

MACHINE TOOL FACTORY  
OF CSEPEL WORKS  
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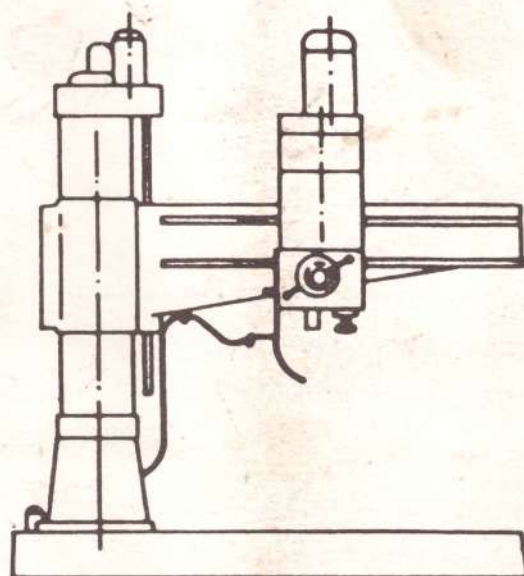
20080



# RF 50

## RADIAL DRILLING MACHINE

### operator's manual



Type of the machine: ..... RF 50/1600  
N° of the machine: ..... 11640

1982 DEC 10

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— The right for alterations reserved —

Identification number: ..... Text : ..... pages

The present Manual contains information and useful hints concerning the putting into operation, the constructional lay-out, the operation, further the handling and maintenance of the radial drilling machine illustrated on the back of title page.

Operator and foremen must be thoroughly acquainted with the content, therefore, before setting the machine into operation.

To ensure the accurate operation of the machine, it is very important to operate it from the very beginning in compliance with the relevant instructions.

Attention should be paid to the transport, the preparation of the foundation and the erection of the machine. After the machine is put into operation, special care should be paid to correct lubrication and systematic cleaning. The operator should make his best to get familiar with all operating and maintenance instructions.

The Manual contains useful hints and advices whose observation results not only in the lasting accuracy and undisturbed operation of this up-to-date machine, but also in economical advantages. We hope that the machine will operate to your satisfaction and we ask to inform us about your experiences, remarks and suggestions in connection with the machine running in order to enable us to utilise them in the further development of the machine.

For your kindness we are grateful in advance.

MACHINE TOOL FACTORY OF CSEPEL WORKS  
CUSTOMERS' SERVICE



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RF-50/1250 1600	1.02 WARRANTY	1.6
<p>We guarantee the following points of the operator's manual. In order of the further development of our products we reserve the right for the eventual modification of data not indicated.</p> <p><u>Guaranteed data:</u></p> <ol style="list-style-type: none"> <li>1./ Identification data of manufacturing company and delivered machine.</li> <li>2./ Principal and characteristic dimensions and weight of the machine.</li> <li>3./ Standard accessories: characteristic dimensions and quantity.</li> <li>4./ Foundation plan, instructions for erection.</li> <li>5./ Dimensions of case.</li> <li>6./ Fitting dimensions of machine for adopting tools and clamping devices.</li> <li>7./ Data observed and listed in the acceptance record.</li> </ol> <p><u>Changes made on the machine:</u></p>		
	5	

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1600

## 1.03 TECHNICAL DATA

1.7

For the sake of simplicity the type designations have been marked in the manual with the signs "a" and "b" as follows:

RF-50/1250 = type "a"

RF-50/1600 = type "b"

		Dimension in mm	
		Max. possible diameter	
		In steel 600 N/mm <sup>2</sup>	In cast iron 260 N/mm <sup>2</sup>
Boring,	without drilling, feed rate 0,25 mm/r	50	63
Tapping,	drilled to 1/2 dia mm	100	120
	Whitworth threads inch	1 1/4"	1 3/4"
	Metric fine threads mm	50	60

<u>Spindle</u>	Type "a"	Type "b"
Distance to side of sleeve, mm max.	1250	1600
	min.	350
Distance to baseplate, mm max.	1420	
	min.	350
Travel, mm	300	
Spindle bearing seat dia/quill dia, mm	40/78	
Morse taper No.	5	
Number of speeds	12	
Range of speeds, with 50 cycles r/min	45-63-90-125-180-250-355- 500-710-1000-1400-2000	



RF-50/1250 1600	1.03 TECHNICAL DATA	1.8
<div> <div>Spindle</div> <div> <div>Type "a"   Type "b"</div> <div> Range of speeds with 60 cycles r/min 50-71-100-200-280-400-560-800-1120-1600-2240 </div> <div> Feeds, number range, mm/r 9 0,05-0,075-0,112-0,17-0,25-0,37-0,56-0,84-1,25 </div> <div> Sleeve dia. mm 360 </div> </div> </div> <div> <div>Baseplate</div> <div> <div>Type "a"   Type "b"</div> <div> Working surface: length x width, mm 1325x930   1675x930 </div> <div> T-slots, number and spacing mm 4x200   4x200 </div> </div> </div> <div> <div>Machine</div> <div> <div>Overall dimension, mm:</div> <div> length x width x height Type "a" : 2190x950x2830 Type "b" : 2540x950x2830 </div> <div> Weight including standard accessories, kg Type "a" : 3050 Type "b" : 3200 </div> <div> Case dimensions, mm:</div> <div> length x width x height Type "a" : 2500x1300x3200 Type "b" : 2800x1300x3200 </div> </div> </div>		
	5	

RF-50/1250 1600	1.04 ACCESSORIES	1.9
<p><u>1.04.1 Standard accessories</u></p> <ul style="list-style-type: none"> <li>1 - complete electrical equipment</li> <li>1 - double socket wrench,</li> <li>2 - lifting shackles</li> <li>8 - securing bolts, nuts and washers /for lifting shackles/</li> <li>1 - hexagon wrench 10 KGSZ 29.1050</li> <li>1 - hexagon wrench, opening 6, No. 255509-0</li> <li>1 - hexagon wrench, opening 14,</li> <li>1 - hexagon wrench, opening 19,</li> <li>1 - socket wrench for triangular headed bolt CSVF SZ 3031-8</li> <li>1 - tool knockout key,</li> <li>1 - LUB oil gun</li> <li>2 - operator's manual</li> <li>2 - test records</li> <li>1 - packaging list</li> <li>1 - instructions for connecting</li> <li>1 - list of spare parts /in case of order/</li> <li>6 - shear bolt 250298-2</li> </ul> <p><u>1.04.2 Extra accessories</u></p> <p>Cubic table /3 size optional/  Tilting table        -"  Cooling equipment, complete  Work light /excluding bulb/  Machine vice /complete/  Boring spindle</p>		
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RF-50/1250 1600	2.00 PUTTING INTO OPERATION	2.1
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### 2.01 Transport

Fig. 017.

The machine is shipped in a totally assembled state, in polyethylene cover, packed in a case lined with waterproof paper. The case is provided with inscriptions or conventional marks calling for careful handling. Make sure to avoid heavy tiltings or shocks during transport; when moving or lifting with a crane, the hoisting ropes should be arranged according to the marks on the case.

### 2.02 Unpacking

On receiving the machine, first check the intactness of the case, respectively of the machine and the completeness of the parts and accessories named in the transport list.

Draw up a report and send it immediately to the deliverer, should any irregularities /external damages, deviation from transport list/ be experienced. Later such reclamations will not be accepted.

After unpacking use an endless hemp rope of adequate strength for hoisting the machine which should be arranged as seen in the respective figure. Insert expediently under the bearing parts of the rope some felt pads in order to prevent rubbing off the paint.

Should no crane be available, the machine can be moved with the aid of tube rollers placed under the base-plate.

### 2.03 Cleaning

In order to prevent rusting, the bright surfaces of

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RF-50/1250  
1600

## 2.00 PUTTING INTO OPERATION

2.2

the machine are coated with protective layer. After unpacking the machine should be thoroughly cleaned from all dirt deposited during transport as well as from the rust-preventing layer. The protective coats should be removed with paraffin. After wiping dry apply a light coat of grease or oil free of acid to all bright, sliding surfaces. Before putting the machine into operation, fill it up with oil.

### 2.04 Foundation, erection, levelling

Fig. 018.

The foundation of the machine must be prepared exactly as shown in the foundation drawing.

The machine will not be installed directly on the concrete foundation, but on approximately 100 x 100 x 10 steel plates "C" arranged near to the foundation bolts. The machine being placed should be accurately levelled with the aid of steel wedges A and B; first arranging them opposite each other around the centre of the longer sides of the baseplate /mark B/ so that the, machine freely balances on both of these wedges. In this position make knocks on the corresponding wedge until a crosswise level position is attained by using a spirit level. Next, placing the other pair of wedges /mark A/ under the short sides of the baseplate, level the machine longitudinally as well.

After levelling grout the foundation bolt holes; and after setting tighten uniformly the foundation

RF-50/1250 1600	2.00 PUTTING INTO OPERATION	2.3
<p data-bbox="341 421 1310 506">bolts - keeping an eye on the level -, and finally grout the baseplate in the usual manner.</p> <p data-bbox="229 566 598 600"><u>2.05 Connecting-up</u></p> <p data-bbox="341 629 1054 714">See in chapter "Electrical equipment" /on page 8.1/</p>		
	5	



The design of the machine renders it suitable for drilling, boring, tapping, reaming, etc. operations chiefly on bulky work because the spindle may be set into position merely by rotating the radial arm and shifting the drilling head along it, without having to move the workpiece. The settings mentioned above are made by hand, but the arm is elevated and lowered by an electric motor.

In its structural details, the machine conforms to up-to-date requirements. It can be quickly and accurately set to the work and clamped in position, it is equipped with automatic depth control, is easy and simple to operate. All these features favourably affect the versatility of the machine.

The broad range of available spindle speeds and feed rates permits the machining of a diversity of materials, such as steel, cast iron, copper, aluminium, plastics, etc. Thus, all materials used in practice can be machined at the most adequate cutting speed and with the most suitable rate of feed.

The machine consists of the following main assemblies:  
/fig.0.00/

- 001./ Main drive
- 002./ Feed-changing device
- 003./ Feed clutch
- 004./ Starting and reversing unit
- 005./ Spindle
- 006./ Feed engaging head
- 007./ Spindle counterbalance
- 008./ Drilling head housing
- 009./ Column

RF-50/1250 1600	3.00 DESCRIPTION OF MECHANISM	3.2
<p>010./      Electrical collector slip ring</p> <p>011./      Arm</p> <p>012./      Arm clamping device</p> <p>013./      Limit switch</p> <p>014./      Clamping</p> <p>015./      Clamping disjunction device</p> <p><u>3.01 Main drive</u></p> <p>Fig. 001.</p> <p>The 12-speed spindle drive mechanism is incorporated in the upper part of the spindle head. It is powered by a 4 kW electromotor through a dual-disk clutch. Right- or left-hand rotation of the spindle is derived through engaging of the clutch in the two directions.</p> <p>The main drive is suitable for transmitting a torque of 260 Nm. This means that motor power can be fully exploited at speeds over approximately 125 r/min. The main drive is noiseless; ground gears assure its even rotation.</p> <p>Twelve spindle speeds are available, they are obtained by shifting cluster gears in the main drive with a lever. On shaft "11" of the main drive there is a disk, surrounded by a Ferodo-lined brake band. At stoppage it is automatically forced against the brake disk and it stops spindle rotation in about 2 - 3 s.</p> <p>A safety clutch 3 having a shear-pin is fitted on the upper part of spline shaft "7", as a protection against overloads. The shear pin can be easily replaced after removing the small lid on top of the head housing.</p> <p>The shear bolt: <math>\sigma_B = 420-520 \text{ N/mm}^2 \text{ } \phi 3,5 \text{ h6x15 mm}</math></p>		
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3.02 Feed-changing device

Fig.002

The feed-changing device is built in the middle part of the head as a block, separately. Setting of the different feed rates can be made by moving the mechanical engaging lever 107 horizontally and vertically.

The required feed rate will be selected from the disk of the feeds and the engaging lever will be set to this value, in the same sequence as indicated on the disk.

For the selection of feeds and spindle speeds is advisable to set up only technologically related values. In the case of 2000-r/min spindle speed it is not recommended to disengage the spindle in value of 1,25 mm/r. feed through the overload clutch to avoid any damage.

CAUTION Feed gears should be shifted only with the spindle stopped.

3.03 Feed clutch

Fig. 003

The mechanism feeds the spindle through ball overload clutch 132 and worm gearing 133. Power feed is disengaged by this ball-type clutch when an overload occurs, or the required drilling depth is attained and the spindle reaches the limit stop.

3.04 Starting and reversing device

Fig. 004 and 020

The starting lever is mounted on the right side of the drilling head, in the under third part of it.

In addition to engaging or changing of the twin multiplate-disk clutch and operating the brake, this lever plays a part in locking the main and auxiliary drives too.



RF-50/1250 1600	3.00 DESCRIPTION OF MECHANISM	3.4
<p data-bbox="245 353 497 389"><u>3.05 Spindle</u></p> <p data-bbox="363 405 1445 931">5 antifriction bearings mounted in the quill ensure accurate and low-friction running of spindle 204. Radial forces are taken up by radial ball bearings, thrust is counteracted by thrust ball bearings. Longitudinal traversing of spindle 204 is by fine fitted quill and by the gear being engaged with it. The surface-hardened spindle is made of material Cr 80, and the quill is nitridised for surface-hardening, thus assuring lasting accuracy and long life. The standard spindle has an inner taper Morse No. 4 and against order, a spindle inner taper Morse No. 5 is available.</p> <p data-bbox="255 981 624 1016"><u>3.06 Engaging head</u></p> <p data-bbox="371 1028 525 1064">Fig. 006</p> <p data-bbox="371 1077 1453 1458">Power and hand feed engagement, spindle traverse by hand and drilling depth adjustment are effected with the engaging head. Its dual engaging lever 265 has two positions. If withdrawn it serves for traversing the spindle by hand, and in its inner position it engages the power feed. The adjustment of the drilling depth, too, is effected by this engaging head, with an accuracy of 0,1 mm.</p> <p data-bbox="264 1507 804 1543"><u>3.07 Spindle counterbalance</u></p> <p data-bbox="379 1554 533 1590">Fig. 007</p> <p data-bbox="379 1606 1441 1749">The spindle is counterbalanced by coil spring 310, preloaded with the aid of cam 302. The spindle is connected to it through roller chain 306.</p> <p data-bbox="379 1767 1444 1960">Readjusting is performed conveniently by worm gearing 301. This form of counterbalancing is very advantageous and compact, and at the same time, counterbalancing is even in the full length of the spindle.</p>		
	5	

3.08 Drilling head design

Fig. 008

The head is mounted on the slideways of the radial arm, it can be traversed horizontally along them and clamped in position for drilling. The head incorporates the assemblies required for drilling operations. On its front wall there is a chart for setting feed rate, spindle speed and cutting speed.

3.09 Column

Fig. 009

The baseplate is made of quality machine tool casting. On its working surface there are T-slots for holding work, and internally it is designed for forming a coolant tank.

The column is fastened to the baseplate. A chain of roller bearings at the bottom of the column, and a cylindrical and a thrust bearing at the top ensure rotation of the sleeve.

3.10 Electrical collector slip ring

Fig. 010

The electrical connecting head ensures - maintaining the electrical contact - full rotation of the radial arm.

3.11 Arm

Fig. 011

By the hole of its bracket the arm fits on the sleeve, and may be traversed on it vertically and clamped in the required position. It is locked to the sleeve by key. The head rolls on horizontal ways.



3.12 Clamping the arm

Figures 009, 012

The automatic mechanism keeps the arm constantly clamped to the sleeve, and releases it only for the duration of elevating or lowering. When pushbuttons lb5 or lb4 are pressed, the elevating motor and the elevating screw start to rotate clockwise and counter-clockwise, respectively.

Elevating screw 416 releases the clamping of the arm by lifting nut 485 with trapezoidal thread and through lifting lever 397, turning bar 495, furthermore through clamping bolts controlled by cam. With the spindle rotating in any direction, nut 485 effects releasing after a certain amount of elevating or lowering, while nut 489 rotates together with the screw. When engaging bar 486 of the nut - the bar acting also as a stop - stops lifting nut 489 in its rotation, the arm will be elevated or lowered. As soon as the pushbutton is released, the elevating motor receives counter-current which makes it rotate in a reverse sense thereby returning the nut 485 to its central position, and consequently the clamping of the arm takes place in this manner. When the nut reaches its central position, it actuates an electric switch interrupting the current of the motor and stopping it.

3.13 Limit switch.

Fig. 013

It has the task, when elevating or lowering the arm, in its end positions, to cut the circuit of elevating-lowering motor lm2 and to stop traverse.



3.14 Clamping

Figures 014, 009

The machine is equipped with an electro-hydraulic clamping mechanism which clamps the sleeve to the column and the head to the arm.

The gear oil pump 536 driven by the clamping motor supplies oil to one or the other side of plunger 533, depending on the sense of rotation of the motor, corresponding to clamping or releasing. The clamping motor is started by pressing pushbutton 1b3.

One of the plungers actuates the clamping of the sleeve, the other that of the drilling head, through gears and shafts. Should the operator continue to actuate the motor after clamping has been effected, the oil begins to flow through ball valves 547 - mounted on the plungers and set to 18 atm.

On either side of the pump there is a ball valve beneath oil level ensuring an oil supply free of air. To obtain this, actuate the clamping mechanism 4 - 5 times when putting the machine to its first use. The oil level in the clamping house must attain the centre line of the oil level indicator even after having actuated the mechanism for longer time.

When clamping the sleeve, the clamping mechanism rotates spline shaft 389 which transmits this motion through geared connections 386 and 387 to threaded screw 384. The screw elevates nut 378 and the lever 402 being engaged with it acts as a double-armed lever, forcing the sleeve against the tapered surface on the column. This feature ensures effective clam-

RF-50/1250 1600	3.00 DESCRIPTION OF MECHANISM	3.8
<p>ping and centering, in addition. When releasing, the threaded screw draws downward the nut, and the lever 402, respectively, which thus lifts the sleeve as compared to the column. In this manner the tapered surfaces will be separated from each other, and the arm together with the sleeve can be easily swivelled.</p> <p><u>Clamping the drilling head</u></p> <p>Fig. 008</p> <p>The central clamping mechanism rotates the horizontal clamping shaft supported on the two ends of the radial arm. The clamping shaft forces the head against the arm, with the aid of eccentric sleeve 344 and retaining insert 339.</p> <p><u>3.15 Disjunction of clamping</u></p> <p>Fig. 015</p> <p>The clamping of the arm and that of the head can be separated by means of switch a3, so that the arm remains clamped and only the clamping of the head gets released. This will be obtained with the aid of solenoid valve 572 controlling the way of oil flow into the cylinders of the central clamping, according to the separation.</p>		
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RF-50/1250  
1600

## 4.00 CHARTS

4.1

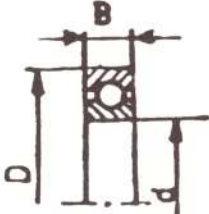
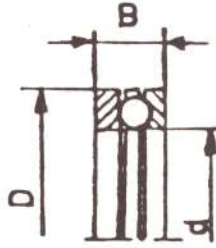
4.01 Chart of gears: See figures 001, 002, 003, 004, 006,  
007, 008, 009, 010, 014.

N <sup>o</sup>	Pos. N <sup>o</sup>	N <sup>o</sup> of schema	z/m
1	2	3	4
1	6	255286-0	15/2,5
1/a	8	255280-8	28/2,25
2	10	255278-1	32/2,25
3	12	261032-0	34/2,5
4	13 /at 50 Hz/	255262-6	25/3
5	13 /at 60 Hz/	255558-8	25/3
6	15 /at 50 Hz/	540473-3	18/3
7	15 /at 60 Hz/	540474-0	17/3
8	17	261041-6	34/2,5
9	36	240076-7	44/2
10	38	261054-0	31/2,5
11	40	240075-0	33/2
12	41	261033-7	23/2,5
13	42	255272-9	27/2,25
14	44	255271-2	22/2,25
15	45	255270-5	18/2,5
16	46	261035-1	22/2,5
17	47	255275-0	37/2,25
18	48	255276-7	20/2,25
19	49	255284-6	32/2,25
20	50	255283-9	53/2,5
21	51	255285-3	49/2,25
22	52	261059-5	17/2,25
23	54	255305-0	46/2
24	54 /0,1-2,53/ /feed/	261098-0	33/2
25	55	255296-3	29/2





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1	2	3	4		
26	55 /0,1-2,53 feed/	261097-3	42/2		
27	56	255297-0	27/2,5 30/2,5		
28	57	255298-7	68/2,5 27/2,5		
29	80	261149-3	16/2,5		
30	82	261148-6	34/2		
31	84	261147-9	51/2		
32	87	261154-1	14/2		
33	88	261153-4	37/2		
34	92	261165-1	rack m = 2		
35	93	261161-3	27/2		
36	95	261158-9	31/2		
37	96	261149-3	16/2		
38	97	261163-7	36/2,25		
39	98	261156-5	49/2		
40	99	261157-2	43/2		
41	100	261171-6	rack m = 2		
42	101	261170-9	16/2		
43	104	261168-2	12/2		
44	105	261173-0	20/2		
45	133	255097-8	1 - start worm with right-hand spiral,m=2,9946		
46	176	255394-0	22/2		
47	177	255308-1	12/1,75		
48	179	261067-4	26/1,75		
49	185	255551-9	20/1,75		
50	253	255205-9	44/2,48655		
51	267	255212-1	60/2,9946		
52	271	248623-3	22/2		
53	274	255217-6	15/2		
54	277	255203-5	15/2		
		5			

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56	283	248621-9	1 - start worm with left-hand spiral, m=2, 48655	
57	301	206565-2	1 - start worm with right-hand spiral, m = 4	
58	309	206508-5	45/4	
59	344	255342-1	58/1	
60	345	255343-8	14/1	
61	385	255176-6	25/2	
62	387	255179-7	25/2	
63	405	540454-4	17/2,5	
64	409	540453-7	41/2,5	
65	411	255183-8	50/2,5	
66	415	540406-3	18/2,5	
67	454	248056-7	rack m = 2	
68	522	250133-8	26/2	
99	527	250124-2	20/2,5	
100	533	235475-6	rack m = 2,5	
101	534	250131-4	18/2,5	
102	536	241816-4	17/2	
103	536	241199-2	17/2	
104	543	235487-3	rack m = 2,5	
105	552	250154-1	22/2	
106	553	250153-4	20/2,5	
		5		

RF-50/1250 1600	4.00 CHARTS	4.4	
4.02 Chart of antifriction bearings			
	$\phi d \times \phi D \times B$		Qty
	6000	10 x 26 x 8	1
	6003	17 x 35 x 10	2
	6004	20 x 42 x 12	3
	6005	25 x 47 x 12	3
	6006	30 x 55 x 13	2
	6007	25 x 62 x 14	1
	6008	40 x 68 x 15	1
	6008/P52	40 x 68 x 15	3
	6009	45 x 75 x 16	4
	6203	14 x 40 x 12	6
	6204	20 x 47 x 14	4
	6205	25 x 52 x 15	1
	6207	35 x 72 x 17	1
	6208	40 x 80 x 18	1
	6304	20 x 52 x 15	3
	6013	65 x 100 x 18	2
	51105	25 x 42 x 11	1
	51108	40 x 60 x 13	4
	51110	50 x 70 x 14	1
	51114	70 x 95 x 18	1
	51206	30 x 52 x 16	1
	51208	40 x 68 x 19	1
	51214	70 x 105 x 27	1
	51215	75 x 110 x 27	1
5			



RF-50/1250 1600	4.00 CHARTS	4.5	
		$\phi d \times \phi D \times B$	Qty
	NU 1020	100 x 150 x 24	1
	53212 U	60 x 100 x 31	1
	5		

RF-50/1250 1600	5.00 TECHNOLOGY	5.1												
<p>5.01 <u>Performance test</u></p> <p>The machine may be subjected to a performance test, according to the following technological specifications:</p> <table><tr><td>drill diameter</td><td>50 mm</td></tr><tr><td>drill material</td><td>high-speed steel</td></tr><tr><td>workpiece material</td><td>steel</td></tr><tr><td></td><td><math>\sigma_B = 600 \text{ N/mm}^2</math></td></tr><tr><td>speed</td><td>125 r/min</td></tr><tr><td>feed</td><td>0,25 mm/r</td></tr></table> <p>The machine and its parts must perform drilling according the above specifications without difficulty. The safety clutch must not disengage during this operation.</p>			drill diameter	50 mm	drill material	high-speed steel	workpiece material	steel		$\sigma_B = 600 \text{ N/mm}^2$	speed	125 r/min	feed	0,25 mm/r
drill diameter	50 mm													
drill material	high-speed steel													
workpiece material	steel													
	$\sigma_B = 600 \text{ N/mm}^2$													
speed	125 r/min													
feed	0,25 mm/r													
	5													

5.02 Operation5.02.1 Starting the spindle

See in chapter "Electrical equipment"  
/Page 8.2/

5.02.2 Selecting the spindle speed

Fig. 020

Spindle speeds are selected by means of a disk "A" and the shifting lever "B" in the following manner: Select the necessary spindle speed on speed indicator plate 1h 10-15. The value may be indicated in red or in black. If, for instance, settings must be made for a speed value indicated in black, then rotate disk with the aid of lever "A" until the black dot on its hub arrives opposite the arrow mark on the head. Then the selected speed marked in black can be engaged with lever "B". When effecting the engagement, two digits will light up in a circle on the indicator plate of which the top, black digit indicates the engaged speed in this case.

If the red mark of the engagement disk is brought to the arrow mark, then the digit lit up in red will indicate the speed.

Shifting the lever in logical sequence according the selected digits on the speed indicator plate, the selected value of spindle speed will be got. If for instance the value located at the centre of the bottom row of the plate must be engaged, then shift the lever to the centre of the bottom row as well. Speed gears should only be shifted with the spindle at standstill or running to standstill. Should the



engagement lever jam during shifting, return it to its original position and jog the gear-shifting mechanism by giving it a short impulse with the starter handle. Both the main drive and the auxiliary drive are equipped with interlocks which prevent gear breakage due to the shifting /even accidental/ of the levers on the one hand, and prevent the starting of the spindle until the gears are fully engaged, on the other.

#### 5.02.3 Setting the feed rate

Fig. 020

Feeds are set by shifting the 9-position lever "c" horizontally and vertically. Select the required feed rate on feed indicator plate 1h1-9 and by shifting the lever in logical sequence according to the digit selected on feed indicator plate, the selected value of feed-rate will be obtained.

The engaged feed rate will appear lit up in a circle on the feed indicator plate.

#### 5.02.4 Key and example for using the cutting speed chart

Fig. 023

1. spindle speed, r/min
2. cutting speed, m/min
3. material of work
4. recommended feed for drilling, mm/r
5. material of tool
6. tool steel
7. high-speed steel
8. recommended cutting speed, m/min

RF-50/1250 1600	5.00 TECHNOLOGY	5.4
<p><u>Example:</u></p> <p><u>Given:</u></p> <ol style="list-style-type: none"> <li>1. work material: cast iron grade Öv 20</li> <li>2. drill material: tool - steel</li> <li>3. Diameter of drill: 25 mm</li> </ol> <p><u>Find:</u> feed rate to be set on machine, and spindle revolution.</p> <p>Starting from the work material /mark 3.1/, cast iron grade Öv 20, the recommended cutting speed limits /8 to 14 mm/ are indicated beneath the inscription "tool steel" /mark 6/, going to the right.</p> <p>The recommended feed rate which corresponds to 0,25 mm/r is to be found in column for drill diameter D = 25 mm crossing the line for Öv 20.</p> <p>Next the value 8 to 14 m/min. obtained in column "tool steel" /mark 6/ must be observed /see table 1 for drill diameter D=25 mm as proceeding vertically/. The corresponding approx. value found there is 9,6 to 14,1 m/min. Proceeding to the left from there, the spindle speed to be used is found, this is 125 to 180 r/min. The example on the scheme is indicated with dashed line.</p> <p><u>5.02.5 Clamping and releasing of sleeve and head Fig.020</u></p> <p>The common clamping of the sleeve and head will be effected by means of pushbutton lb3 the releasing with pushbutton lb2. On pressing the pushbuttons the electro- hydraulic clamping mechanism acts once for clamping, once for releasing the clamped position. In its released state one can rotate the sleeve together with the arm, and the drilling head can be deplaced on the arm ways by means of a hand-wheel.</p> <p><u>5.02.6 Lifting and lowering the arm</u></p> <p>See chapter "Electrical equipment" /Page 8.3/</p>		
	5	

6.01 Key to the symbols on lubrication scheme

Fig. 019.

Symbols indicating the frequency and means of lubrication:

 ..... daily 2-5 drops

 ..... weekly - " -

 ..... in every half year

 ..... maintaining oil level

 ..... filling can

 ..... oil can

 ..... lubricating brush

 ..... oil gun

 ..... oil drain



RF-50/1250 1600	6.00 MAINTENANCE		6.2
6.02 <u>Data of lubricants</u>			
Characteristics	Machine oil		
	G 30	T 30	
Kinematic viscosity at 50°C $\text{mm}^2 \text{ s}^{-1}$	30 - 35	30 - 38	
Flash point /Marcusson/ °C at least	180	190	
Solidification point °C	-15	+ 5 below	
Acid number mg KOH/g max;	0,15	0,06	
<u>Coolant:</u>			
Characteristics	Boring oil		
	FE - 2		
Kinematic viscosity at 50°C $\text{mm}^2 \text{ s}^{-1}$	15		
Flash point /Marcusson/ °C at least	140		
Solidification point °C	- 10		
pH	7,5 - 9,5		
	5		

RF-50/1250 1600	6.00	MAINTENANCE	6.3
3 Other lubricants corresponding to the Hungarian ones Lubrifiants correspondant aux lubrifiants hongrois Sonstige, den ungarischen entsprechende Schmierstoffe			
Mobil	Shell	B.P.	
1 Fluid 200	Donax T 6	BP. HL 100	
Tex Oil 200 Mum D.T.E	Carnea Oil	BP. HP 20	
Oil Heavy um	Tellus Oil 29	BP. HL 100	
ran 027 B	Garla Oil B	BP. Energol CFL	
va 3	Tonna 33	Energol HP 20 C	
ccite Oil E Nr 4	Vitrea Oil 13	BP. Energol HP 3	
grease No 3	TEET FO 3	Energol C 2	
lube C 90	Dentax SAE-90	BP. Gear 90	

No	Hungarian Hongrois Ungarisch	Marken der DDR	
		Hidro 33	
		G 30	MR 45
		Hidro 30	Hidro 33
		GXS 15	SO-110
		GX 60	MR 90 gef
		O-20	SPR 21/20
		Zs-90	MF rot
8	C 90	GL 125	



RF-50/1250 1600	6.00 MAINTENANCE	6.4
<p data-bbox="188 344 1054 383"><u>6.04 Lubrication of certain structural parts</u></p> <p data-bbox="301 394 453 427">Fig. 019</p> <p data-bbox="301 459 1326 589">Before each work shift lubricate the cleaned machine as indicated in Fig. 019. Make sure the lubricant has really got to the lubrication points.</p> <p data-bbox="188 633 975 672"><u>6.04.1 Lubricating the drilling head unit</u></p> <p data-bbox="317 701 1358 1070">The structural parts contained in the head are lubricated by means of a gear pump located in the upper part of the drilling head. The pump draws oil through a filter from an oil reservoir incorporated in the head, and discharges it through a ball valve and oil line to the bearings of the main drive; from here also the parts of the auxiliary drive will be sprayed. Oiling is of the circulation type.</p> <p data-bbox="317 1099 1321 1279">Fill the oil reservoir of the drilling head with grade T 30 oil to 2/3 of oil level gauge 601 through oil hole 600. /About 2,5 litres of oil will be required for filling up./</p> <p data-bbox="317 1308 1262 1438">Change of oil is necessary approximately every 6 month, after thoroughly cleaning the reservoir. Refill as required.</p> <p data-bbox="180 1482 991 1520"><u>6.04.2 Lubricating the elevating mechanism</u></p> <p data-bbox="317 1550 1337 1630">The elevating mechanism is lubricated by an eccentric-operated displacement pump.</p> <p data-bbox="317 1659 1318 1792">Fill up the oil reservoir through oil hole 602 with grade T 30 oil to 2/3 of oil level gauge 603. /About 1 litre will be needed for filling./</p> <p data-bbox="317 1821 1262 1951">Lubrication is of the circulation type, refilling will only be required when oil level sinks below 1/3.</p>		
	5	

RF-50/1250 1600	6.00 MAINTENANCE	6.5
<p><u>6.04.3 Oil supply of the clamping mechanism</u></p> <p>Fill up the housing through oil hole 604 to 2/3 of oil level gauge 605. Use grade T 30 oil - approximately 1,5 litre.</p> <p>The oil level must not sink after operation. Oil pressure is exerted by means of a gear pump to the clamping and releasing pistons and the oil will be reused by circulation. Change of oil is necessary approximately every 6 months, after thoroughly cleaning the reservoir.</p> <p><u>6.04.4 Other points of lubrication</u></p> <p>Use grade G 30 oil for lubricating the other machine parts, according to the symbols found on figure 019.</p> <p><u>6.05 Cleanliness</u></p> <p>Remove all deposited dust, swarf and other grit from the machine before and after each shift. Bearing surfaces must be kept impeccably clean for any particles getting between the sliding surfaces will cause seizing and consequent inaccuracy of operation.</p> <p>Do not use compressed air for cleaning since swarf might be blown between the bearing surfaces.</p> <p><u>6.06 ADJUSTING OF CERTAIN STRUCTURAL PARTS</u></p> <p><u>6.06.1 Adjusting the brake</u></p> <p>Fig.004</p> <p>In the spindle does not come to standstill in 2 - 3 seconds after shifting the starter handle to its centre position, the brake requires readjustment.</p>		
	5	



RF-50/1250 1600	6.00 MAINTENANCE	6.6
<p>Readjusting may be effected after loosening nut "A" by screwing in the bolt "B". The adjusted position can be locked by means of nut "A".</p> <p>Brake readjustment can also be effected by setting spring 161 with the aid of nut "C".</p> <p><u>6.06.2 Readjusting the toothed segments of the engaging head Fig. 006</u></p> <p>After the possible dismantling of the engaging head adjust engaging rocker 268 so that when the dual engaging handle 265 is pushed towards the head housing, the teeth of the segment will be in mesh with the teeth of worm wheel 267 to full depth. Adjust this latter by means of pin bolt 280. When adjusting be careful as far as the amount concerned because if the pin bolt is turned in too far, the dual handle cannot be pushed toward the head housing; and if the bolt is loosened excessively, the teeth of the dual handle in the interior position, will be hardly in mesh and they may brake off when loaded.</p> <p><u>6.06.3 Readjusting the spindle. Fig. 005</u></p> <p>Should there be an excessive play between the spindle 204 and the toothed quill 202 for effecting feed or ball bearing must be replaced for some reason, than dismount the engaging head and the guide sleeve of the quill, than remove the chain of the spindle counterbalance from the quill, arresting it so that it could not be winded up by the spring. Then the spindle can be removed together with the toothed quill.</p>		
	5	



RF-50/1250 1600	6.00 MAINTENANCE	6.7
<p data-bbox="403 412 1350 539">Axial play can be taken up by readjusting the two grooved nuts 200 on the spindle. Remove these nuts if bearings must be replaced.</p> <p data-bbox="252 602 1137 636"><u>6.06.4 Readjusting the spindle counterbalance</u></p> <p data-bbox="403 651 560 685">Fig. 007</p> <p data-bbox="403 714 1425 1032">Tensioning of the spindle counterbalance spring may be effected by rotation of square end wormshaft protruding from the spring housing. Make this adjustment always in the lowest position of the spindle. Adjusting is correct when the spindle may be easily moved along its whole travel - up and down - with an even effort.</p>		
	5	

6.06.5 Readjustment of main drive dual clutch

Fig. 001

Readjustment will be necessary if the disk clutch slips under the allowed maximum load.

Perform readjusting as follows:

- 1./ Dismount the cover on top of the right side of drilling head.
- 2./ Turn shaft of the clutch so that locking tongue 18 of locking spring pin 19 be in direction of mounting hole.
- 3./ Lift out the spring lock pin 19 by means of locking tongue 18.
- 4./ By setting the upper clutch, the adjustment of right-hand rotation of the spindle can be carried out, by setting the lower clutch, the adjustment of left-hand rotation is realised.
- 5./ In lifted out position of locking pin turn adjusting nut 23 as necessary.
- 6./ Snap locking pin into the hole corresponding to the adjusted new position.
- 7./ Reassemble the cover.

6.06.6 Adjustments for head travel

Fig. 008

The head travels horizontally along the arm ways on eccentrically supported rollers.

Should the gap between the ways of the arm and of the head increase in excess of 0,05 mm due to the wear of the ways or to the angular displacement of eccentric shaft adjustments become necessary. For this purpose

RF-50/1250 1600	6.00 MAINTENANCE	6.9
<p>shift the drilling head along the arm until one of the rollers faces the mounting hole. Then clamp the head and loosen retaining nut "A". Turn the square head of eccentric shaft 329 with a socket wrench until a gap of only 0,05 mm remains between the running surface of the roller and the arm way. Secure this adjusted position by means of nut "A". Then release the clamping and make adjustment with the other roller as described above.</p> <p>Screws "B" of the top clamping slat of the head can also be tightened through the mounting hole. If adequate tightening cannot be obtained by means of the screws, remove the slat and have it machined on surface "C" to make up for wear.</p> <p><u>6.06.7 Clamping of the head</u></p> <p>Fig. 008</p> <p>If the head can be easily traversed with the handwheel when clamped, the clamping mechanism requires adjustment. Proceed as follows.</p> <p>Release the head and through the rear mounting hole of the arm loosen the screw located at the rear of the head until toothed retaining insert 353 is lifted by the spring force from the teeth of sleeve "D". Reaching in on the right side of the head rotate splined bushing 344 together with eccentric shaft 340 to the right by one or two teeth, then replace the retaining insert and screw it in for keeping the adjusted position.</p> <p>After this adjustment actuate the clamping mechanism and check the effectiveness of the clamping by rotating the handwheel for the head travel.</p>		
	5	



6.06.8 Adjustments for sleeve clamping

Fig. 009

If in a clamped state the cylinder does not clamp adequately, then in the clamped state of the cylinder remove the setscrew from the sleeve with internal splines 387 on the vertical shaft, withdraw the sleeve with internal splines from the toothing, and rotate shaft 389 to the left by one tooth actuating the release pushbutton. Make the toothing for being in mesh and secure the adjusted position with the setscrew.

If swivelling the arm with the sleeve, when released, involves greater effort, proceed as above with the difference of rotating the shaft by one tooth to the right instead of to the left. If the arm is difficult to swivel after performing this adjustment, then shaft 389 has been adjusted in excess.

6.06.9 Adjustments for arm clamping

Fig. 011

Should readjustments become necessary after a prolonged period of operation, make them in the clamped state; otherwise there is a risk of overadjustment.

For adjustments withdraw the cotter pins from nuts "A" and "B" and reset said nuts until a 0,03 mm thick feeler gauge can no more be introduced between the arm bracket and the sleeve /at the side facing the head as well as at the opposite one/. After adjustment replace the cotter pins into their holes. Spacer screws "C" have been installed to prevent the arm bracket from opening out excessively when being in the released state. These screws should be adjusted by means of the holding and securing nuts so as to let them have a 0,8-1,6 mm gap for fitting, with clamped arm bracket.

RF-50/1250 1600	6.00 MAINTENANCE	6.11
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Electric adjustments for automatic extension arm clamping

Switch adjustment is adequate if the elevating motor is stopped when clamping cam 1<sub>4</sub> is in a central position. For adjustments, reset the switch 2b3 in the position, required by loosening and retightening the clamping screw.

6.07 Spare parts

After a prolonged operation period of the machine one can reckon with the wear and failure of some structural parts. In the following table you will find conforming with the experiences the list of recommended spare parts on the base of two years of service and one shift a day.

Drawing No	Figure No	Position No	Denomination	Note
250103-9 250104-6	012	489 485	Lifting nut /for clamping the arm/	Single-start 8 mm right-hand trapezoidal thread
250022-7 582814-2	009	378	Threaded sleeve /to frame structure/ Threaded spindle	Single-start 12 mm pitch right-hand trapezoidal thread
108648-1	001	25	Engaging plate /outer/ /to main drive/	12 pieces Heid typ.
250298-2	001	6	Shear pin	$B=420-520 \text{ N/mm}^2$
255346-9	008	339	Clamping slide	Fit when assembling
108622-3	001	26	Engaging plate /inner/ /to main drive/	14 pieces Heid typ.
108649-8	001	22	Lever	6 pieces Heid typ.

	5	
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RF-50/1250 1600	6.00 MAINTENANCE	6.12								
<u>Parts that need fitting</u> Fig. 028										
Denomination	Figure No.	Position No.								
Spindle quill	028	202								
Flanged sleeve	028	205								
<p>When ordering always state the dimensions /marks X and Y/ of the holes, taking for these parts, with an accuracy of thousandths of a millimetre.</p> <p><u>6.08 Ordering of spare parts</u></p> <p>The parts of the machine should be ordered according to the pos. No-s in figures 001 - 015. On some places of the assemblies grouped position numbers are given: these parts can be delivered - for reasons of assembling and storing - only assembled and not separately.</p> <p>May we also call the attention of our customers to the fact that the following data are absolutely indispensable for us when placing orders for various spare parts. Should any of those data be missing, our Company will not be in the position to meet the orders of our customers with full responsibility.</p> <p><u>Example</u></p> <table> <tr> <td>Type of machine</td> <td>RF 50/1250</td> </tr> <tr> <td>Fabrication number</td> <td>80001</td> </tr> <tr> <td>Position number of part</td> <td>204</td> </tr> <tr> <td>Number of pieces needed</td> <td>1</td> </tr> </table>			Type of machine	RF 50/1250	Fabrication number	80001	Position number of part	204	Number of pieces needed	1
Type of machine	RF 50/1250									
Fabrication number	80001									
Position number of part	204									
Number of pieces needed	1									
	5									



RF-50/1250  
1600

6.00 MAINTENANCE

6.13

When ordering electromotors please indicate the following characteristics:

Motor

Type

Rating

Voltage

Service /star Y or delta  $\Delta$  /

6.09 Devices for accident prevention and safety

The operator as well as the security of the machine is protected by mechanical and electrical safety devices. The electrical equipment of the machine is provided with complete contact protection. Control voltage is of 220 V.

At the mains connection an earth screw serves as shock-protection.

The machine is provided with no-voltage cutout which stops the machine at voltage failures. For restarting, the switch must be first set to neutral position and, to the position starting, after voltage has returned.

The arm is cut out at the uppermost and lowest positions by stops. The dropping down of the arm - which could occur due to the shearing off of the carrier nut threads - is immediately prevented by a clamping device which is actuated by means of a fixed nut built into the arm.

Power feed to the spindle automatically shifts over to hand feed in case of an overload. This automatic disengagement must not be prevented by force.

RF-50/1250 1600	6.00 MAINTENANCE	6.14
<p>While erecting the machine, the head and the radial arm should be in a clamped state. Do not swivel the arm before bolting down the baseplate and until the concrete has set; otherwise the machine might turn over.</p> <p>It is the operator's duty to provide protection against flying swarf and splashing of coolant, corresponding to the local conditions.</p> <p>Swarfs or chips should be removed exclusively by a scraper designed for this end.</p>		
	5	

RF-50/1250  
1600

7.00 EXTRA ACCESSORIES

7.1

#### 7.01 Boring spindle

Fig. 025

For the sake of economics and for a higher accuracy on drilled holes, the machine may be delivered against separate order with a boring spindle. The machine provided with such a boring spindle cuts the drilled workpieces to an accuracy of IT - 8.

In case of a boring spindle the weight of the tool is max. 10 kg.

#### 7.02 Cubic and tilting tables

Figures 026, 027

Cubic and tilting tables are manufactured in three sizes, according to said figures as to execution and dimensions. The tables are made in quality machine tool casting, and are ribbed for assuring adequate rigidity. Cubic tables are made of one part, tilting tables have two main parts.

Both types are provided with clamping nuts securing stable locking to the baseplate. In addition both tables have T-nuts on their tops and on one of their side surfaces, for clamping the workpieces.

The upper part of the tilting table may be inclined to 90 degrees from the horizontal plane by means of a hand crank. Before tilting release the clamping of the table and after having adjusted the required position, clamp it again. The amount of tilting is indicated on the graduated scale.

The cubic and tilting tables enlarge significantly the working range of the machine, as their use permits machining of such workpieces which cannot be machined without them.



RF-50/1250 1600	7.00 EXTRA ACCESSORIES	7.2
<p><u>Lubrication</u></p> <p>In the case of continuous use, the ball-type oilers of the tilting table should be charged once every week.</p> <p>Use grade G 30 oil.</p> <p><u>Standard equipment</u></p>		
	Cubic	Tilting
	table No. of drawing	
Retaining screw M20, complete Drawing No. 255591-1	255585-6 2 pieces	255030-1 2 pieces
Retaining screw M27, complete Drawing No. 207779-2	240179-9 240118-4 2 pieces	216514-3 241910-3 2 pieces
Hand crank, Drawing No. 255584-9	-	255030-1 216514-3 241910-3 1 piece
Mounting wrench Opening 32 mm	-	216514-3 1 piece
	5	

RF-50/1250 1600	8.00 ELECTRICAL EQUIPMENT	8.1
<p data-bbox="178 365 411 398"><u>8.01 Notice</u></p> <p data-bbox="292 432 1337 656">Before applying voltage to the machine, inspect the electrical appliances and operating equipment for the state of their home positions, make sure of the insulation resistance of the motors which must be at least 0,5 megohm.</p> <p data-bbox="292 689 1353 869">When making connections to the mains, check the machine for earthing, shock protection, safety and other electrical viewpoints according to the corresponding specifications.</p> <p data-bbox="178 913 813 947"><u>8.02 Connecting-up the equipment</u></p> <p data-bbox="292 958 446 992">Fig. 020</p> <ul style="list-style-type: none"> <li data-bbox="292 1025 1257 1149">a/ Connect mains phase and eart wires to the mains connections of the machine and to earth screw, respectively.</li> <li data-bbox="292 1182 1313 1261">b/ Energize the machine by switching on master switch al</li> <li data-bbox="292 1294 1313 1473">c/ Connection to mains as regards the sequence of phases is correct if having pressed the pushbutton - position VI - the spindle, as seen from upwards, rotates clockwise.</li> <li data-bbox="292 1507 1329 1585">d/ Having pressed the pushbutton lb4 the arm must go downwards.</li> </ul> <p data-bbox="292 1619 1345 1843">When the rotation or the direction of traversing is opposite in sense, stop immediately the motion by means of master switch al. In order to eliminate the trouble interchange two phases of the mains connection, after having made a cutoff outside the machine.</p>		
	5	

During delay adjusted on time relay d2 the drilling motor accelerates, contactor cl8 drops out, contactor cl9 operates and becomes self-holding, the drilling motor continues operation in delta connection.

c/ Elevating and lowering the arm

When pushbutton lb5 is actuated, contactor cl.2 responds and operates motor lm2 which first releases the axial clamping of the radial arm and, when this is terminated, starts to elevate the arm. When elevation is started, clamping switch 2b3 closes and when the pushbutton is released to terminate elevation, contactor cl.3 cuts in the elevating motor in reverse which axially clamps the arm.

This lasts until 2b3 breaks the circuit of the coil of cl.3 and the operating comes to an end with the elevating motor coming to standstill.

The lowering of the radial arm is effected in a similar manner with the difference that pushbutton lb4 is then actuated. In the extreme positions of the arm the elevating motor is cut out by limit switches 2b1 /when elevating/ and lb4 /when lowering/.

Should the mains connection be incorrect as to the sequence of phases, the travel of the arm will be limited in such a manner by the limit switches 2b2 and 2b5 preventing breaking, that the arm will perform a down and an up motion permanently, and can be arrested only by the main switch.

The elevating motor is protected against overloads by protective elements e2.4, against short circuits by fuses el.1.



RF-50/1250 1600	8.00 ELECTRICAL EQUIPMENT	8.4
<p>d/ <u>Starting and stopping pump motor</u></p> <p>Pump motor 1m4 supplies the required amount of coolant. It will be started and stopped by means of switch a2.</p> <p><u>8.04 Maintenance</u></p> <p>Dust off the control equipment at least once monthly. Inspect, at the same time, the contacts of all switches for impurities. Should such be found, remove them for ensuring a metal-to-metal contact. Never use emery cloth for cleaning ! In the case of heavy burns or failures, exchange the contacts.</p> <p>Repairs of any kind on the control equipment should be effected only by an expert electrician and only if the control equipment is dead. When switching out the master switch, the section from the mains connection to the master switch, will still be live. The main fuses located outside the machine must therefore, be removed for making the machine totally dead.</p> <p>Control cabinet is unlocked with the trilateral box spanner provided. Electrical parts contained in control cabinet are under voltage even if the cabinet door is opened. For deenergizing the mains fuses outside the machine they must be screwed out.</p>		
	5	

AL EQUIPMENT al data table				8.5
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280	380	420	440	500
13	10	9	8	7
Dol II. 16	Dol II. 16	Dol II. 10	Dol II. 10	Dol II. 10

264	24-	Machine lighting	/Volt/	24v
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Circuit diagram No. for starting in Y/ $\Delta$ connexion	
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Circuit diagram No. for starting in Y/ $\Delta$ connexion	
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Values are valid for mains voltage fluctuations of  $\pm 5\%$ , too!  
Data being applied to the machine are indicated!

"lm3" DV 754 K80 0,75kW			"lm4" 2COA2 - 17 0,125kW		"m21"
Nominal motor current		"el.2" Fuse	Nominal motor current and bimetal relay set up	"a2" Rating	
Ampere	Ampere	Ampere	Ampere	Ampere	Volt
3,1		Dol 6	0,7	0,6-1,0	220
2,4		Dol 6	0,55	0,4-0,6	280
1,8		Dol 6	0,4	0,24-0,4	380
1,6		Dol 6	0,35	0,24-0,4	420
1,5		Dol 6	0,33	0,24-0,4	440
1,3		Dol 6	0,3	0,24-0,4	500
1420 / 1680			2700 / 3240		50 / 60c/s

RF-50/1250 1600	8.00 ELEC Elec	
Mains voltage	/Volt/	220
Current requirement	/Ampere/	17
Mains fuse	/Ampere/	Dol II. 20
Operating voltage	/Volt/	220 ~
Circuit diagram No. for direct starting	572002-4	
Circuit diagram No. for direct starting		

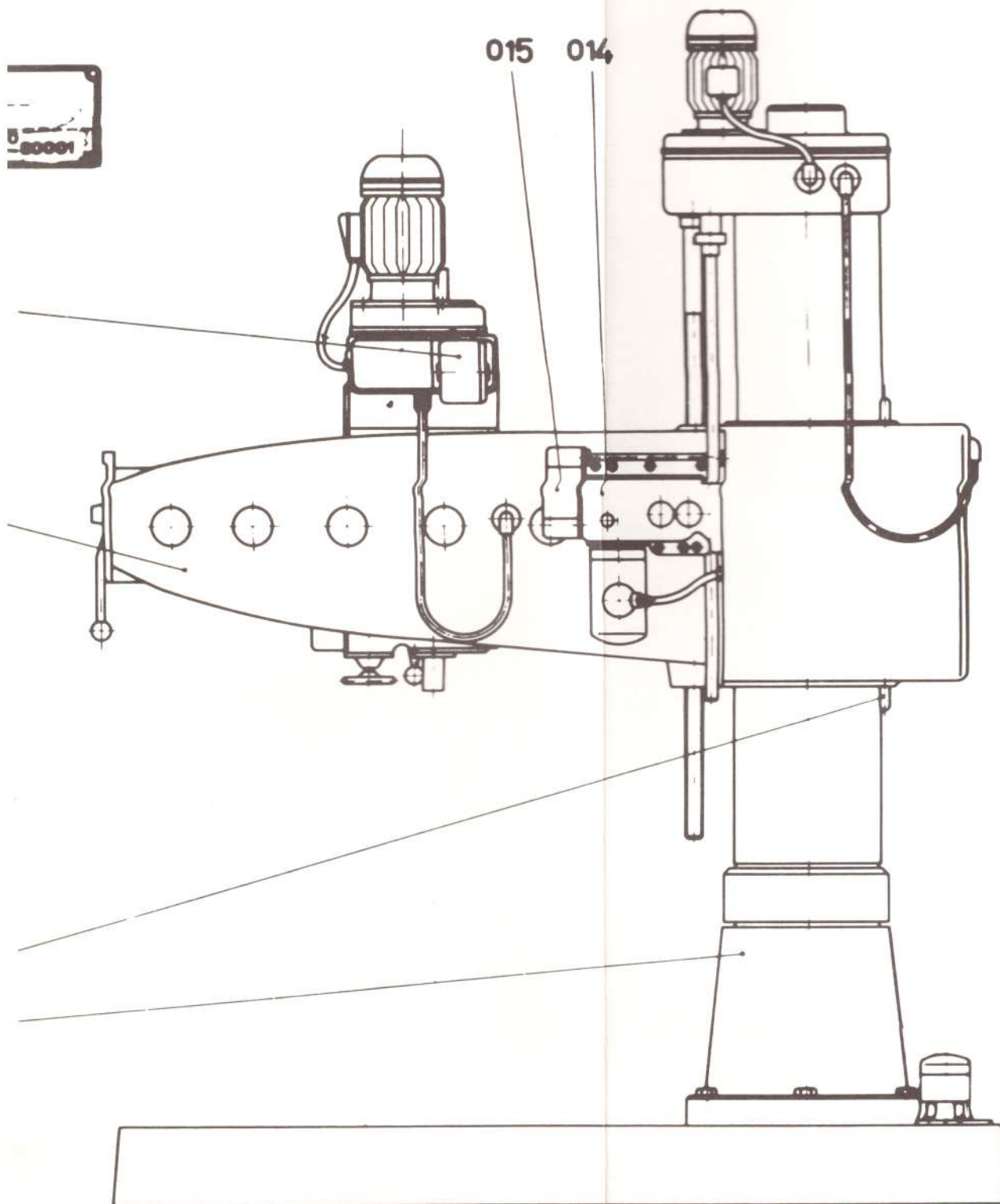
Dol: fuse with retarded cut-off  
Do : fuse with quick cut-off

Mains Voltage	M O T O R S				
	"1m1" VZP 112M/4 4 kW		"1m2" VZP 90 L/4 1,5 kW		
	Nominal motor cur- rent and bimetal relay set up	"e2.2"	Nominal motor cur- rent and bimetal relay set up	"e2.4"	"e1.1"
		Rating		Rating	Fuse
Volt	Ampere	Ampere	Ampere	Ampere	Ampere
220	15	10-16	6,4	3,7-6,6	Dol 10
280	11,9	6,6-12	4,9	3,7-6,6	Dol 10
380	8,8	6,6-12	3,7	2,1-3,7	Dol 10
420	7,8	6,6-12	3,2	2,1-3,7	Dol 10
440	7,4	6,6-12	3,1	2,1-3,7	Dol 6
500	6,6	3,7-6,6	2,7	2,1-3,7	Dol 6
three- phase a.c.	1440 / 1730		1420 / 1720		



RF-50/ <sup>1250</sup> <sub>1600</sub>	8.00 ELECTRICAL EQUIPMENT		8.6
Symbol	Denomination		Type
a1	Main switch	GANZ KK	ZVGKE 25
a2	Pump motor switch	KL.M.	PKZMO-O, 4 +
a3	Separating switch of common clamping	KONTAKTA	Kbm 2-42b
a4-12	Switch for feed-pilot lamp		Csepel
a13-18	Switch for drilling spindle-pilot lamp		Csepel
1b2	Unclamping push button	VBKM	Ny green
1b3	Clamping push button		Ny green
1b4	Lowering push button		Ny green
1b5	Elevating push button		Ny green
1b6	Stop push button of drilling motor		Ny red
1b7	Start push button of drilling motor	KL.M.	Ny green
1b1	Alarm stop push button		K/P-v/i
2b1	Elevating limit switch		Pn 2-2
2b2	Lowering limit switch for preventing breakage	KONTAKTA	Pn 2-2
2b3	Clamping switch	EVIG	V 10 K
2b4	Lowering limit switch	KONTAKTA	Pn 2-2
2b5	Elevating limit switch for preventing breakage	KONTAKTA	PN 2-2
c1.1-e2.2	Drilling motor contactor and protective element		DILO-52/ZO-... +
c1.2-e2.4	Elevation contactor and protective element		DILO-52/ZO-... +
c1.3	Lowering contactor	VBKM	DILO-52
c1.4	Clamping contactor		DILO-52
c1.5	Unclamping contactor		DILO-52
c2.1	Drilling motor braking contactor		DILO-52
d1	Drilling motor braking timing relay	SCHIELE	ERN 0,5-10 sec.
c1.1	Elevation-lowering motor free		1 nh tt nf tt

el.3	Transformer fuse	VBKM	Do II. 2A Db II. Df II.
el.4	Machine light fuse		Do II. 4A Db II. Df II.
el.5	Drilling motor braking fuse		Do I II. 6A Db II. Df II.
el.7	Operating circuit fuse		Do I II. 2A Db II. Df II.
el.6	Direct current fuse		Do II. 2A Db II. Df II.
e23	Drilling motor braking protecting element		ZO-2,1-3,7
lh1-9	Feed signal lamp		LJ201-05 bulb 24V 2W
lh10-15	Signal lamp for boring spindle rotation	KONTAKTA	LJ201-05 bulb 24V 2W
lh16	Drilling motor pilot lamp		LJ202-04 bulb 24V 2W
3hl	Machine light	Vill.ip.Sz. LT 63	bulb 24V 40W
ml.2	Operating transformer	VBKM	KT 250G +V/O-24-220-264/ O-30V
lm1	Drilling motor	EVIG	+
lm2	Elevating-lowering motor	EVIG	+
lm3	Unclamping-clamping motor	IMI	+
lm4	Pump motor	MEZ	+
nl.1	Drilling motor braking rectifier	TUNGSRAM	10 A 600 V
nl.2	Rectifier	TUNGSRAM	H 40-32 1,1-8
L1	Mains connection	WEIDMÜLLER	SK25/V
lr1-lr2-lr3	Series resistance	REMIK	R617 100 ohm 5W
ls1	Separating coil of common clamping	DANUVIA	GH 35-4-S-24V
5ul	Collector ring		Csepel Drwg. No:20-240890
	For starting Y/ proceed as follows		
cl6	Drilling motor Y- contactor	VBKM	DIL00-52
cl7	Drilling motor -contactor	VBKM	DIL00-52
d2	Timing relay	SCHIELE	ERN 0,5-10 sec.
Signe + : values are to be found in the table of characteristics!			

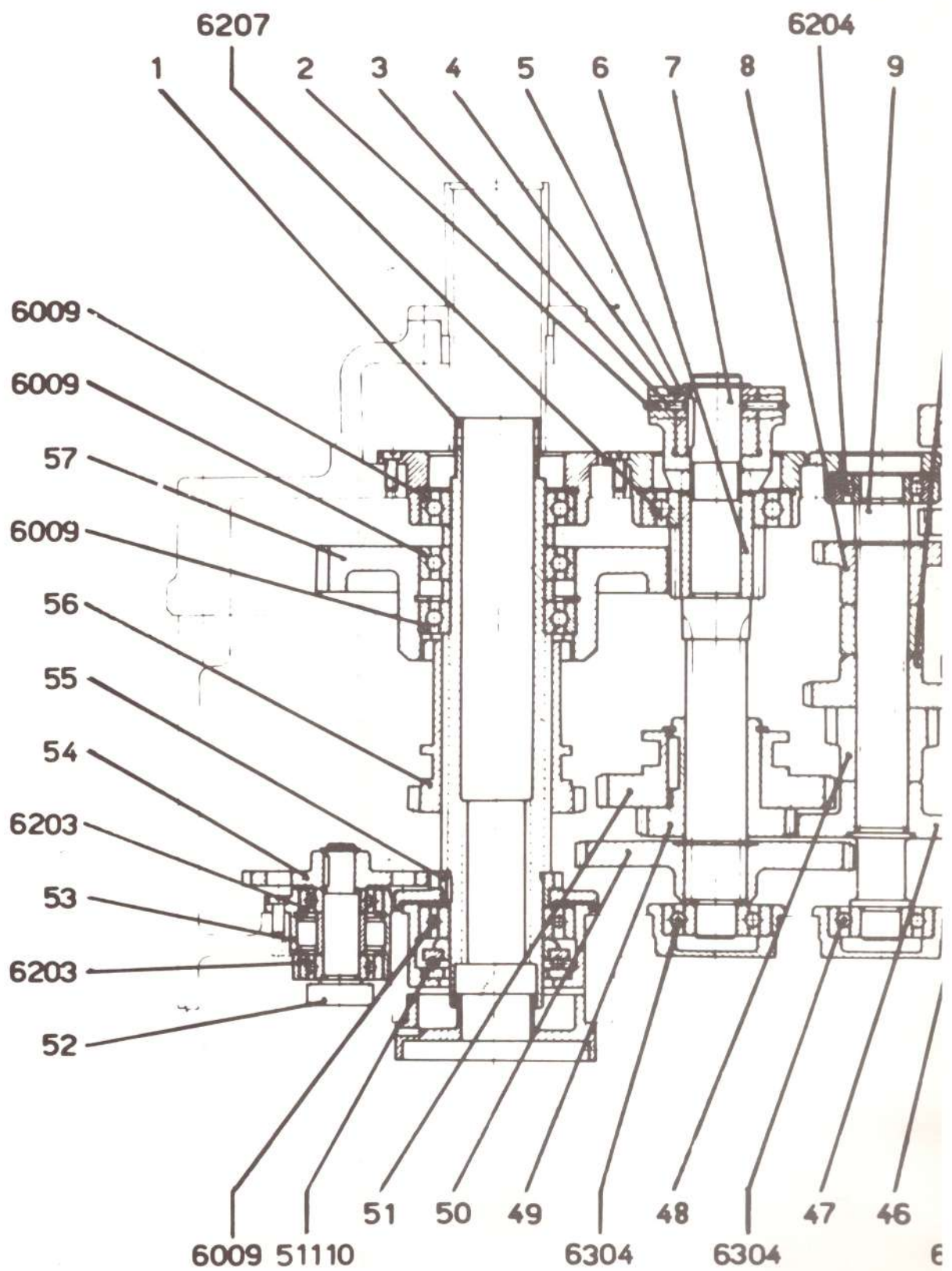


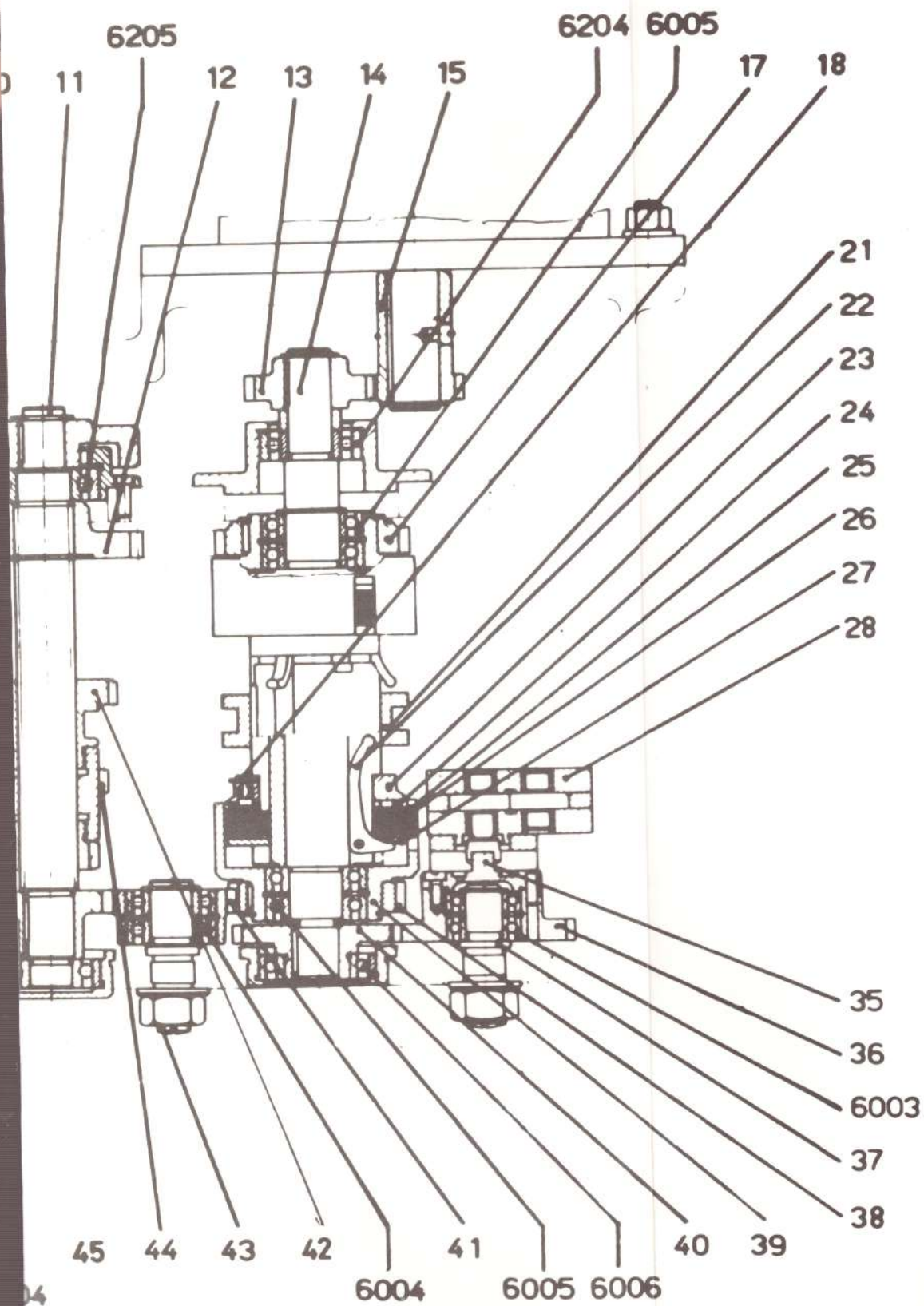
RF50/ 1250  
1600

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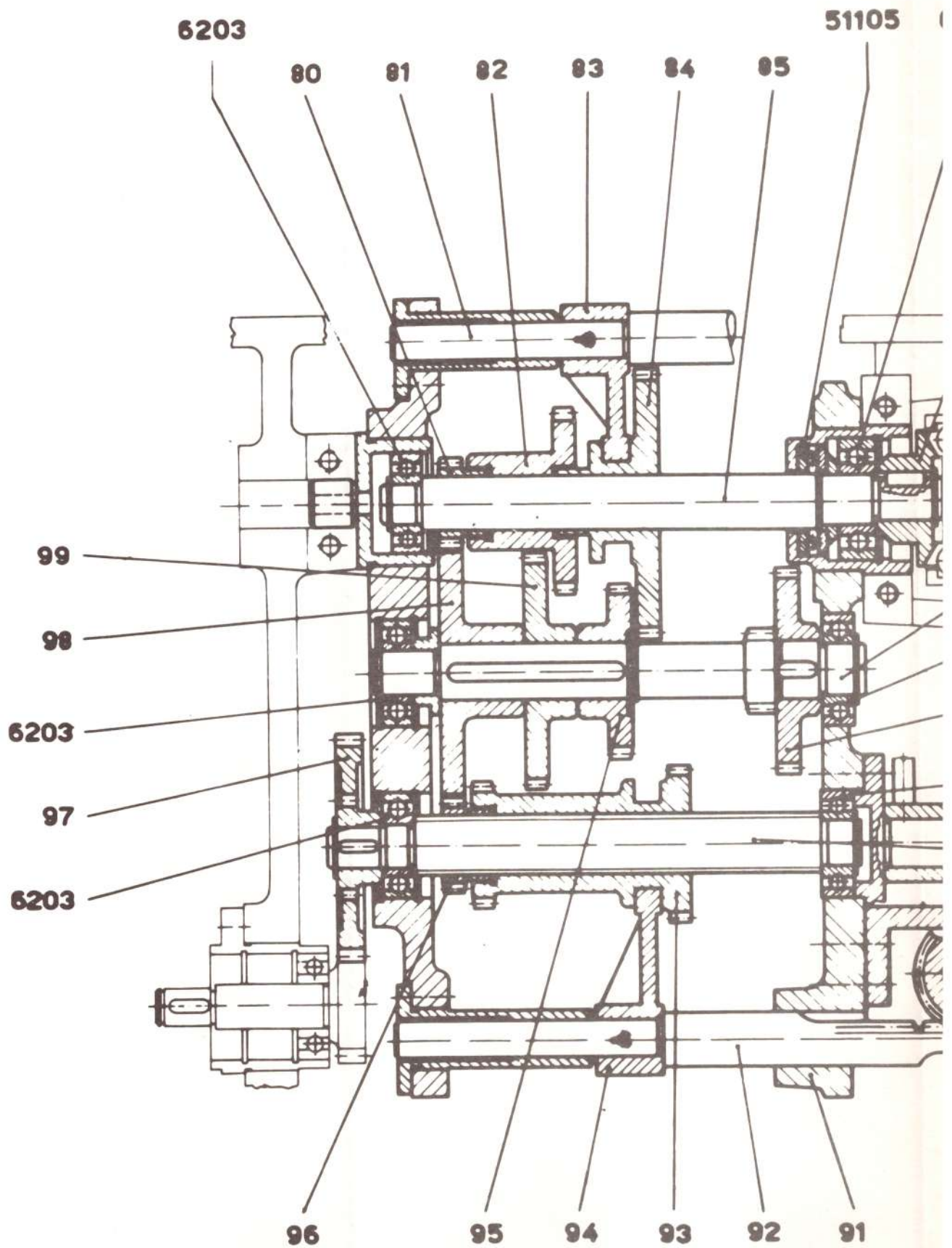
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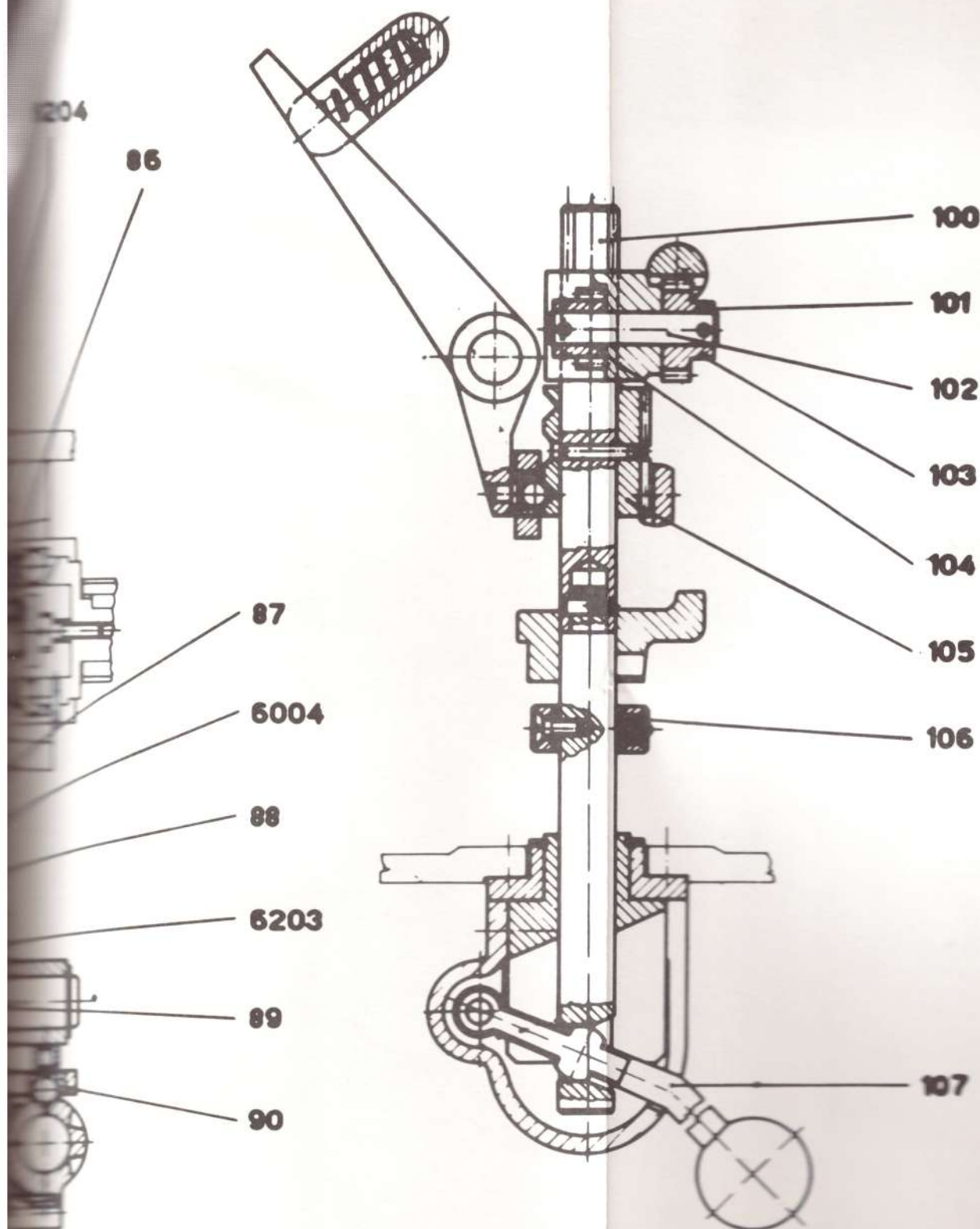


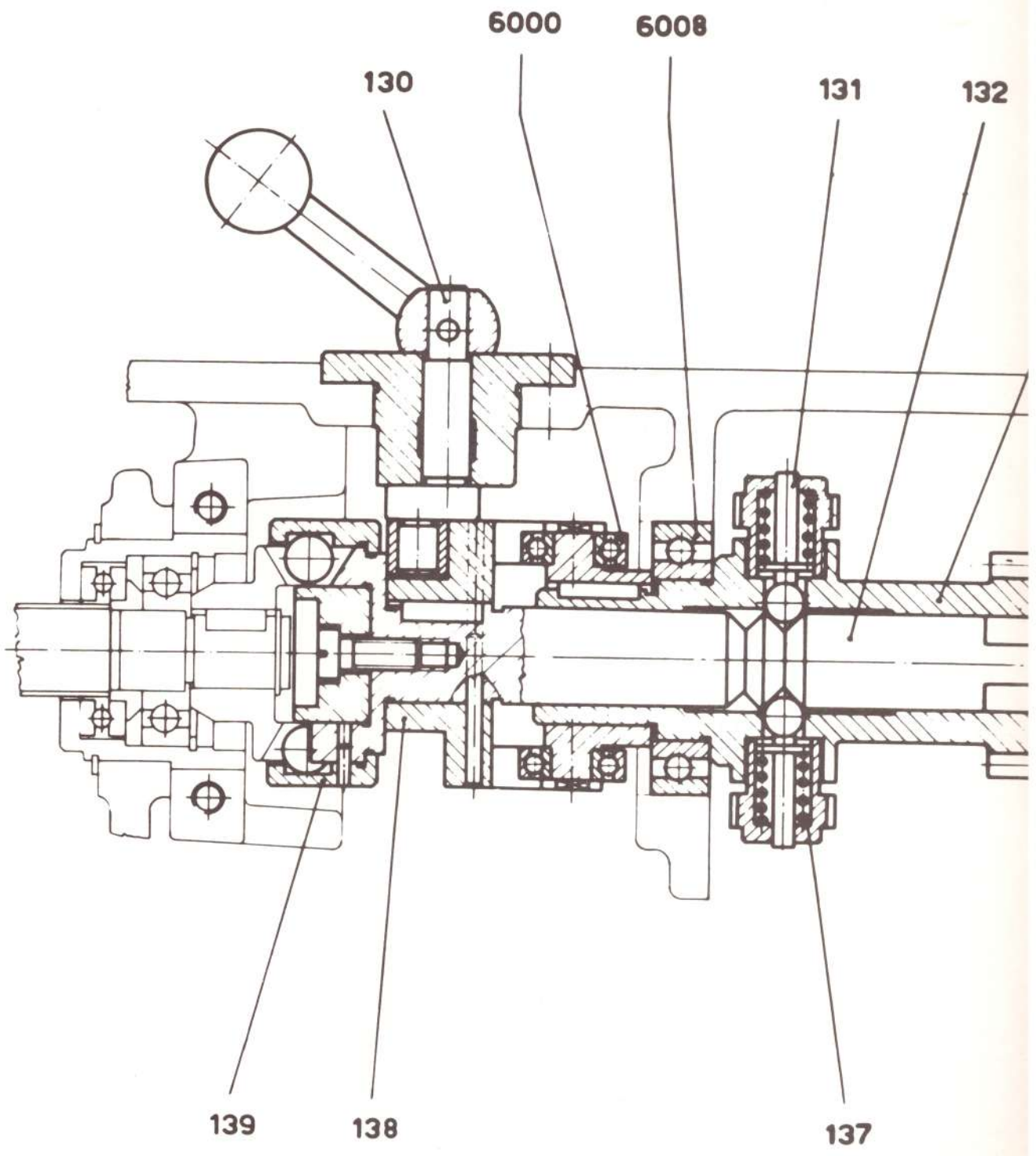


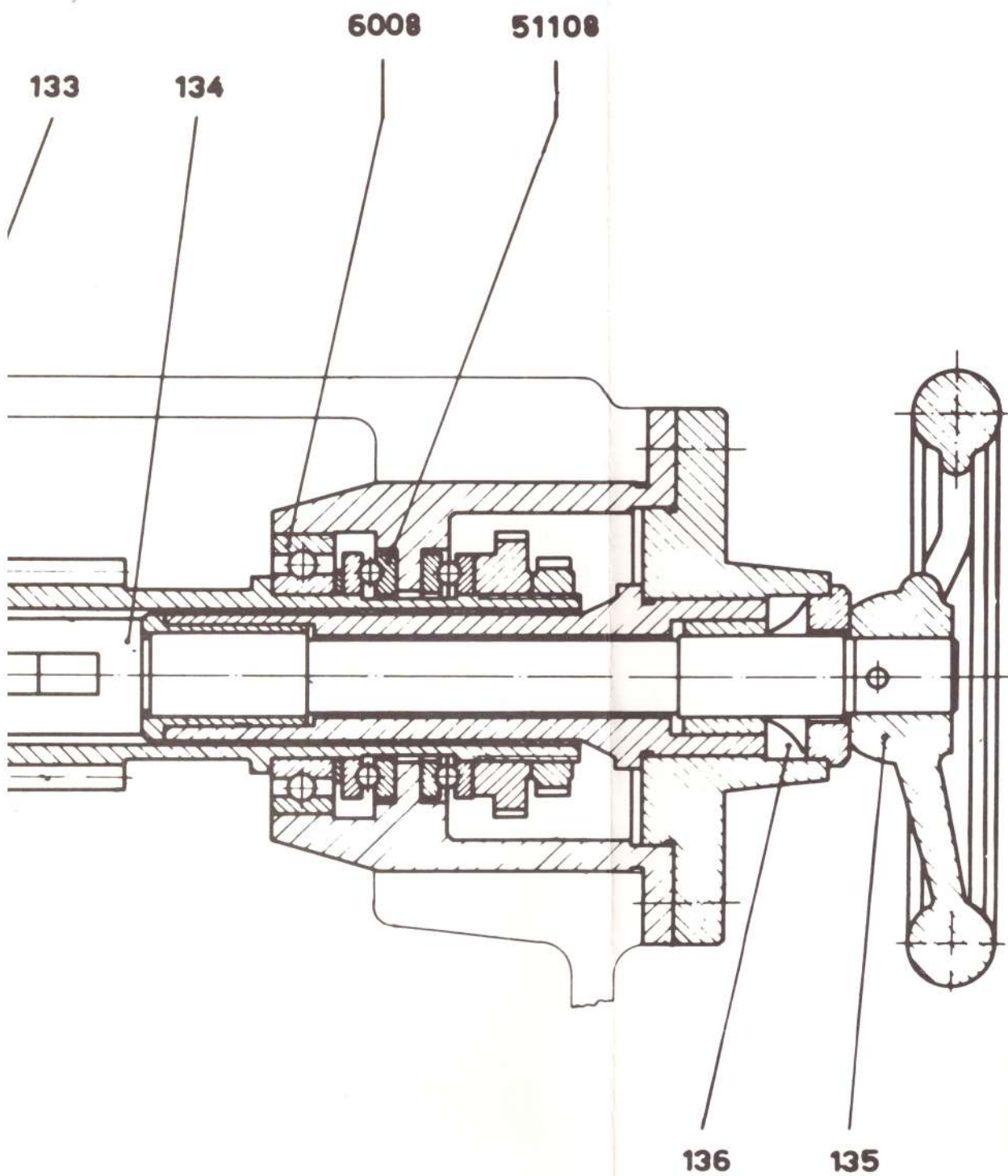










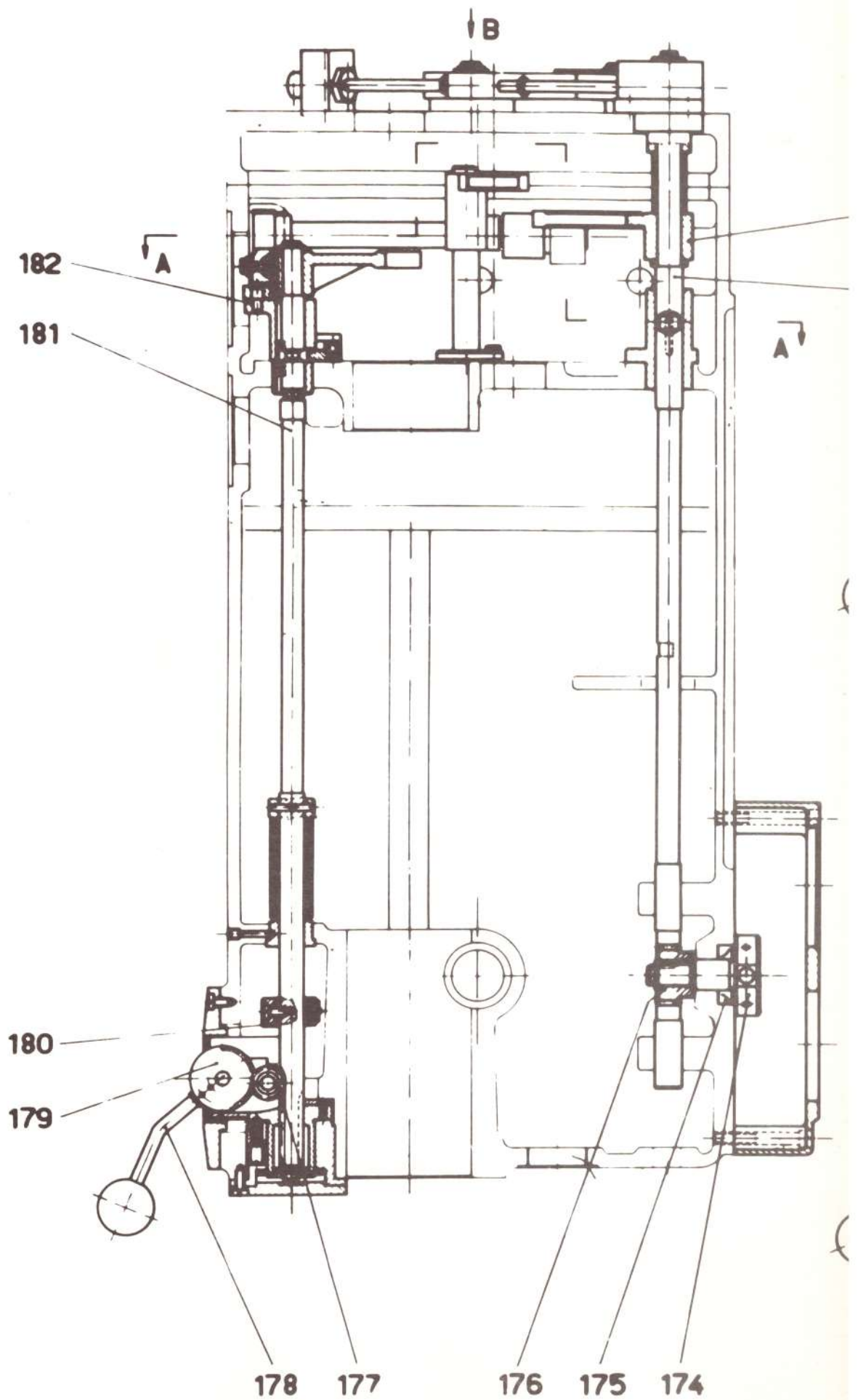


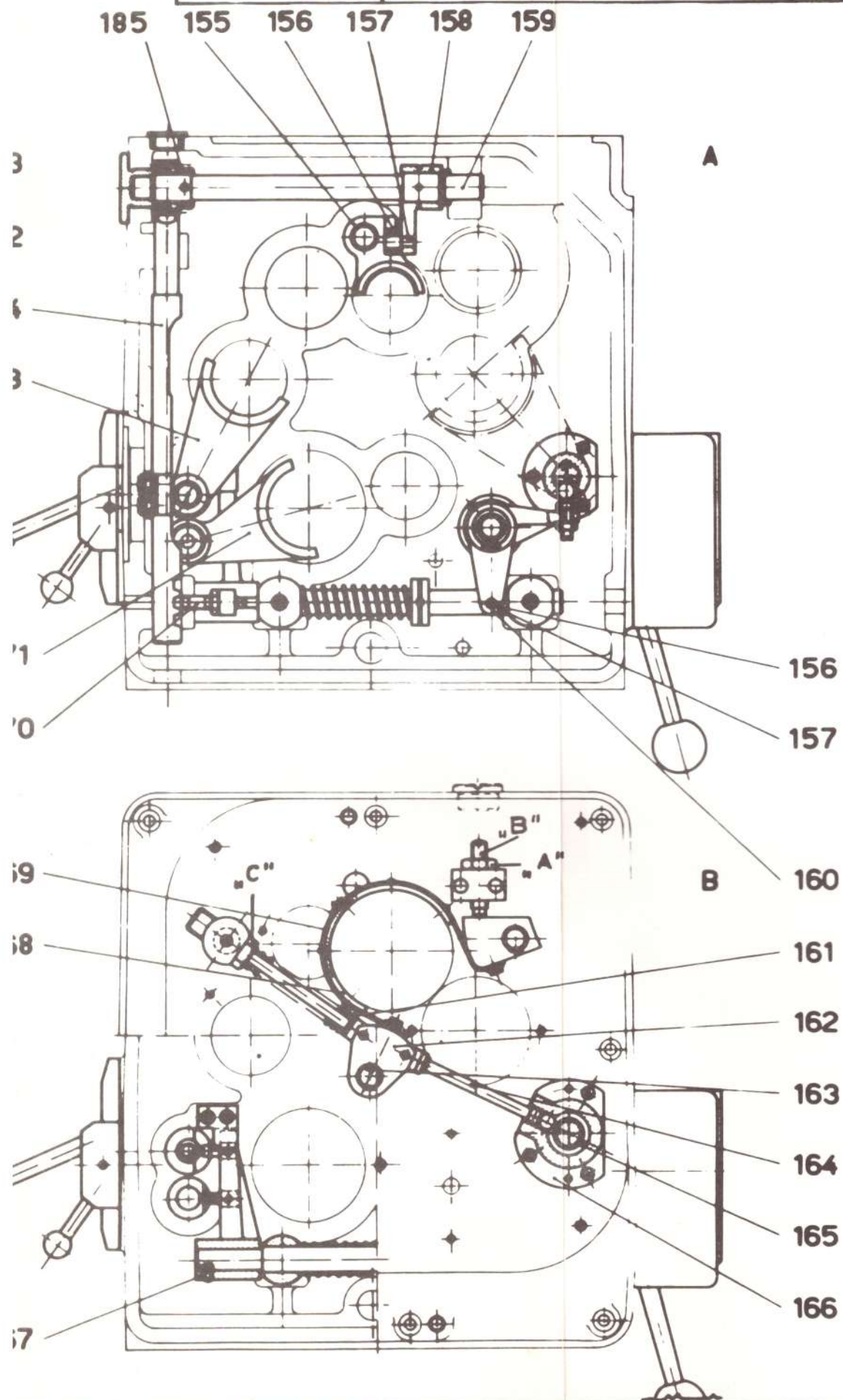
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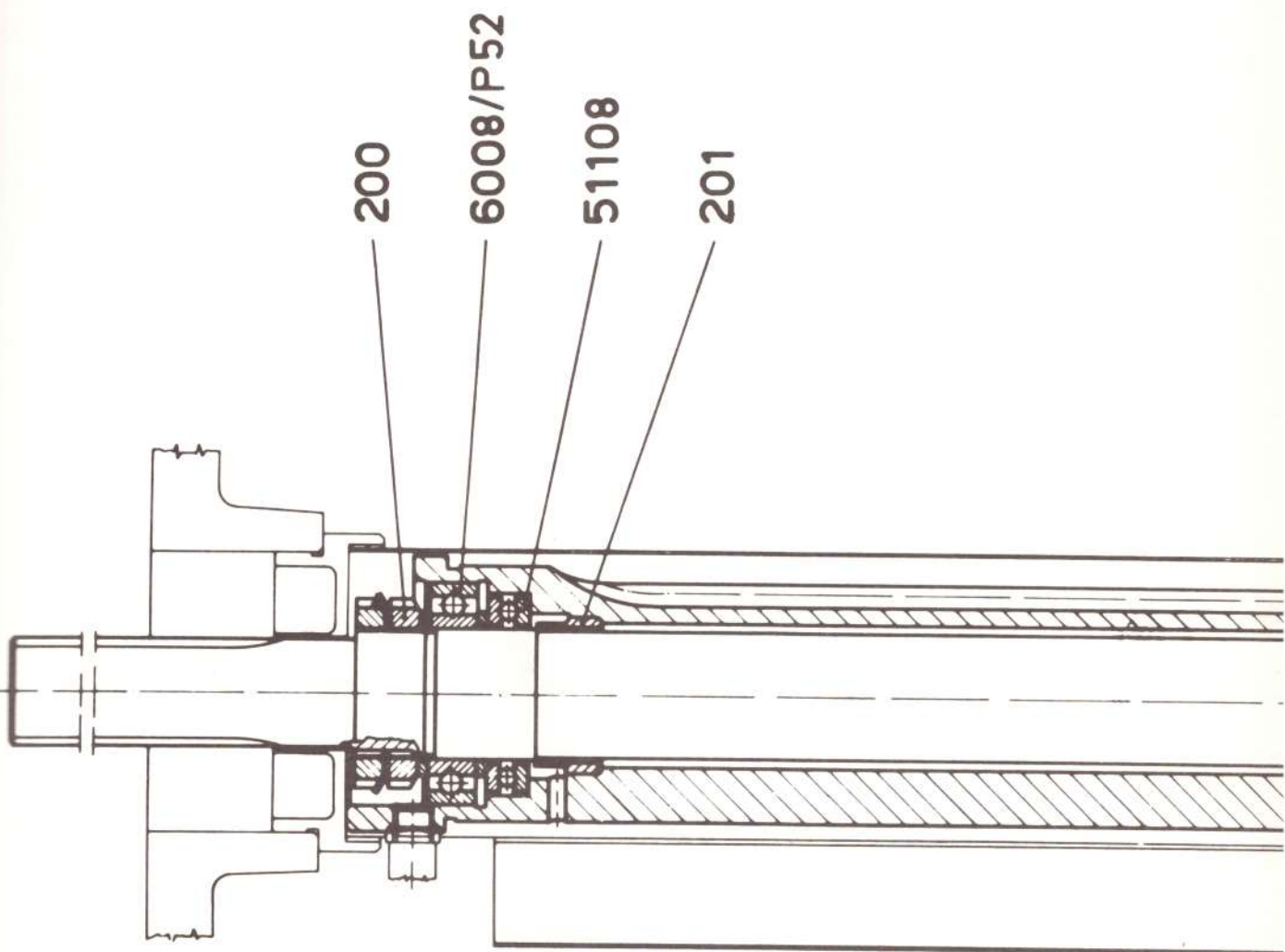
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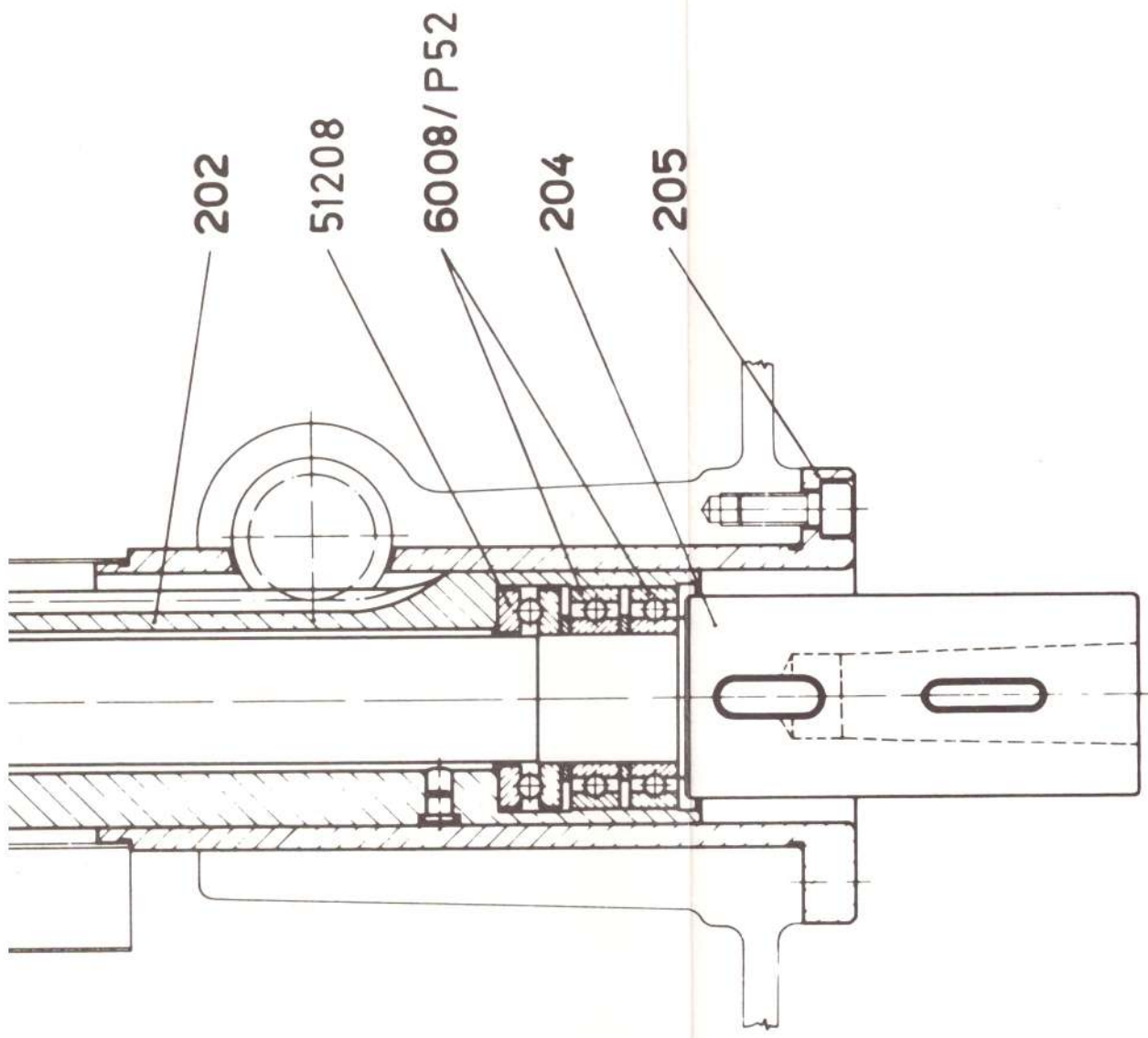




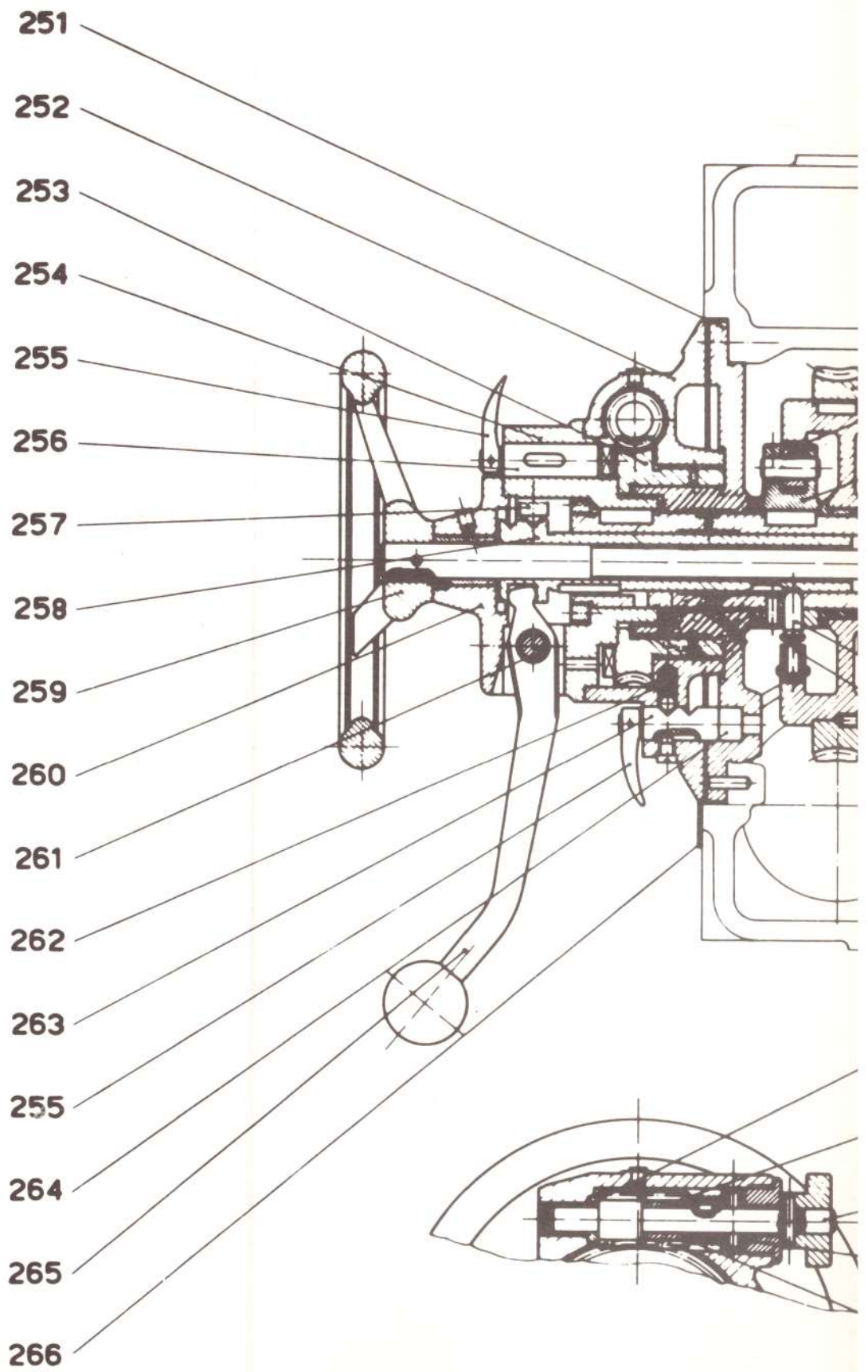


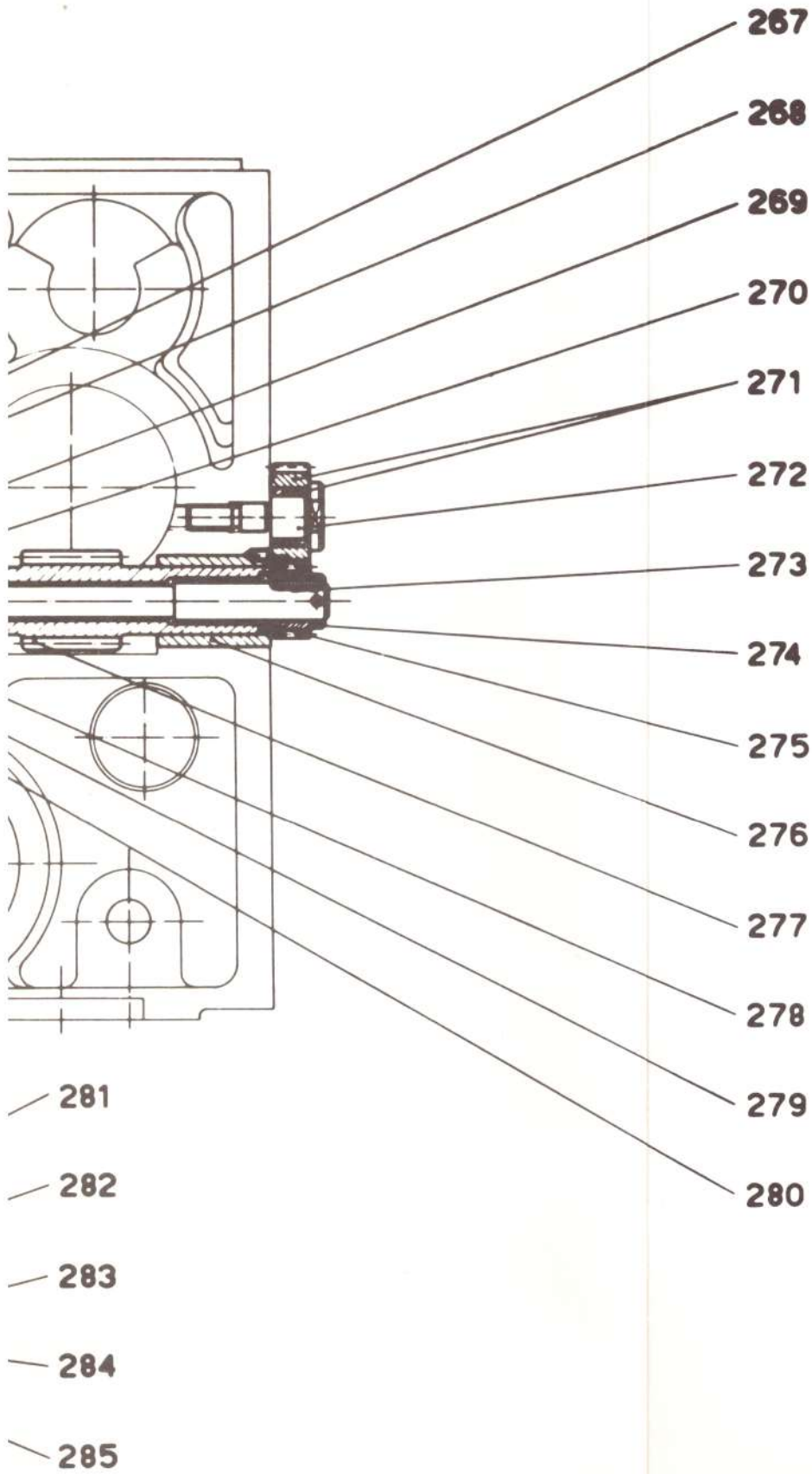






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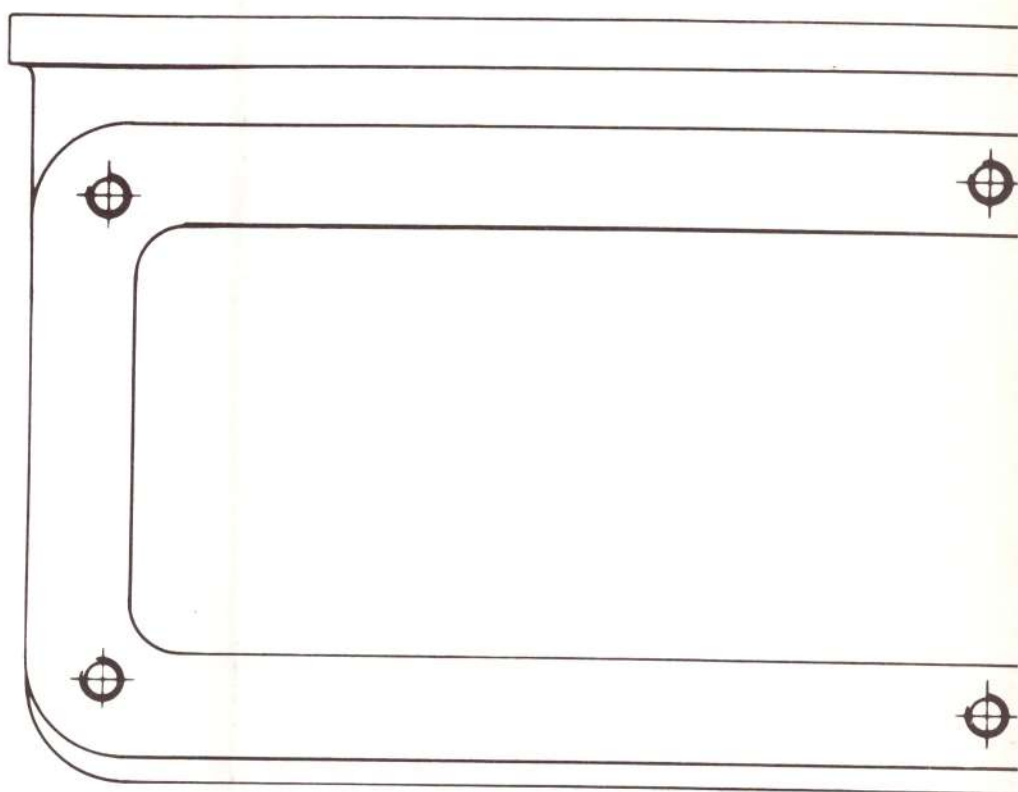


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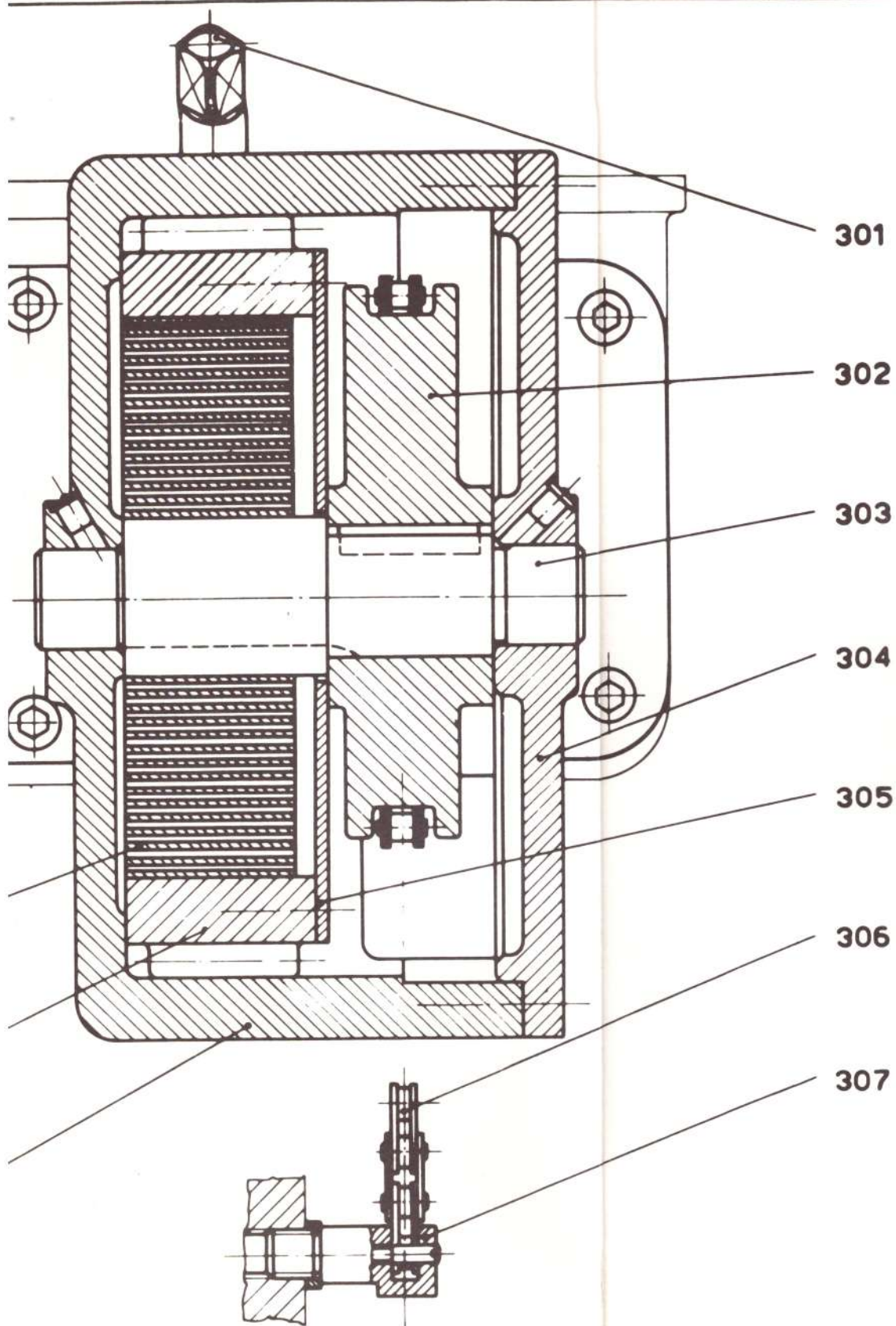


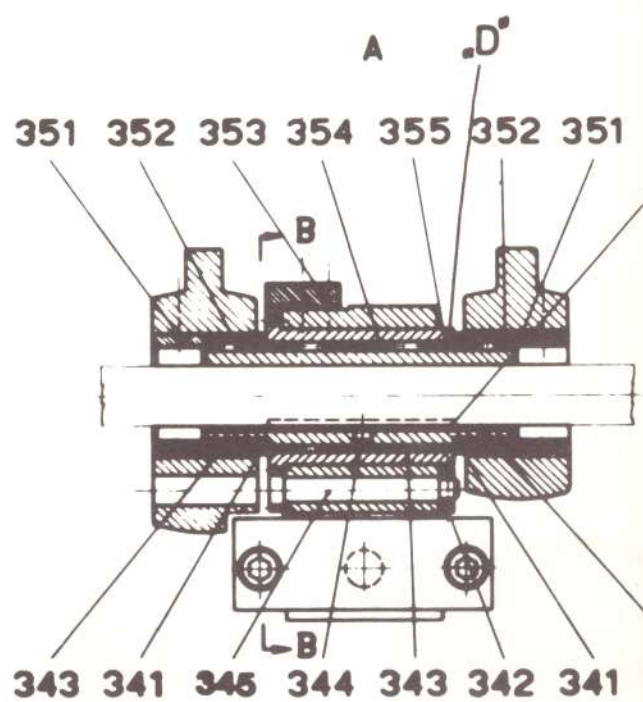
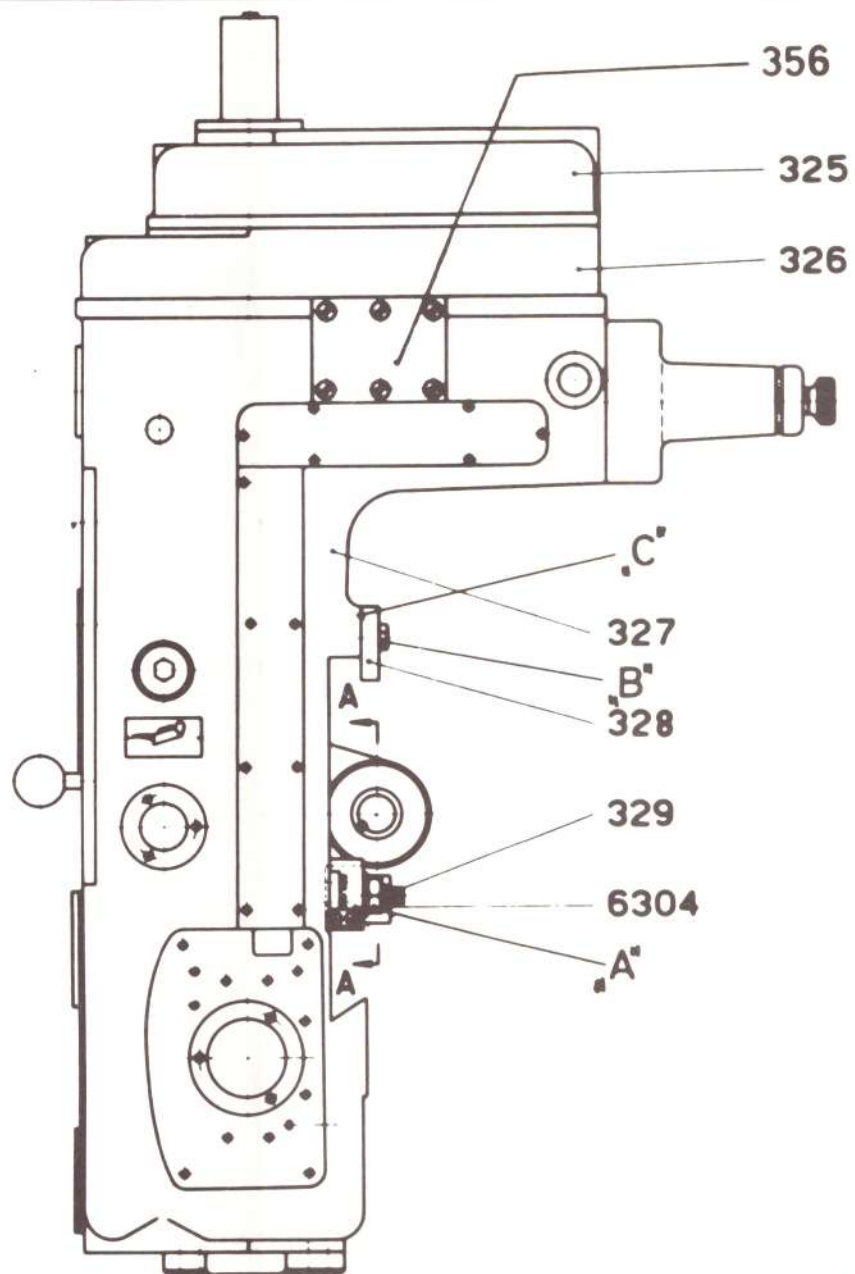


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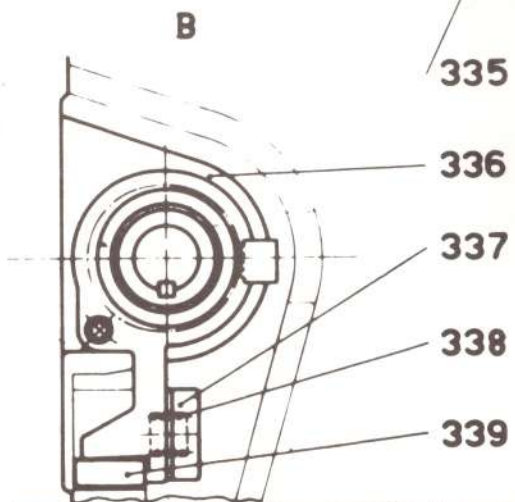
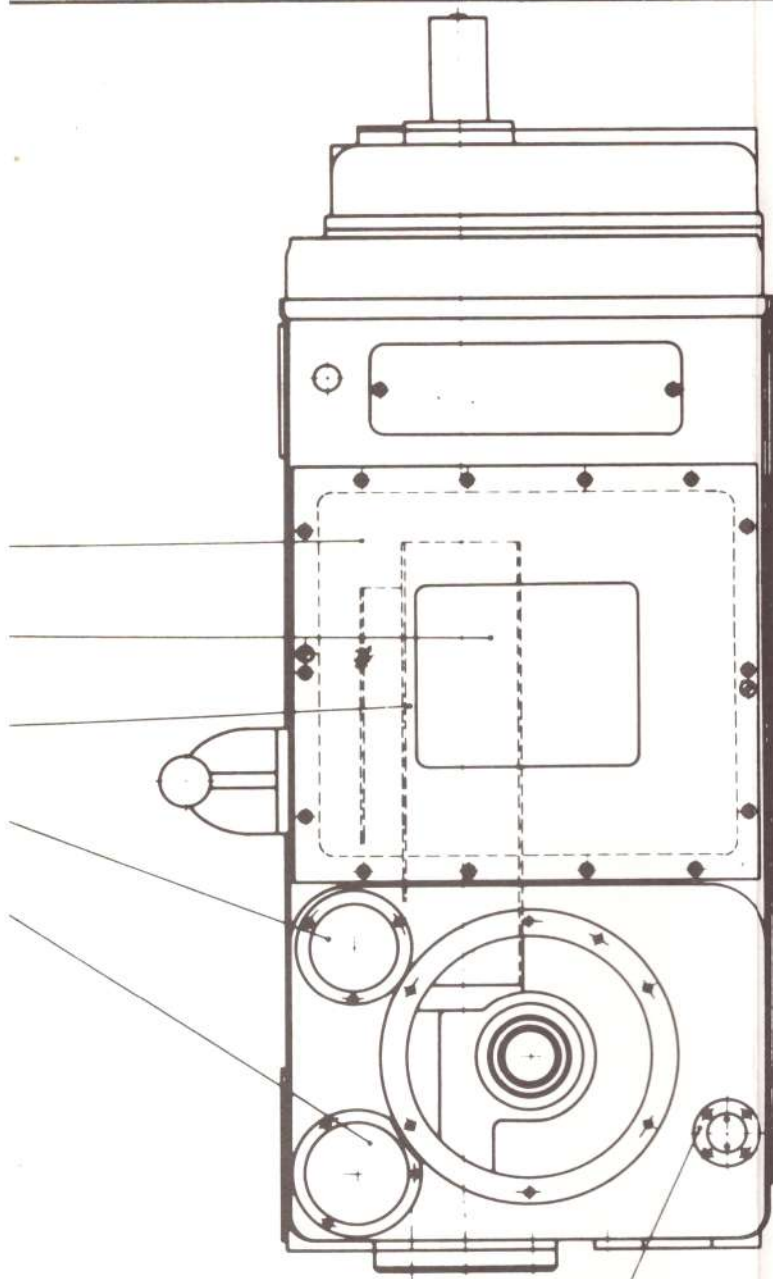
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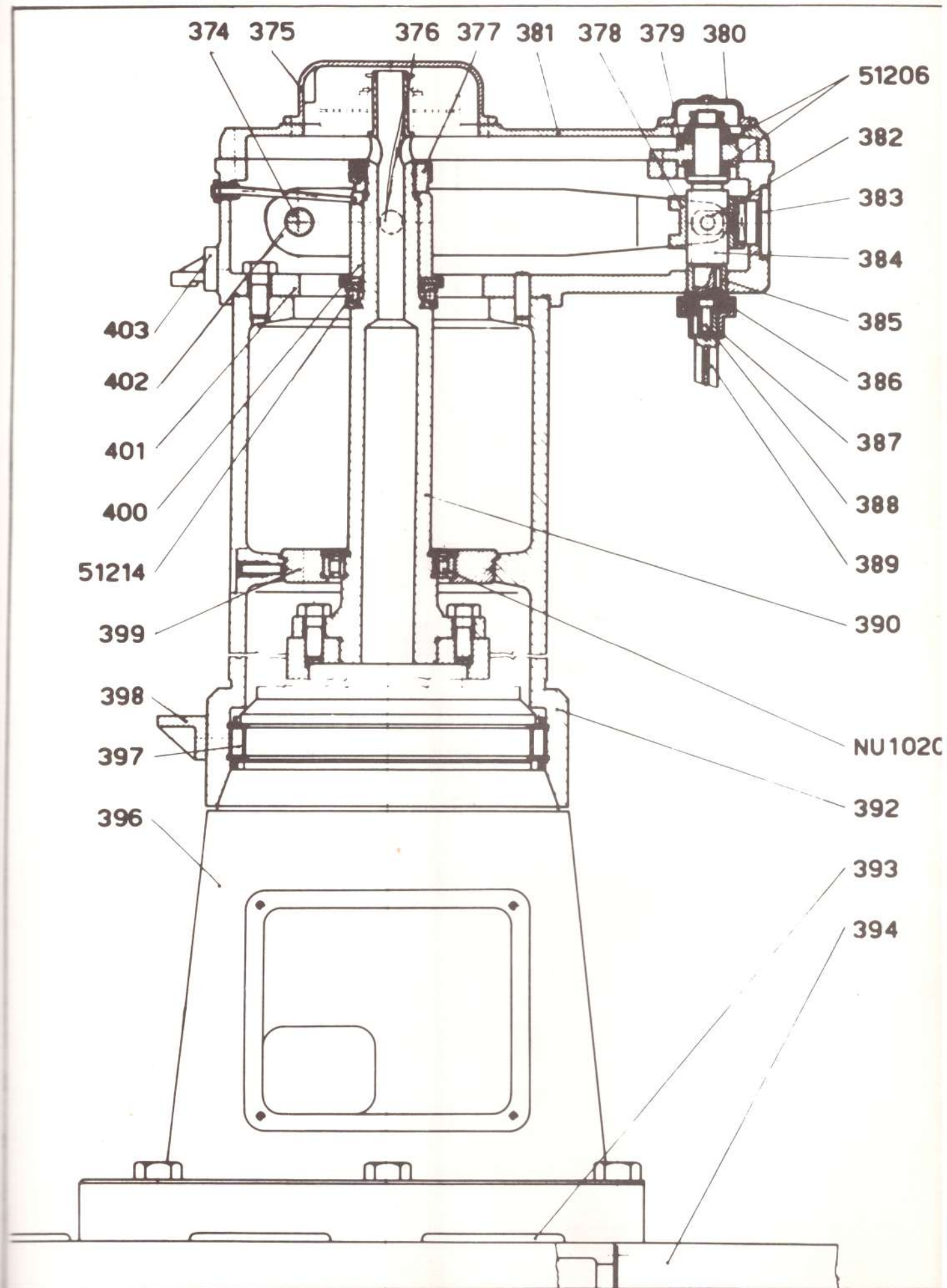


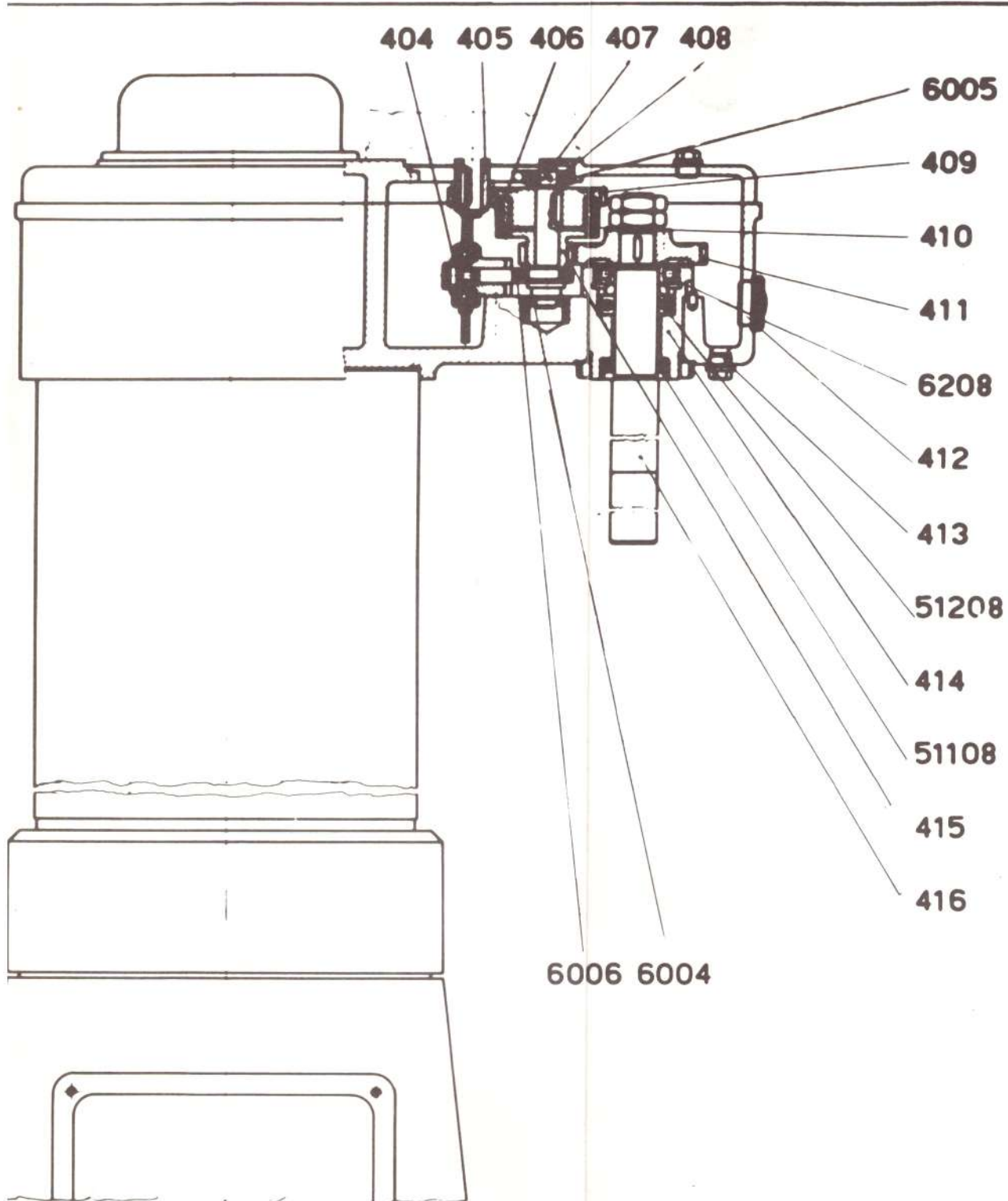


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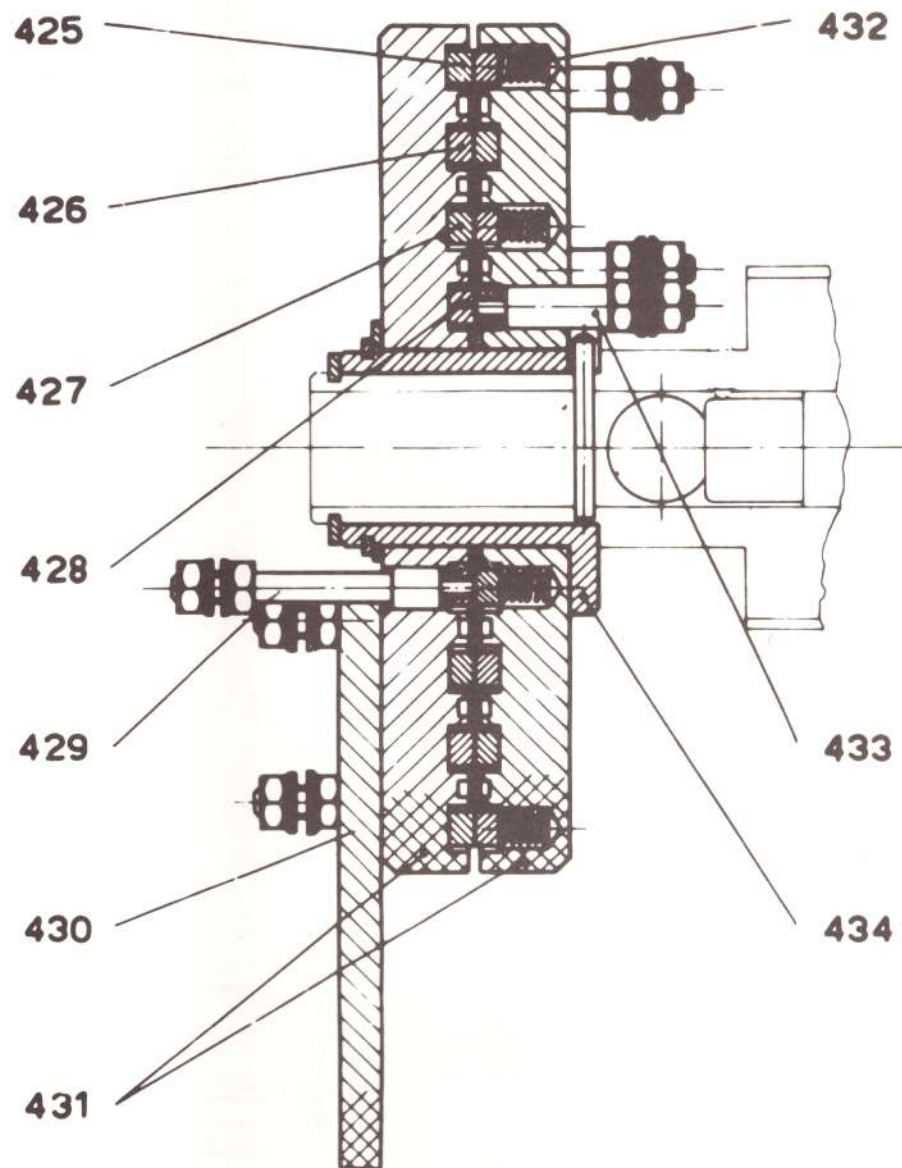
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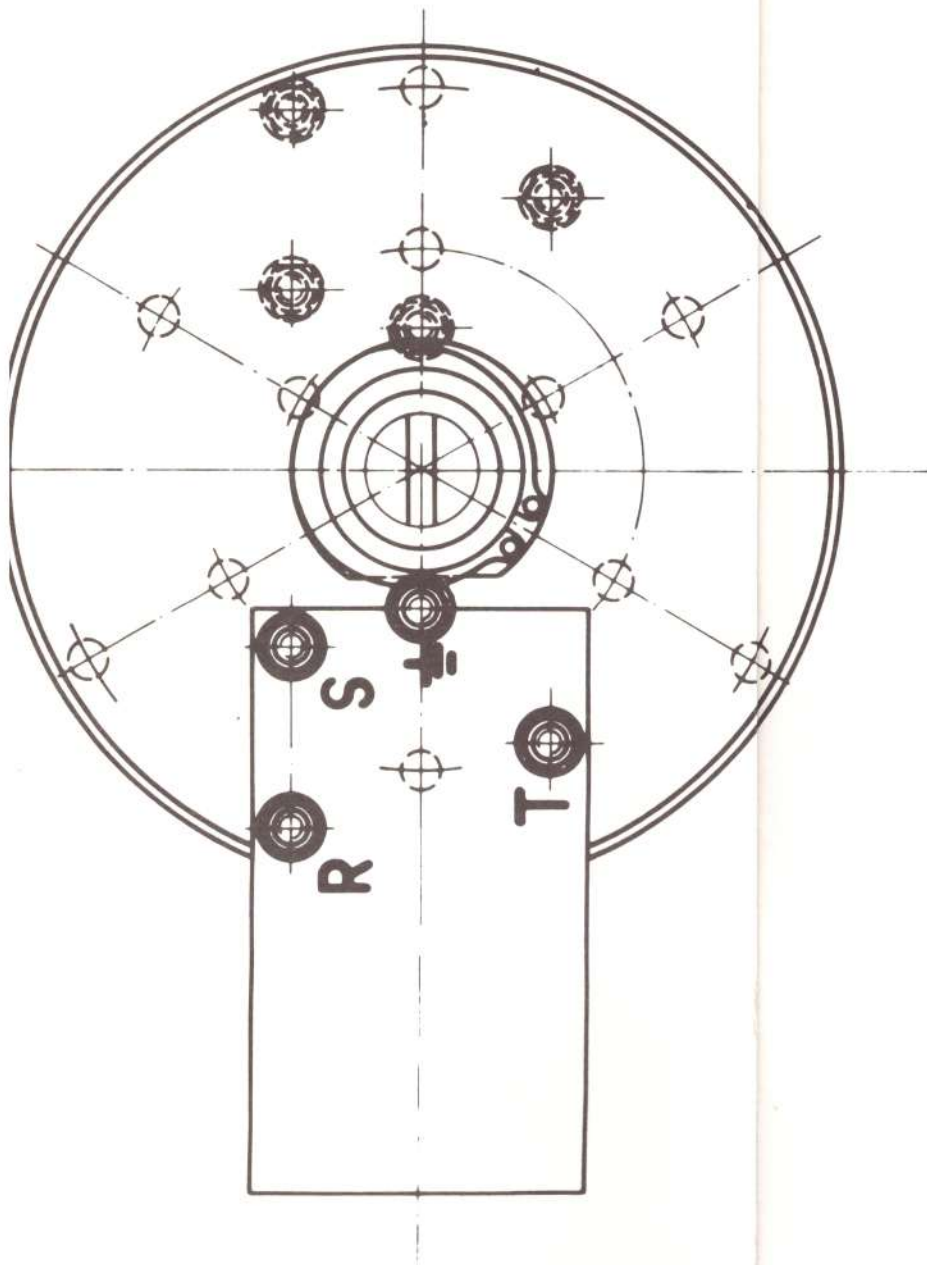
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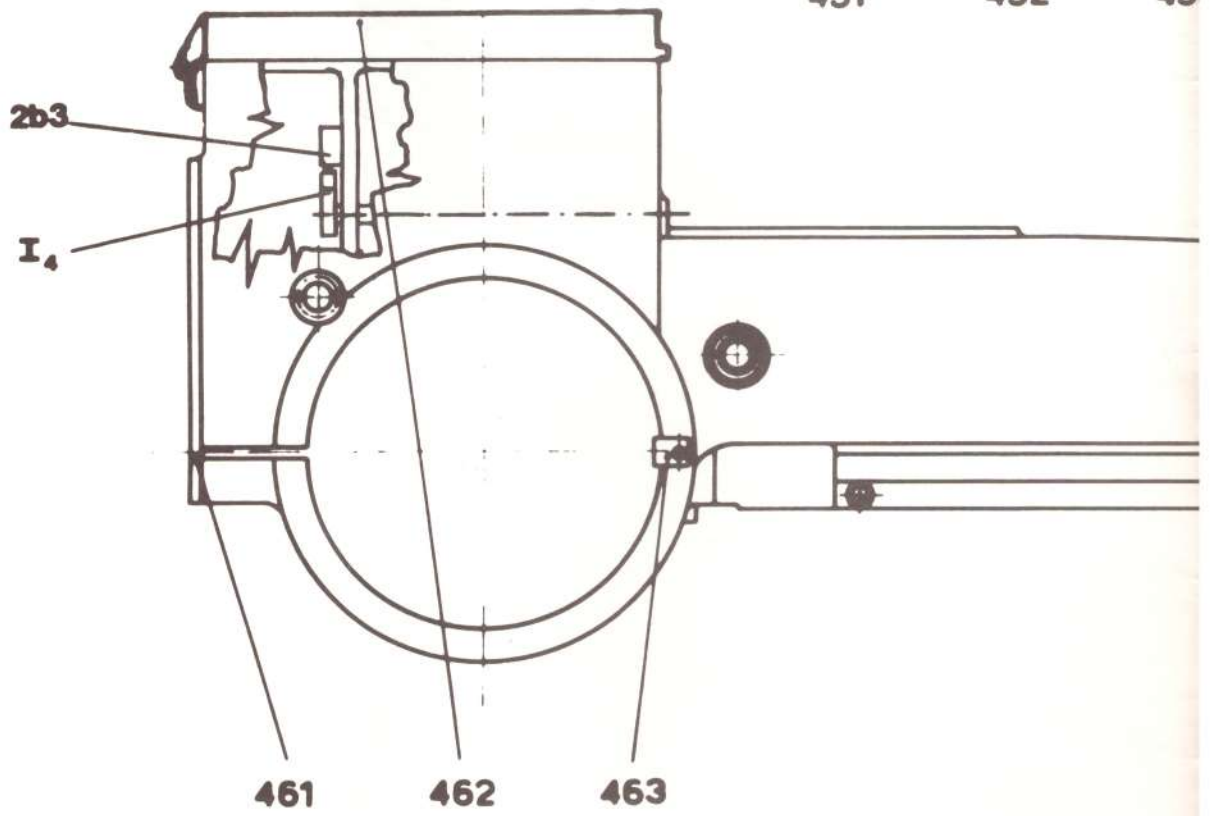
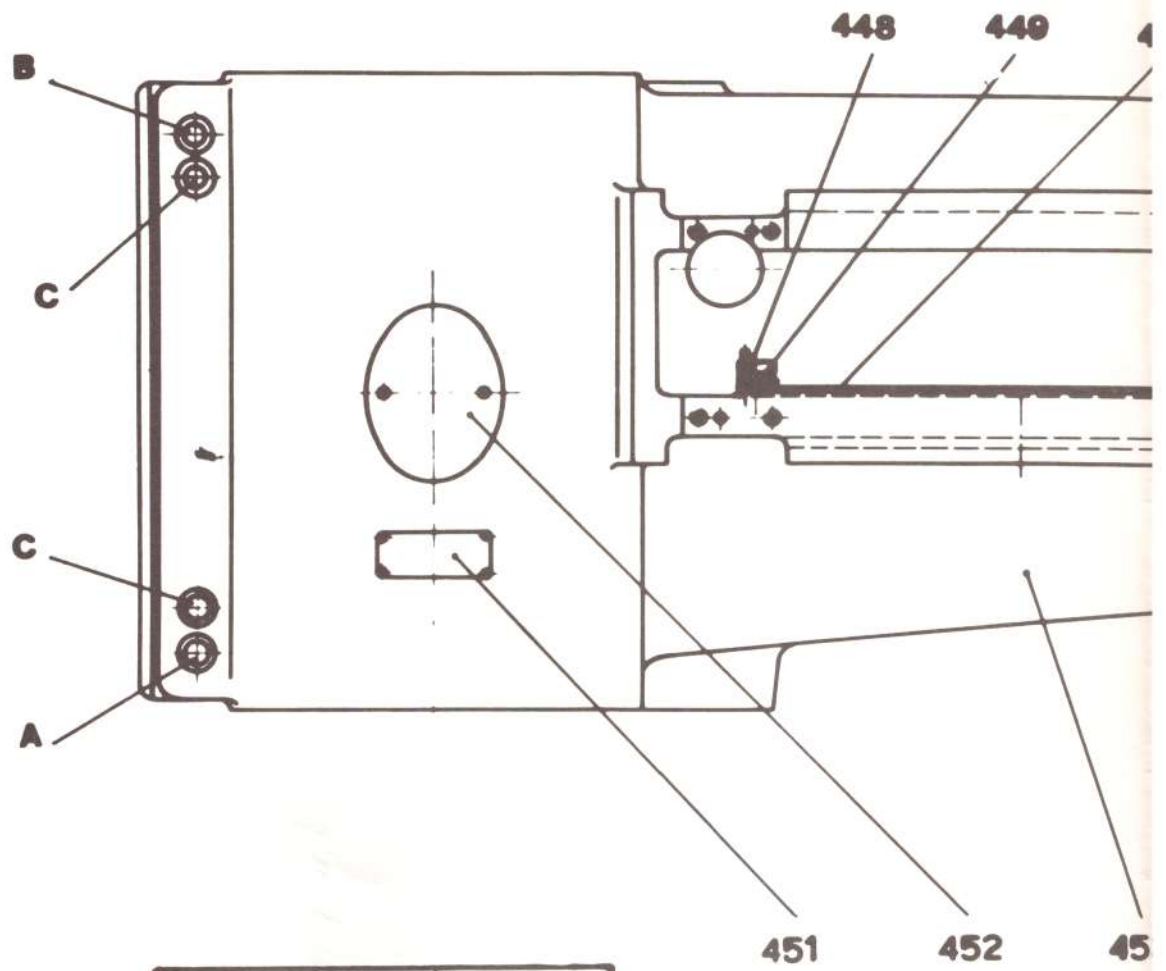






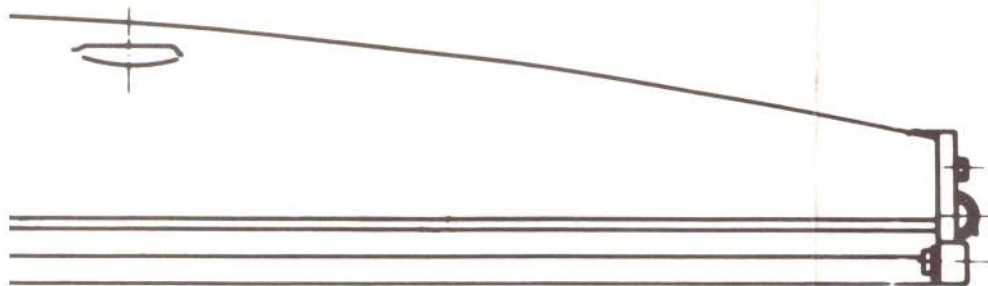
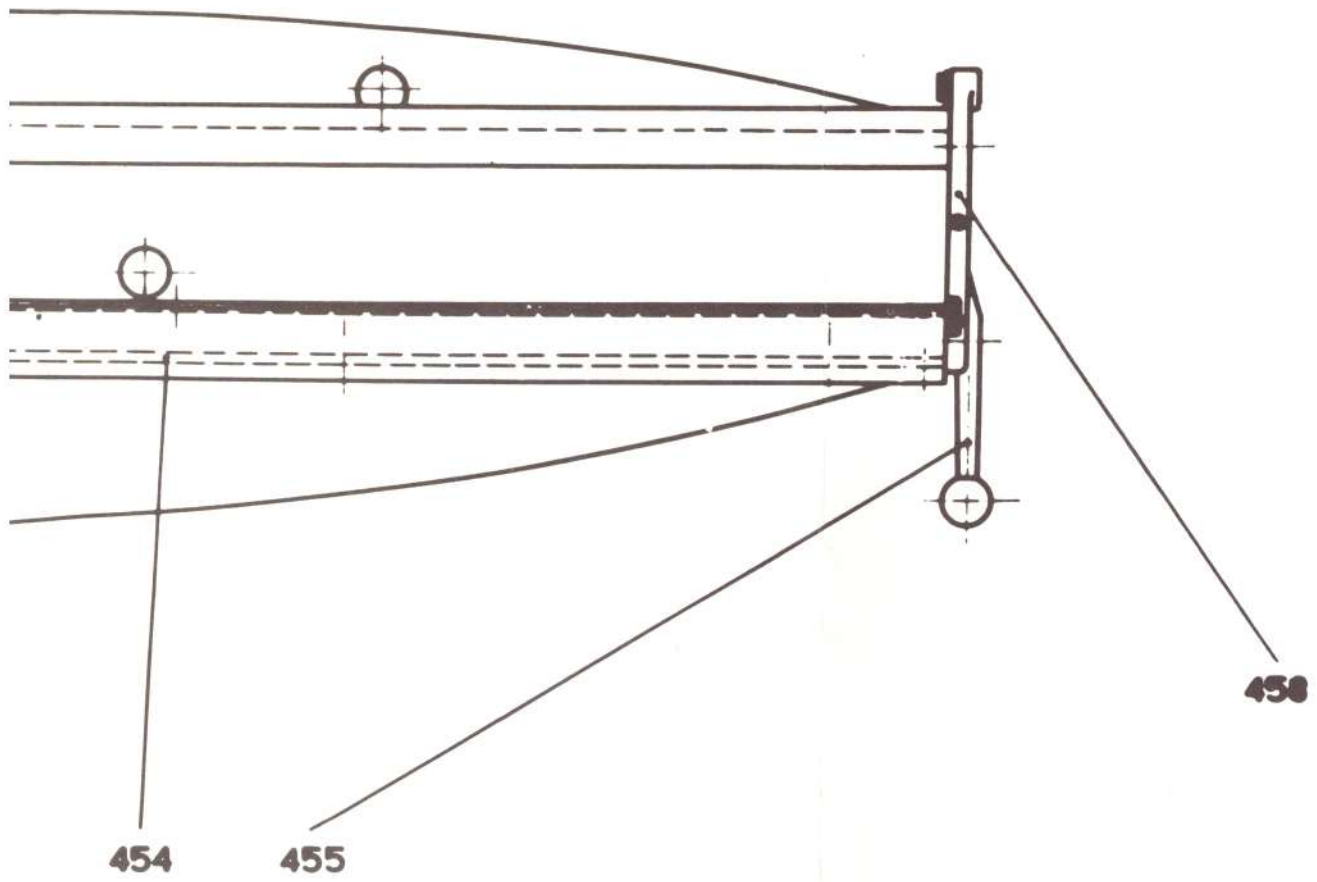








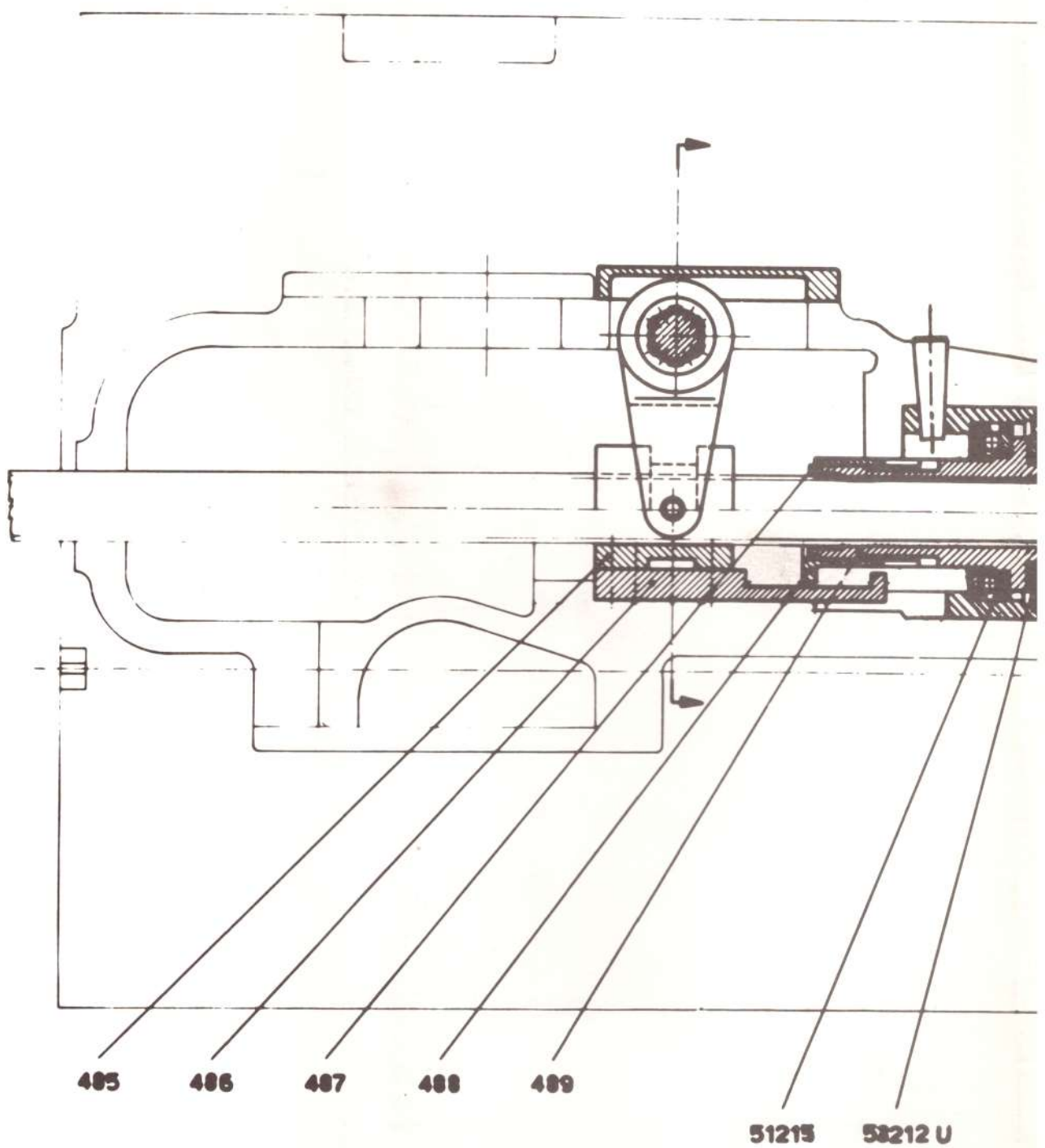
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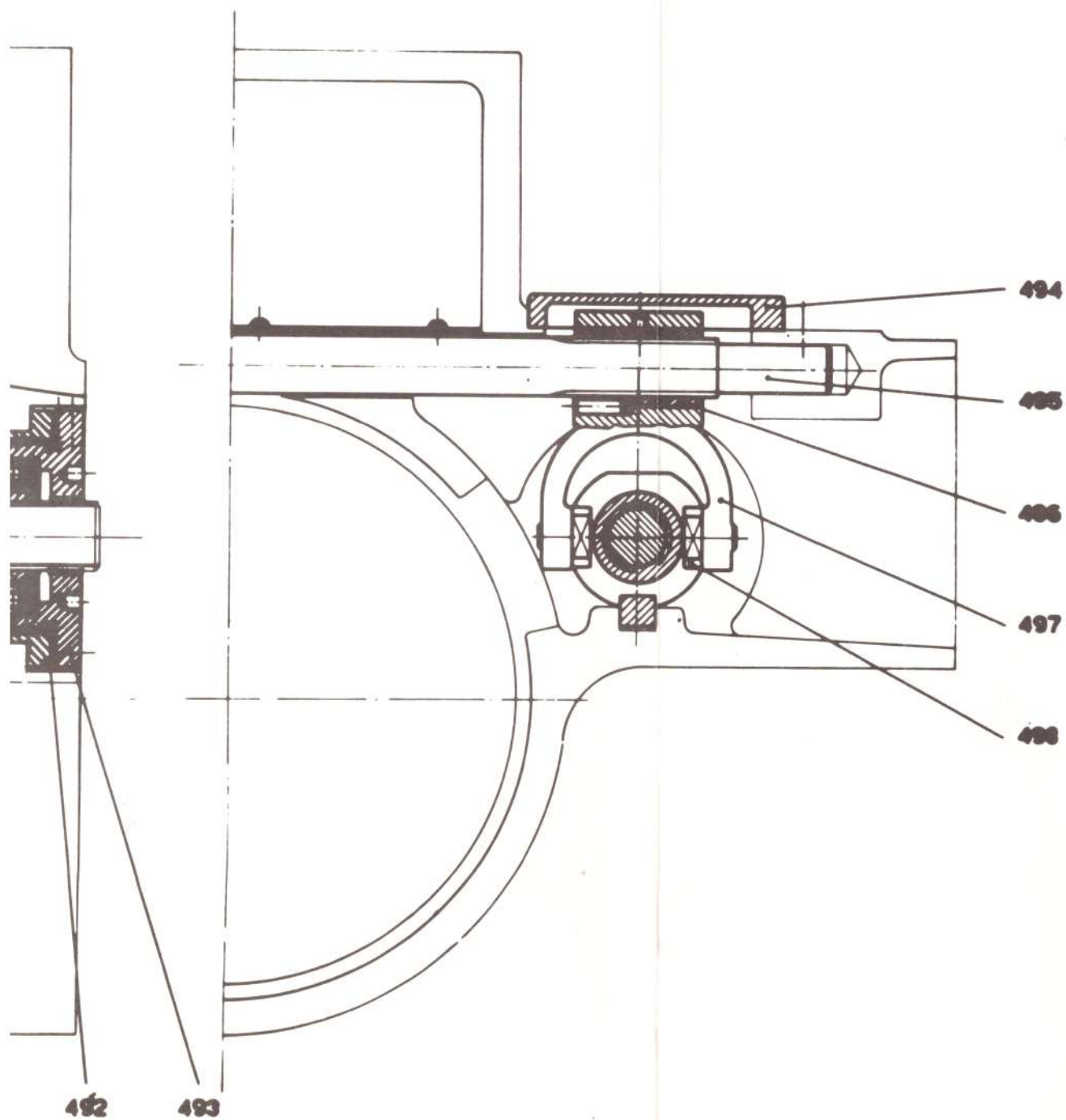


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250085-6

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012



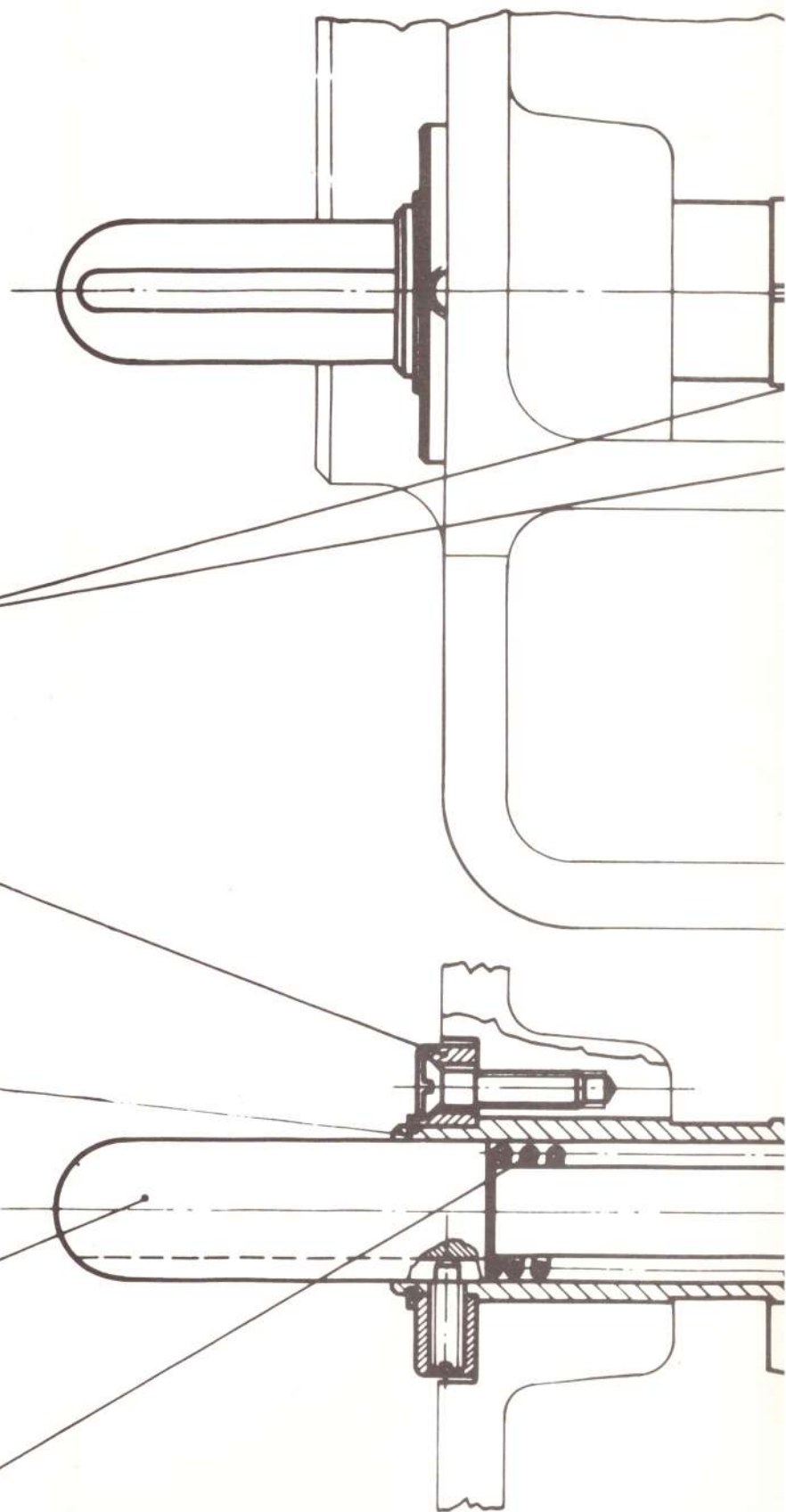
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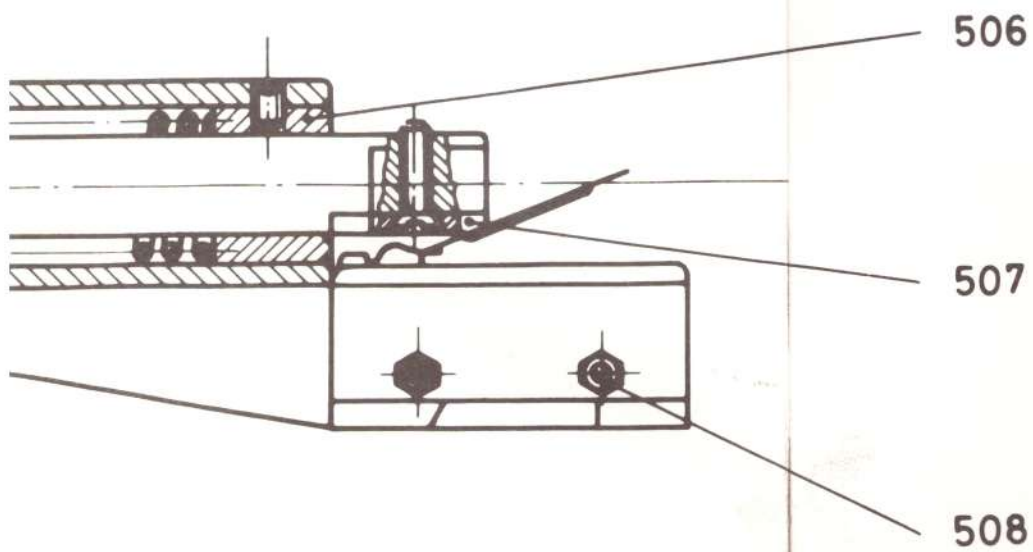
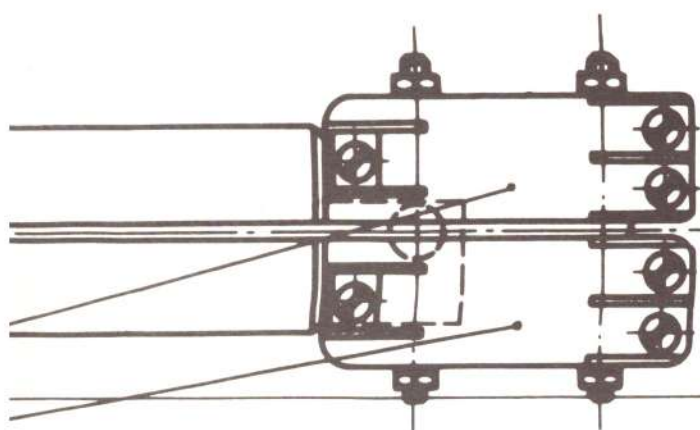
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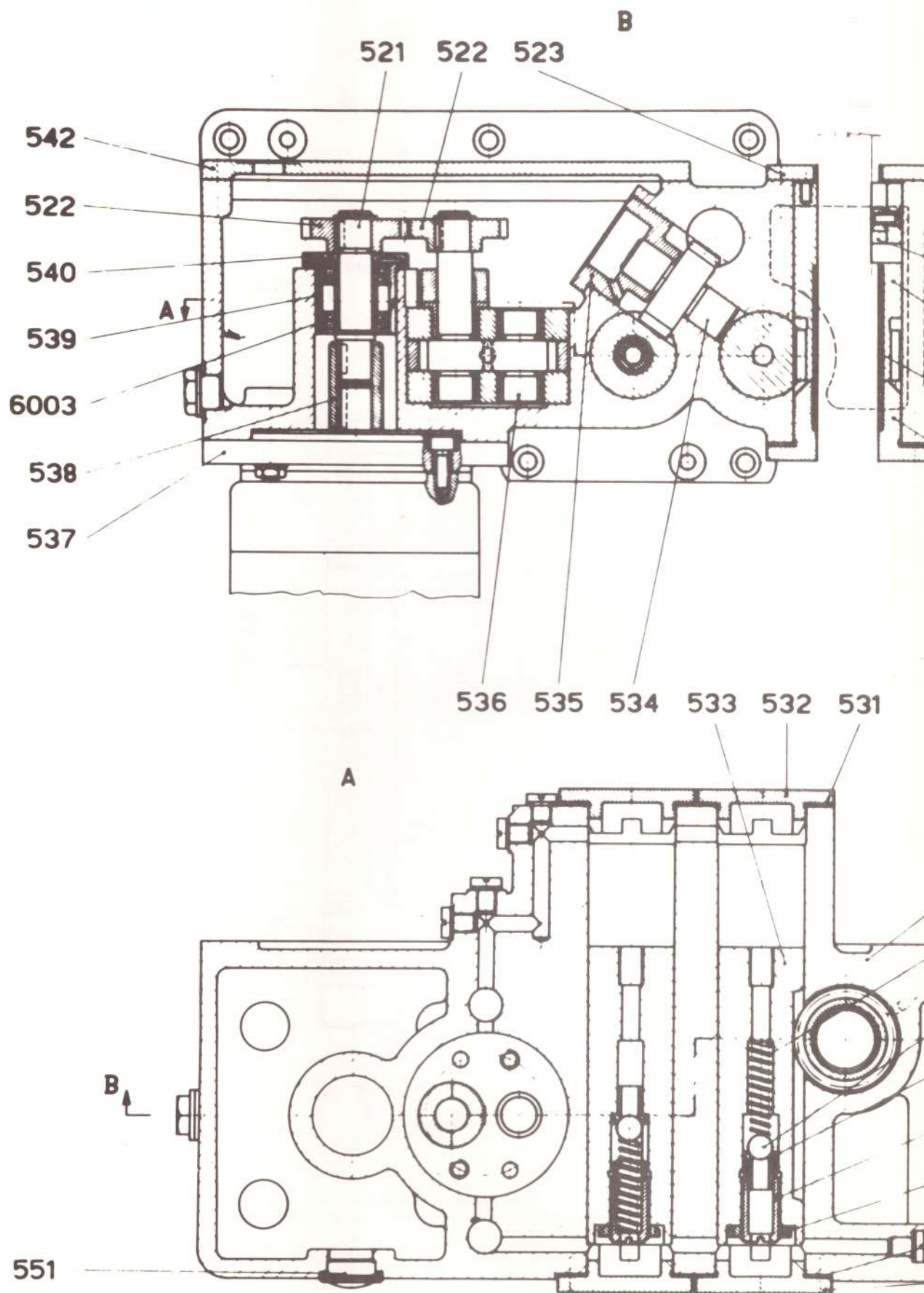




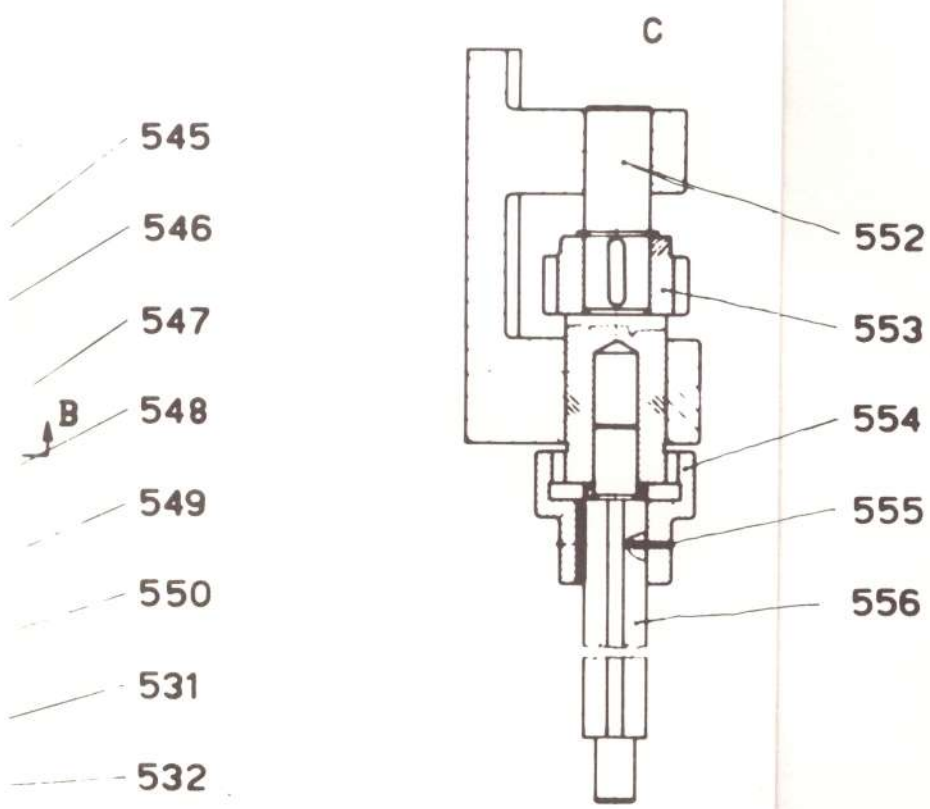
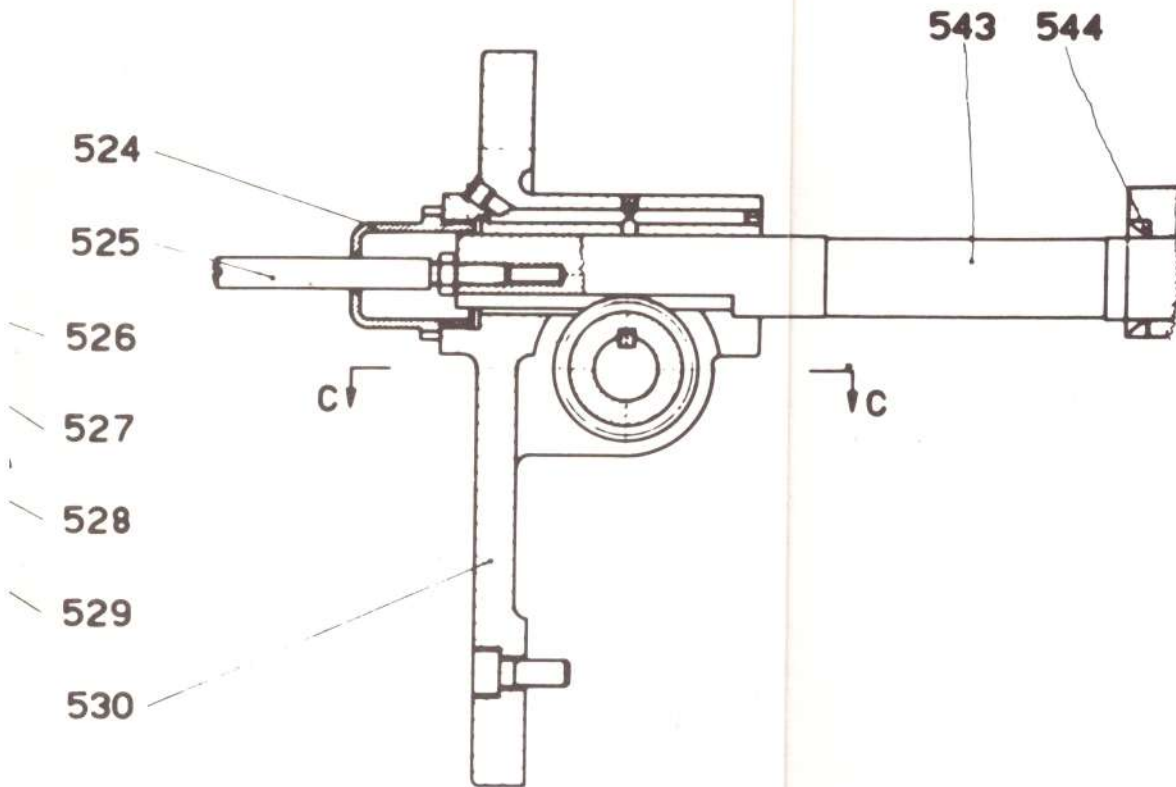
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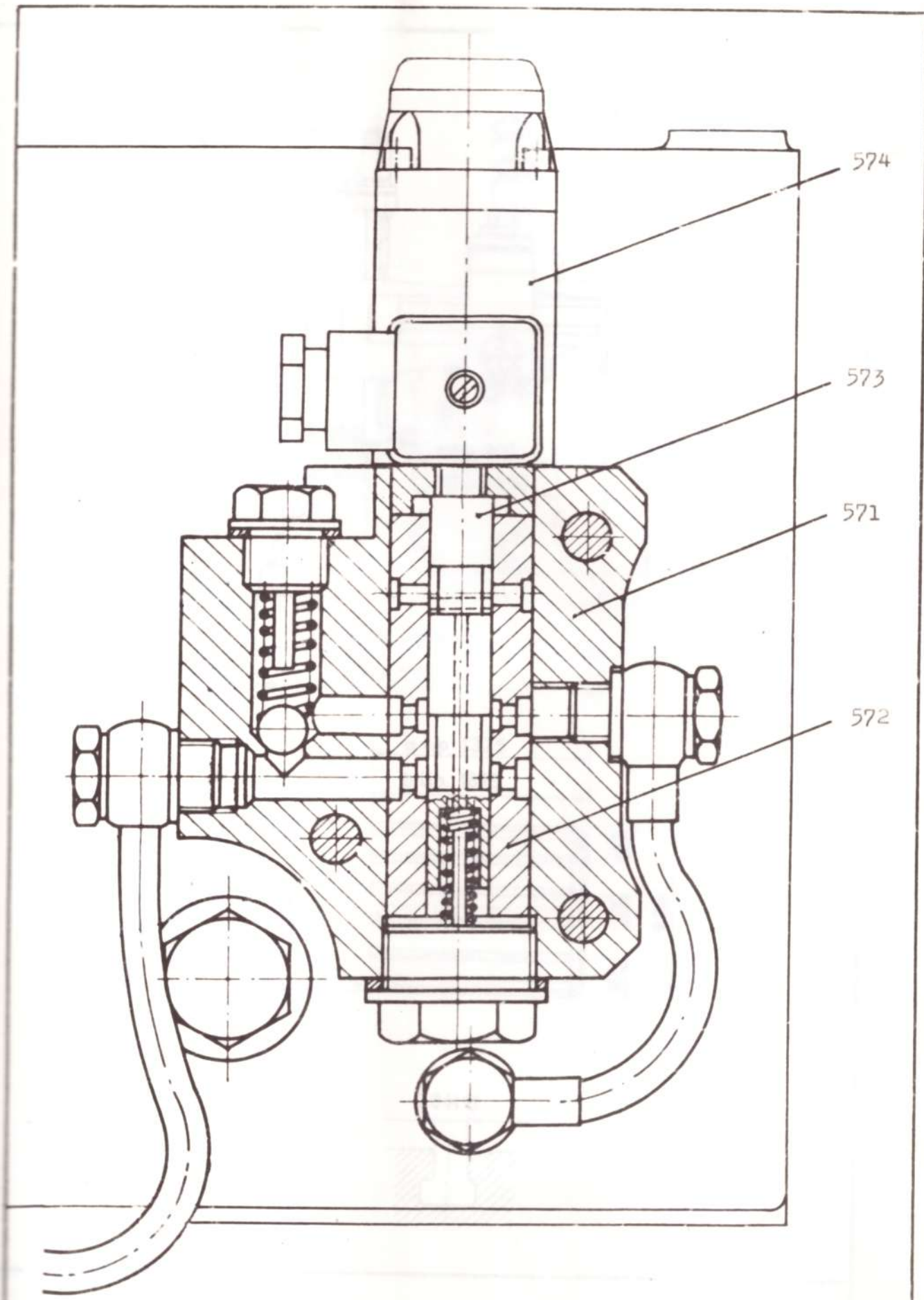
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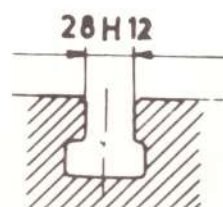
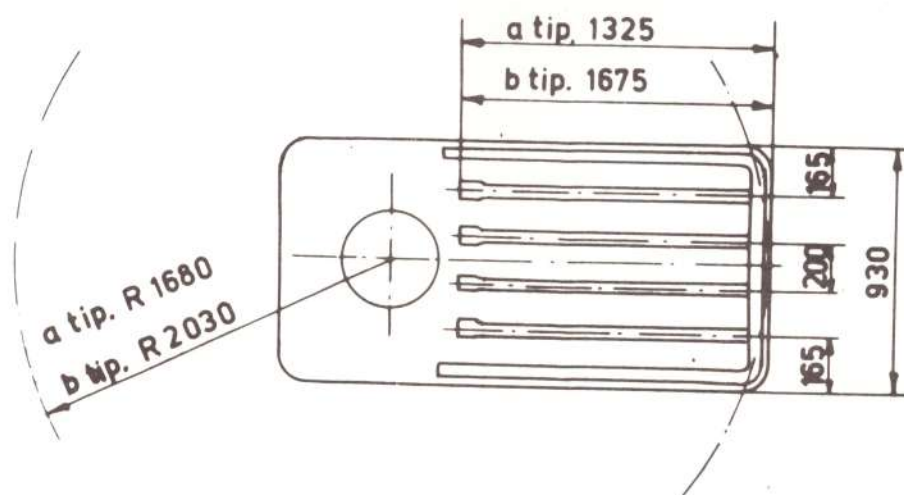
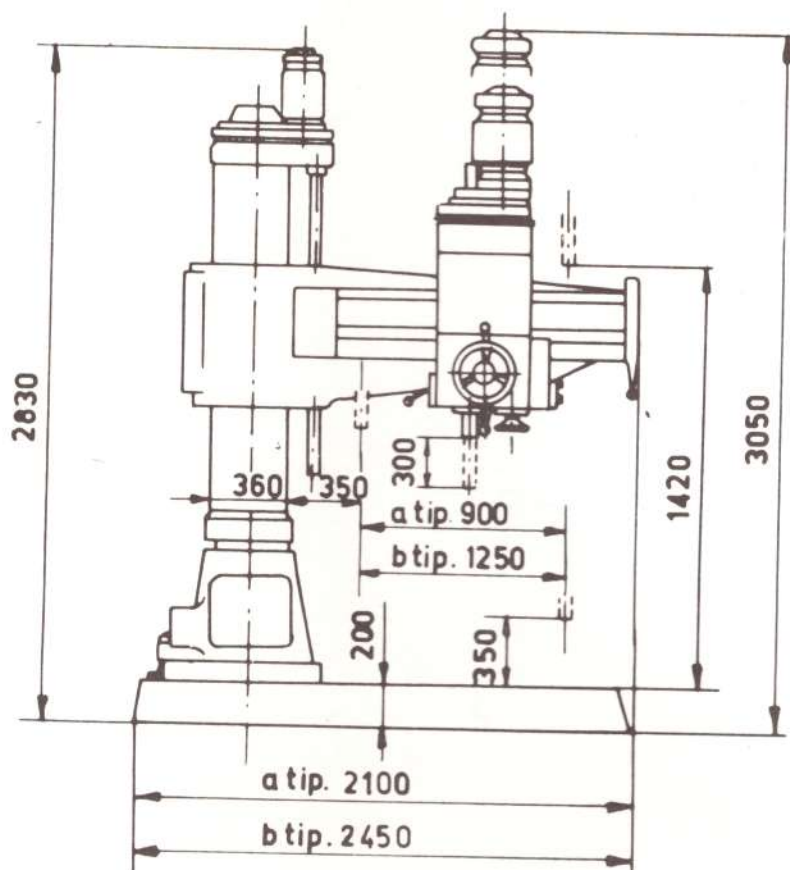
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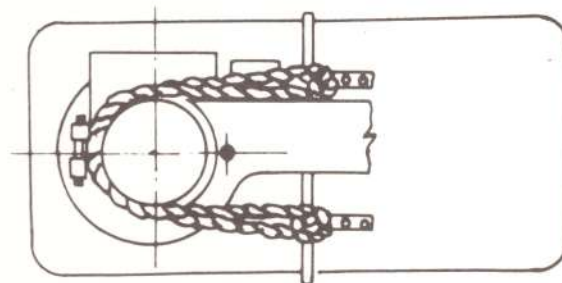
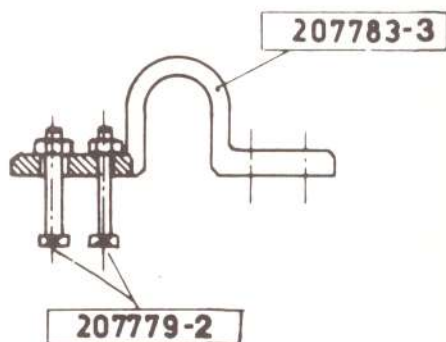
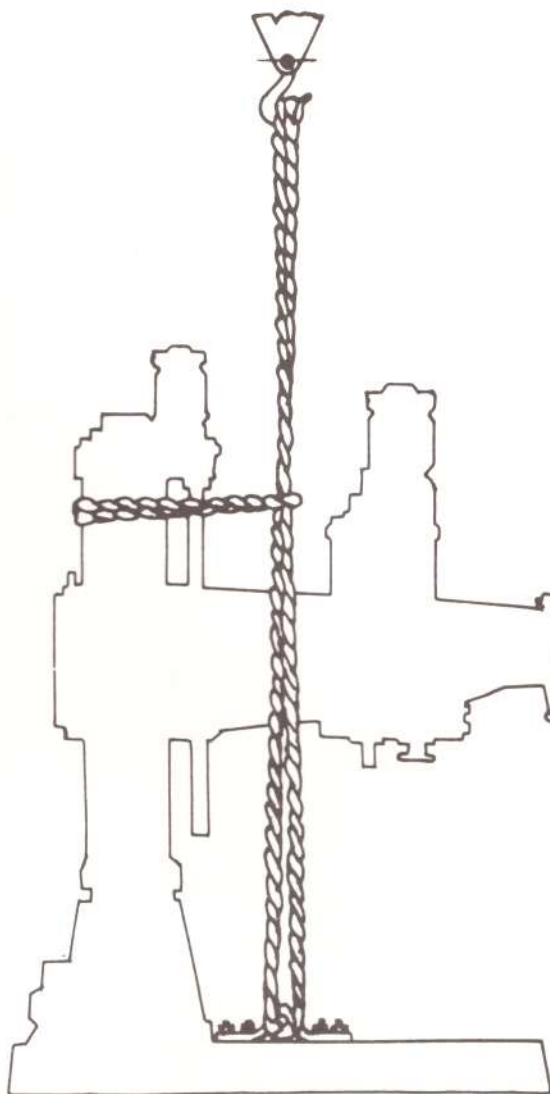
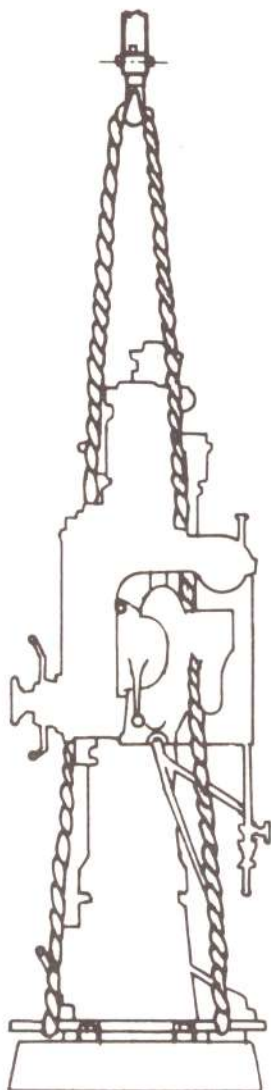


RF50/1250  
1800

5

016



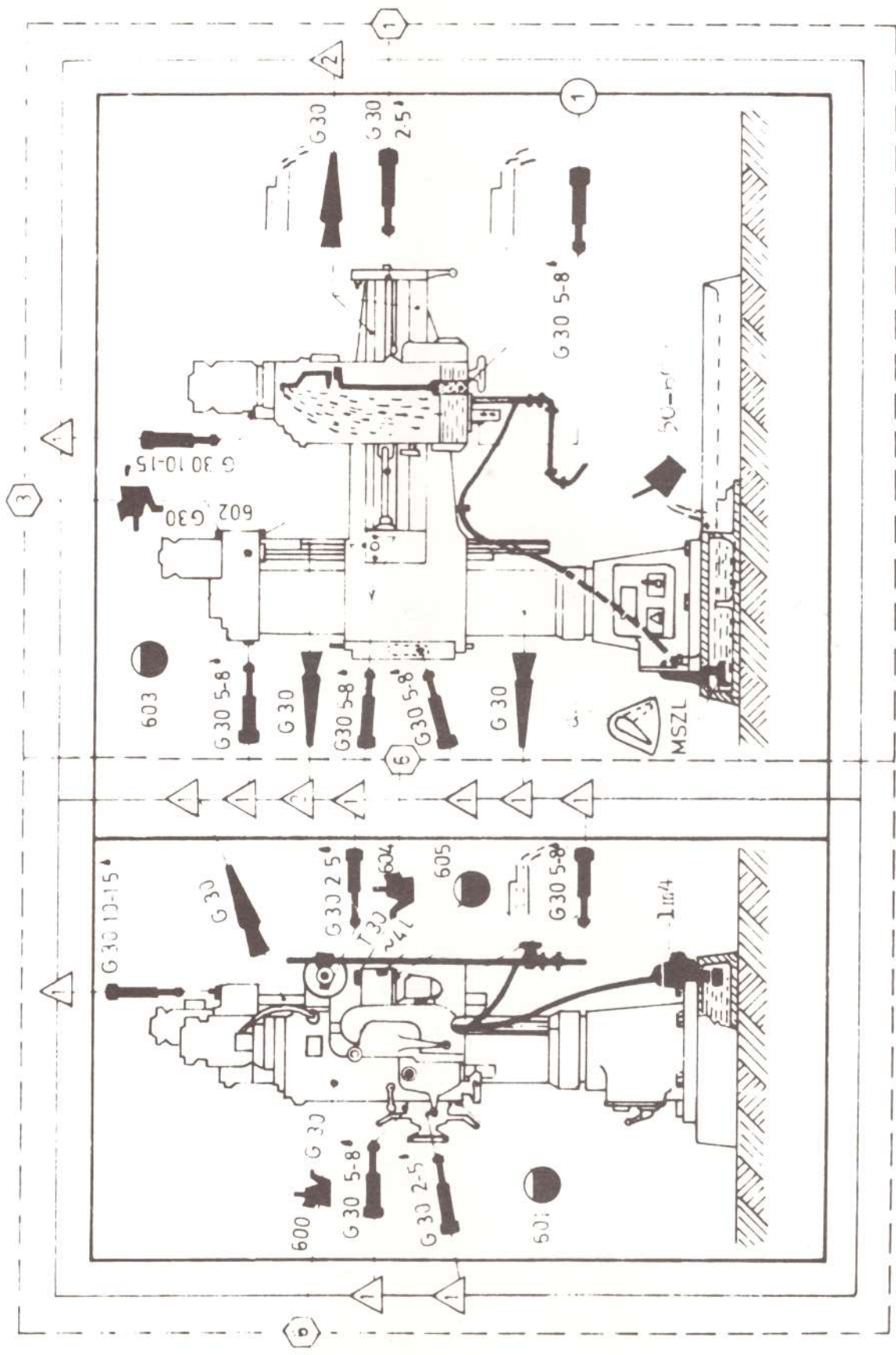


RF50/1250  
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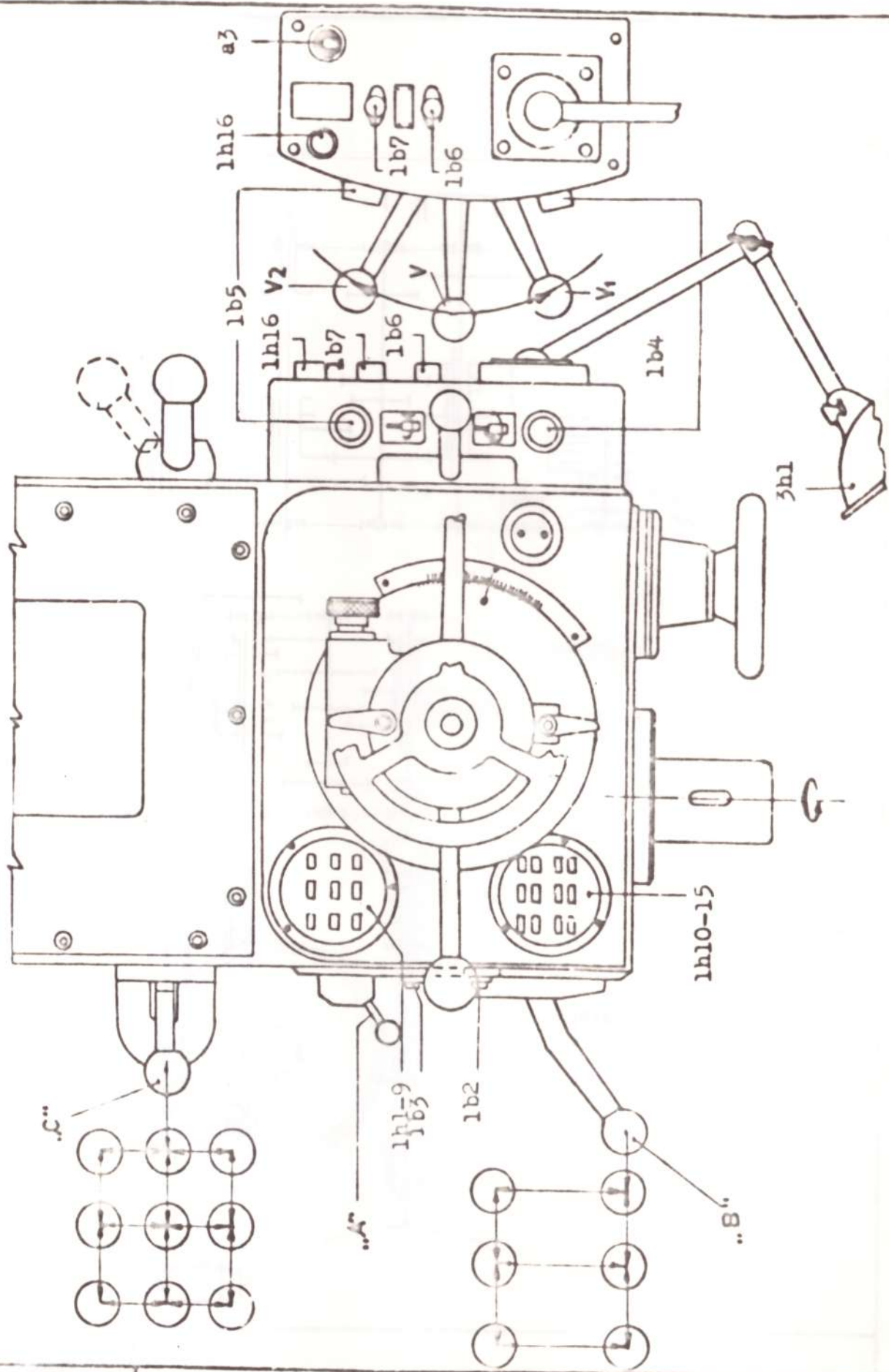
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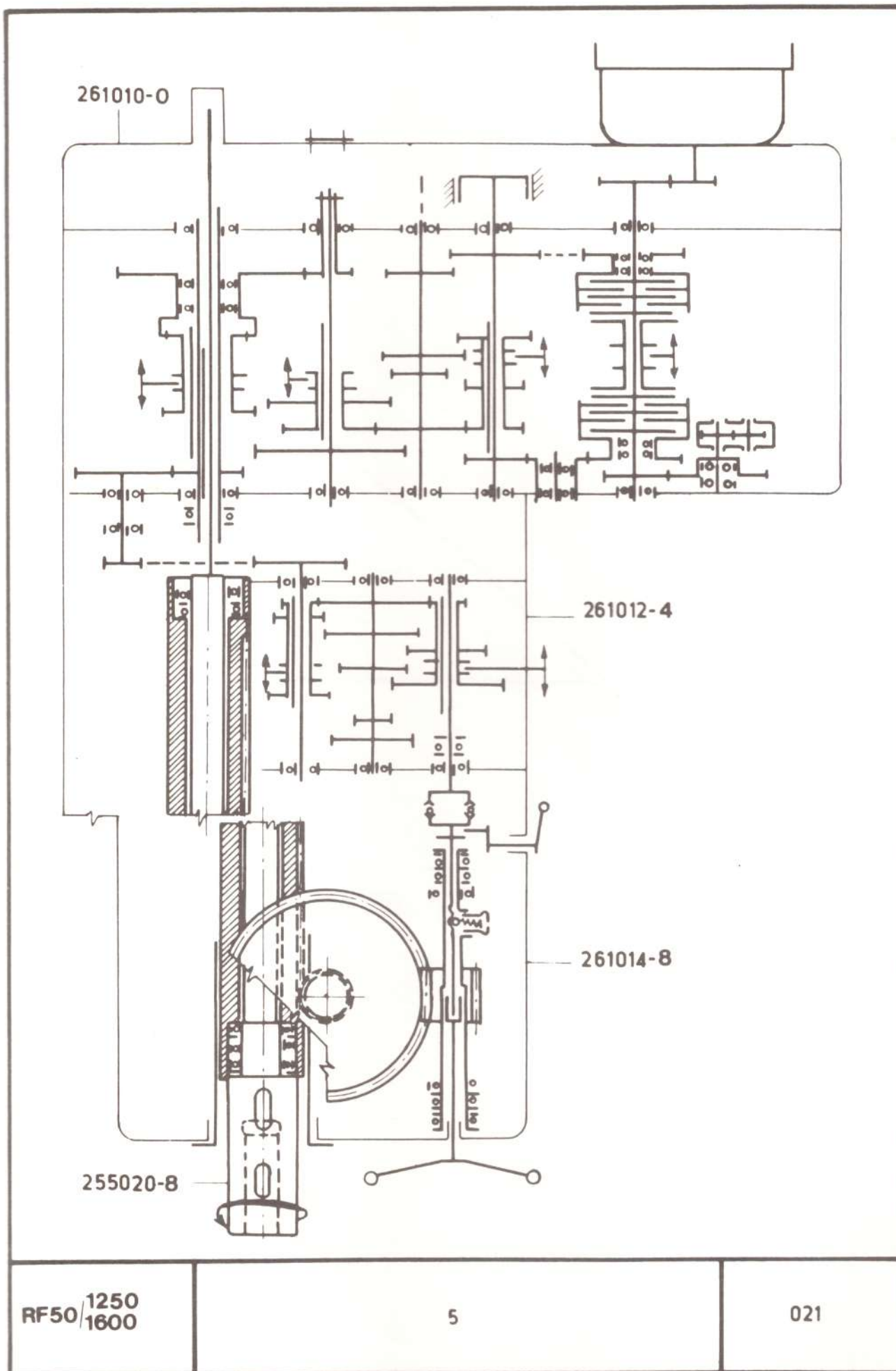
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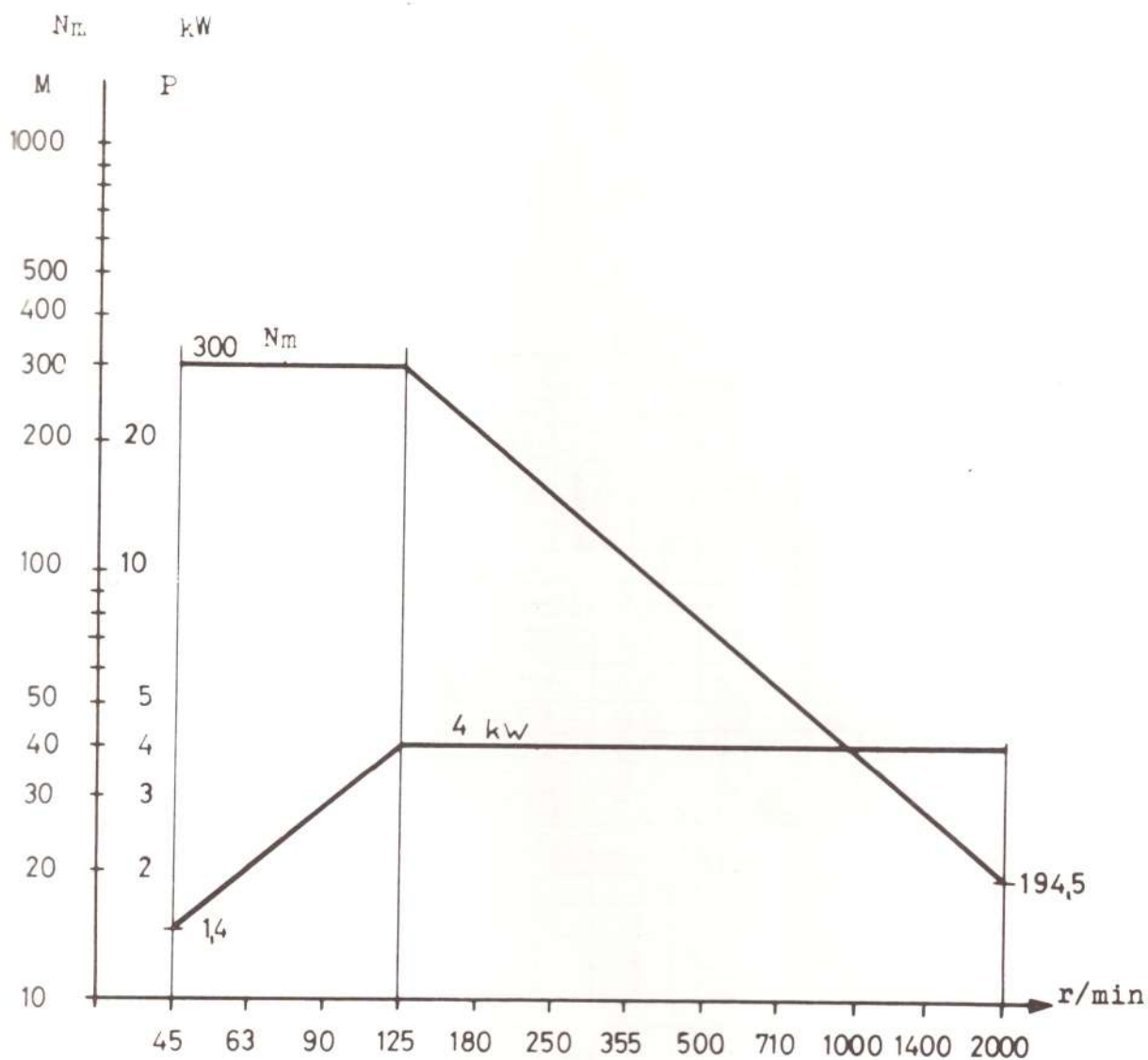















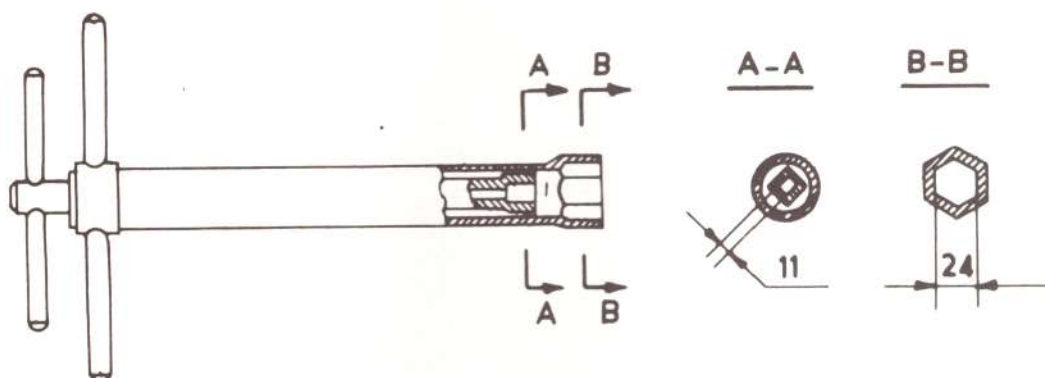
RF/1250  
1600

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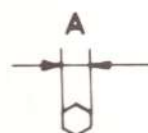
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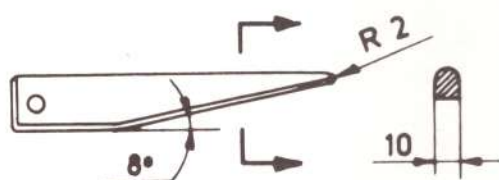
Ajánlott vágósebesség $m/min$									
szerszám anyag		szerszám ac.		gyors ac.		szerszám ac.		gyors ac.	
A munka db anyaga	Öv. 20		8-14	20-35		4-5	5-6		6-8 12-16
	Öv. 25		6-9	15-25		3-4	5-6		3-5 8-12
	A. 50		10-18	25-40		4-5	5-6		3-7 9-15
	A. 60		9-12	25-32		3-4	5-6		2-3 5-8
	A. 70		9-12	20-28		3-4	5-6		2-3 5-7
Ajánlott előtolás fűrdshoz $mm/r$									
D=		5	10	15	20	25	30	40	50
A munka db anyaga	Öv. 20	0,075	0,075	0,112	0,17	0,25	0,37	0,37	0,37
	Öv. 25	0,075	0,075	0,112	0,17	0,25	0,25	0,37	0,37
	A. 50	0,075	0,05	0,112	0,17	0,25	0,25	0,37	0,37
	A. 60	0,05	0,05	0,112	0,17	0,17	0,25	0,37	0,37
	A. 70	0,05	0,05	0,112	0,112	0,17	0,25	0,25	0,25
Vágósebesség $m/min$									
Orsófordulat $r/min$	45	0,7	1,4	2,1	2,8	3,5	4,2	5,6	7,0
	63	1,0	2,0	2,9	3,9	4,9	5,9	7,9	9,9
	90	1,4	2,8	4,2	5,6	7,0	8,4	11,3	14,1
	125	1,9	3,9	5,9	7,8	9,6	11,8	15,7	19,6
	180	2,8	5,6	8,5	11,3	14,1	17,0	22,6	28,7
	250	3,9	7,8	11,8	15,7	19,6	23,6	31,4	39,2
	355	5,5	11,1	16,7	22,3	27,9	33,4	44,6	56,8
	500	7,8	15,7	23,5	31,4	39,2	47,1	62,8	78,5
	710	11,1	22,3	33,4	44,6	55,7	66,9	89,2	111,5
	1000	15,7	31,4	47,1	62,8	78,5	94,2	125,6	157,0
1400	22,0	44,0	66,0	88,0	110,0	132,0	176,0	220,0	
2000	31,4	62,8	94,2	125,6	157,0	168,5	251,3	314,1	



255500-7



	A
255509-0	6
KGSZ 29.1060	10
—11—	14
—11—	19

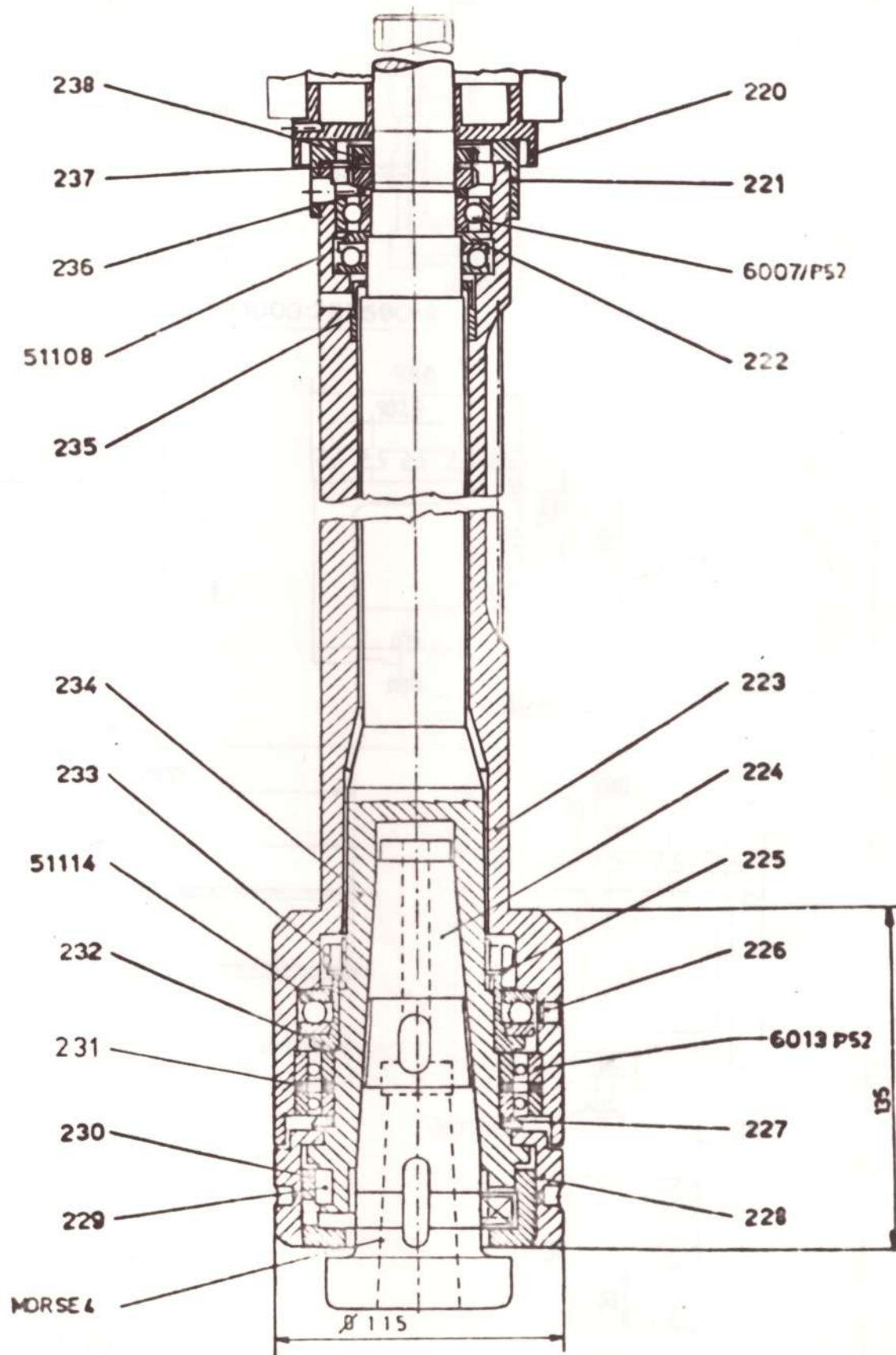


LUB

RF 50/1250  
1600

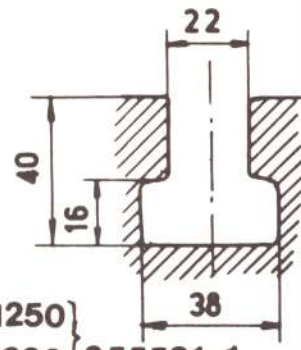
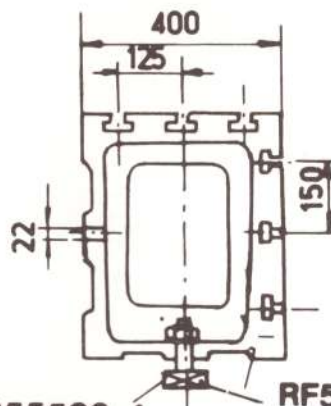
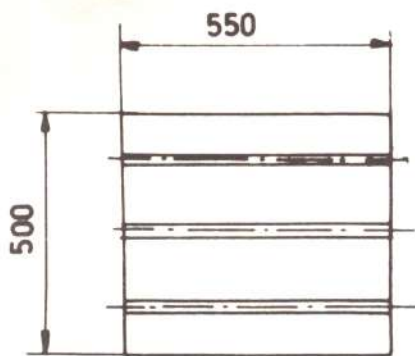
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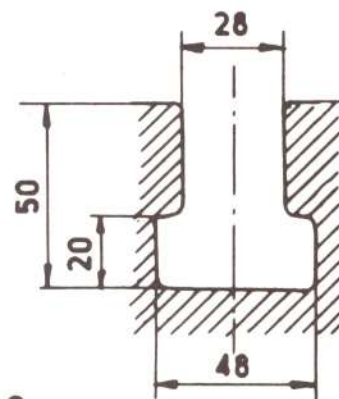
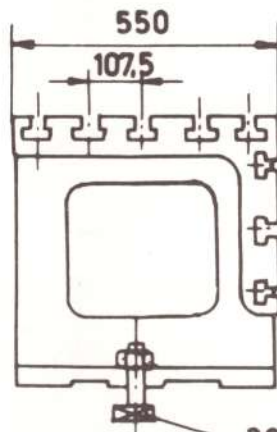
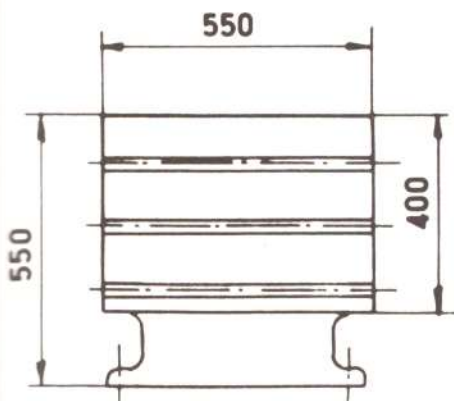


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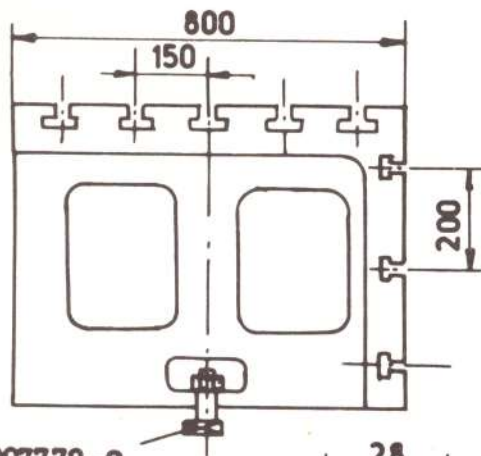
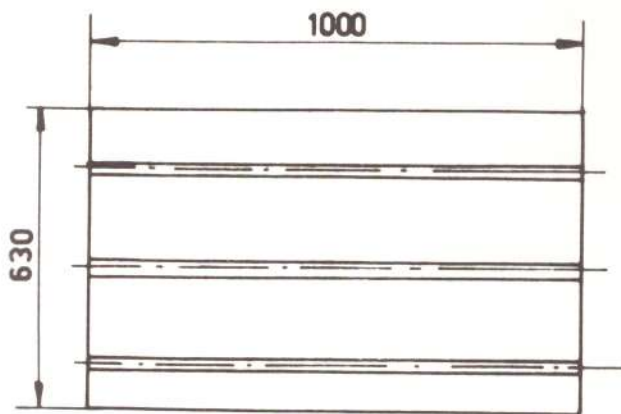




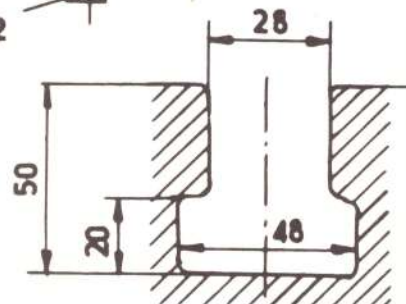
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240179-9    280 kg    207779-2



207779-2

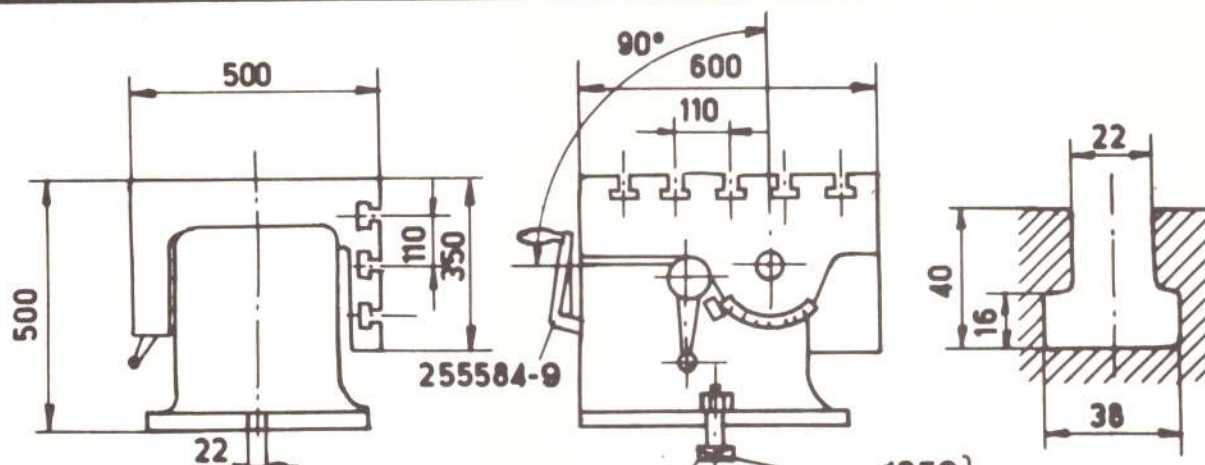


240118-4    750 kg

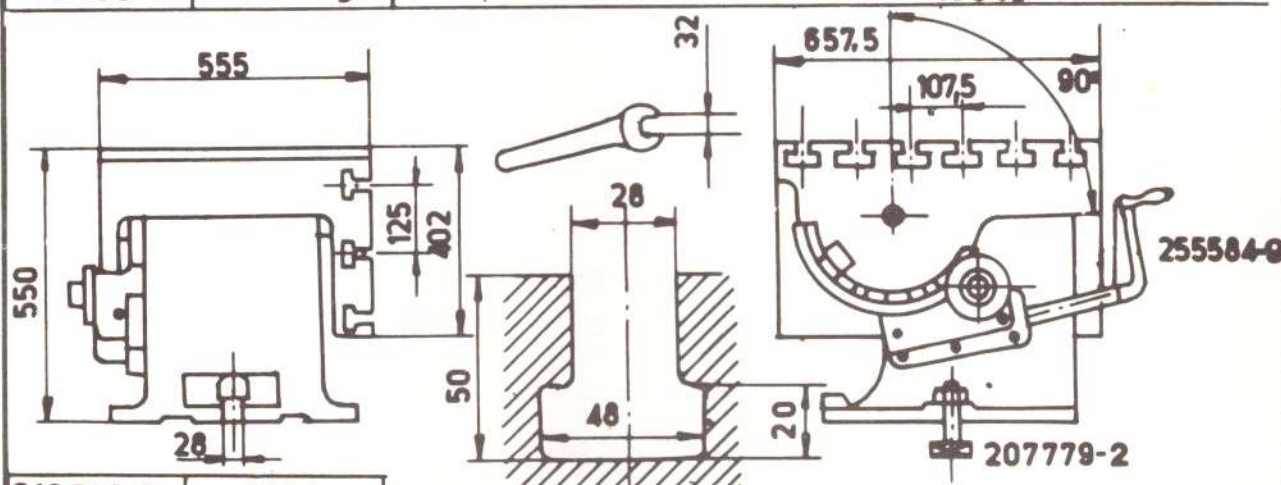
RF50

5

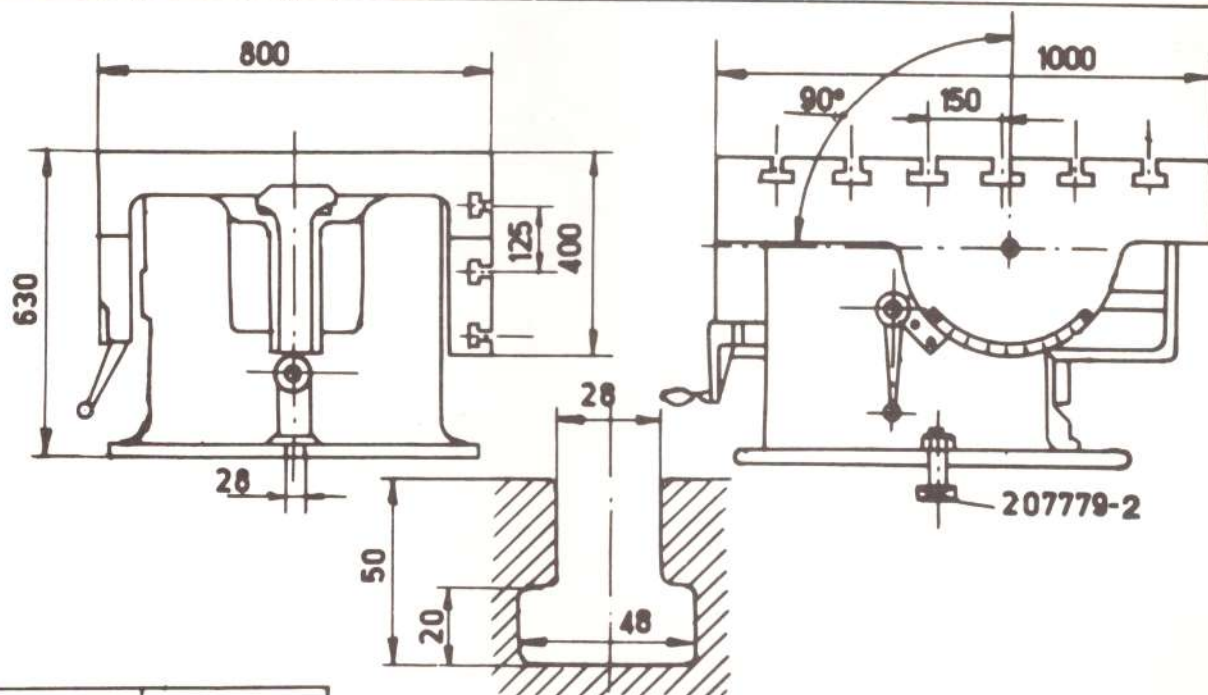
026



255030-1	326 kg	RF50/1000=255590-4	RF50/1250 1600	255591-1
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216514-3	380 kg
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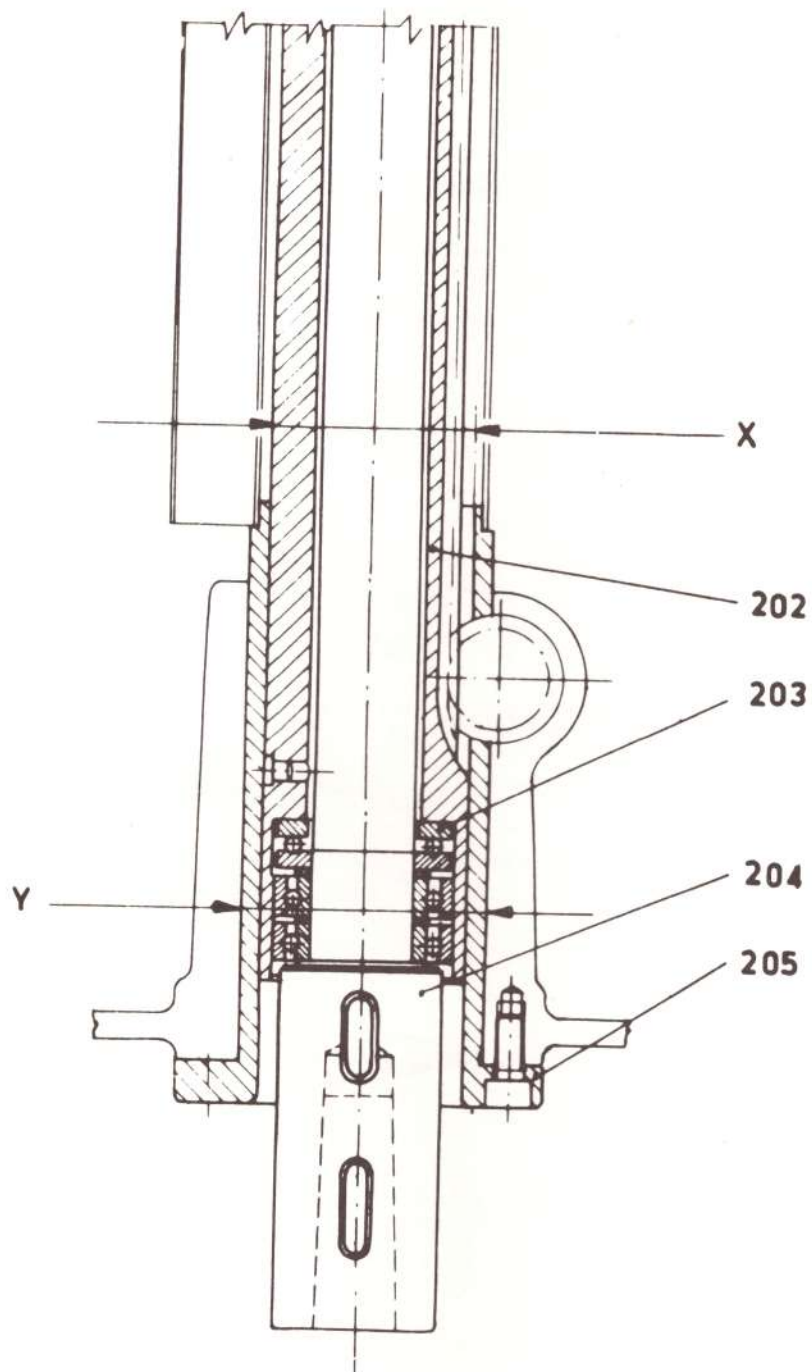


241910-3	875 kg
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RF50

5

027



RF50/1250  
1600

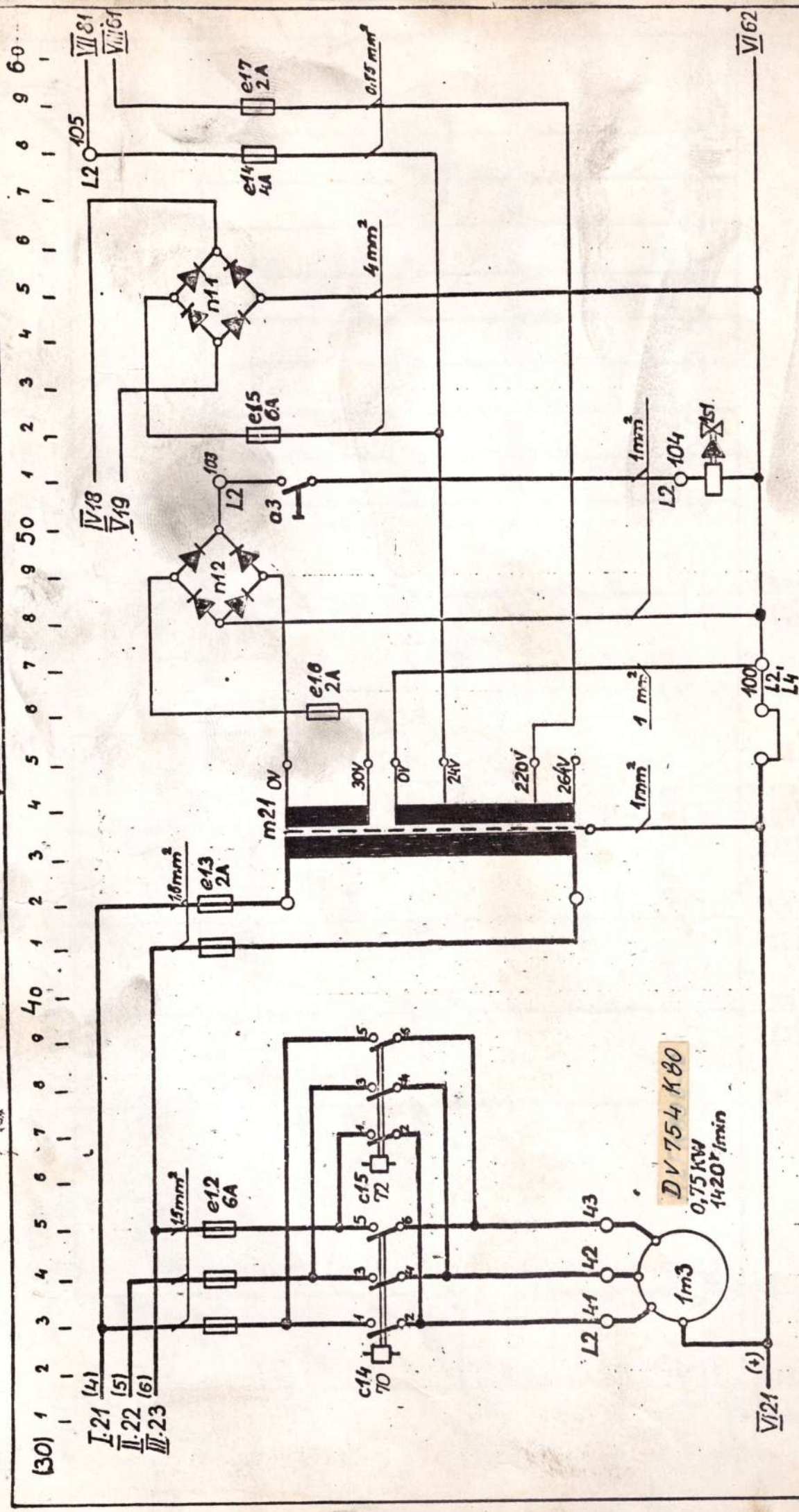
5

028



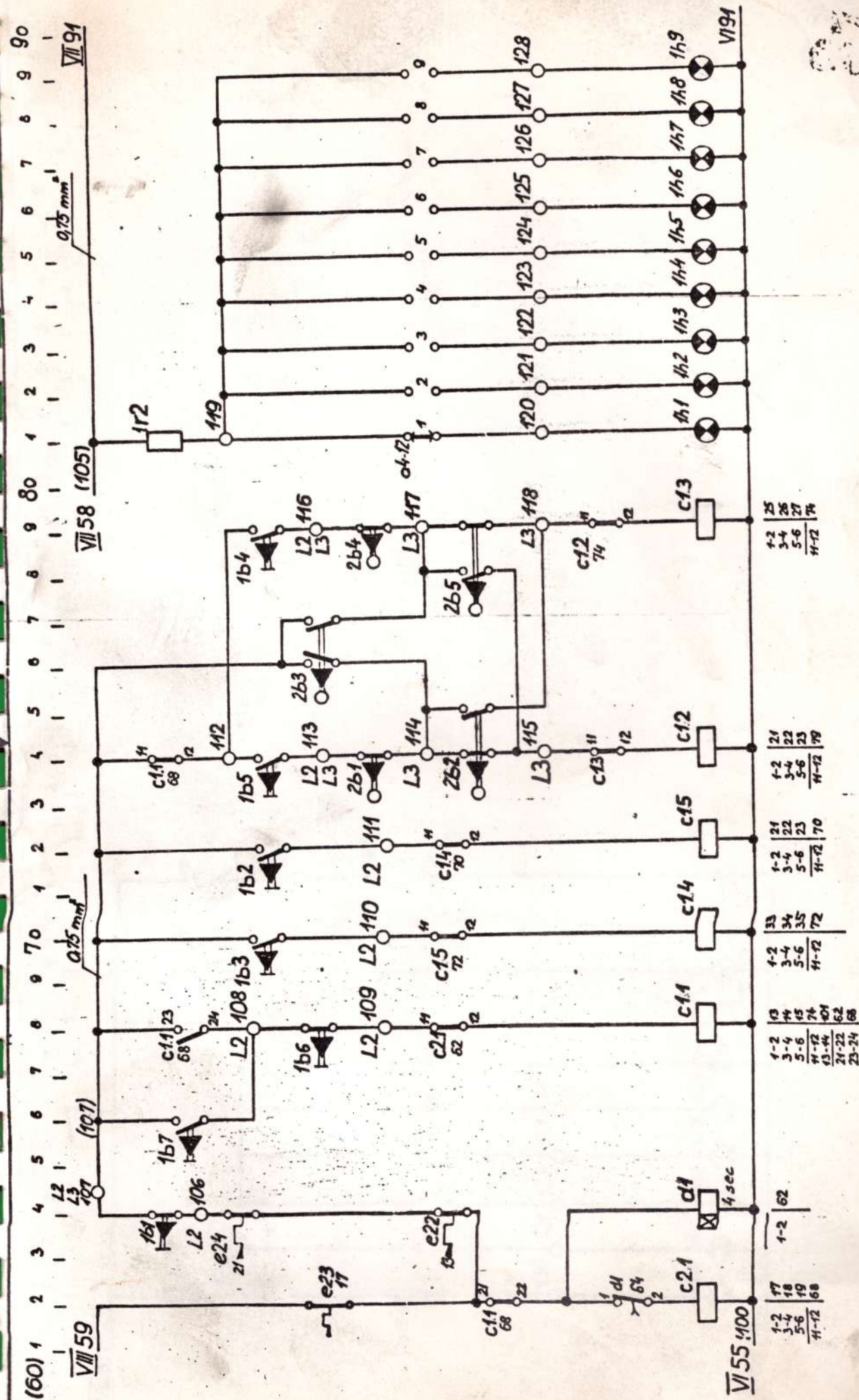






Rögzítés Klemmung	Oldás Entklemmung	Küldött transzformátor Eszaktársaság	Égztetés szétválasztás Trennung der Elementen	Fűrés egyenirányító Brenngleichrichter
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Fok mágnes k.   
 Drem-Schalt-   
 schütz

Fok idő-   
 relé   
 Bremszeit-   
 relé

Furómotor mágnesk.   
 Bohimotor-   
 Schaltschütz

Rögizítés   
 mágnesk.   
 Klemm-   
 Schütz

Oldás   
 mágnesk.   
 Entklemm-   
 Schütz

Emelés mágnesk.   
 Hebeschalt-   
 schütz

Süllyesztés mágnesk.   
 Senkschalt-   
 schütz

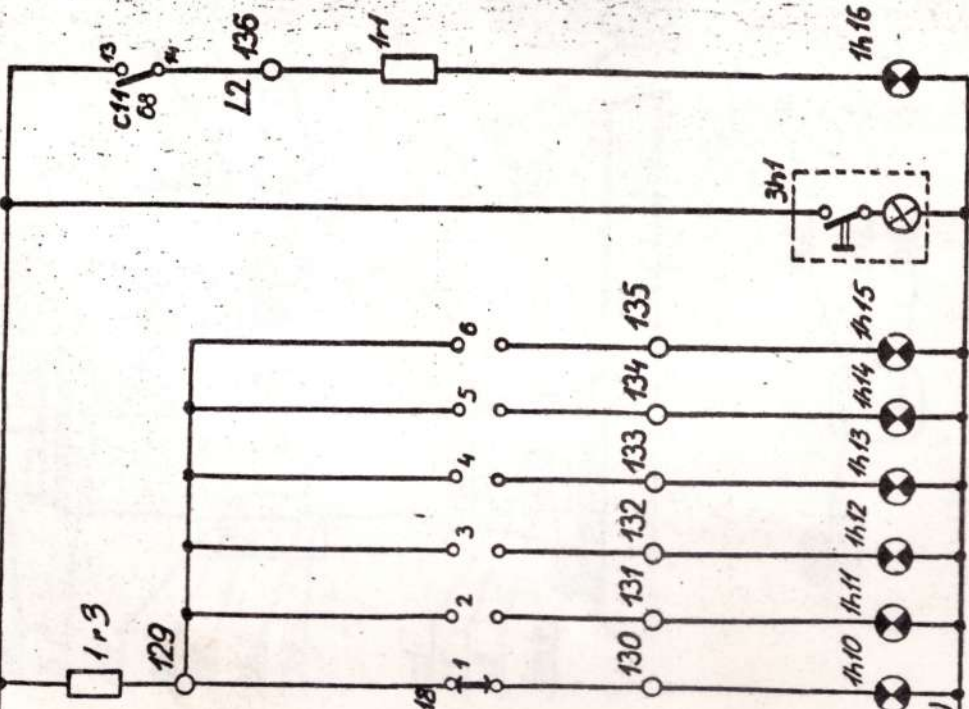
Előtölés jelzőlámpák   
 Vorschub-Meldeleuchten

CSEPEL TITAN   
 Budapest



1 2 3 4 5 6 7 8 9 10 11 12  
 1 2 3 4 5 6 7 8 9 10 11 12  
 1 2 3 4 5 6 7 8 9 10 11 12

VII. 89 (105)



VII. 89 (100)

Osófördulat jelzőlámpák  
 Spindelumdrehung Meldeleuchte  
 Gépvilágítás  
 Maschinen-  
 beleuchtung  
 Furómotor jelzőlámpa  
 Bohrer-Meldeleuchte



