1. INTRODUCTION

This operation instruction manual conforms to the requirements of the 89/392/EEC Machine Directives and subsequent amendments.
In the light of this, special attention has been given to safety aspects and accident prevention in the work-place for each stage in the machine's "life". Information which could be of particular assistance to the operator has been highlighted.
The "Operating instructions" are an integral part of the machine and should be consulted before, during and after the start up of the machine and whenever else required. The content of these instructions should always be carefully observed.
The observance of the above is the only way to achieve the two fundamental aims of this manual:

- **Optimization of machine performance**
- **Prevent damage to the machine and injury to the operator**

The index of the chapters and the index of the drawings, diagrams and tables is contained in chapter 3 and can be used to help the location of specific information.

CAUTION : BEFORE INSTALLING THE MACHINE, READ THE OPERATING INSTRUCTIONS CAREFULLY

2. INFORMATION ABOUT MAINTENANCE ASSISTANCE

2.1 GUARANTEE

- MACC S.r.l. products are guaranteed against material and manufacturing defects for a period of 12 months from the date of delivery or, if the machine is installed by MACC employees, from the date of machine start up.
- The buyer is only entitled to the replacement of parts which are acknowledged as faulty: carriage and packing are at the buyer's expense.In the event of the above, the following information should be supplied:

1. Date and number of purchasing document
2. Machine model
3. Serial number
4. Code of any relevant drawings

- Requests for compensation for the inactivity of the machine will not be accepted.
- The guarantee does not cover uses which are not in line with these operating instructions which are an integral part of the machine. Nor is maintenance covered if the instructions supplied are not observed.
- The guarantee will not cover machines which have undergone unauthorized modifications.

Modification or tampering with the safety devices is strictly forbidde

3. INDEX

3.1 INDEX OF CHAPTERS

3.2 INDEX OF DRAWINGS, DIAGRAMS AND TABLES

ENCL. TYPE	DESCRIPTION	ENCL No.	CHAP
Table	Choice of circular blade	1	7.3
Drawings	Overall Dimentions	1	6/7.1
Drawings	Electrical details - electrical installation	2	6
Drawings	Motor-blade block	2	6/7.3
Drawing	Machine assembly	3	7.3/8.3

4. DESCRIPTION OF THE MACHINE

4.1 SAFETY STANDARDS COMPLIED WITH DURING THE DESIGN AND CONSTRUCTION OF THE MACHINE

During the design and construction of this machine the following standards and legal provisions have been complied with:

UNI-EN 292-1 Safety of the machinery. Basic concepts, general design principles. Part 1:Terminology and basic methodology.

UNI-EN292-2 Safety of the machinery. Basic concepts, general design principles. Part 2: Technical specifications and principles.

UNI-EN 294 Safety of the machinery. Safety distances to prevent upper limbs from reaching dangerous areas.

UNI-EN 349 Safety of the machinery. Minimum openings to prevent parts of the human body from being squashed.

UNI-EN 953 Safety of the machinery. General requirements for the design and construction of guards (fixed and mobile).

UNI-EN 954-1 Safety of the machinery. Parts of the control system related to safety. Part 1: General design principles.

CEI-EN 60204-1 Safety of the machinery. Machine electrical equipment. Part 1: General rules.

CEI EN 60204 Amendment 1 Aug 88 Electrical equipment for industrial machines. Part 2: Design of components and examples of drawings, diagrams, tables and instructions.

CEI EN 60439-1 Assembled equipment for protection and manoeuvre for low voltage (BT Panels) Part 1: Prescriptions for standard (AS) and non standard (ANS) equipment.

D.P.R. no. 547/55 Rules for prevention of accidents in the work-place.

Legal Prov. 15.8.91 no. 277 Putting into effect of 86/188 EEC directives

The following EEC directives were also taken into consideration since these rules have to be observed by the user of the machine:

89/654/EEC dated 30.11.89 Minimum safety and health prescriptions for the work-place

89/655/EEC dated 30.11.89 Minimum safety and health prescriptions for the use of work equipment by workers during work.

89/656/EEC dated 30.11.89 Minimum safety and health prescriptions for the use, by workers, of individual protection equipment during work.

The equipment used is in compliance with the relevant regulations.

4.2 DESCRIPTION OF THE MACHINE AND ITS COMPONENTS

The K 225 cutting-off machine with circular blade for ferrous metals produced by MACC is made from a solid casting, carefully processed . The upper surface, designed to allow the complete draining away of the cutting fluid, has been processed using precision machinery to allow the attachment of a sturdy vice with burr-proof jaws.

The bar-stop device allows the length required to be preset and a constant level of performance for repeated cuts.

The blade-holding head is firmly attached to a reduction unit in oil bath built onto the motor and to the base by means of a joint which provides 45° rotation to left and the cutting movement with manual feed.

The main switch is located above the motor block.

The control lever, fitted with an ergonomic hand-grip and blade activation button with safety release action, reduces fatigue during operation to a minimum.

The blade is protected by a guard which in its turn protects the operator from ejected shavings and coolant.

The machine is supplied with a set of service spanners.

4.3 INTENDED AND UNSUITABLE USES OF THE MACHINE

The K 225 cutting-off machine with circular blade has been designed and built to cut bars, structural steel and ferrous metal pipes in accordance with the instructions contained in this manual.
Therefore, the cutting of other materials is not permitted: if the above recommendations are not observed, the machine could be damaged and the health and safety of the operator put at risk.
Cutting is not permitted, if the bar has not been first locked in the vice.

5. MAIN TECHNICAL DATA

Under no circumstances should the following data be altered, this is in order to protect the correct functioning of the machine and to avoid creating safety risks for the operator.

MOTOR Motor Power Motor revolutions (two speeds)	single-phase single-phase KW 0,75 1400 rpm
CIRCULAR BLADE (SAW) Maximum diameter and thickness	Number of teeth and feed holes according to table Diameter: 225 mm Thickness: 2
BLADE REVOLUTIONS per minute	52 rpm
CUTTING ANGLE	45° right
PIECE LOCKING VICE: MAX OPENING	70 mm
COOLANT TANK CAPACITY	litres 1
MACHINE WEIGHT	Kg 32 - N 310

6. MACHINE INSTALLATION

A. MACHINE CHECK AND CONTROL LEVER ASSEMBLY

The machine should be checked to make sure that it has not been damaged during transportation and handling. Keep the machine in its normal position and avoid turning it upside down.
Control lever assembly (drawing 4 Encl. 2) : Fit the supplied head lever 22, into position 20 and fasten it by means of the nut 72. To fit the handle, connect the electric cable terminals 220 to the microswitch 218 and place it in the left second half of the handle as shown in draw. 3 Encl.2. Then insert the button 222 and the lever 22. Complete the assembly using the screws 221 and then 219. Make sure that the cable is inserted into the lever slot 22, after having checked that there are no burrs or sharp edges in the slot.

B. ASSEMBLY OF CIRCULAR BLADE

For the assembly of the circular blade, remove the screw No. 34 (Draw. 5 Encl. 2), keeping the motor-blade block raised and rotate the mobile guard 31 backwards. Unscrew the screw 29 counter clock wise, withdraw the flange 28, insert the circular blade, making sure that the toothing faces the same direction as the arrow on the mobile guard. Then refit flange 28 and screw 29.

C. ELECTRICAL CONNECTION TO THE MAINS

Install a differential thermomagnetic switch with characteristics suited to the mains.
Make sure that the power supply voltage corresponds to the voltage on the motor plate. Connect the cable to the power supply line observing the colour codes of the individual wires, pay particular attention to the earth wire. Connect the machine, make sure that the rotation of the circular blade is in the direction shown by the arrow on the guard.

D. CUTTING COOLANT

For the cooling of the circular blade, fill the tank with emulsible oil obtained from a mixture of water and AGIP SP 7648 oil with a percentage of 5-7%

7. MACHINE START UP AND OPERATION

7.1 DEVICES AND THEIR LOCATION

(The location of the devices described is shown on the K 225 installation plan Encl. 1)

Code	42	LOCKABLE MAIN SWITCH
Code	218	START-STOP MICROSWITCH: situated inside the handle located at the end of the control lever and has safety release action.
Code	59	CUTTING ANGLE DEVICE: to check that cutting inclination is as required
Code	9	LOCKING VICE
Code	65	BAR-STOP
Code	22	CONTROL LEVER WITH HANDLE

7.2 TOOLS SUPPLIED

1 Allen wrench size 3
1 Allen wrench size 4
1 Allen wrench size 5
1 Allen wrench size 6
1 Allen wrench size 14

7.3 OPERATION

CHECKS TO CARRY OUT BEFORE EACH CUT

A. Make sure that the circular blade is fastened securely by means of screw 29 (DRAW.5 ENCL.2)
B. Check that the hand indicates the required cutting angle (vice scale)
C. Make sure that the head and vice are locked by means of the lever 52 (DRAW.6 ENCL.3)
D. With the motor off, lower the head and check that at the end of the stroke, the circular blade does not touch the bench 2. If the circular blade does touch, adjust the screw 67 (DRAW.4 ENCL.2).
E. Make sure that the piece to be cut is adequately secured in the vice.
F. Make sure that the coolant is circulating in the machine.

CUTTING OPERATION

A. Before each cutting operation, if the cutting inclination is not as required, correct or change the inclination by loosening the screw 52 (DRAW.6 ENCL.3) and after correction, securing the screw again.
B. Clamp the piece to be cut by means of the handwheel 7, press the main switch 42, take hold of the handle 25 located at the end of the head lever and press button 218. The blade will now start turning.
C. Position the blade carefully on the piece to be cut. Then increase the pressure in order to accelerate the cutting operation without using excessive force. To make a series of cuts, position the bar-stop 65 at the size required. Fix it into position by using the knob 66.
D. To replace the circular blade carry out the same operations used to assemble the circular blade. (chapter 7c).
E. For the choice of most suitable blade consult the table ENCL. 1.

We strongly discourage the use of blades with ruined or insufficiently sharp cutting edges

7.4 SPECIAL SAFETY CHECKS

A. Before using the machine, check carefully that the safety devices are in good working order, that the mobile parts are not blocked, that no parts are damaged and that all the components are installed correctly and are functioning properly.

B. Make sure, before operating the machine, that the screws of the guards and other protective devices are adequately secured, especially the screws on the circular blade guard and the rotation levers of the circular blade mobile guard.

C. Check that the safety microswitches are functioning correctly.

D. Make sure that the mobile guard does not leave uncovered an angle of more than 5° in order to prevent fingers from entering.

E. Pay attention to environmental conditions. Do not expose the machine to rain; to not use it in damp environments, position the machine on a clean dry floor that has no oil or grease stains.

F. Before using the machine, the operator should make sure that all tools and service spanners used for maintenance or adjustment have been removed.

7.5 GENERAL SAFETY RULES

A. Wear appropriate clothing. The operator's clothing should not be loose or dangling nor should it have parts which could easily get caught.

B. Avoid unstable operating positions. Find a safe and evenly balanced position to operate the machine.

C. Keep the work area tidy, untidiness increases the risk of accidents.

D. Do not use the power supply cable to disconnect the plug from the socket. Protect the cable from high temperatures, oil or sharp edges. For outdoor use, only use extension cables which are in line with current regulations.

7.6 MEASURES TO PREVENT RESIDUAL RISKS

A. The removal of guards and tampering with the safety devices is strictly forbidden.

B. Gloves should always be worn.

C. Standard work clothing should be used and kept closed and should not have flapping parts.

D. The machine should not be cleaned with liquids under pressure.

E. In the event of fire, extinguishers should not be used unless they are the powder type. The electric power supply to the machine should always be disconnected in these circumstances.

F. Do not insert foreign bodies into the motor cover and to not supply the machine with voltage by tampering with the safety microswitches or main switch.

G. Take the necessary precautions to avoid the machine being started by other people during loading, adjustment, piece changing or cleaning.

8. MAINTENANCE AND REPAIRS

8.1 GENERAL SAFETY MEASURES

A. Before carrying out any work on electrical equipment, remove the power supply plug from the control panel (disconnect voltage).

B. Only use cables to supply power, which have a cross-section suited to the power of the machine.

C. Repairs should only be carried out by authorized personnel. Only spare parts made by the original manufacturer should be used, otherwise these could cause damage or injury.

8.2 ROUTINE CHECKS AND MAINTENANCE

FREQUENCY (working hours)	OPERATION
1000 hours	Replace the oil in the gear box with AGIP ACER 320 oil (0.2 litres) or equivalent.
1000	Lubrication of mobile parts in the piece locking vice
50	Cleaning of the coolant tank and filter check

8.3 DESCRIPTION OF ROUTINE MAINTENANCE

A. Replacement of gear box oil

Remove caps 38 and 19 (draw.6 Encl.3), let all the used oil flow out into a container which should have a label indicating the contents for the purposes of disposal. Replace cap 19. Feed 0.2 litres of oil (as specified above) into the oil feed hole located on the upper part of the gear box and then replace cap 38.

B. Lubrication of mobile parts of piece locking vice

Clean and grease the parts worked by the bench 2 , the vice 9 and the vice screw 6.

C. Cleaning of the coolant tank: Filter check.

Empty the coolant from the tank by means of the tap located on the rear part of the machine bench (after moving the liquid feed pipe away from this). Collect the coolant in a container for future disposal. Clean out the shavings and the metallic powder, taking care not to scatter this over the machine especially around the motor and the box containing the electrical equipment. Reconnect the pipe, check filter 44 and if necessary replace it. Fill the tank with the amount and liquid stated previously.

9.INFORMATION REGARDING ENVIRONMENTAL NOISE

An environmental noise test carried out on the K 225 cutting-off machine with circular blade, identical to the machine to which these operation instructions refer, has given the following results:

ACOUSTIC RADIATION PRESSURE

1. L_{Aeq} = 84.2 dB (A)
2. L_{peak} = 90.6 dB (the maximum acceptable value is 140 dB).
3. The level of background noise has no influence = 48.5-54.2 dB (A)

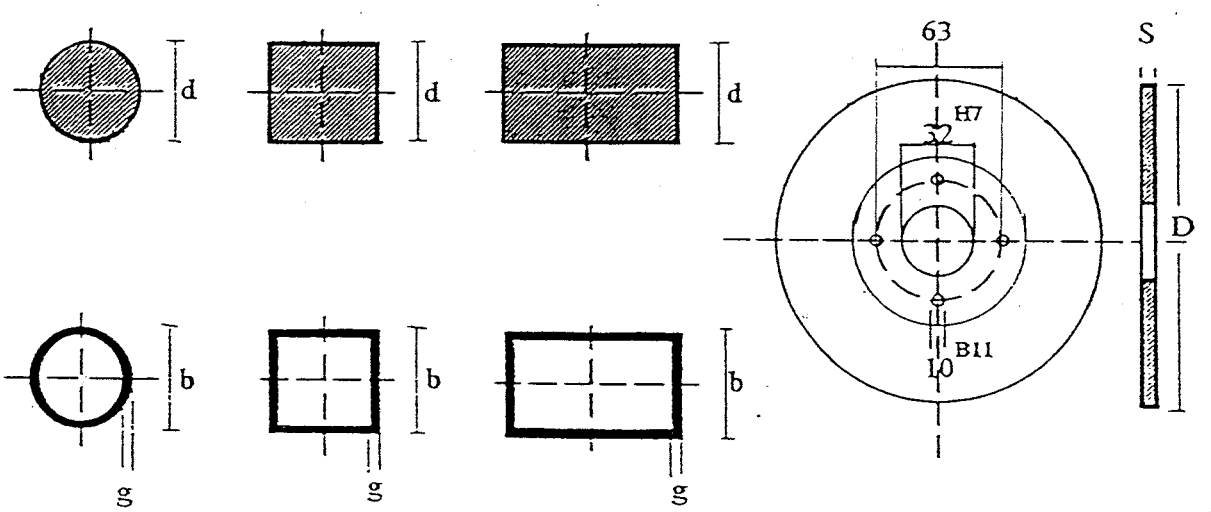
10. LIST OF SPARE PARTS (available from MACC)

POS.	DESCRIPTION	CODE	POS.	DESCRIPTION	CODE
1			39	Key 5x5x30 DIN 6885	
2	Bench	002/25	40	Dowel 8x35 DIN 914	
3			41	Switch box	
4	Pin 8x26 DIN 6325		42	Switch	
5			43	Motor	001/80
6	Vice screw	012/25	44	Filter	042/25
7	Vice handwheel	014/25	45	Splash	
8	Head carrying arm	004/25	46	Bearing	
9	Vice jaw	013/25	47	Worm screw	009/25
10	Dowel 8x10 DIN 915		48	Self-locking ring nut 16x1 DIN 981	
11	Vice cover	015/25	49	Water pipe	
12	Screw 5x8 DIN 912		50	Screw 4x6 DIN 912	
13	Screw 6x20 DIN 912		51	Pump carrier braket	018/25
14	Bush	027/25	52	Screw 10x40 DIN 933	
15	Belleville washer		53	Washer D.10 DIN 125/A	
16	Pump pushing stud	020/25	54	Dowel 6x10 DIN 914	
17	Pump stud braket	019/25	55		
18	O- Ring 3100	045/25	56		
19	Oil level plug		57	Head pin	032/25
20	Head	005/25	58	Screw 6x16 DIN 933	
21	Spacer	044/25	59	Graduated sector	023/25
22	Head lever	039/05	60	Splash guard 25-35-7	046/25
23	Helical gear	010/25	61	Stopper	024/25
24	Pin 6x40 DIN 1		62	Head gear	035/25
25	Head lever handle	046/05	63	Nut M 16 DIN 934	
26	Disk shaft	011/25	64	Bar stopper rod	031/05
27	Disk		65	Bar stopper	037/25
28	Disk flange	017/05	66	Bar stopper knob	077/25
29	Disk fastening screw	029/25	67	Screw 6x30 DIN 933	
30	Disk guard	007/25	68	Pump	022/25
31	Disk movable guard	008/25	69	Rear guard	028/25
32	Snap ring D.45 E DIN 471		70	Nut M 8 DIN 934	
33	Screw 6x16 DIN 912		71	Nut M 6 DIN 934	
34	Screw 6x16 DIN 912				
35	Disk movable guard movable rod	026/25			
36	Disk movable guard fixed rod	025/25			
37	Screw 6x16 DIN 912				
38	Oil filling cap				
39	Key 5x5x30 DIN 6885		218	Micro switch of handle	
40	Dowel 8x35 DIN 914		219	Screw	
41	Switch box		220	Electrical cable	
42	Switch		221	Screw	
43	Motor	001/80	222	Button	

SCELTA DELLE SEGHE- BLANDE SELECTION
CHOIX DES FRAISES SCIE- WAHL DER SAGEBLATTER

ALLEGATO N°1

DIAMETRO - DIAMETER DIAMETRE - DURCHMESSER		200	225	250	275	300	315	350
SPESSORE - THICKNESS EPAISSEUR - DICKE		1.8	1.8	2	2.5	2.5	2.5	3
b = 10 - 80	t	3	3	3	3	3	3	3
g = ⩽ 2	z	200	230	250	280	300	315	350
b = 10 - 80	t	5	5	5	5	5	5	5
g = 2 - 4								
d = 10 - 18	z	130	140	160	170	190	200	220
d = 20 - 80	t	8	8	8	8	8	8	8
g = 4 - 10								
d = 18 - 30	z	80	90	100	110	120	120	140
d = 30 - 40	t	10	10	10	10	10	10	10
	z	60	70	80	90	90	100	110
d > 40	t	—	—	—	12	12	12	12
	z	—	—	—	70	80	80	90



Si garantisce il funzionamento ottimale della vite-corona utilizzando seghe con fori di trascinamento.

Best performance of worm screw worm wheel gearing is guaranteed when circular saw blades with drawing-holes are used.

Nous garantissons le bon fonctionnement de la vis et couronne seulement si l'on emploie des fraise-scies avec trous d'entrainement.

Die verwendung von sägeblattern mit mitnehmerlöchern sichert den guten betrieb der schnecke und des schneckenkranzes.

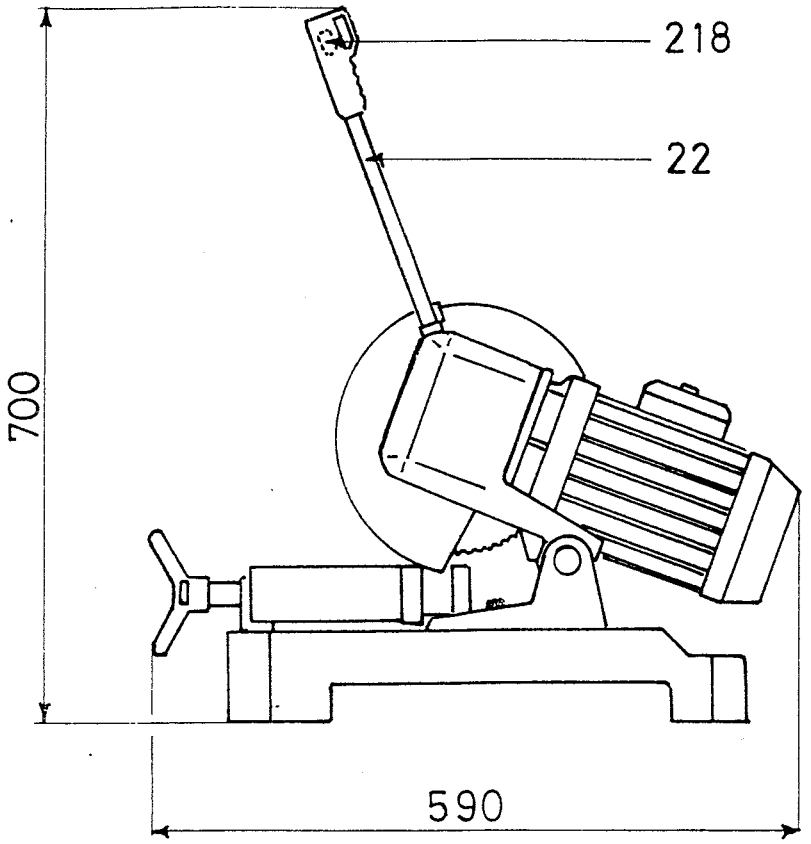
b = diametro esterno/altezza (tubi) - outside diameter/height (pipe)
diametre extérieur/hauteur (tube) - aussendurchmesser/hohe (rohr)

d = diametro/altezza (pieni) - diameter/height (solid)
diamètre/hauteur (plein) - durchmesser/höhe (voll)

g = spessore del tubo - pipe thickness
epaisseur du tube - rohrdicke

t = passo dentatura - toothing pitch
pas denture - entfernung verzahnung

z = numero di denti - number of teeth
numero de dents - zahnnummer



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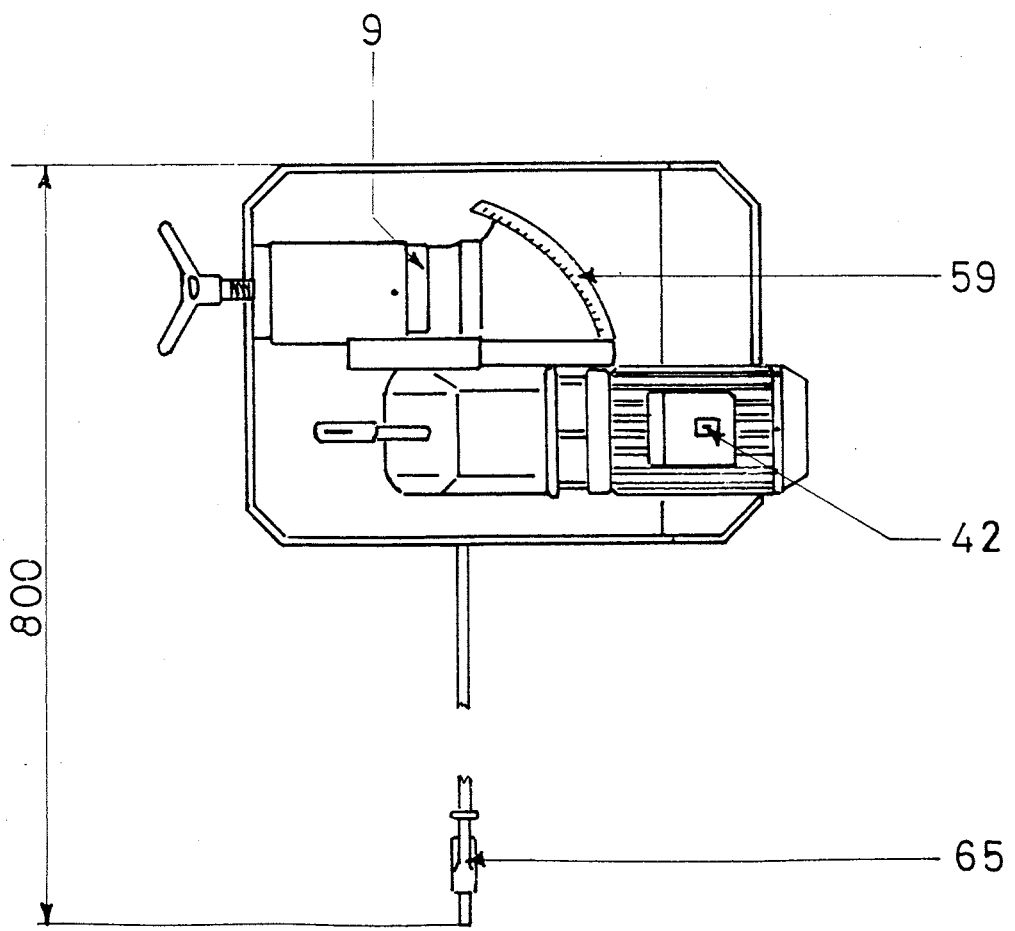

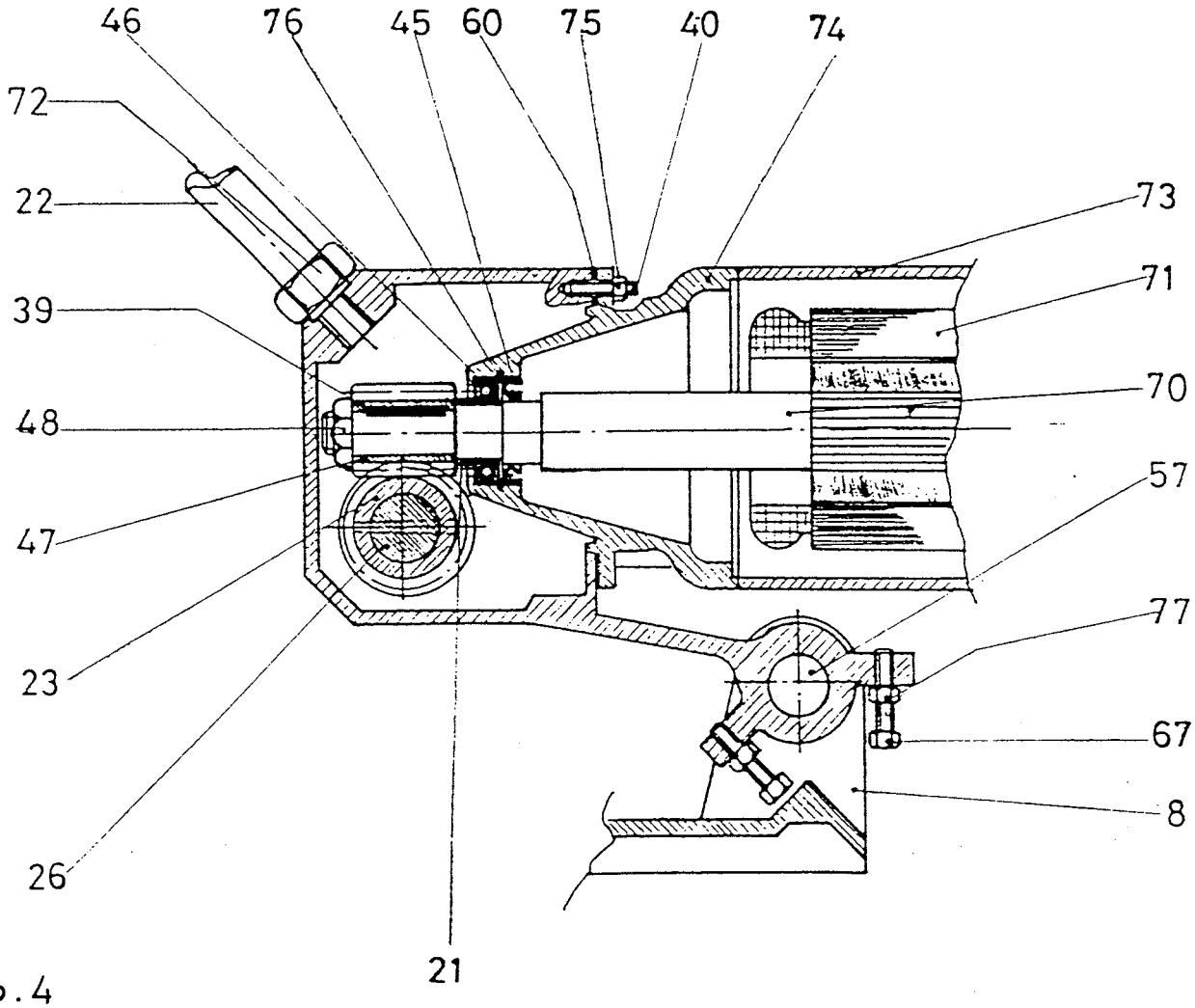
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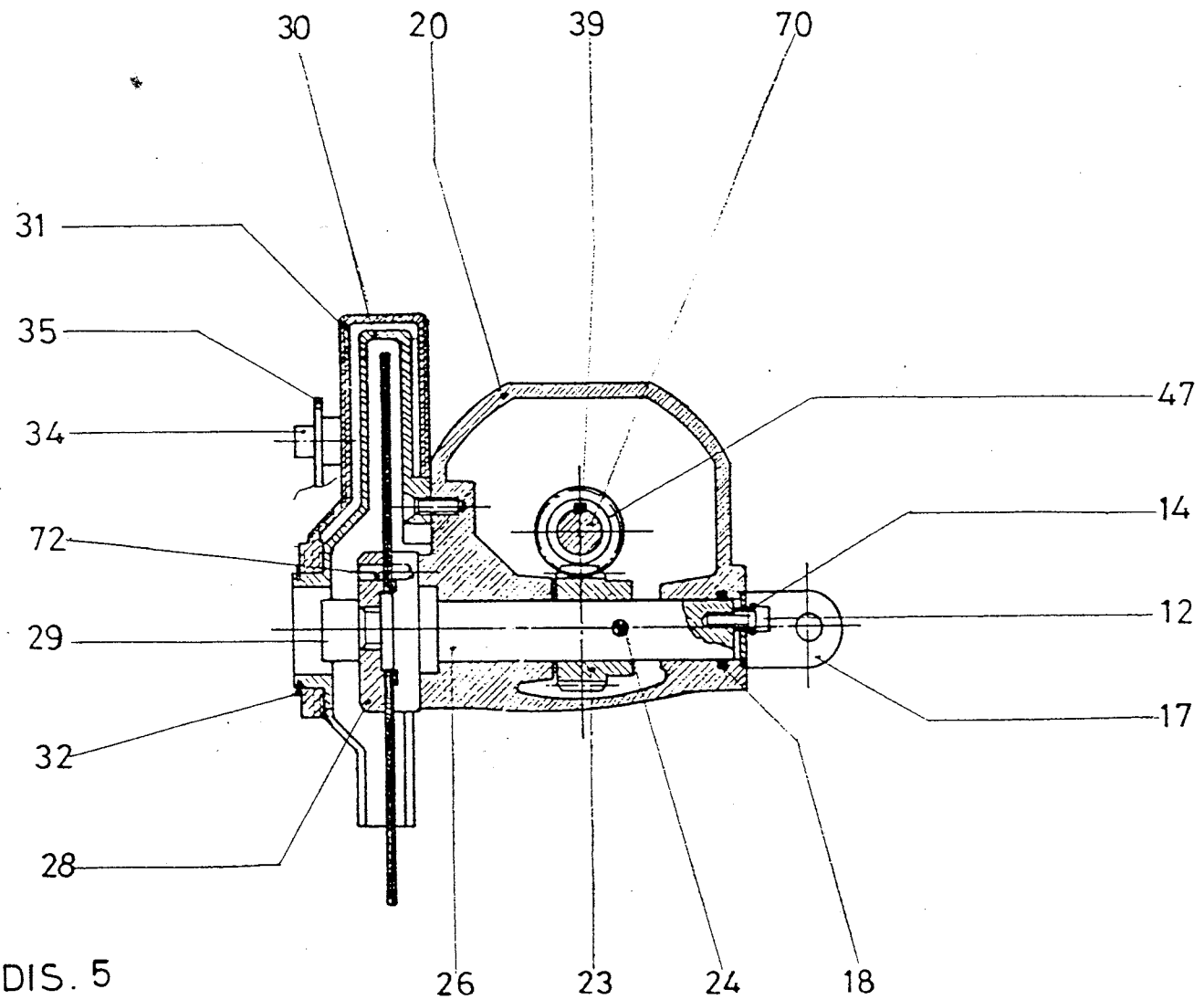
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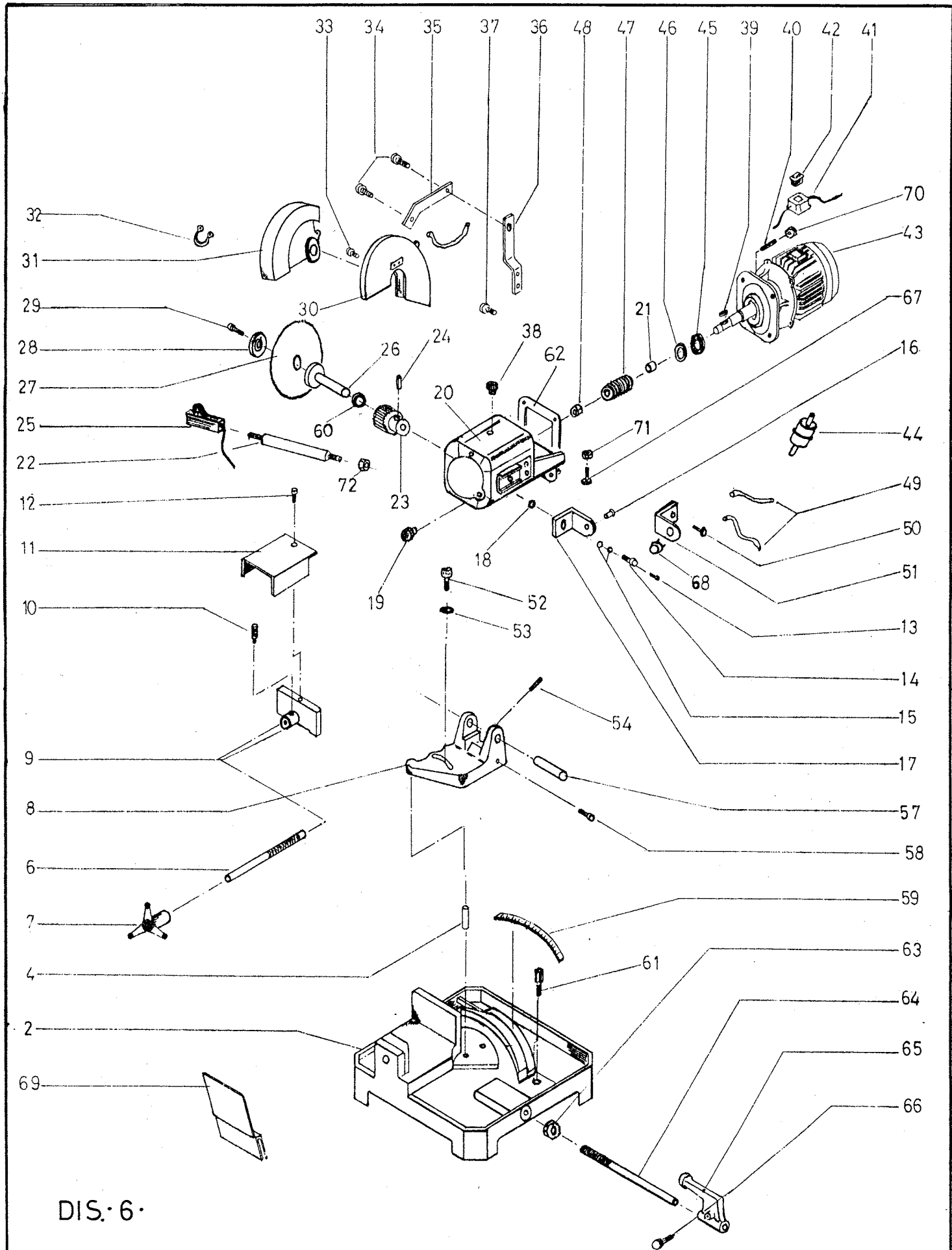

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ALLEGATO 3