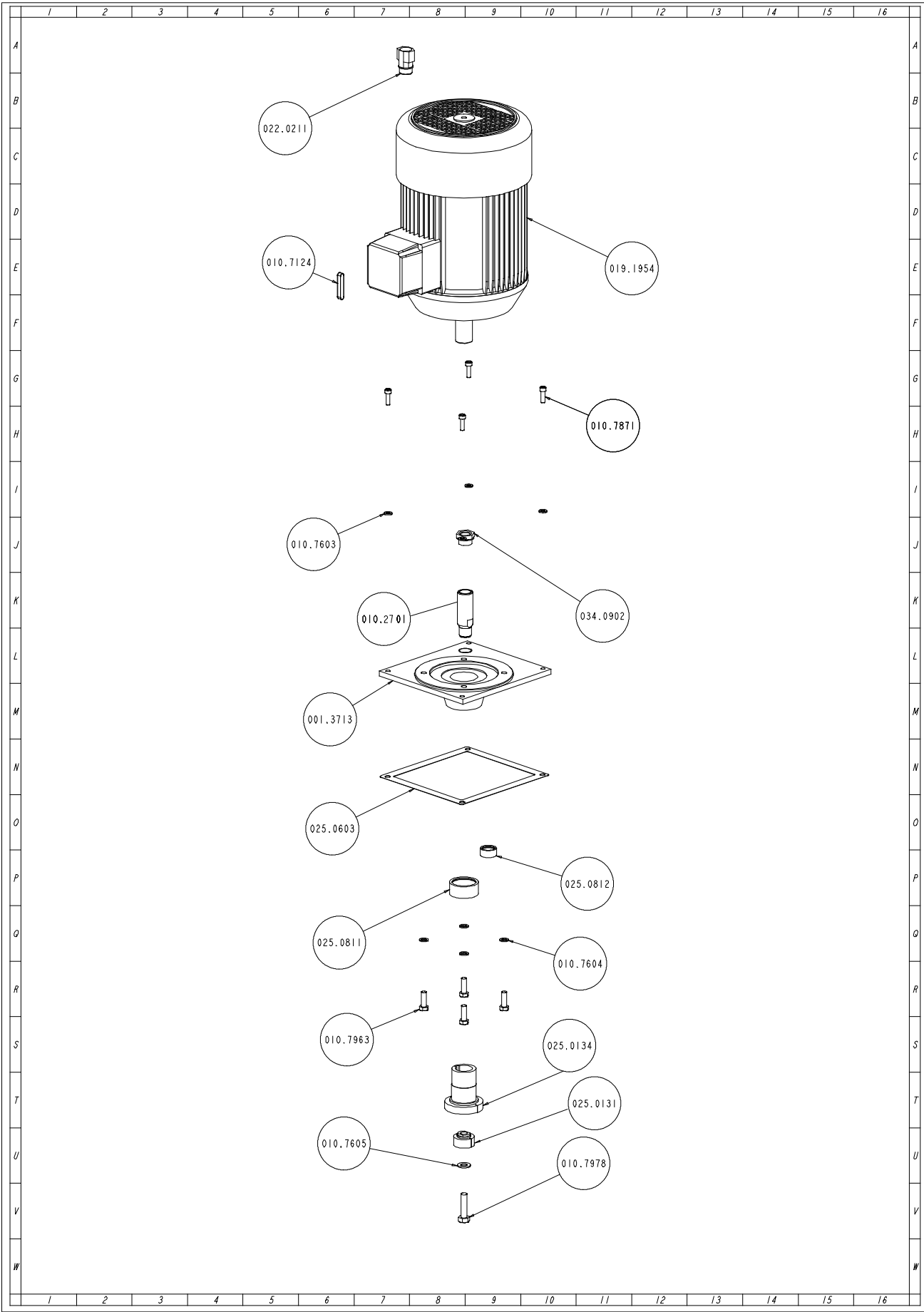
This part of the manual contains detailed exploded views of the machine which can help to gain a deeper knowledge of how it is made.

### Head unit



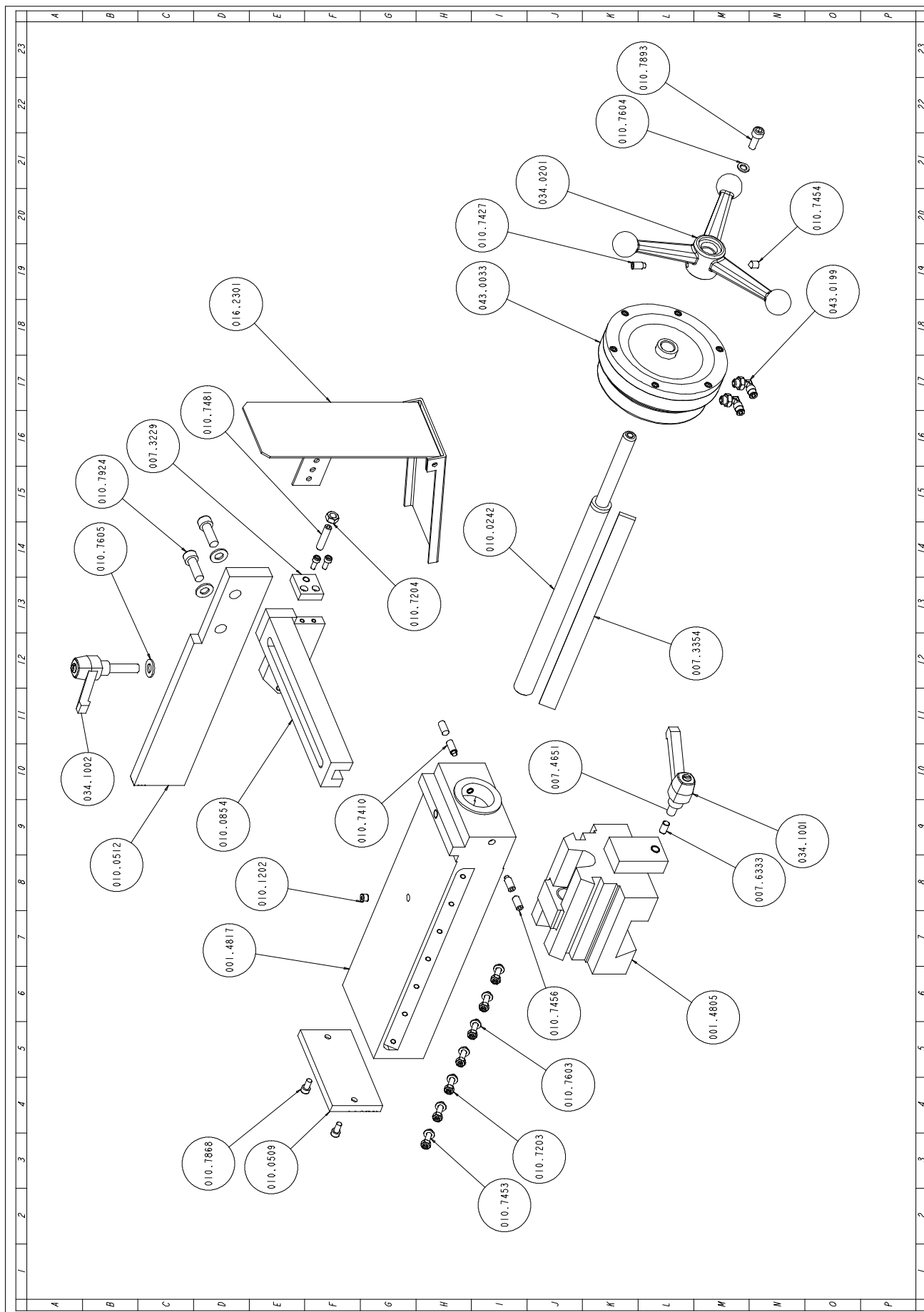
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001.3705	SUPPORTO VOLANTINO	NR	1,000
001.3714	FORCELLA CAMBIO	NR	1,000
001.3726	.TESTA OPERATRICE TI 352 4 VEL	NR	1,000
007.3204	TAMPONE CUSCINETTI	NR	1,000
007.3223	ANELLO DISTANZIALE CUSCINETTO	NR	1,000
007.3353	PIASTRINO COMANDO CAMBIO	NR	1,000
007.3358	PERNO LEVA CAMBIO	NR	1,000
007.3359	BOCCOLA RIPRESA CORSA	NR	1,000
007.3360	ALBERO MOVIMENTO TESTA	NR	1,000
007.3363	FLANGIA ESTERNA TI 350 - 370	NR	1,000
007.3537	PIASTRINO PULILAMA TI	NR	1,000
007.3616	GHIERA FIX CUSCINETTO	NR	1,000
010.0352	GHIERA AUTOBLOCCANTE 35X1,5	NR	1,000
010.0354	GHIERA AUTOBLOCCANTE 30X1,5	NR	1,000
010.0913	MOLLA SOLLEVAMENTO TESTA	NR	1,000
010.1271	LINGUETTA 8X7X70 FORATA TI 350	NR	1,000
010.1653	PERNO FLANGIA	NR	2,000
010.1654	PERNO FLANGIA	NR	2,000
010.2101	RUOTA SOLLEVAMENTO TESTA	NR	1,000
010.2322	FLANGIA BLOCCAGGIO CUSCINETTI	NR	1,000
010.3167	BATTUTA FINE CORSA TESTA IN BA	NR	1,000
010.7008	ANELLO SEEGER DIAM. 25	NR	1,000
010.7041	ANELLO SEEGER PER FORI DIAM. 6	NR	2,000
010.7125	CHIAVETTA 10 X 8 X 56	NR	1,000
010.7204	DADO M8	NR	1,000
010.7205	DADO M10	NR	1,000
010.7226	DADO AUTOBLOCCANTE M6	NR	1,000
010.7409	GRANO VCE P.CIL. 8 X 10	NR	3,000
010.7456	GRANO VCE P.CON. 8 X 16	NR	2,000
010.7457	GRANO VCE P.CON. 8 X 20	NR	1,000
010.7603	RONDELLA DIAM. 6	NR	4,000
010.7606	RONDELLA DIAM. 12	NR	1,000
010.7768	SPINA ELASTICA DIAM. 6 X 40	NR	1,000
010.7773	SPINA ELASTICA DIAM. 8 X 10	NR	1,000
010.7774	SPINA ELASTICA DIAM. 6 X 26	NR	1,000
010.7859	VITE TCEI 5 X 12	NR	5,000
010.7861	VITE TCEI 5 X 20	NR	16,000
010.7875	VITE TCEI 6 X 40	NR	4,000
010.7890	VITE TCEI 8 X 12	NR	1,000
010.7891	VITE TCEI 8 X 16	NR	2,000
010.7893	VITE TCEI 8 X 20	NR	1,000
010.7957	VITE TE 5 X 12	NR	3,000
010.7961	VITE TE 8 X 20	NR	4,000
010.7980	VITE TE 10 X 60	NR	1,000
010.7986	VITE TE 12 X 35	NR	1,000
010.7994	VITE TSPEI 6 X 12	NR	2,000
010.8000	VITE TSPEI 6 X 8	NR	1,000
011.0019	.ALBERO PORTADISCO TI 350 CEME	NR	1,000
016.0458	COPERCHIO MOLLA	NR	1,000
016.0553	GUIDA SPAZZOLA PULILAMA	NR	1,000
025.0067	CUSCINETTO 3207	NR	1,000
025.0068	CUSCINETTO 6203	NR	1,000
025.0069	CUSCINETTO 32007X	NR	2,000
025.0071	CUSCINETTO 626 2RS	NR	2,000
025.0145	CORONA ELICOIDALE DIS. 86.06.0	NR	1,000
025.0194	ANELLO DI TENUTA OR 176 VITON	NR	1,000
025.0195	ANELLO DI TENUTA 45X62X10 G VI	NR	1,000
025.0196	ANELLO DI TENUTA OR 3043 VITON	NR	1,000
025.0551	SPAZZOLA PULILAMA 6X25 030 GG4	NR	1,000
025.0804	BOCCOLA GRAFITATA L. 15 DIAM.	NR	2,000
025.1034	RUOTA DENTATA 43007/53 ALBERO	NR	1,000
025.1035	ALBERO VITE SENZA FINE 43003/5	NR	1,000
025.1037	RUOTA DENTATA 43005/53 ALBERO	NR	1,000
025.1151	PATTINO LGW20HAZ1C	NR	4,000
034.0901	TAPPO LIVELLO OLIO 1/2 "GAS.	NR	1,000
034.0905	TAPPO OLIO TAO/3 1/2" NERO	NR	1,000
034.1106	VOLANTINO DIAM.100 A 6 LOBI	NR	1,000
010.7840	VITE TCEI 3 X 10	NR	2,000
034.1113	VOLANTINO DI MANOVRA X TI350 4 VEL.	NR	2,000

Motor assembly



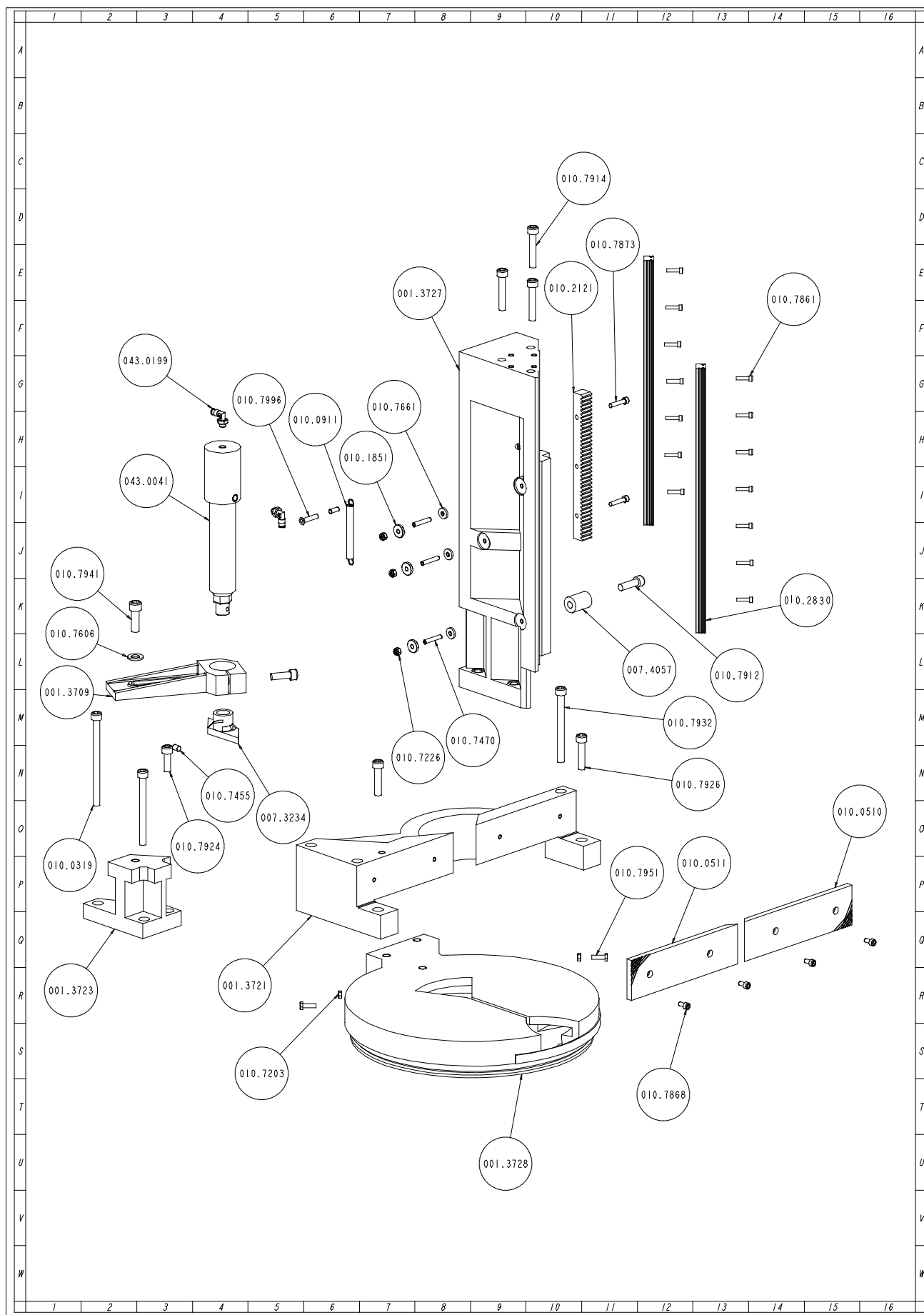
<b>Code</b>	<b>Description</b>	<b>U. of M.</b>	<b>Quantity</b>
001.3713	COPERCHIO SUPERIORE TESTA	NR	1,000
010.2701	PROLUNGA TAPPO OLIO	NR	1,000
010.7124	CHIAVETTA 8 X 7 X 45	NR	1,000
010.7603	RONDELLA DIAM. 6	NR	4,000
010.7604	RONDELLA DIAM. 8	NR	4,000
010.7605	RONDELLA DIAM. 10	NR	1,000
010.7871	VITE TCEI 6 X 20	NR	4,000
010.7963	VITE TE 8 X 25	NR	4,000
010.7978	VITE TE 10 X 40	NR	1,000
019.1954	KW 2,6/1,84 8/4P.C112 B.14 V.3	NR	1,000
022.0211	RACCORDO RAPIDO SEM PG 13,5	NR	1,000
025.0131	RUOTA DENTATA 43004/53 ALB. MO	NR	1,000
025.0134	RUOTA DENTATA 43006/53 ALB.MOT	NR	1,000
025.0603	GUARNIZIONE TESTA 4 VEL.	NR	1,000
025.0811	BOCCOLA A RULLINI DHK 4020 HK	NR	1,000
025.0812	BOCCOLA A RULLINI DHK 2012 HK	NR	1,000
034.0902	TAPPO OLIO SFP 1/2" ROSSO	NR	1,000

## Vice



Code	Description	U. of M.	Quantity
001.4805	SUPPORTO MORSA M	NR	1,000
001.4817	SCORREVOLE MORSA TI 370 SX	NR	1,000
007.3229	TASSELLO X BATTUTA SCORR. ANTI	NR	1,000
007.3354	LARDONE MORSA	NR	1,000
007.6333	PERNO BLOCCAGGIO MORSA TI 370	NR	1,000
007.4651	GRANO BLOCCAGGIO PIANO ROTANTE	NR	1,000
010.0242	VITE MORSA	NR	1,000
010.0509	GANASCIA MORSA	NR	1,000
010.0512	GANASCIA ANTIBAVA	NR	1,000
010.0854	SUPPORTO SCORREVOLE GANASCIA A	NR	1,000
010.1202	OLIATORE A SFERA DIAM. 8	NR	1,000
010.7203	DADO M6	NR	7,000
010.7204	DADO M8	NR	1,000
010.7410	GRANO VCE P.CIL. 8 X 16	NR	2,000
010.7427	GRANO VCE P.CIL. 8 X 12	NR	1,000
010.7453	GRANO VCE P.CON. 6 X 30	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	2,000
010.7481	GRANO VCE PUNTA PIANA 8 X 35	NR	1,000
010.7491	GRANO VCE PUNTA PIANA 10 X 60	NR	1,000
010.7603	RONDELLA DIAM. 6	NR	7,000
010.7604	RONDELLA DIAM. 8	NR	1,000
010.7605	RONDELLA DIAM. 10	NR	3,000
010.7859	VITE TCEI 5 X 12	NR	6,000
010.7860	VITE TCEI 5 X 15	NR	6,000
010.7868	VITE TCEI 6 X 12	NR	2,000
010.7893	VITE TCEI 8 X 20	NR	3,000
010.7924	VITE TCEI 10 X 30	NR	2,000
010.9074	GRANO VCE PUNTA PIANA 10 X 20	NR	1,000
016.2301	RACCOGLITORE ACQUA MORSA TI 35	NR	1,000
025.0203	ANELLO TENUTA 35X25X7	NR	1,000
025.0452	RULLI 6X6 AISI 420	NR	1,000
034.0201	VOLANTINO MORSA GRANDE	NR	1,000
034.1001	LEVA A SCATTO 8 MA	NR	1,000
034.1002	LEVA A SCATTO 10 MA	NR	1,000
043.0033	CILINDRO VOLAMPRESS 125- 8	NR	1,000
043.0199	ATTACCO A GOMITO GIREV.4X1/8 C	NR	2,000

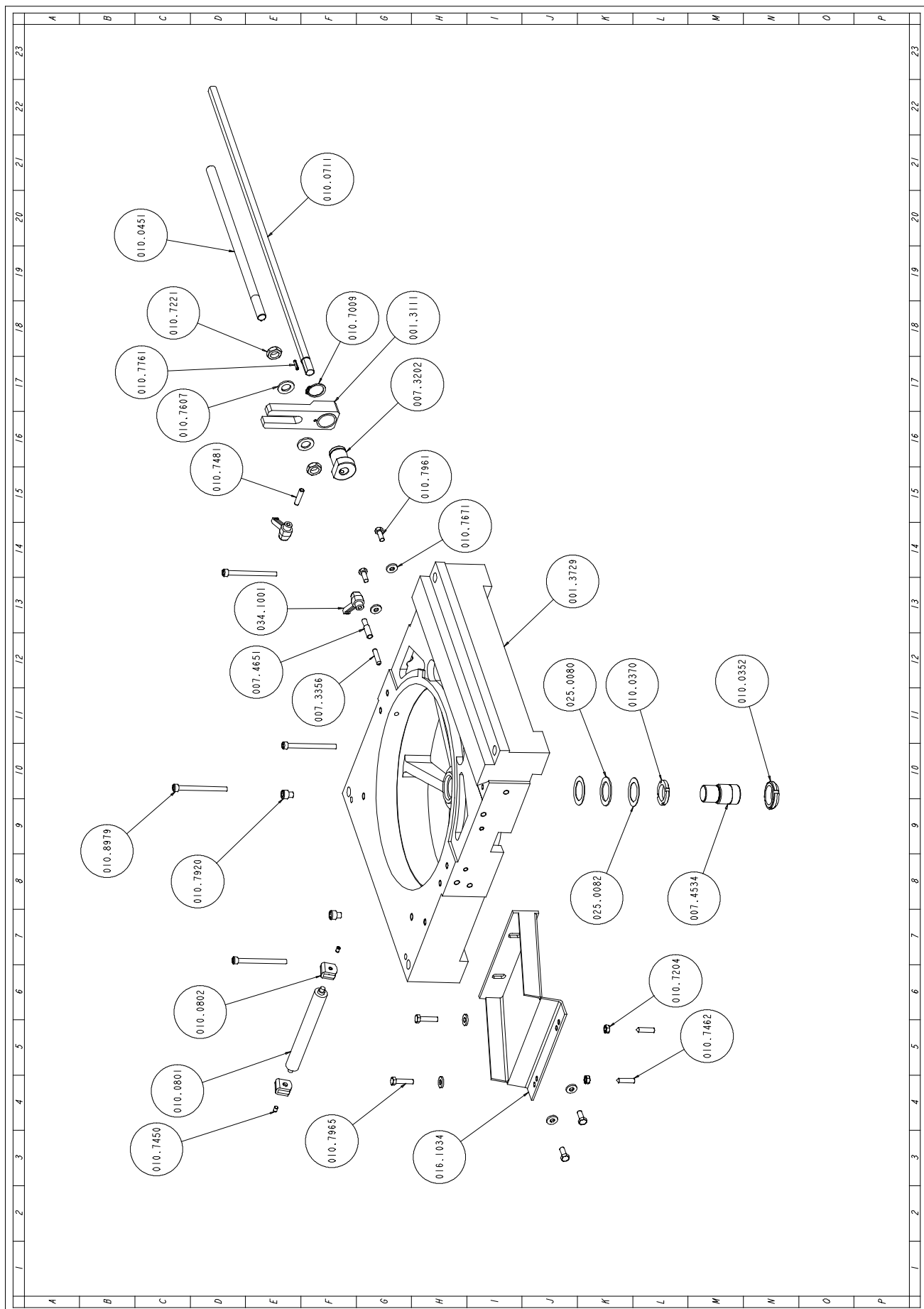
## Turntable





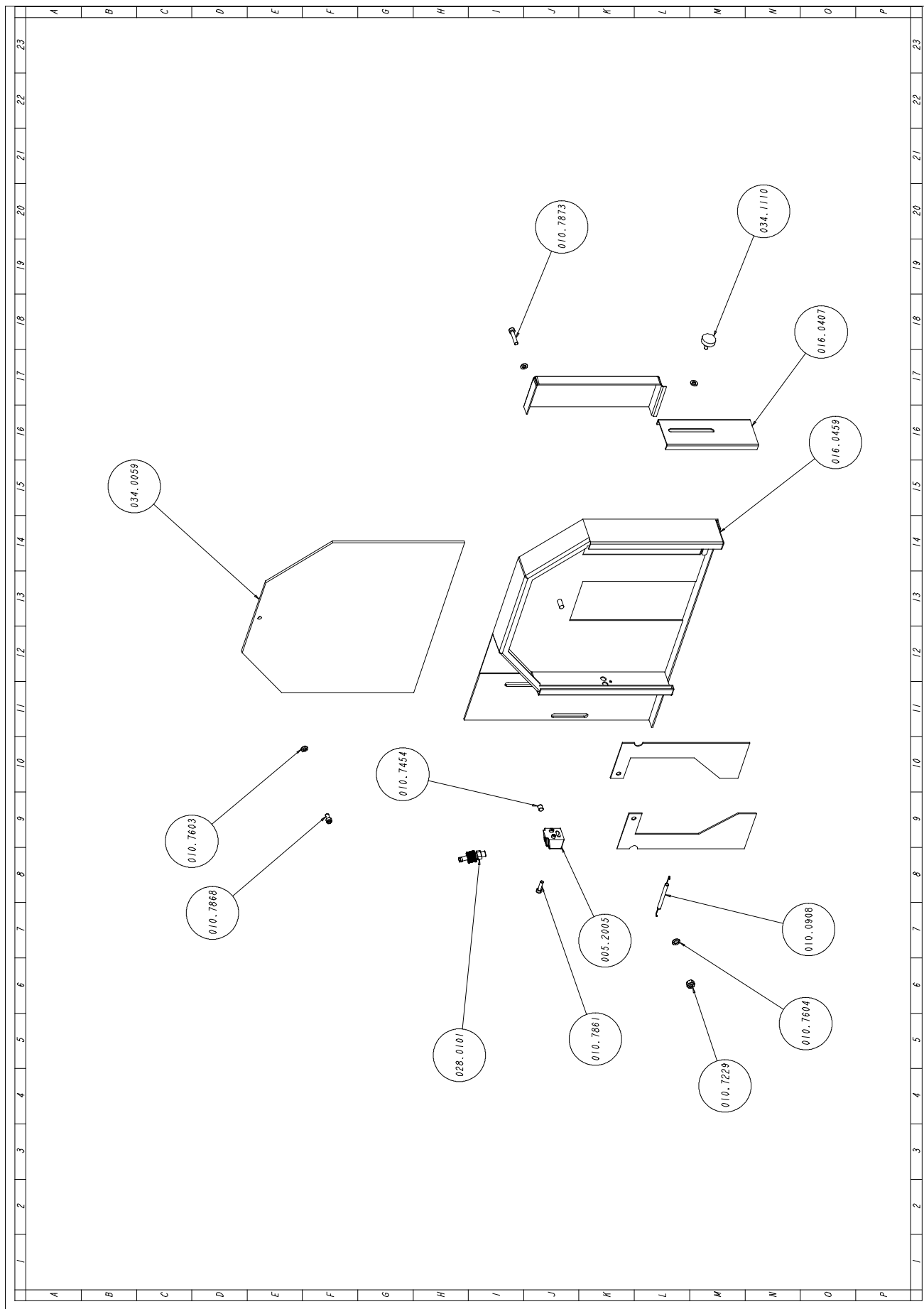
Code	Description	U. of M.	Quantity
001.3709	STAFFA BLOCCAGGIO CILINDRO SUP	NR	1,000
001.3721	SQUADRO MORSA	NR	1,000
001.3723	SUPPORTO CILINDRO SUPPLEMENTAR	NR	1,000
001.3727	.COLONNA PORTANTE TI 352	NR	1,000
001.3728	PIATTAFORMA GIREVOLE TI 350 N.	NR	1,000
007.3234	BOCCOLA/GANASCIA X CILIN.SUPPL	NR	1,000
007.4057	BOCCOLA BATTUTA FINE CORSA	NR	1,000
010.0319	VITE 8.8 TCEI 10X140 TI	NR	1,000
010.0510	GANASCIA MORSA DESTRA	NR	1,000
010.0511	GANASCIA MORSA SINISTRA	NR	1,000
010.0911	MOLLA RICHIAMO CARTER DISCO	NR	1,000
010.1851	BOCCOLA PER CARTER DISCO - DIAM	NR	3,000
010.2121	CREMAGLIERA	NR	1,000
010.2830	GUIDA PATTINO HGW 20 HC2 RO 430 E20 ZB- H	NR	2,000
010.7203	DADO M6	NR	2,000
010.7226	DADO AUTOBLOCCANTE M6	NR	3,000
010.7455	GRANO VCE P.CON. 8 X 10	NR	1,000
010.7470	GRANO VCE PUNTA PIANA 6 X 35	NR	3,000
010.7606	RONDELLA DIAM. 12	NR	1,000
010.7661	RONDELLA SPESSORE DIAM. 6 X 3	NR	3,000
010.7861	VITE TCEI 5 X 20	NR	14,000
010.7868	VITE TCEI 6 X 12	NR	4,000
010.7873	VITE TCEI 6 X 30	NR	2,000
010.7912	VITE TCEI 10 X 35	NR	1,000
010.7914	VITE TCEI 10 X 55	NR	3,000
010.7924	VITE TCEI 10 X 30	NR	2,000
010.7926	VITE TCEI 10 X 45	NR	2,000
010.7932	VITE TCEI 10 X 110	NR	2,000
010.7941	VITE TCEI 12 X 35	NR	1,000
010.7951	VITE TE 6 X 20	NR	2,000
010.7996	VITE TSPEI 6 X 30	NR	1,000
043.0041	CILINDRO MORSE 50X10 0 40 L.15	NR	1,000
043.0199	ATTACCO A GOMITO GIREV.4X1/8 C	NR	2,000

Fix platform assembly



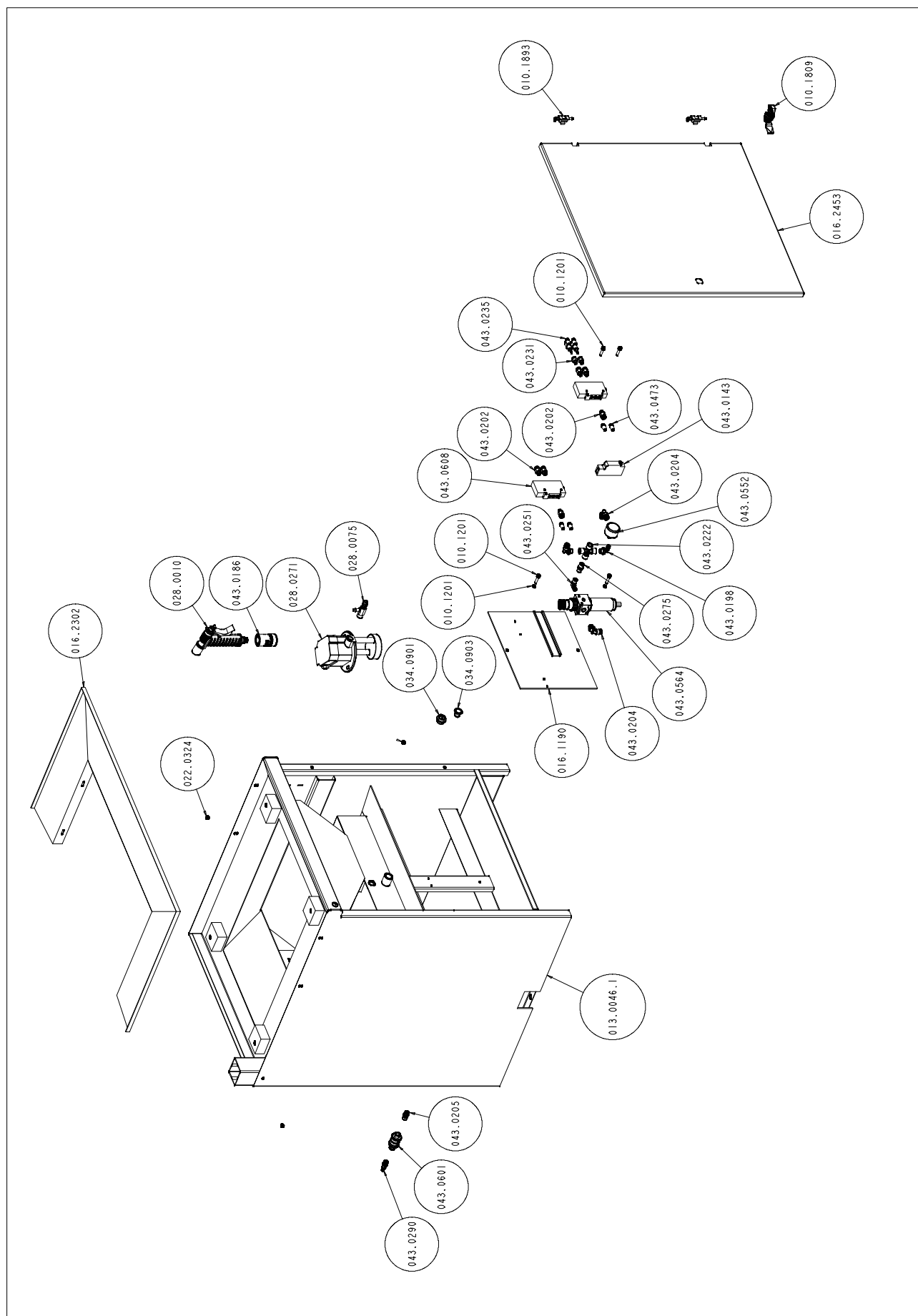
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001.3111	DISTANZIALE BATTUTA	NR	1,000
001.3729	PIATTAFORMA FISSA	NR	1,000
007.3202	BOCCOLA X BATTUTA	NR	1,000
007.3356	PERNO BLOCCAGGIO PIANO GIREVOL	NR	1,000
007.4534	PERNO DI CENTRO	NR	1,000
007.4651	GRANO BLOCCAGGIO PIANO ROTANTE	NR	1,000
010.0352	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
010.0711	ASTA MILLIM.CROMATA MM.600 FIL	NR	1,000
010.0801	RULLO TIPO	NR	1,000
010.0802	SUPPORTO PER RULLO	NR	2,000
010.7009	ANELLO SEEGER DIAM. 30	NR	1,000
010.7204	DADO M8	NR	2,000
010.7221	DADO M16 BASSO	NR	2,000
010.7450	GRANO VCE P.CIL. 6 X 6	NR	2,000
010.7462	GRANO VCE P.CON. 8 X 30	NR	2,000
010.7481	GRANO VCE PUNTA PIANA 8 X 35	NR	1,000
010.7607	RONDELLA DIAM. 16	NR	2,000
010.7671	RONDELLA SPESSORE DIAM. 8 X 3	NR	6,000
010.7761	SPINA ELASTICA DIAM. 4 X 20	NR	1,000
010.7920	VITE TCEI 10 X 10	NR	2,000
010.7961	VITE TE 8 X 20	NR	4,000
010.7965	VITE TE 8 X 35	NR	2,000
010.8979	VITE TCEI 8 X 95	NR	4,000
016.1034	BRACCETTO APPOGGIA BARRA	NR	1,000
025.0080	GABBIA ASSIALE A RULLINI AXK 3	NR	1,000
025.0082	RALLA AS 3552	NR	2,000
034.1001	LEVA A SCATTO 8 MA PK55	NR	2,000

Blade guard unit



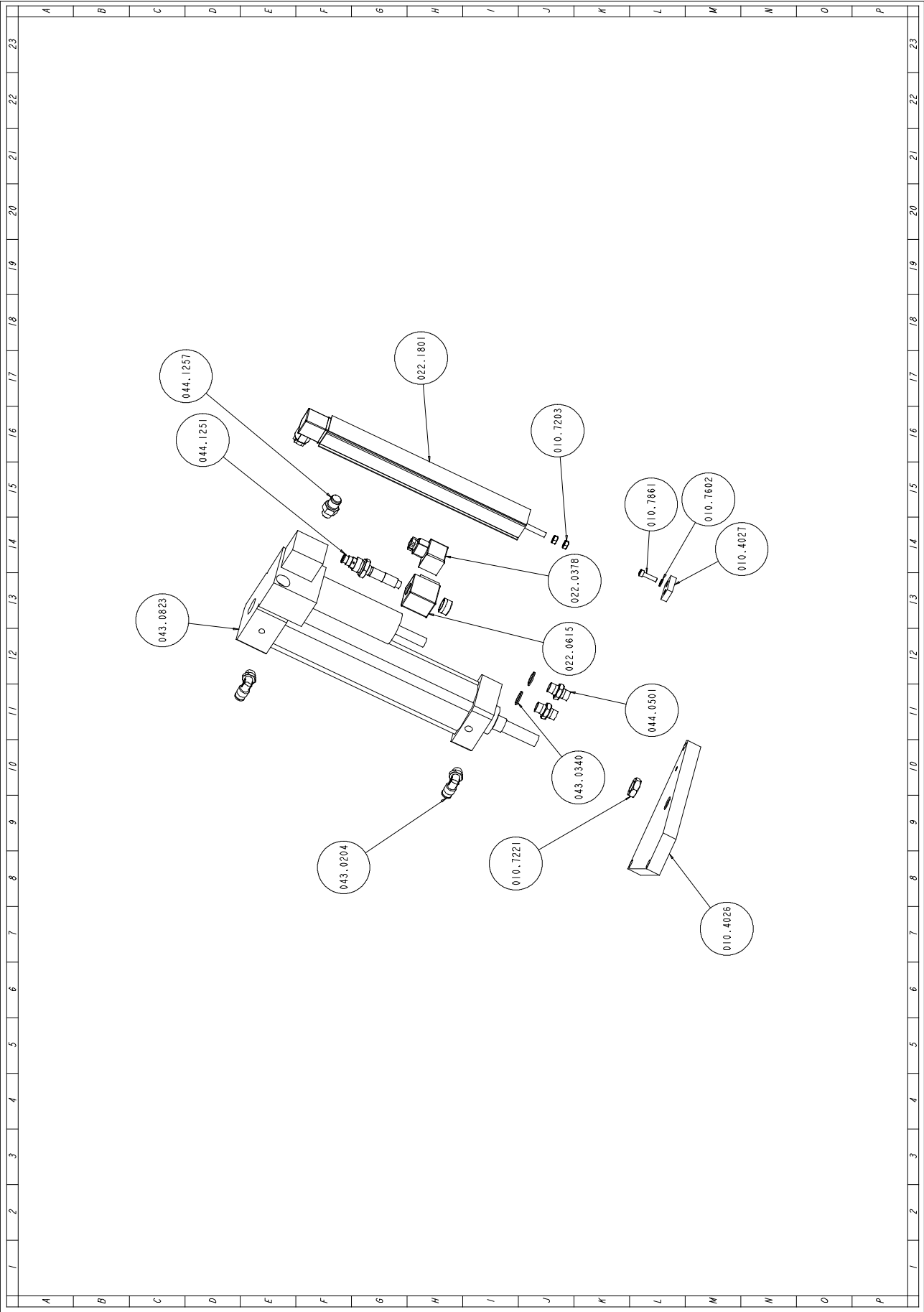
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005.2005	SPRUZZATORE RUBINETTO	NR	1,000
010.0908	MOLLA CARTER DISCO	NR	1,000
010.7229	DADO AUTOBLOCCANTE M8	NR	1,000
010.7454	GRANO VCE P.CON. 8 X 8	NR	1,000
010.7603	RONDELLA DIAM. 6	NR	3,000
010.7604	RONDELLA DIAM. 8	NR	1,000
010.7861	VITE TCEI 5 X 20	NR	1,000
010.7868	VITE TCEI 6 X 12	NR	1,000
010.7873	VITE TCEI 6 X 30	NR	1,000
016.0407	PARASCHIZZI ANTERIORE	NR	1,000
016.0459	CARTER DISCO	NR	1,000
028.0101	REGOLATORE PER RUBINETTO 8 X 1	NR	1,000
034.0059	PROTEZ.LEXAN TI 350 + AD.SCELT	NR	1,000
034.1110	VOLANTINO DIAM.30 M6 X 10	NR	1,000

## Base assembly



Code	Description	U. of M.	Quantity
013.0046.1	PIEDISTALLO TI 352 - 352 MA - 352 SX EVO	NR	1,000
016.2302	RACCOGLITORE ACQUA MORSA	NR	1,000
022.0324	PASSACAVI 24 INC.MM.2.5	NR	2,000
028.0010	PISTOLA	NR	1,000
028.0075	RACCORDO A T 3/8 X 17 X 9	NR	1,000
028.0271	ELETTROPOMPA EZ/C V. 220- 380	NR	1,000
016.1190	QUADRO PNEUMATICO	NR	1,000
034.0901	TAPPO LIVELLO OLIO 1/2 "GAS.	NR	1,000
034.0903	TAPPI OLIO 3/8" GAS	NR	1,000
043.0143	PRESSOSTATO PNEUM.PS1P1091	NR	1,000
043.0186	RACCORDO FEMMINA 1/2 AQUASTOP	NR	1,000
043.0198	ATTACCO A GOMITO GIREV.4X1/4 C	NR	1,000
043.0204	ATTACCO A GOMITO 8X1/4 - CL 65	NR	3,000
043.0205	ATTACCO A ESAGONO 8X1/4 - CL 6	NR	1,000
043.0222	RACCORDO A CROCE CL 2033 1/4	NR	1,000
043.0231	RIDUZIONE MF 1 _8 CL2520	NR	2,000
043.0235	BIFORCAZ. A Y TUBO 4MM. 242753	NR	2,000
043.0251	ATTACCO A GOMITO MF 1 _8 CL2520	NR	1,000
043.0275	NIPPLO CONICO A2- 1/4 - CL 2500	NR	1,000
043.0290	INNESTO RAPIDO 1/4 GHIOTTO 13/	NR	1,000
043.0473	SILENZIATORE IN OTTONE 1/8" CL	NR	4,000
043.0552	MANOMETRO DIAM. 40	NR	1,000
043.0564	FR 1/4 20- 08	NR	1,000
043.0601	VALVOLA VMS 114- 1/4 08	NR	1,000
043.0608	VALVOLA 5 VIE 1/8 PVLB111618 P	NR	2,000
010.1201	VITERIA E BULLONERIA	NR	3,000
043.0202	ATTACCO A ESAGONO 8X1/8 - CL 6511	NR	2,000
010.1893	CERNIERA SPORTELLO PIEDISTALLO N.T.	NR	1,000
010.1809	CHIUSURA SPORTELLO	NR	1,000
016.2453	SPORTELLO PIED. TI 352 - MA - SX EVO	NR	1,000

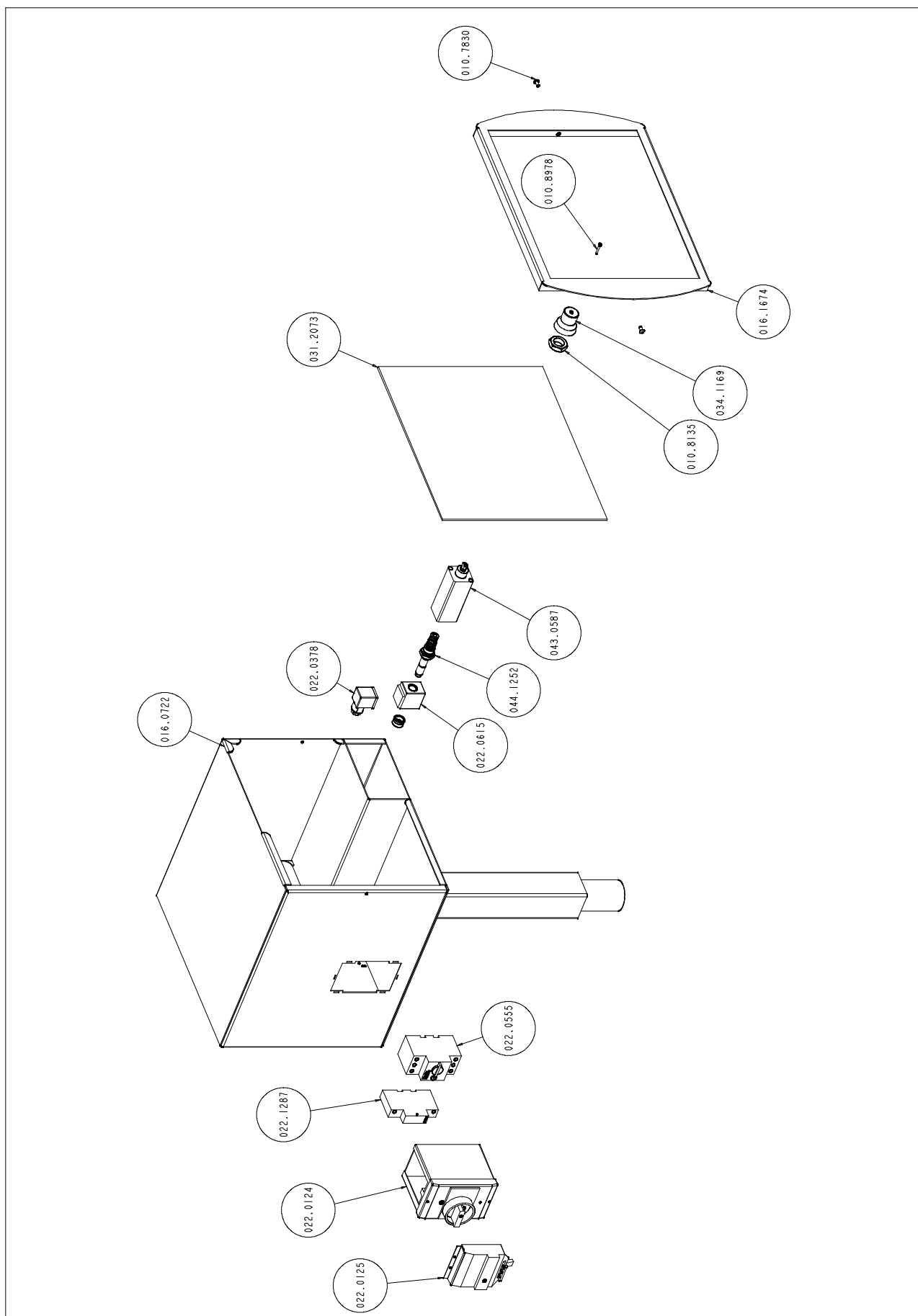
Cylinder unit





<b>Code</b>	<b>Description</b>	<b>U. of M.</b>	<b>Quantity</b>
010.4026	PIASTRA FISSAGGIO STELO CILIND	NR	1,000
010.4027	PIASTRA FISSAGGIO POTENZIOMETR	NR	1,000
010.7203	DADO M6	NR	2,000
010.7221	DADO M16 BASSO	NR	1,000
010.7602	RONDELLA DIAM. 5	NR	1,000
010.7861	VITE TCEI 5 X 20	NR	1,000
022.0378	CONNETT.BOBINA VALV. RIGENERAT	NR	2,000
022.0615	BOBINA X VALVOLA RIGENERATRICE	NR	1,000
022.1801	POTENZIOMETRO LINEARE LWH225- 0	NR	1,000
043.0204	ATTACCO A GOMITO 8X1/4 - CL 65	NR	2,000
043.0340	RONDELLA RAME 13X19X1,5- 1/4	NR	2,000
043.0823	UNITA' IDROPNEUMATICA	NR	1,000
044.0501	NIPPLO NP 1/4 IDRAULICO	NR	2,000
044.1251	VALVOLA RIGENERATRICE CILINDRO	NR	1,000
044.1257	VALVOLA DI CARICO CILINDRO	NR	1,000

## Control panel



<b>Code</b>	<b>Description</b>	<b>U. of M.</b>	<b>Quantity</b>
010.7830	VITE BUTON 5X10	NR	4
010.8135	DADO M20 BASSO	NR	1
010.8978	VITE TCEI 3X20	NR	1
016.0722	QUADRO COMANDI	NR	1
022.0124	CUSTODIA ISOLANTE E- PKZO- GR	NR	1
022.0125	BLOCCO LUCCHETTABILE SBV- PKZO- E	NR	1
022.1287	INTERRUTTORE PKZM0- 10	NR	1
034.1169	MANOPOLA DI REGOLAZIONE MONOGIRO	NR	1
043.0587	REGOLATORE DISCESA TESTA	NR	1
044.1252	VALVOLA RIGENERATRICE CILINDRO	NR	1
034.0488	CORNICE X QUADRO COMANDI TI 352 - 372 SXI- EVO	NR	1
022.0555	SGANCIATORE U- PKZO V.400.50 COD.73138	NR	1
022.0378	CONNETTORE V.1406 X BOBINA RAC VALVOLA	NR	1
022.0615	BOBINA V24 RAC X VALVOLA RIGENERATRICE	NR	1
031.2073	CONSOLLE DI PROGRAMMAZIONE SX- SXI EVO NT	NR	1
016.1674	CORNICE QUADRO COMANDI X SXI EVO	NR	1



# Adjustments

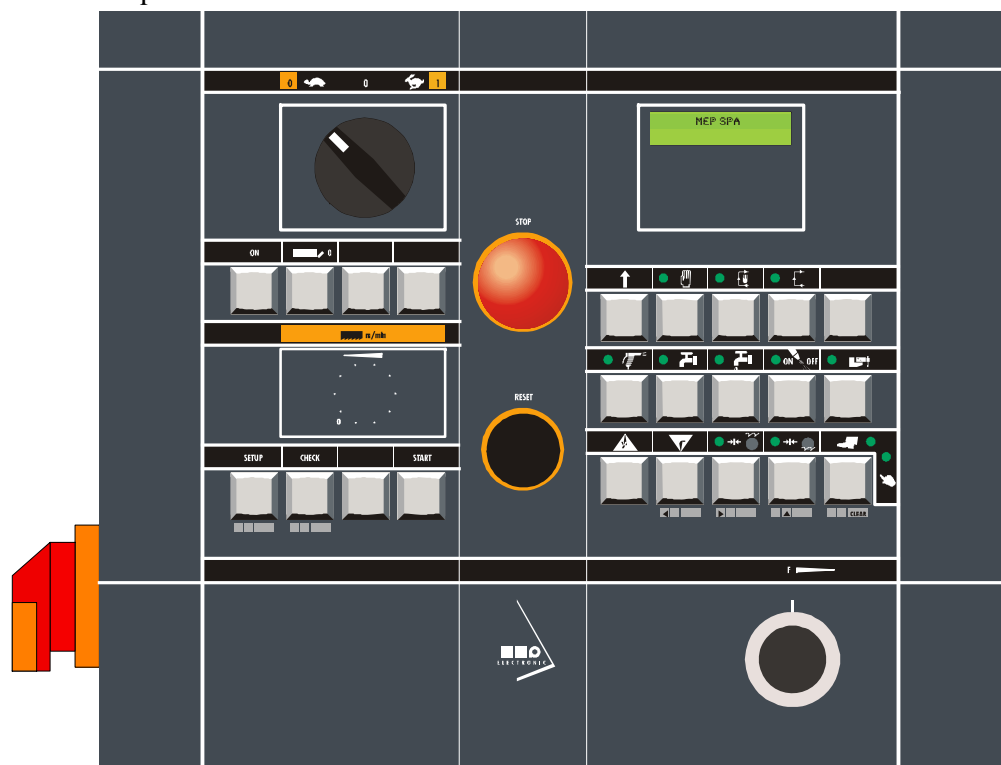


The steps for setting the electronic, mechanical, and pneumatic systems on SX models, are illustrated in this chapter. By following these instructions you can “customise” your machine to carry out the type of cut to be made, thus optimising the time taken for this operation.

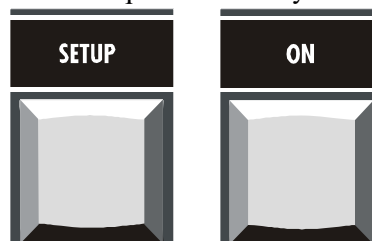
## Displaying and editing the set-up parameters

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

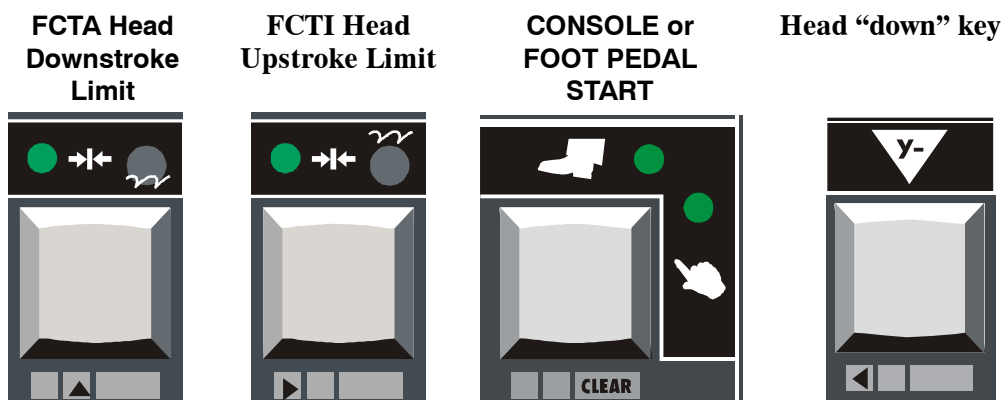
- Power up the machine at the main switch located on the left hand side.



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



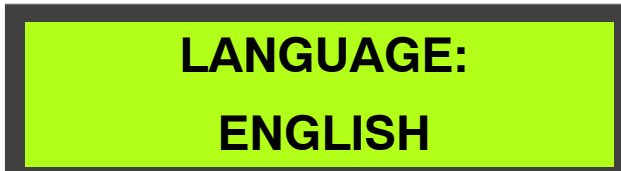
- Once inside the SET - UP menu, use the following keys to navigate through the different menu screens:



- 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.

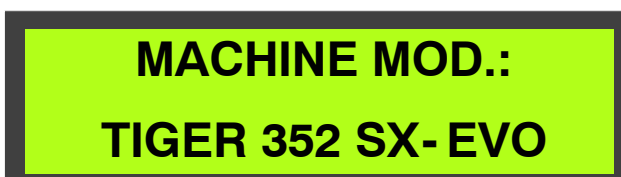
#### Set language parameter

- Press ▲ to change the display messages presentation language.



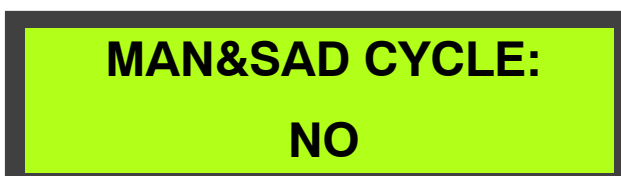
#### Set parameter for machine type

- 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

This function is not included for this machine model. Thus, do not consider this video page and go to the next one by the key ▶.



### **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**  
**NO**

### **Inverter presence settings**

This function is not included for this machine model. Thus, do not consider this video page and go to the next one by the key ▶.

**INVERTER:**  
**NO**

### **Blade speed proximity settings**

This function is not included for this machine model. Thus, do not consider this video page and go to the next one by the key ▶.

**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**

### Disc stop setting

- ▶ Press the ► key to display the disc stop parameter, then press ▲ to set the value of this parameter.  
If the value is set as 2, the disc never stops;  
if it is set as 1, the disc stops in the RHLS (rear head limit switch) point;  
if the value is set as 0, the disc stops in the FHLS (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 = 2.0**

### Machine maximum power input setting

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

**I MAX MOTOR**  
**BLADE = 07,0**

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



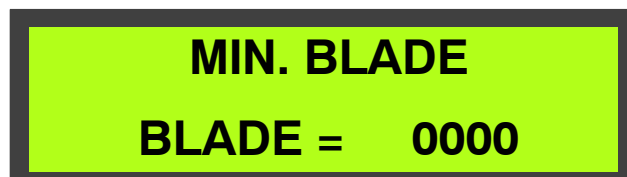
### Measurement unit setting

- ▶ 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.



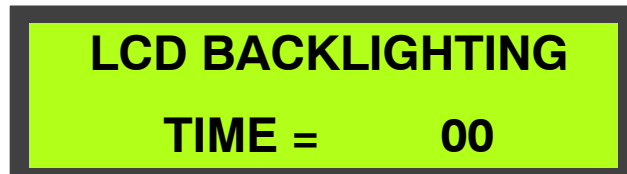
### Setting minimum blade tensioning

This function is not included for this machine model. Thus, do not consider this video page and go to the next one by the key ▶.



### 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.



### Cutting head stroke

The operating head covers the space between the rear position and the forward position that can be defined in the SET- UP with the FHLS- RHLS parameter. Anyway, it is necessary to check if the operating head actually and not virtually covers the cutting width between its structural limits of rear head limit switch and forward head limit switch.

The adjustment is aimed at setting the value of the head current position both at RHLS (rear limit 254) and at FHLS (forward limit 054) displayed with the linear potentiometer.

To get this result carry out the following adjustment:

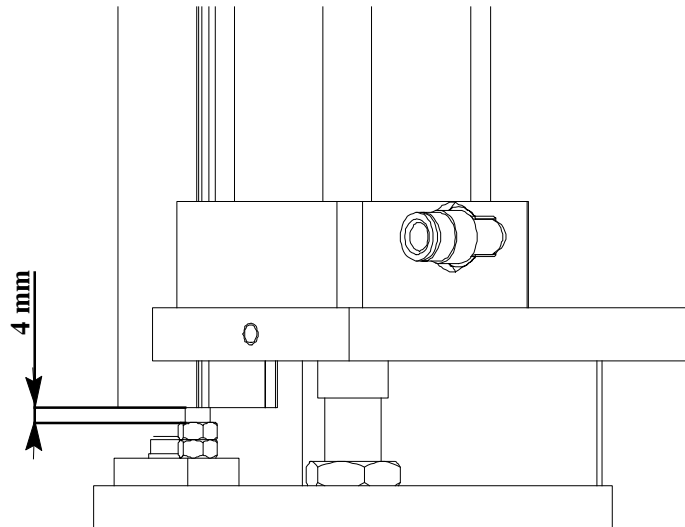


- ▶ press in sequence and simultaneously the ⬆ key and the key for the head lowering (Y+), to position the cutting head completely upwards;

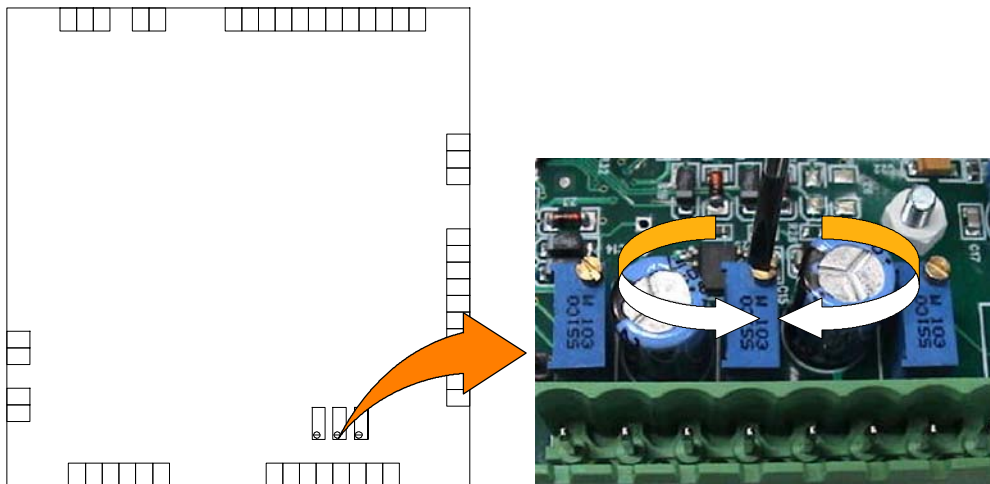
**N.B.**

When the cutting head is totally up, the potentiometer stem is inside the potentiometer body. In this position make sure that the adjustment nut for the stem

max. stroke is at about 4 mm from the lower base of the linear potentiometer.



- ▶ Open the control board removing the frame and pull the keyboard out of the console;
- ▶ Identify the board IUD/IUV of the controller M30 to adjust the potentiometer indicated by the arrow in the following image:

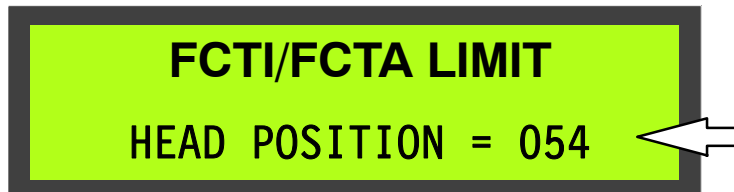


- ▶ The IUD/IUV board includes three adjacent potentiometers. Adjust the adjustment screw of the potentiometer indicated by the arrow by a screw-driver at a value of 254; the obtained variation is displayed on the machine.



- ▶ Position the console again in its seat and re- install the frame fastening it by screws.
- ▶ Press in sequence and simultaneously the keys ↑ and RHLS to store the obtained value.

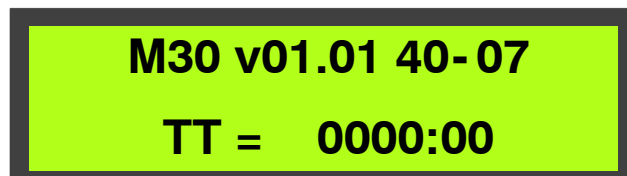
- ▶ Set the FHLS point, taking the head completely down, pressing in sequence and simultaneously the  $\uparrow$  key and the key for the head lowering (Y- ).



- ▶ Press in sequence and simultaneously the keys  $\uparrow$  and FHLS to store the obtained value.
- ▶ 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

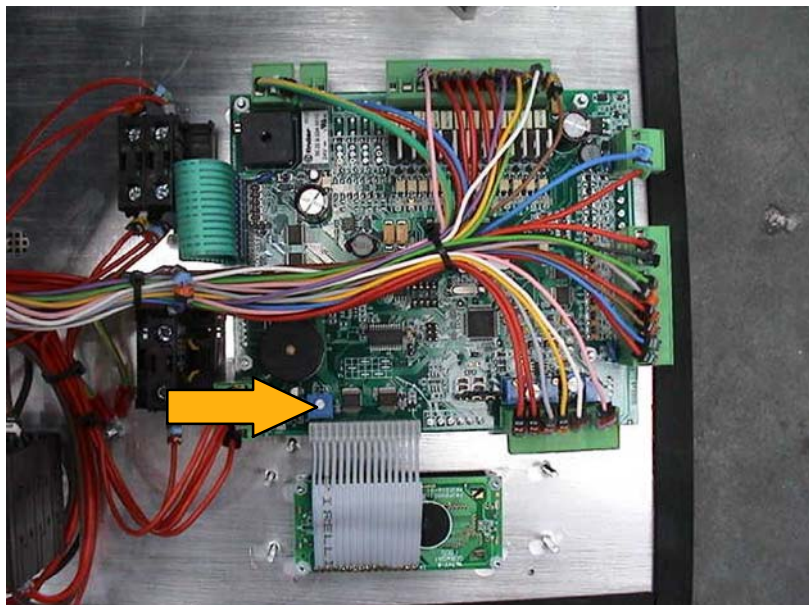
- ▶ This parameter indicates the installed software version and the total working time of the machine.



### 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 M30 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.

## Air treatment unit

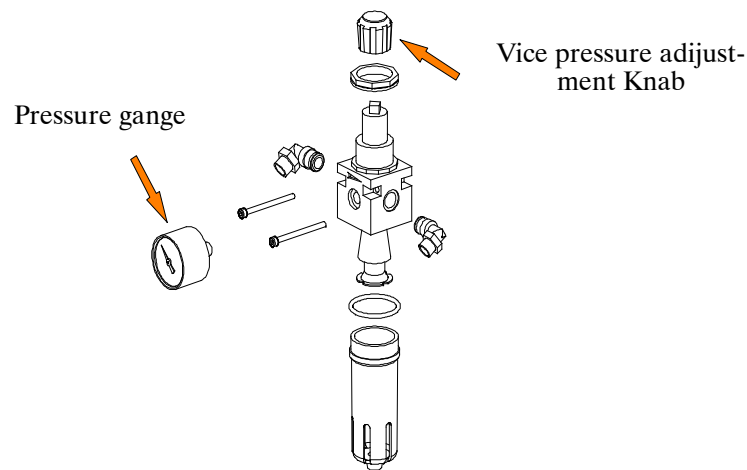
The pneumatic circuit on the machine activates the shearing vice by means of the volampress cylinder, and the machine's cutting head by means of the oil pneumatic cylinder.

The compressed air is conditioned and purified as it enters by a treatment unit that, when regulated, stabilises the pressure at around 6 Bar, depending on the pressure in use in the factory.


In any case, the pressure can be set where material may be deformed or may prove to be unstable during cutting, and the vice is positioned at  $2 \div 3$  mm from the workpiece before it is closed.

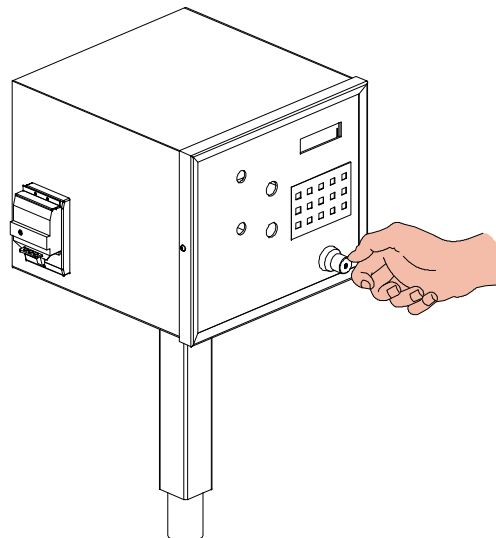
One requirement is for the user of this machine to provide a plant in his factory with the characteristics shown in Chapter 4.

The figure below shows an exploded view of the air treatment unit. The operating pressure of the vice shown on the pressure gauge is set by rotating the handle indicated by the arrow.



### Cutting head operating pressure

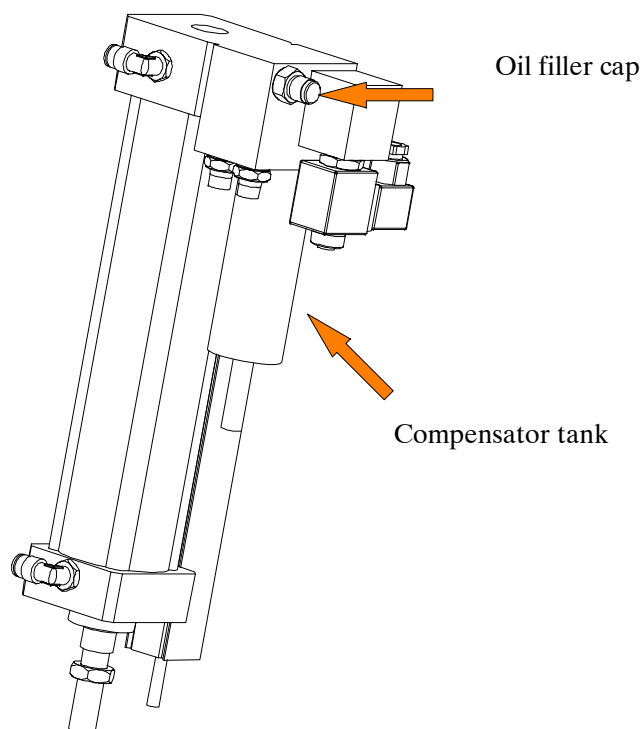
The cutting head cuts the material pushed by a hydro pneumatic cylinder, with a downstroke speed set by the oil flow regulator on the control panel. The regulator has a scale of 0 to 9 and is indicated on the panel by the symbol : when this is rotated clockwise, the downstroke speed is reduced, when it is turned counter-clockwise the speed is increased.



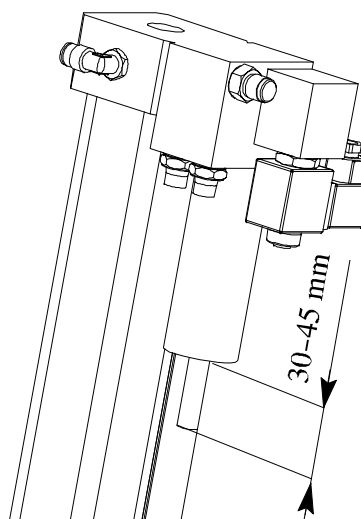
## Cutting head actuator cylinder (CPT)

### Replenishing the head cylinder

When the oil level in the compensator tank falls it must be topped up. The figure below illustrates the various components of the cutting head cylinder.



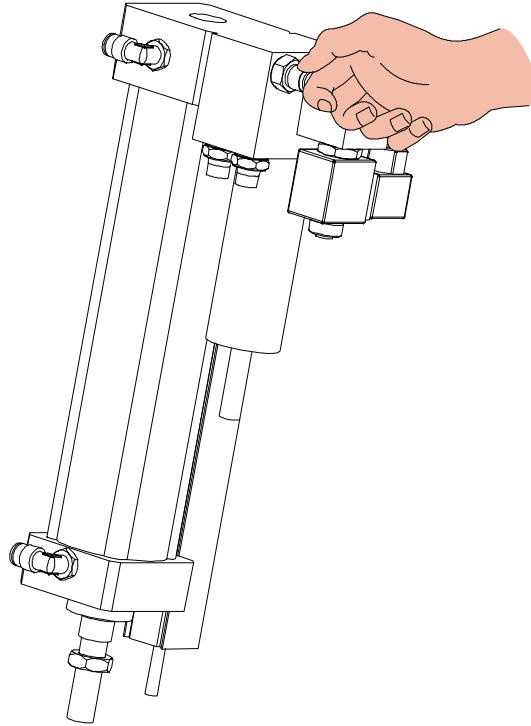
The level decrease is evaluated by measuring the distance between the seat of the split pin on the stem and the tank that, in standard conditions, must be about 30 mm when the cutting head is in the FCTA position (forward head limit switch) and about 45 mm when the head is in FCTI (backward head limit switch).



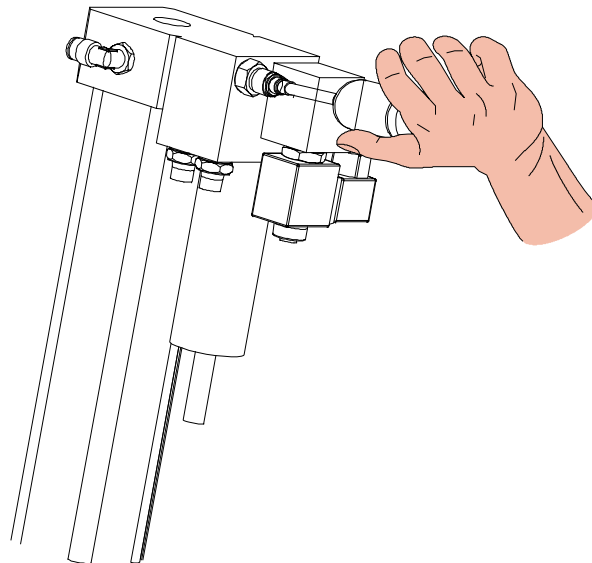
If this is not the case, top up the oil level as follows:

- keep the head in the FCTI position (fully up);

- unscrew and remove the filler cap on the side of the cylinder;



- then, using an electric or manual pump like the one shown in the figure, fill the cylinder with AGIP ATF DEXRON hydraulic oil or one with similar characteristics;



- when the rod protrudes by  $30 \div 45$  mm, the correct oil level has been restored;
- run a few dummy cutting strokes in semi- automatic mode to expel any air from inside the circuit. If cutting head movement is not linear and constant, and the rod retracts by several millimetres, top up the oil level again.

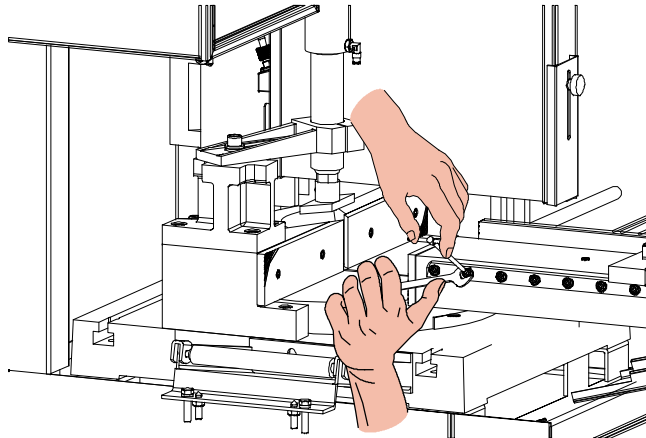
## Vice

The shearing vice, which is a standard fitting on the **C350- 2S**, is equipped with an anti- chip device, adjustable cross positioning, and is driven by a pneumatic cylinder known as the volampress. These elements will be dealt with one by one in the following.

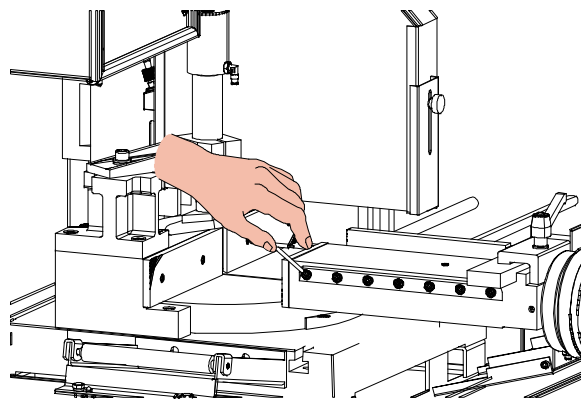
### Adjusting the vice play

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

- ▶ slacken all the locknuts on the grub screws in the slide, holding the screws still using an Allen key.
- ▶ move the vice to its fully open position.



- ▶ adjust the slight pressure exerted by the grub screws on the gib, starting with the first two in contact with the lead screw.
- ▶ adjust these two grub screws and tighten the relative lock nuts, keeping the screws still with an Allen key.

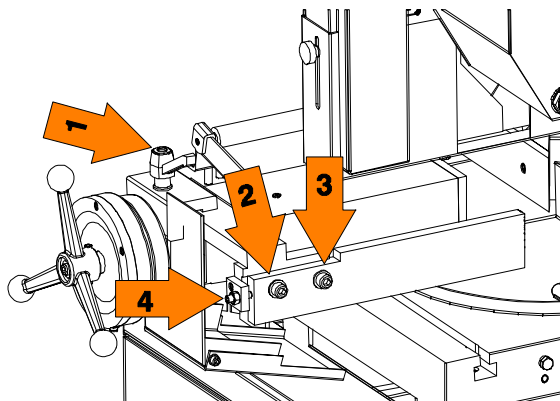


- ▶ close the vice until the other two grub screws coincide with the lead screw.
- ▶ repeat this adjustment on the gib grub screws for the entire length of the slideway
- ▶ at the end of the operation, use the handwheel to move the slide backwards and forwards, identifying the zones where the grub screws exert greater pressure on the gib.
- ▶ repeat the adjustments if necessary.

## Rag prevention device

The vice is fitted as standard with a rag prevention device that serves to support the material and prevent the formation of ragged edges at the end of the cut. To adjust the rag prevention device transversely:

- ▶ loosen the release lever (1) located above the vice slide;
- ▶ movement the rag prevention device arm to the right or left;
- ▶ tighten the release lever.



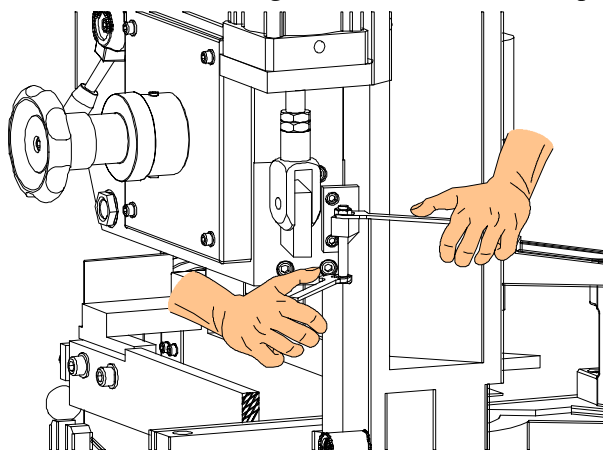
To adjust the longitudinal position of the vice jaw, proceed as follows:

- ▶ tighten the cutting vice completely;
- ▶ slacken the two screws located to the side of the rag prevention device (2- 3);
- ▶ slacken the nut that locks the grub screw;
- ▶ adjust the longitudinal position of the rag prevention vice jaw by slackening or tightening the grub screw (4) until the position of the rag prevention jaw is aligned with that of the cutting jaw;

## 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.





## Disc

The HSS cutting discs can be used for any kind of cut since they combine good levels of toughness and elasticity thanks to various coatings, along with a good cutting resistance.

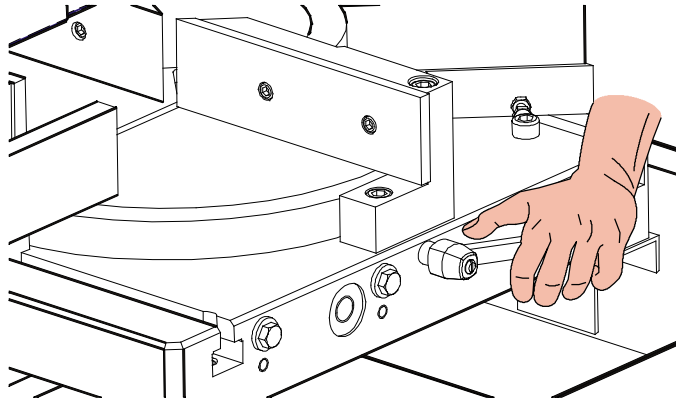
The discs are made of a single piece of Tungsten - Molybdenum super - rapid steel with a hardness of about  $64 \pm 1$  HRC. A special characteristic of the discs during cutting is the excellent finish of the cut surfaces.

### Adjusting the turntable stops

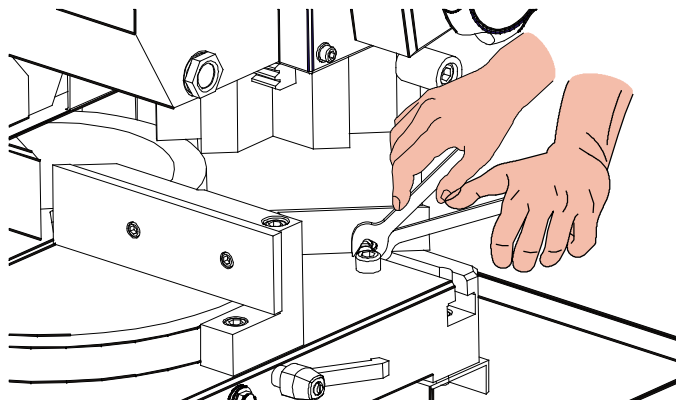
If it found that a cut at  $0^\circ$ ,  $45^\circ$  or  $60^\circ$  does not correspond exactly to the angle shown on the turntable, the right and left stops will need adjusting. The procedures for correcting and adjusting the disc stops at  $0^\circ$ ,  $45^\circ$  and  $60^\circ$  right and left are described below.

Sequence of operations for  $0^\circ$  stop:

- release the turntable by means of the release lever on the right hand side of the table;



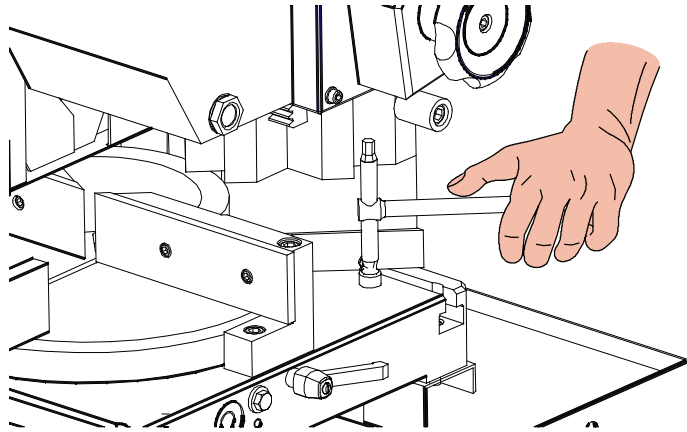
- adjust the nut using two 10 mm spanners until the stop corresponds to the  $0^\circ$  notch; loosen the lock nut and adjust; tighten the lock nut while holding the bolt steady; check and repeat if necessary.



Sequence of operations for  $45^\circ$  right stop:

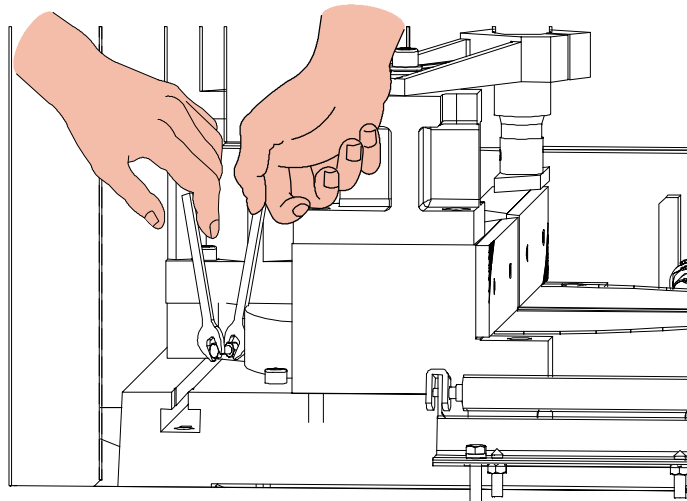
- release the turntable by means of the release lever on the right hand side of the table;

- remove the screw that functions as the 0° stop so as to reach the 45° right position;



- adjust the nut using two 10 mm spanners until the stop corresponds to the 45° notch; loosen the lock nut and adjust;

To adjust the 45° and 60° left stops, proceed as for the other positions, but remove the 45° stop screw (shown by the arrow in the photo) to reach the 60° left stop, in the same way as for the 45° right stop described above.



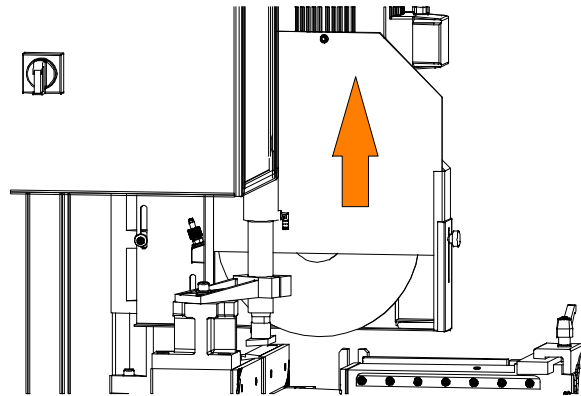
## Changing the blade

As we have already said, this machine uses different kinds of blades according to the material to be cut. The procedures described below, however, also apply in the event of wear or breakage of the blade.

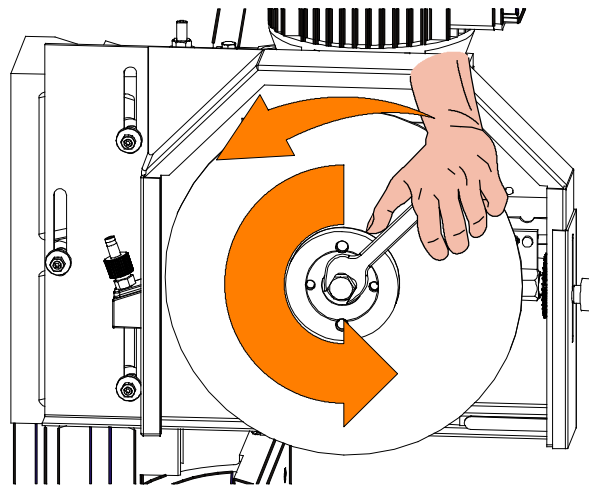
To replace the blade, proceed as follows:

- switch off the machine and position the head so that the disc is easily accessible;
- the machine is equipped with a vertical pneumatic vice that can be moved away from the guard by unfastening the screw fixing it to the support;

- remove the screw with knob to free the plexiglass guard cover and lift it off in a vertical direction;

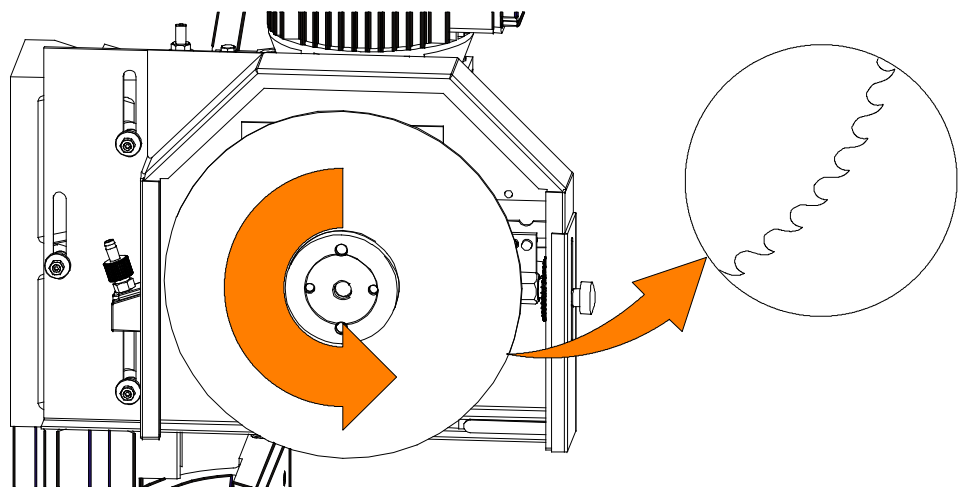


- use a 19 mm spanner to slacken the hexagonal screw that locks the disc, turning the spanner in the direction of rotation of the disc; remove the old disc and insert the new one, making sure that the centering pins fit correctly into the holes in the disc;

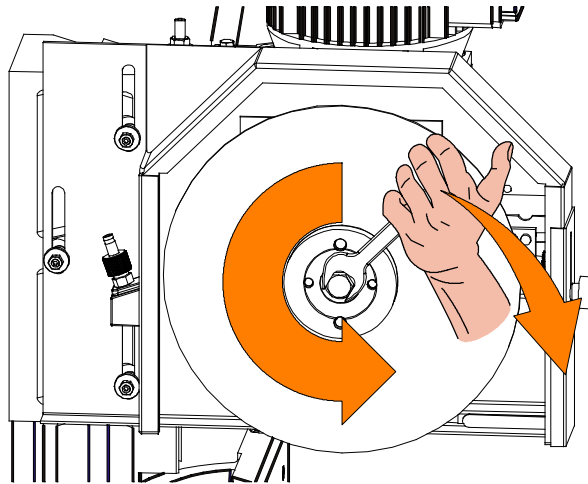


**Attention**

Make sure that the teeth on the cutter blade are facing in the direction of rotation. When changing the tool, turn the cutter blade until drive is engaged to eliminate any backlash in the drive pins.



- Tighten the lock nut and refit all guards and any other components you may have removed to facilitate installation.

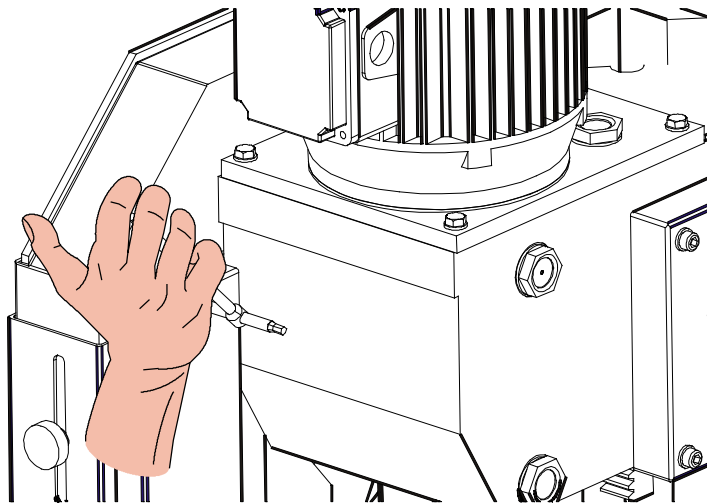


**N.B.** Adjust the position of the blade- cleaning brush, or replace it when worn.

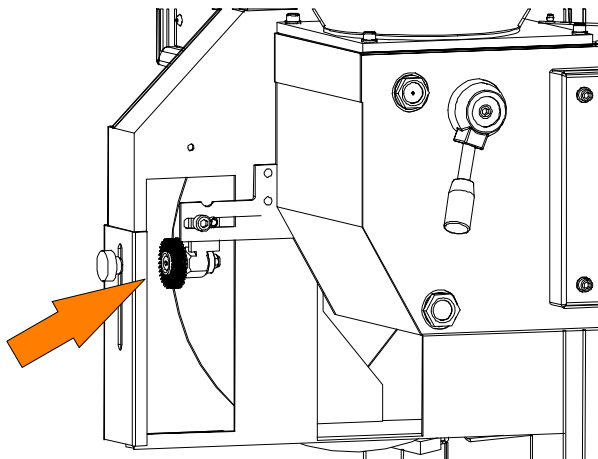
### Adjusting the position of the blade- cleaning brush

When the cutter disk is not clean enough, check the blade- cleaning brush for wear and if it's working correctly. The figure below illustrates how the brush should be adjusted if need be.

- Loosen the screw highlighted in the drawing, and remove the protection;

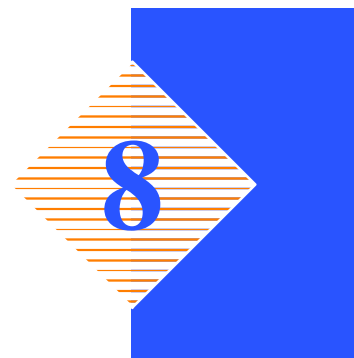


- adjust the position of the blade in relation to the teeth, as shown;



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# Maintenance and choice of consumables



**C350- 2S** 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 Hyd-Mech 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

The daily maintenance operations to carry out on the machine are as follows:

- ▶ remove all swarf from the machine (do not use compressed air or fluffy rags);
- ▶ empty the swarf drawer (the swarf collection drawer is located in the base and is accessible through the front opening panel);
- ▶ top up the lubricant/coolant fluid level;
- ▶ check the wear of the blade and change if necessary;
- ▶ check the blade cleaning brush, clean it and reposition it: if worn, replace.

### Weekly

The weekly maintenance operations are as follows:

- ▶ remove all swarf from the machine;
- ▶ clean the vice and lubricate all the joints and sliding surfaces using a good quality oil;
- ▶ check the oil level in the transmission box; if necessary fill through cap.
- ▶ check the vice sliding mechanism. If it is not smooth or is subject to side play, adjust as described in chapter 7.

### Monthly

This section lists the operations to be carried out for the monthly maintenance of the machine.

- ▶ check that the machine performs cuts perpendicular to the work surface; if not, contact our technical service centre;
- ▶ check that the blade is at right angles to the workpiece rest shoulder; if not, contact our technical service centre;
- ▶ check that the 0 degree notch on the fixed work table is in line with the graduation on the turntable. If not, adjust as described in chapter 7;

- ▶ check the precision of the 45° right and 45° and 60° left stops; if they are not adjusted correctly, proceed as described in chapter 7;
- ▶ clean thoroughly the water tank and the electric pump filter.

## Maintenance of working parts

During maintenance work on the **C350- 2S**, special attention must be paid to operating units such as the hydro- pneumatic cylinder, the loading of which we have already described in the 7 chapter, and the transmission box.

### Transmission box

Transmission box maintenance:

- ▶ after the first 100 working hours, drain the transmission box through the drain plug located in the rear lower section of the unit and refill with new oil. If, in addition to the yellow filings from the bronze rim, there are other impurities in the drained oil, remove the cover and thoroughly wash the inside. The washing should be carried out using flushing oil, avoiding the use of cotton or threadbare rags for drying. Refill the transmission box;
- ▶ after every 2000 working hours repeat the oil change operation.

## 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.

### Oils for pneumatic and hydraulic circuit

The machine is supplied with AGIP ATF DEXRON oil, ISO and UNI grade FD 22. The oils are used with the air treatment unit and the hydro- pneumatic cylinder. However the following oils can 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

### Oils for transmission box

The machine is supplied with **SHELL Omala Oil 460** oil, ISO and UNI symbol 460. However the following oils can be regarded as compatible or with equivalent characteristics:

**SHELL Omala Oil 460 - AGIP Blasia 460 - API DT 460 - BP Energol GR XP 460 - CASTROL Alpha SP 460 - FIAT EPZ 460 - MOBIL Mobilgear 634 - Q8 Goya 460**

Transmission box:

- capacity kglt. 4,8

### **Oils for lubrication/coolant liquid**

The oil used for the lubrication/coolant fluid in the machine is CASTROL Syntolin TFX. Though there are no specific standards for these types of oils, Hyd- Mech considers that CASTROL Syntolin TFX is the best product available with regard to quality:price ratio. Nevertheless, the following oils of similar characteristics can be said to be compatible:

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

Finally, one particular blade manufacturer (LENOX) recommends and supplies a coolant under the name of LENOX BAND- ADE SAWING FLUID.

Coolant tank:

- tank capacity 15 litres
- oil concentration 5- 6%

### **Oils for spray mist system (optional)**

The used oil type for the optional spray mist system is BLASER Vascomill 22. The following oils can also be said to have similar characteristics and are therefore compatible:

UNIST Coolube 2210 - FUCHS Plantocut Micro Plus 27

- tank capacity Lt. 1



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# Cutting speed and choice of tools



The cut speed is determined by the speed the cutter disc rotates at, and by the feed speed. The latter is set manually by the movement of the tool head, whereas the cutter disc rotation speed is selected on the control panel with the speed setting switch. This chapter describes the various cutting speeds of which the standard and special machine configurations are capable.

## Cutting speed

### **C350-2S 4 speed, standard machine**

The basic machine version, with 4/8 pole motor, is capable of the following cutting speeds:

- 1st speed = 15 rpm
- 2nd speed = 30 rpm
- 3rd speed = 45 rpm
- 4th speed = 90 rpm



### **C350-2S 4 speed, optional**

The optional machine version, with 2/4 pole motor, is capable of the following cutting speeds:

- 1st speed = 15 rpm
- 2nd speed = 30 rpm
- 3rd speed = 45 rpm
- 4th speed = 90 rpm

## Choice of blade

The different types of cutter disks that the **C350- 2S** can mount must, however, have the following main characteristics.





- “Fine tooth pitch”: for thin wall materials such as sheet steel, tubes and profiles;
- “Coarse tooth pitch”: for large cross- sections; for soft materials (aluminium alloys and soft alloys in general).

### Tooth pitch

The choice of the most suitable tooth pitch depends on various factors:

- the size of the section;
- the hardness of the material;
- wall thickness.

Solid sections call for discs with a coarse tooth pitch, while small cross- sections require blades with finer teeth. This is because when cutting walls of small cross- section (1 ÷ 7 mm) profiles, it is important that the number of teeth actually making the cut should not be too small, otherwise the effect obtained will be one of tearing rather than of swarf removal, leading to a large increase in shearing stress. On the other hand, when cutting thick materials or solid sections using an excessively fine tooth pitch, the swarf collects as a spiral inside the gullet, and since fine tooth pitches have small gullets, the accumulated swarf will exceed the gullet capacity and press against the walls of the workpieces, resulting in poor cutting (same situation with soft materials), greater shearing stress and hence breakage of the blade.

Choice of tooth pitch T as a function of cross- section to be cut for light alloy solid pieces and profiles			
 S 		 S  sp	
S in mm.	Pitch T	S and sp in mm.	Pitch T
10	4- 5	10 sp = 0,5	3
30	6- 8	30 sp = 1,5	4 - 5
50	8- 10	50 sp = 2,5	5 - 6
70	10- 12	70 sp = 3,5	6- 7
90	12	90 sp = 4,5	7 - 8
130	16	130 sp = 6,5	8

#### KEY:

S = diameter or width of the solid piece to be cut in mm;

sp = thickness of the wall to be cut in mm;

T = tooth pitch in mm.

A larger pitch should be chosen when, as a result of the shape of the piece to be cut, the cross- section at any given point exceeds the average cross- section given above.

### 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.



### Cutting and feeding speed

The cutting speed, in m/min, and the head feeding speed, in cm<sup>2</sup>/min, are limited by the amount of heat generated near to the points of the teeth. If the head feeding speed is too high, the cut will not be straight in either the vertical or the horizontal plane. As we have already said, the cutting speed depends on the strength (kg/mm<sup>2</sup>) and hardness (HRC) of the material and the dimensions of the thickest section. The feeding speed depends on the cross- section of the material. Solid or thick- walled materials (thickness > 5 mm), can therefore be cut at high speed providing there is sufficient swarf removal by the blade, while thin- walled materials such as tubes or thin profiles must be cut with a low feeding speed. A new blade requires a wearing- in period, during which time a feeding speed of about half normal speed should be used.

### Lubricant/coolant

The lubricating/cooling fluid must ensure that the blade teeth and material in the area of the cut do not overheat. Furthermore, the quantity and pressure must be sufficient to remove the swarf from the cutting zone. The fluid must be an

excellent lubricant, such that prevents abrasion of the teeth and welding of the swarf to the teeth themselves (seizing).

### Blade structure

The circular blades most frequently used for cutting- off machines are HSS- DMO5/M2 consisting of a single piece and characterised by a high level of toughness and a good cutting resistance. With non- ferrous materials it is normal to use circular blades with brazed hard metal (HM) cutting edges, which offer excellent resistance to wear but low resistance to impact, which in any case is not generally a problem with non- ferrous materials.

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	Cr	W	Mo	V	Co	HRC
HSS- DMO 5/M2	0,47	1,00	6,37	1,00	0,12		45- 50

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

### Types of blades

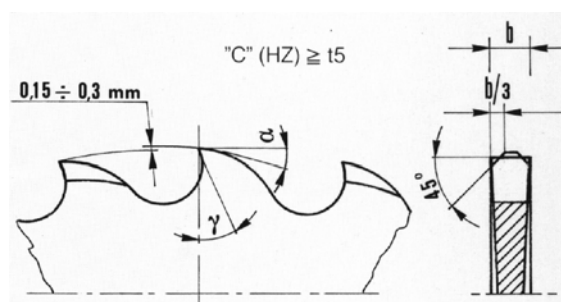
The blades fitted on the **C350- 2S** have dimensions 350x32x2.5 and are made of HSS DMO5 since the machine is intended for cutting ferrous materials. In addition to the size and pitch of the teeth, the blades also have other geometric characteristics according to their particular use:

- tooth sharpening, which in this case may be BW with alternate raked tooth or C with roughing tooth raked on both sides and non-raked finishing tooth;
- tooth pitch, the distance between the crests of two subsequent teeth (tooth pitch = T).

### Tooth shape

#### "C" TYPE SHARPENING (HZ)

Coarse tooththing with roughing tooth raked on both sides and non- raked finishing tooth. The roughing tooth is about 0.3 mm higher.

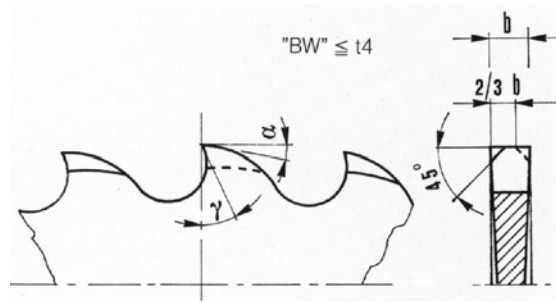


Coarse tooththing with roughing tooth and finishing tooth. Used in saws with pitch greater than or equal to 5 mm for cutting ferrous and non- ferrous materials with solid or solid- profiled sections.



# "BW" TYPE SHARPENING DIN 1838- UNI 4014







Coarse toothing with teeth alternately raked to the right and left.





Toothings generally used on cutting- off machines for cutting ferrous and alloy materials with tubular and profiled sections.



The **C350- 2S** uses 350x2.5x32 discs made of HSS DMo5 and teeth with type C sharpening for hollow sections; for solid sections it uses 350x32x2 discs, again made of HSS. The tooth pitch is also important as shown in the table below. Disc selection table for TIGER machine. Other disc characteristics are: dimensions: internal hole diam. 32 mm, distance between fixing holes 63 mm, tooth shape type C.

TIGER MODEL	 			 			 		
	D.	T	Z	D.	T	Z	D.	T	Z
352	350	5	220	350	8	140	350	12	90

This table can be used to facilitate the choice of toothing since it takes into account both the size of the material to be cut and the diameter of the disc to be used.

		D 200			225		250		275		300		315		350		370		400		425		450		500	
		S	t z	t z	t z	t z	t z	t z	t z	t z	t z	t z	t z	t z	t z	t z	t z	t z	t z	t z	t z	t z	t z	t z	t z	t z
<div></div> <div>Solid section</div>	10	5 130	6 100	5 140	6 120	5 160	6 128	5 180	6 140																	
	30	6 100	8 80	6 120	8 80	6 128	8 100	6 140	8 110	6 160	8 120	7 140	8 120													
	50			8 90	10 70	8 100	10 80	8 110	10 90	8 120	10 90	8 120	10 100	9 120	10 110	10 110	11 100									
	70							10 90	12 70	10 90	12 80	10 100	12 80	11 100	12 90	11 100	12 90	10 120	12 100	10 130	12 110	10 140	12 120	10 150	12 130	
	90									12 80	14 70	12 80	14 70	12 90	14 80	12 90	14 80	12 100	14 90	12 110	14 94	12 120	14 100	12 130	14 110	
	110											12 80	14 70	12 80	14 70	12 90	14 80	12 100	14 90	12 110	14 94	12 120	14 100	12 130	14 110	
	130													12 80	16 70	14 80	16 70	14 90	16 80	14 94	16 84	14 100	16 90	14 110	16 100	
	150																	14 90	16 80	14 94	16 84	14 100	16 90	14 110	16 100	
<div></div> <div>Hollow section</div>	D																									
	10	3 200	3 200	3 220	3 220	3 250	3 250	3 280	3 280																	
	30	4 160	5 130	4 180	5 140	4 200	5 160	4 220	5 180	4 220	5 180	4 240	5 200													
	50			5 140	6 120	5 160	6 128	5 180	6 140	5 160	6 120	5 180	6 140	5 200	6 160	5 200	6 180	5 220	7 160							
	70							6 140	8 110	6 160	8 120	6 160	8 140	6 180	7 160	6 180	7 160	8 140	6 200	7 180	6 220	7 190	6 230	7 200	8 260	
	90									8 120	10 100	7 140	8 120	7 160	8 140	7 160	8 140	7 180	8 160	7 200	8 180	7 200	8 220	9 280		
	110											8 120	10 100	9 140	10 120	8 140	9 120	10 140	9 160	10 140	8 150	9 180	10 160	11 200		
	130													9 120	10 110	9 120	10 110	9 140	10 120	9 150	10 130	9 160	10 140	11 170		
150																9 120	10 110	9 120	10 110	9 130	10 120	9 140	10 130	11 170		

Blade selection table with respect to cutting speed and downstroke speed

RECOMMENDED CUTTING PARAMETERS																								
CUTTING ANGLE			α	20	18	15	12	10	12	15	12	12	22	20	20	15	12	16	12	18	18	18		
			γ	8	8	8	6	6	8	6	8	6	8	10	8	5	8	8	16	16	8	8	15	
Cutting section (in mm)			10-20		20-40		40-60		60-90		90-110		110-130		130-150									
			T mm	Vt rpm	T mm	Vt rpm	T mm	Vt rpm	T mm	Vt rpm	T mm	Vt rpm	T mm	Vt rpm	T mm	Vt rpm	T mm	Vt rpm						
			Av mm/1'		160	130	110	60	35	50	20	100	140	110	50	30	45	25	100	1800	400	600	160	130
			T mm		7	6	6	4	3	6	6	8	4	6	4	3	6	7	8	6	7	4	4	3
			Vt rpm		45	30	20	15	9	19	19	23	1000	180	350	400	110	600	400	110	600	400	45	18
			Av mm/1'		150	120	110	60	33	45	45	100	1700	400	600	700	150	1100	600	150	120	120	120	120
			T mm		10	9	8	6	4	8	8	8	12	10	11	10	8	10	10	10	6	5	4	4
			Vt rpm		45	25	18	14	9	18	18	22	900	160	300	350	100	550	350	100	550	350	45	18
			Av mm/1'		140	110	100	50	30	45	45	90	1600	350	550	700	140	1000	600	140	110	110	110	110
			T mm		12	12	11	9	6	11	11	11	12	12	14	12	10	12	12	10	6	6	5	5
			Vt rpm		40	25	17	14	8	17	17	20	800	160	250	300	90	550	350	90	550	350	45	17
			Av mm/1'		130	110	50	50	28	40	40	80	1400	300	550	600	130	900	500	130	110	110	110	110
			T mm		14	14	14	12	8	14	14	14	14	14	17	14	12	16	16	12	6	6	5	5
			Vt rpm		40	20	15	13	8	15	15	19	700	140	200	250	70	500	300	40	16	16	28	28
			Av mm/1'		110	100	80	45	25	40	40	880	1300	300	500	600	110	900	500	110	100	100	100	100
			T mm		16	16	16	14	10	16	16	16	20	16	18	16	14	18	18	14	8	8	6	6
			Vt rpm		35	20	14	13	7	14	14	17	600	130	150	200	60	500	300	35	16	16	26	26
			Av mm/1'		100	90	70	45	25	35	35	70	1100	250	500	500	100	800	400	100	90	90	90	90
			T mm		18	16	16	14	12	16	16	16	20	16	20	18	16	18	18	16	10	10	6	6
			Vt rpm		30	15	12	12	7	12	12	16	500	130	120	150	50	450	200	30	15	15	24	24
Av mm/1'		90	80	60	40	22	35	35	60	900	250	400	400	90	800	400	90	80	80	80	80			
Recommended Lubricants			Emulsion - cutting oil										Cutting oil			Emulsion								

## Classification of steels

The tables on this page provide users with information on materials to cut, enabling their classification with respect to hardness and consequently the correct blade to use.

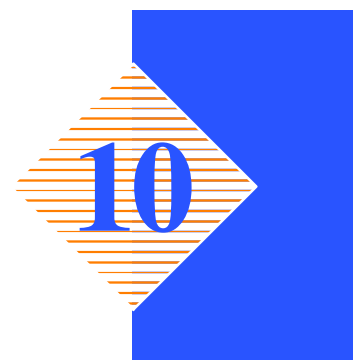
Types of steel				Hardness		
UNI	DIN	BS	AISI	Brinell HB	HRB	kg/mm2
C 22 - C 35	CK 22 - CK 3	En 2 C - En 6	1022 - 1035	160 - 170	34 - 87	55 - 59
C 45	CK 45	En 8	1040	160 - 180	84 - 89	55 - 61
C 10 - C 15	CK 10 - CK 15	En 32 A - En 328	1010 - 1015	150 - 175	81 - 87	51 - 59
C 60	CK 60	En 9	1060	160 - 180	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 Svezia	AISI U.S.A.	DIN Germania	BS Inghilterra	UNI Italia	AFNOR Francia
Carbon steels	1311	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
	1572					
Carbon steels	1650	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
	1880					
Alloy steel	2120	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
	2255					
Alloy steels	2541	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 typu 6 i 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
	2230					
Tool steels	2258	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
	2310 - 12 2754 - 55					
Tool steel	2550	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
	2710					
Stainless steels	2324	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
	2333					
Stainless steel	2343	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
	2353					

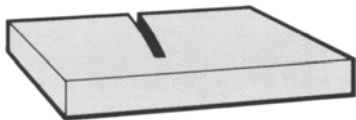
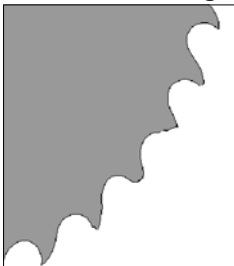



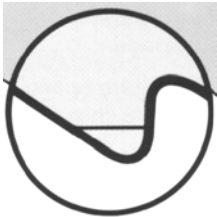
# Troubleshooting





This chapter describes the inspection and troubleshooting procedures for the **C350- 2S**. 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
<b>Cuts not at 90 degrees or angled</b> 	♦ Head speed too high	☞ Reduce head speed
	♦ Disc with worn teeth	☞ Replace disc
	♦ Orthogonality of disc to workpiece rest shoulder	☞ Adjust the position of the blade so that it is at right angles to the workpiece rest shoulder using the 0° adjuster pin; then set the stops at 45° right and left using the appropriate screws.
	♦ Perpendicularity of disc to work surface	☞ Contact our Assistance Office
	♦ Cutting speed too low	☞ Increase cutting speed.
	♦ Broken teeth	☞ Check the hardness of the material being cut.
<b>Teeth breaking</b> 	♦ Incorrect lubricant/coolant fluid	☞ Check the water and oil emulsion; check that the holes and hoses are not blocked; direct the nozzles correctly.

PROBLEM	PROBABLE CAUSE	SOLUTION
<b>Teeth breaking</b> 	<p>▶ Material too hard</p>	<p>☞ Check the cutting speed, feed speed and disc pressure parameters and the type of disc you are using.</p>
	<p>▶ Disc not worn-in correctly</p>	<p>☞ With a new disc it is necessary to start cutting at half feeding speed. After the wearing-in period (a cutting surface of about 300 cm<sup>2</sup> for hard materials and about 1000 cm<sup>2</sup> for soft materials) the cutting and feed speeds can be brought up to normal values.</p>
	<p>▶ Disc with excessively fine tooth pitch</p>	<p>☞ The swarf wedges into the bottom of the teeth causing excessive pressure on the teeth themselves.</p>
	<p>▶ New blade inserted in a partially completed cut.</p>	<p>☞ The surface of the cut may have undergone local thermal alteration, making it harder: when starting work again, use a lower cutting speed and head feed speed. A tooth from the old blade may be left in the cut: check and remove before starting work again.</p>
	<p>▶ Workpiece not clamped firmly in place</p>	<p>☞ Any movement of the workpiece during cutting can cause broken teeth: check the vice, jaws and clamping pressure.</p>
	<p>▶ Vibration</p>	<p>☞ Workpiece vibrates in the vice: check that the slide has been adjusted correctly; check the clamping pressure and if necessary increase.</p>
<b>Rapid tooth wear</b> 	<p>▶ Head speed too slow</p>	<p>☞ The blade runs over the material without removing it: increase head speed.</p>
	<p>▶ Cutting pressure too high</p>	<p>☞ Reduce cutting pressure.</p>
	<p>▶ Cutting speed too high</p>	<p>☞ The teeth slide over the material without cutting it: reduce the cutting speed.</p>
	<p>▶ Insufficient coolant</p>	<p>☞ Check the coolant level and clean piping and nozzles.</p>
	<p>▶ Incorrect fluid concentration</p>	<p>☞ Check and use the correct concentration.</p>

PROBLEM	PROBABLE CAUSE	SOLUTION
<b>Rapid tooth wear</b> 	♦ Material defective	☞ The materials may present altered zones either on the surface, such as oxides or sand, or in section, such as under-cooled inclusions. These zones, which are much harder than the blade, cause the teeth to break: discard or clean these materials.
<b>Broken blade</b> 	♦ Head speed too high	☞ Reduce head speed.
	♦ Teeth in contact with material before starting the cut	☞ Always check the position of the blade before starting a new job.
	♦ Insufficient coolant	☞ Check the coolant level and clean piping and nozzles.
	♦ Vibrations	☞ Workpiece vibrates in the vice: check that the slide is regulated correctly; check the clamping pressure and if necessary increase.

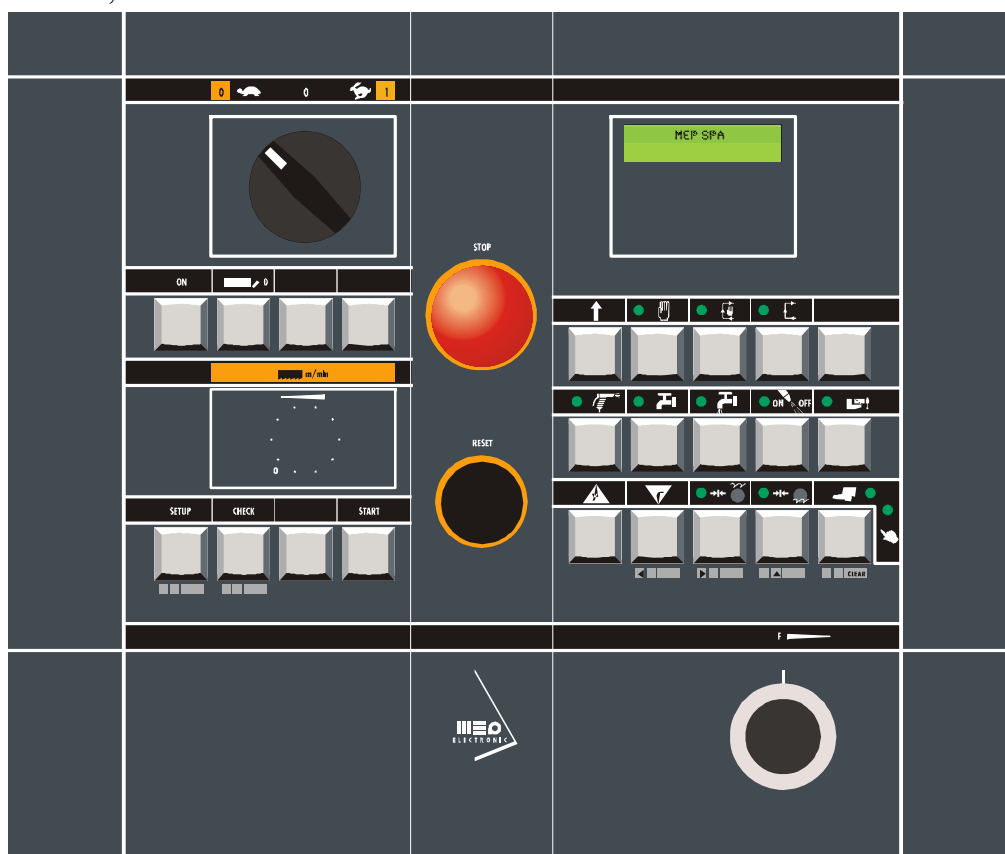
## Troubleshooting

This section deals with the problems which may occur during machine operation. The M30 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).

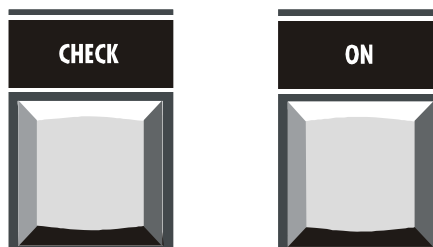
The board IUD/IUV is inside the electric board.

### ***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;



# Diagnostics system

Once you have opened the diagnostics menu, a set of characters, each corresponding to an OUTPUT signal on the M30 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

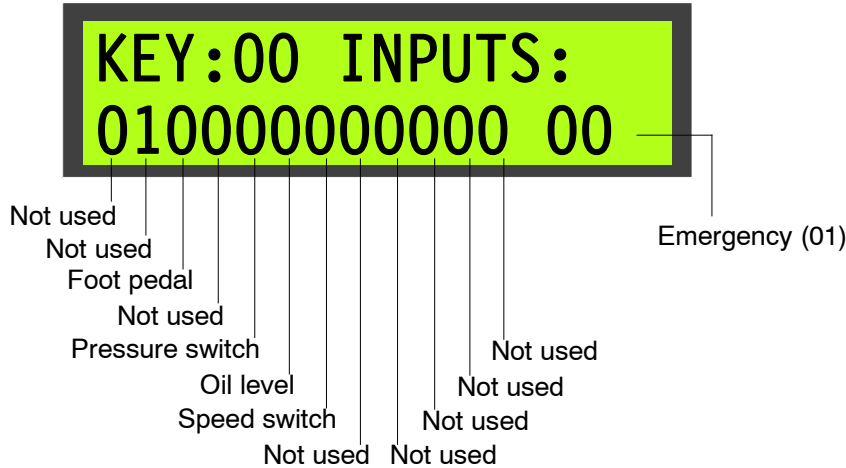
Each console key has an identification number which is displayed on the diagnostics screen after the letter “K”, when the key is pressed. For example, when pressing the key for the manual cycle (HAND key), the figure 12 is displayed next to the letter ”K”:



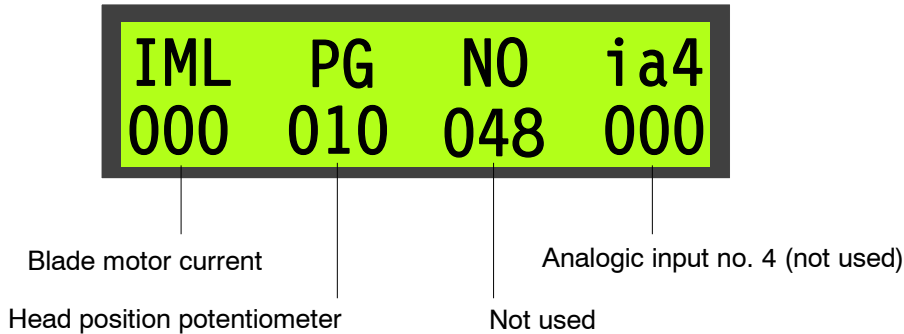
if the figure K does not change pressing the key HAND, the probable malfunctioning is due to the console key that does not deliver power when closed.

## 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;

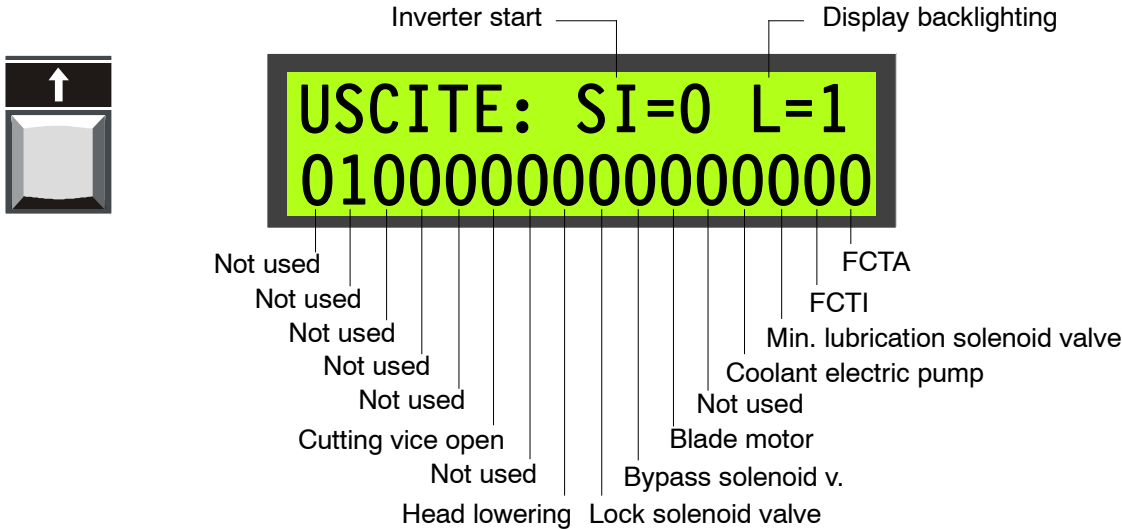


- ▶ Starting from the video page of the digital inputs, press the key “arrow up” once to display the list of the analogic inputs of the board IUD/IUV:



**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.

 IML PT TL ia4 000 010 000 000 Current transformer	<b>AMMETER TRANSFORMER FOR CHECKING BLADE MOTOR ABSORPTION</b> 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 IUV board.
 IML PT TL ia4 000 010 000 000 Head position potentiometer	<b>POTENTIOMETER OF HEAD CYLINDER TRANSDUCER (CUTTING HEAD POSITION)</b> 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 IUV. Move the head manually and check that the value changes on the display.
 IML PT TL ia4 000 010 000 000 ANALOGIC INPUT NO. 3	<b>ANALOGIC INPUT NO. 3</b> Available for connecting optional instruments.
 IML PT TL ia4 000 010 000 000 ANALOGIC INPUT NO. 4	<b>ANALOGIC INPUT NO. 4</b> Available for connecting optional instruments.

## Machine alarms and emergencies

The machine's M30 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.

<b>PRESS RESET</b>	This message is displayed during the initialisation phase after pressing the ON key
<b>PRESS RESET</b>	This message is displayed when the cutting start position is lower than the previous position saved for the cutting end position. ➤ Save both the FCTI and FCTA positions again.
<b>HEAD NOT AT FCTI PRESS RESET</b>	This message is displayed if the head is not positioned at the FCTI position when the cycle is STARTED. ➤ Return the head to the FCTI position before resuming the cycle
<b>SELECT SPEED PRESS RESET</b>	This message is displayed if the cycle is STARTED without having first selected the cutting speed. ➤ Return the head to the FCTI position before resuming the cycle
<b>STOP BUTTON PRESSED PRESS RESET</b>	This message is displayed if an operation is activated before releasing the MUSHROOM HEAD EMERGENCY STOP button. ➤ Release the EMERGENCY STOP button and press RESET.
<b>EMERGENCY BLADE GUARD OPEN</b>	This message is displayed if the blade guard is opened, for example, to change the blade. ➤ Make sure the blade guard is closed. ➤ Check the safety limit switch. ➤ Check the connections.
<b>EMERGENCY INVERTER FAILURE</b>	This message is displayed if the machine is equipped with an INVERTER (optional). Press RESET to test the manual commands. ➤ Check the inverter contactor. ➤ Check the power supply voltage. ➤ Check the power phases and supply voltage of the blade motor. ➤ Check the connections.
<b>EMERGENCY BLADE STOPPED</b>	Displayed when the blade is jammed while cutting: ➤ Press RESET
<b>EMERGENCY AIR PRESSURE</b>	It is displayed when the air pressure from the network fails. ➤ Press RESET
<b>EMERGENCY BLADE MOT I OVERC.</b>	It is displayed when there is an overcurrent at the blade motor ➤ Press RESET

<b>EMERGENCY BLADE TENSION</b>	<p>This message indicates a mechanical or electric/electronic fault affecting the blade tensioning unit.</p> <ul style="list-style-type: none"> <li>➤ Check the blade tension.</li> <li>➤ Check the operation of the tensioning slide.</li> <li>➤ Make sure the blade is correctly positioned on the flywheels.</li> <li>➤ Check the STRAIN GAUGE input on the IUV card.</li> <li>➤ Check the condition of the blade.</li> <li>➤ Check the connections.</li> </ul>
<b>EMERGENCY ERROR CODE: 01</b>	RESETS OR INTERRUPTS NOT JUSTIFIABLE
<b>EMERGENCY ERROR CODE: 02</b>	EEPROM NOT AVAILABLE
<b>EMERGENCY ERROR CODE: 03</b>	RAM TEST FAILED
<b>EMERGENCY ERROR CODE: 04</b>	ROM TEST FAILED
<b>EMERGENCY ERROR CODE: 05</b>	STATUS OR TEMPLATE NON- EXISTENT
<b>EMERGENCY ERROR CODE: 06</b>	CUTTING CYCLE PHASE NON- EXISTENT
<b>EMERGENCY ERROR CODE: 07</b>	EMERGENCY NOT DEFINED
<b>EMERGENCY ERROR CODE: 07</b>	SERIAL 485 FAILURE
<b>EMERGENCY ERROR CODE: 07</b>	SERIAL 422 FAILURE
<b>EMERGENCY ERROR CODE: 08</b>	UNSTABLE DIGITAL INPUTS
<b>EMERGENCY ERROR CODE: 09</b>	UNSTABLE BLADE (ch0) MOT ABSORB ANAL. INPUT



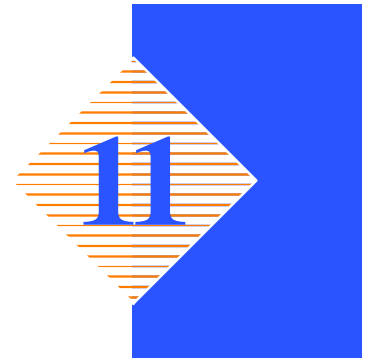
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<b>EMERGENCY ERROR CODE: 10</b>	UNSTABLE HEAD (ch1) POSIT. P. ANAL. INPUT
<b>EMERGENCY ERROR CODE: 15</b>	POWER FAILURE



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# Accessory Installation

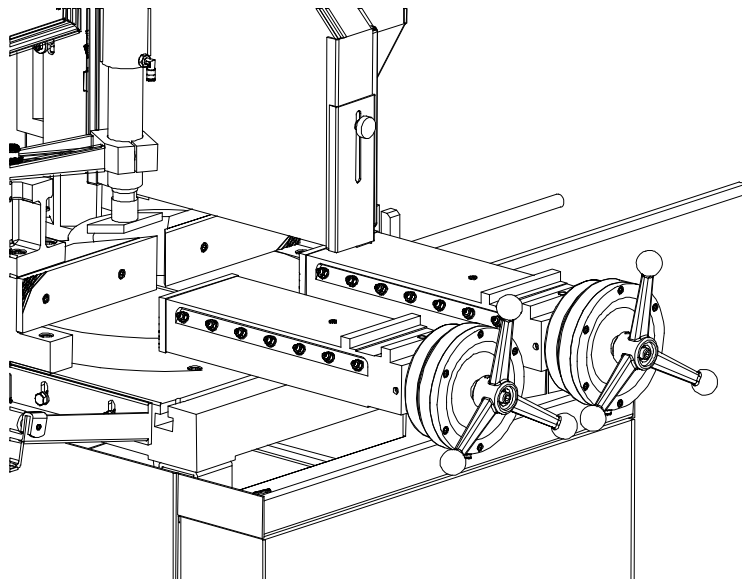


This chapter provides a list of the available accessories that can be fitted to this machine, along with assembly instructions.

## Shearing vices

As well as the vice fitted as standard on the machine, an additional pneumatic vice can also be fitted. The installation procedures are illustrated below:

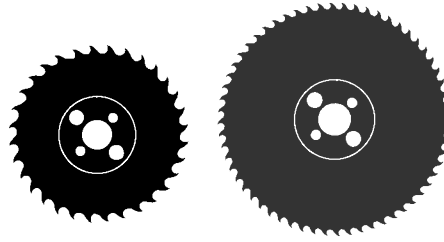
- position the clamp to the right of the blade guard and tighten the feed screw locking plate.
- connect the pneumatic hoses to the opening and closing unions on the pneumatic cylinder of the main pneumatic clamp using Y connectors.



## Circular blade

The machine fits:

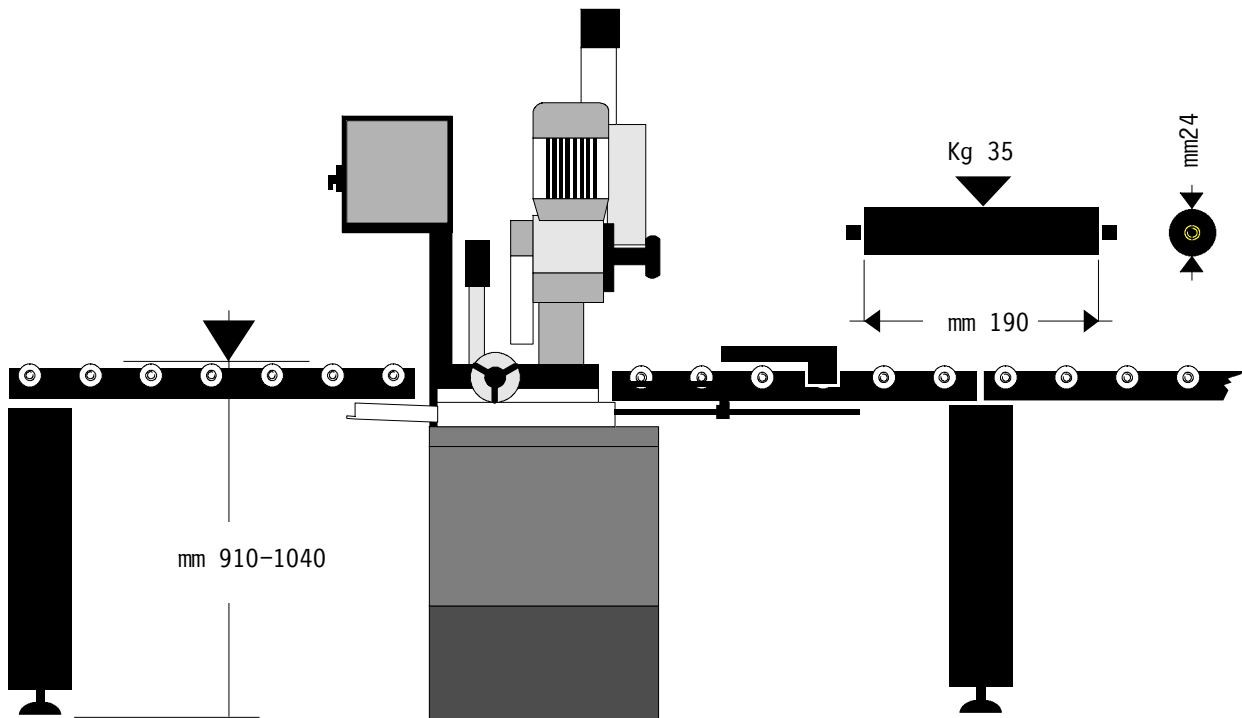
- circular blade HSS DMo5/M2 D.350x32x2.5 for profiles.



See chapter 7 of this manual for cutter blade installation instructions.

## Roller table

- K40 roller table module for feed side, 1500 mm;
- K40 roller table for discharge side, 1500 mm;



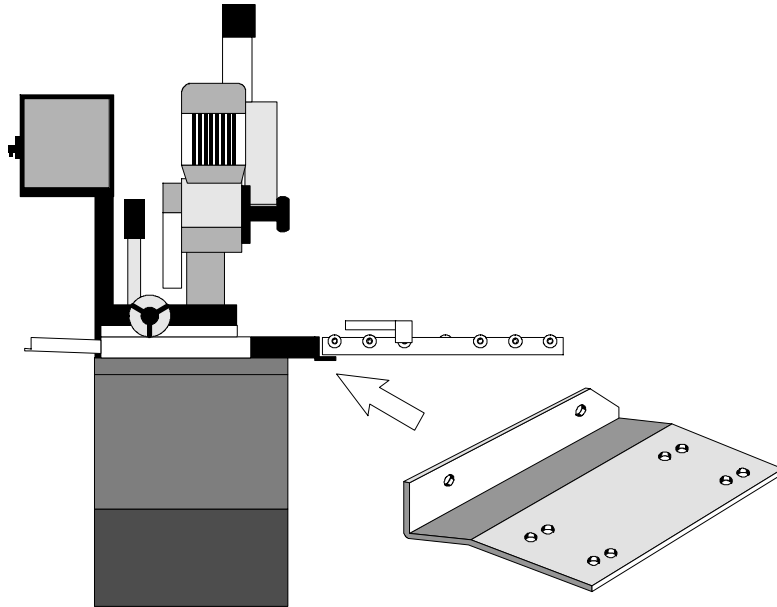
- K40 roller table for discharge side, 3000 mm;
- K40 roller table for discharge side, 4500 mm;
- K40 roller table for discharge side, 6000 mm.
- To fit the roller loading platform on the loading side, the machine has a bar-support arm that one end of the roller-way can be positioned on and then screwed in place.
- To install the roller loading platform on the discharge side an adapter must be used, with or without a support, as explained in the paragraphs that follow.

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### Adattatore pianale a rulli lato scarico

This device is used to attach the discharge roller table to the machine, and instructions are supplied below for how to assemble it:

- ▶ remove the two TE screws from the right side of the slideway;
- ▶ attach the adapter and secure it in place with the screws removed previously.

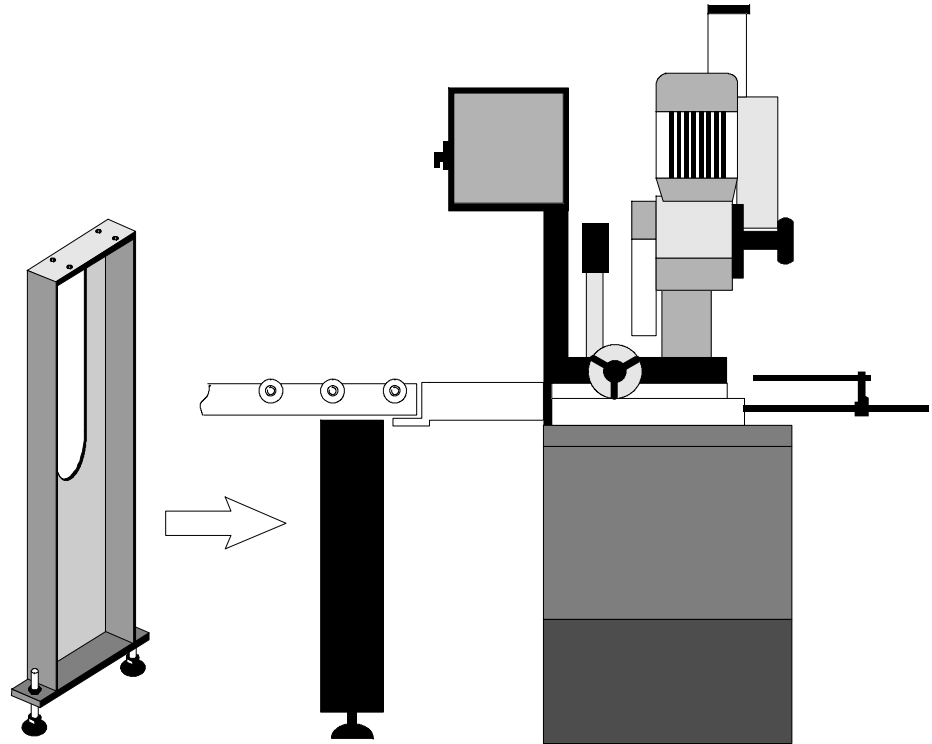


- ▶ Attach the outfeed rolling deck by fixing it with the screws supplied.

### 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);

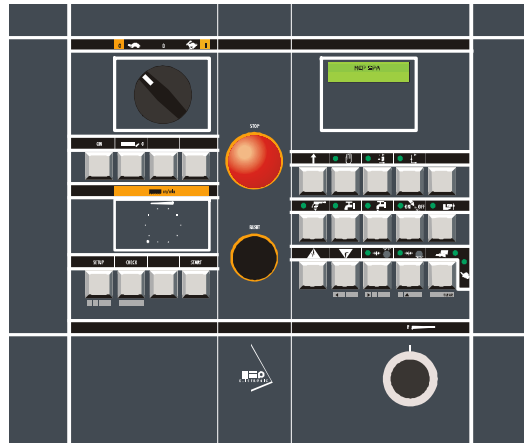


- ▶ position the support to correspond with the holes on the base of the trailer and reconnect to the adapter.

## Foot pedal

This device is used to start the cutting cycle or to stop for emergency.

- Make a hole with diameter 22 mm on the left side of the base at 150 mm of height from the ground and at 60 mm of deepness.



- Make the connection for the selector and the foot pedal as per electric scheme.





# Warranty

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Hyd- Mech 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 one year following the date of shipment to the user. Hyd- Mech's sole obligation under this warranty is limited to the repair or replacement without charge, at Hyd- Mech's factory, warehouse, or approved repair shop, of any part or parts which Hyd- Mech'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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