



BEDIENUNGSANWEISUNG

OPERATION MANUAL

NOTICE D' EMPLOI

ISTRUZIONE DI SERVIZIO

INSTRUCCIONES DE SERVICIO

SKÖTSELINSTRUKTION

TYPE:

SM 6 P II

OPERATING AND MAINTENANCE INSTRUCTIONS

on

MAKA Type S M 6 -P-II Mortising Machine -Installation of the machine

Fix the machine with screws to a foundation or an appropriate floor of high bearing capacity. In case no special foundation is available, the machine may be placed onto, and bolted to, two flat planks. As the machine is nose-heavy when operated in vertical position, the planks shall be arranged in a way that on the Operator's side of the machine their ends protrude for about 8 inches (20 cm).

Operating Voltage

Make sure that the voltage in which the machine has been connected prior to its delivery is the same which is available at your Works (the voltage for which the machine has been connected by supplier is indicated inside the terminal box.

Connecting of the motor in a different service voltage

The principal shaft is driven by a 1.8 hp threephase dual 220/380 voltage motor and turns at a 3000 rpm speed rate. If not otherwise stated on the Purchase Order form, the machine will be supplied connected in 380 Volts. Connecting of the motor to be done at the terminal board inside casing (3) at the rear end plate.

For adapting the control voltage to another service voltage, exchange the control transformer.

Machine connection to electrical supply

Before connecting the machine to the electrical supply, unscrew the terminal box cover (turn the mainswitch to zero position). The connecting cable is to have a section of 4 x 1.5 square; make it pass through the screw type connector (1) on the side of the machine base, lead it into the terminal box and clamp it there at the connecting block. The main connecting terminals are marked R - S - T and provided with the earthing symbol. A commutating switch makes it unnecessary to pay special attention to the mortising motor's sense of rotation, but ,in case of future adjustments to be made, it would be helpful to mark the end positions of the commutator switch by arrows showing the sense of rotation; do this when the machine is trial-run.

The supply line (lead) must be safeguarded by a threepole delay action fuse (see conn.diagram for its nominal value).

Electrical Control

First of all, turn main switch ON, then press the push-button. The machine is ready for operation as the pilot light goes on. Set the commutating switch for the required sense of rotation (position 1 or 2). In case of circuit cut-out, press the push-button again to get the machine back to ready-to-operate condition.

A bimetal relay offers motor overload protection. Bimetallic release action causes disconnection of the machine and pilot light extinction. Push-button pressing cannot re-connect the machine as long as bimetallic release is effective. Motor switch-ON is to be effected by means of a contactor. Contactor exciting is done by a pressurizer DS-1 which switches at the moment when the mortising head leaves its zero position.

Putting to operation

The cycle of operations of the SM6P-II Mortiser is pneumatically controlled. Release of the cycle of operations is effected by a step-on valve pedal (20). The pneumatic control system operates on compressed air of about 8 bars. Connecting to the compressed air supply to be done at the short length of air tubing (24) which is provided with a 1/4" screw connector.

Motor feed speed control is effected with a speed check valve (31) provided on the face of the control cylinder. The feed speed slows down as the check valve is turned to the right-hand side. By turning the check valve to the left-hand side, the motor feed speed is increased to about 10 to 15 mm/sec. Do not start any mortising, before you have made sure that the correct feed speed has been set.

Make sure, when adjusting the machine for a trial run, that the clamping cylinder (22) be set aside, to avoid any collision of clamping cylinder with the mortising tool (6). The clamping cylinder must be always so positioned that it will be out of the mortising tool's reach.

How to operate the valve pedal

Step on the valve pedal (20) to make it rest in DOWN position. This will cause the mortising head to move toward the workpiece, until a depth stop (9) which is provided at the left-hand side of the mortising head overruns a cam valve (23) at the base of the motor guide column. The cam valve activates a cylinder (which is inside the valve pedal 20) causing the valve pedal to snap back UP, so that quick return of the mortising head to zero position is possible.

Some useful hints to the Operator he may think of when adjusting the machine: Back-stepping the valve pedal (20) to an intermediate position will immediately stop the mortising head's advance movement. Immediate run-back of the mortising head to zero position is caused by Operator making the pedal fall back entirely.

Adjustment of the mortising depth

Place the workpiece onto the support-table (5) so that workpiece top edge is flush with the front edge of the support-table. For vertical mortising, adjust the support (29) accordingly. For horizontal mortising, place the workpiece against the stops at the front edge and/or against the chip-breaker (30).

By loosening the clamping screw (7) and adjusting the support-table by means of the handwheel (8), set for a distance of about 15 mm to be between the workpiece and the cutting teeth of the mortising tool. Next, adjust the depth stop (9) and the cam valve (23) for a distance equalling the required depth of mortice plus the 15 mm distance from the workpiece to the cutter's teeth. Now, check and see if the nose of the cutting tool points in the chisel stroke moving direction. If everything is found to be alright, turn the mainswitch (4) to ON position and start mortising.

Motor ON-switching is effected by an electro-pneumatic switch, as soon as the valve pedal is actuated. The eccentric shaft (when looked at it from the Operator's side of machine) must turn clockwise (Refer to fig.II).

Disconnect the machine at its main switch (4), before you exchange mortice cutters. After the machine has been run for a short time, retighten the bolts by which the cutting tools is fixed to the oscillating lever, as any loosening of the bolts may result in a deterioration of the oscillating lever.

To position the mortising tool in relation to the width of the workpiece, release the clamping lever (10) and turn the spindle (11) (on the front, LH side), using a square socket wrench. On completion of this adjustment, re-tighten lever (10) firmly.

Slewing of the mortising head

The mortising machine MAKA SM6-P-II may be adopted for either vertical or horizontal operation (the latter is preferred in processing timbers of important widths). Before slewing the mortising head, unscrew both nuts (12) ,using a 30 mm wrench.

C a u t i o n ! - Do not let drop the head backwards when slewing the motor to either horizontal or back to vertical position.

Selection of the suitable mortising tool (Refer to fig.II)

For optimum mortising results, the length of the cutter's cutting part comprising a certain number of teeth and the stroke length must bear a certain ratio to the length of mortice. This ratio shall be 2:3, i.e. the length of the tool's cutting part must be two thirds of the stroke length, so that the tracks of the cutting part will intersect by one third ,or one half, of the cutting part's length. Cutting part width + stroke length give the mortice length. The overall length (shank plus cutting part) of a mortising tool depends on the depth of mortice required and will usually exceed normal mortice depth by 35 mm. For reason of stability, mortising tools must be kept as short as possible.

Stroke adjustment (refer to fig.1)

Whenever permitted by the length of mortice, mortising with the longest possible stroke is recommended. If the mortice length is to be less than 25 mm, adjustment of the stroke must be made on the eccentric part of the mortising head. To adjust the stroke, proceed as follows : -

Use wrench (SW 10) furnished among the accessories. Stick it onto the front end of the eccentric shaft and turn until both zero marks rest one above the other. Now you can loosen, with the Allen wrench (5 mm), the clamping screw (17) which will be accessible through an opening on the right-hand side of the cover (14).

The eccentric portion is now loose and the shaft can be turned. (leave the Allen wrench stuck in the screw ,it will facilitate holding the shell in its place.)

The maximum stroke will be considered set when the arrow on the face of the eccentric shaft points to the right (toward the "+"-mark),while the balancing piece is in top position. Reduction in the stroke is obtained by turning the shaft to the left and will be in its minimum position after it has been turned 180 degrees. After the required stroke is set, the adjusting screw (17) must be firmly retightened.

Re-adjustments of the stroke call for re-balancing in accordance with the newly-set stroke., failing which, excessive motor vibration will be noticed.

For correct application of the balancing weights, refer to stroke adjustment table fig. III.

Correct balancing of the eccentric portion is extremely important.

Tensioning of V-Belts

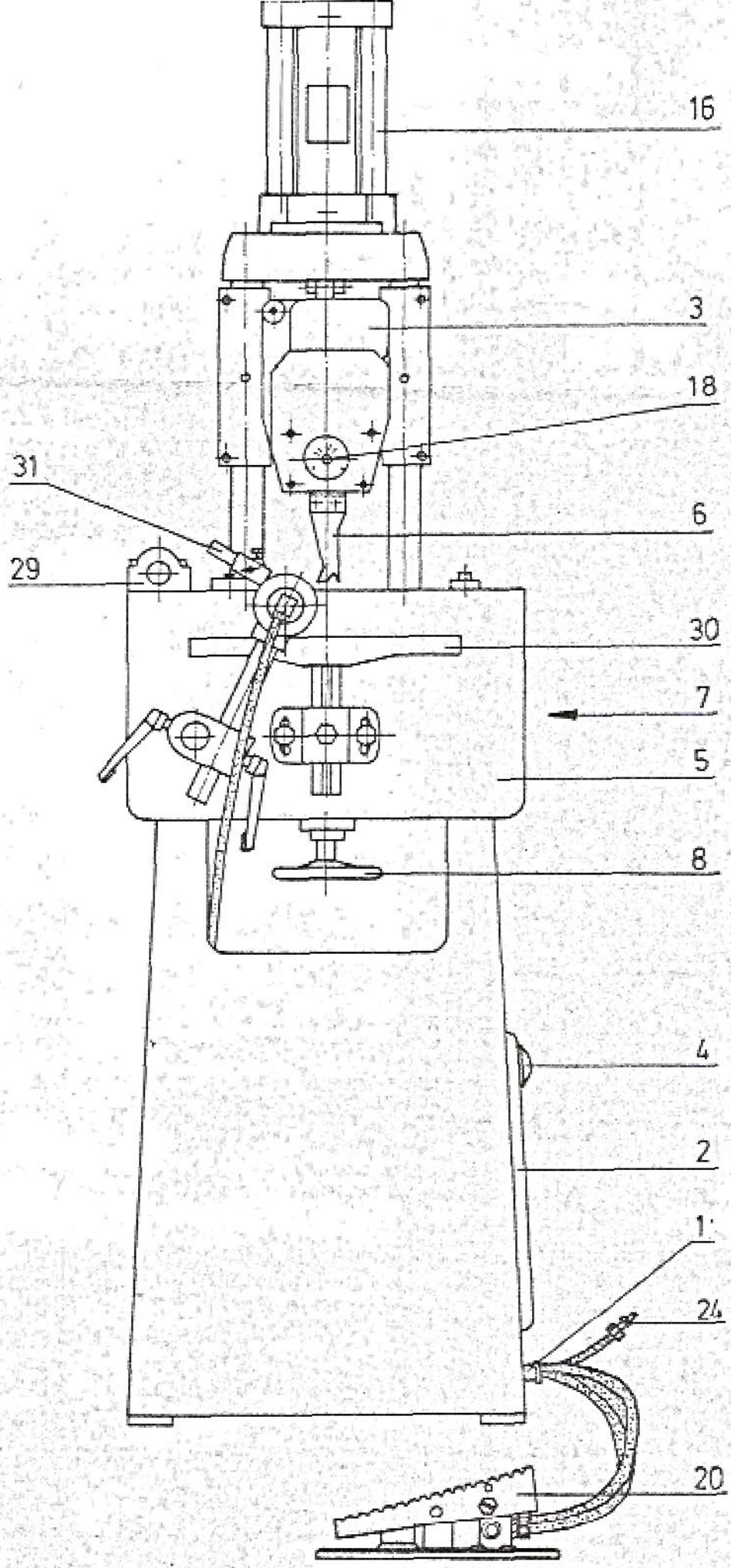
The eccentric shaft is driven by the motor and 2 V-belts and sped up by means of transmission. In case the tension of the V-belts should have decreased as a result of natural wear and tear, reset the belts as follows : -

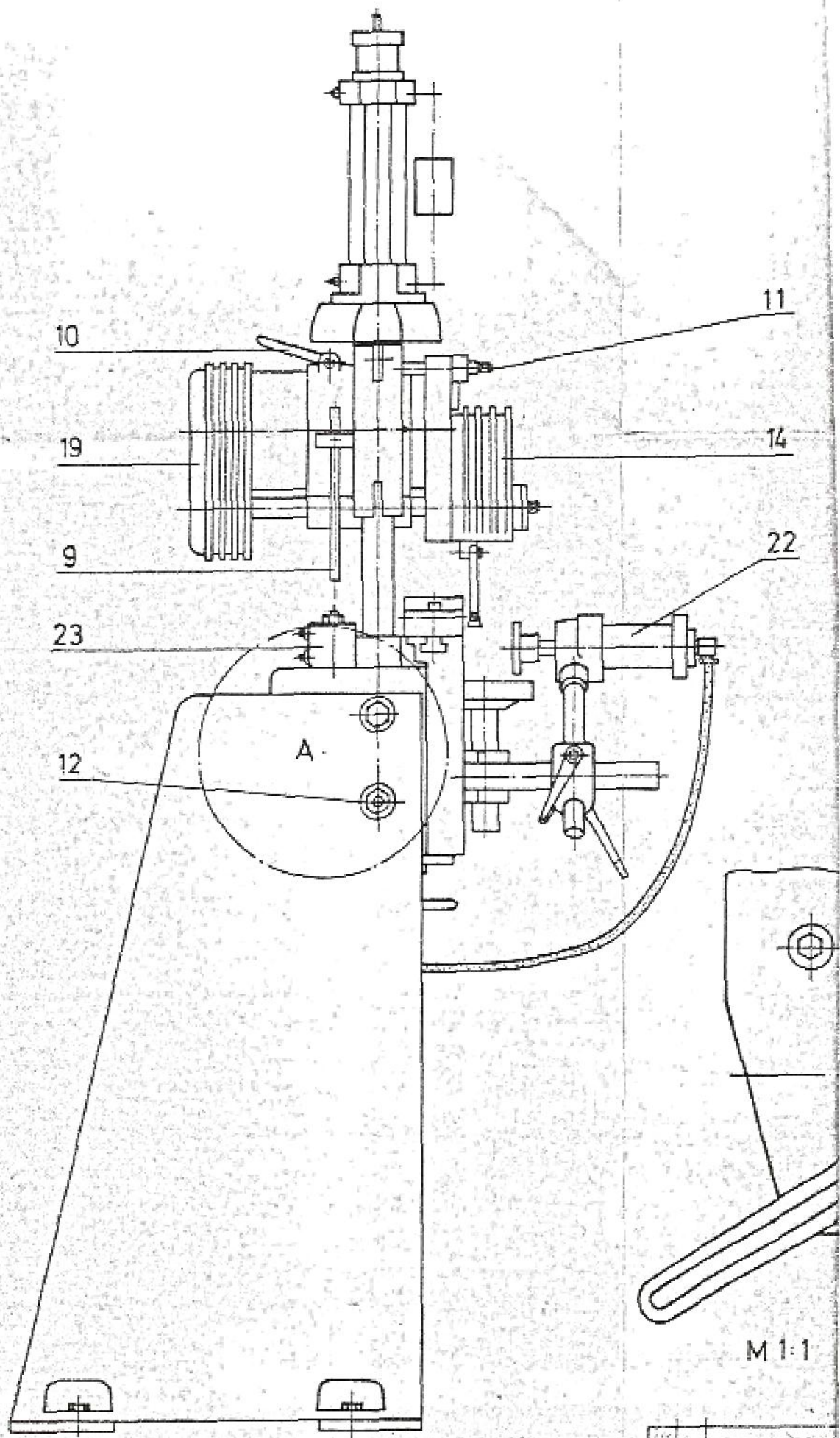
Remove cover (19), unscrew and remove the groove nut. The 0.5 mm spacers fixed between the pulley shall be removed and as washers with the groove nut. Thus, reduction in the widths of the key grooves is possible and the belts will again have their proper tension. When re-tightening the nut, the pulley must be given several turns in order to make the belts run till the outer rim of the pulley. Carrier plates and spacers must be seated very tight and have to be compressed by the nut.

Lubrication and maintenance

The mortising head itself is maintenance-free. Just the cutting part of it should be cleaned of chips at regular intervals.

The motor guide's greasers should be lubricated every 50 hours of operation. Check the pneumatic feed unit for the oil level and re-fill if necessary. (Refer to attached lubrication chart).



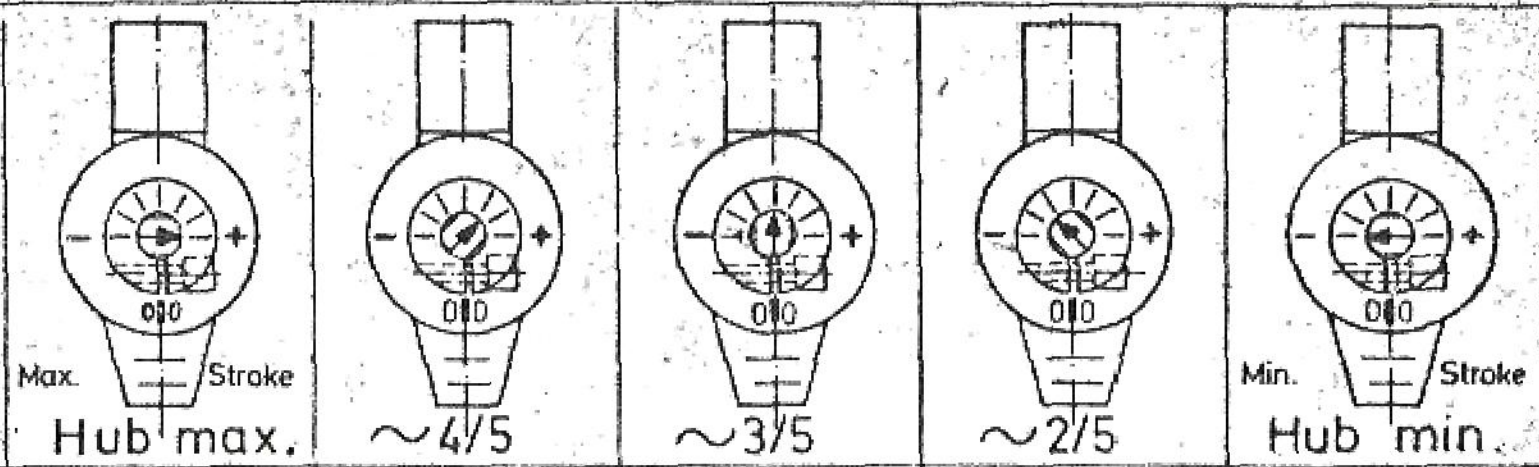


1. Cable gland
2. Door to switchbox
3. Terminal box
4. Cam switch
5. Clamping plate
6. Mortising tool (cutter)
7. clamping screw
8. Handwheel
9. Depth stop
10. Clamping lever
11. Endless screw for adjustment
12. Clamping screw
13. Straining screw (only on SM 6-II)
14. Hood
15. Operating lever (only on SM 6-II)
16. Feed Unit (only on SM 6 P-II)
17. clamping screw
18. Shaft of the eccentric part
19. Hood, rear
20. Valve pedal (only on SM 6 P-II)
21. Device for eccentric clamping (only on SM 6-II)
22. Clamping cylinder (piston)
23. Cam valve (for back-feed) (only on SM 6 P-II)
24. Compressed air connecting point (only on SM 6 P-II)
25. Roller valve for starting run of motor (only on SM 6-II)
26. Switching cone (only on SM 6 -II)
27. Cam valve for clamping cylinder and for starting run of motor (only SM 6 P-II)
28. Switch plate (only on SM 6 P-II)
29. Detention piece
30. Supporting angle
31. Chip breaker

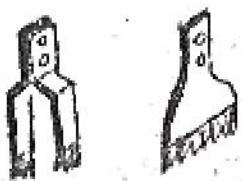
Counterbalancing of SM 6II Mortising lead

Fig.

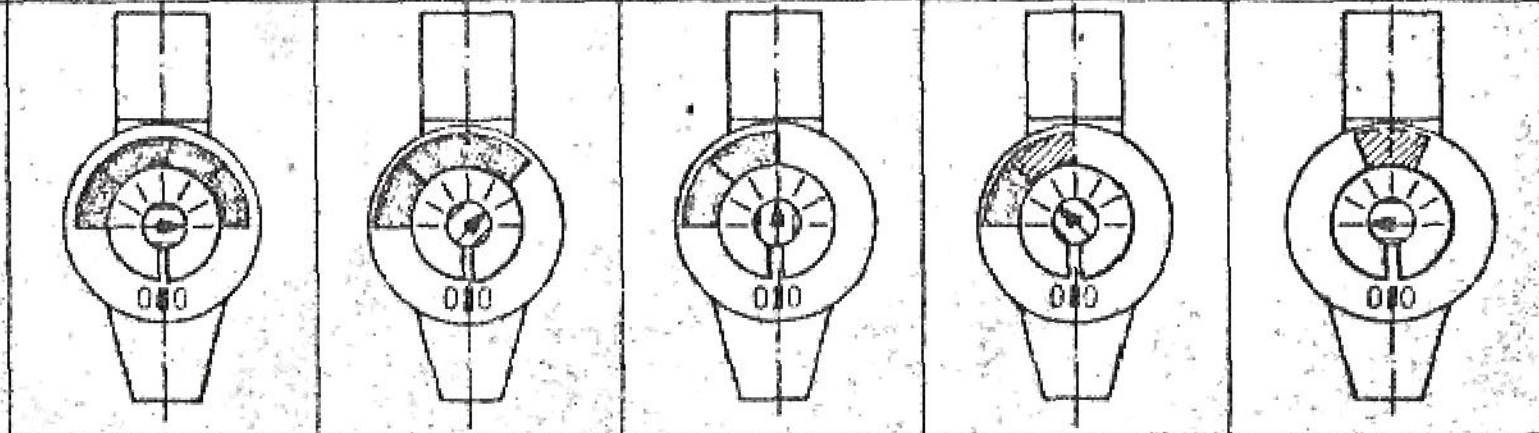
Stroke Setting



Counterbalancing pieces for



Double mortice cutters
Mortice cutters for mortices ≥ 50 mm deep or deeper



Counterbalancing pieces for



Cutting knives and
Mortice cutters which cut ≤ 35 mms deep or less

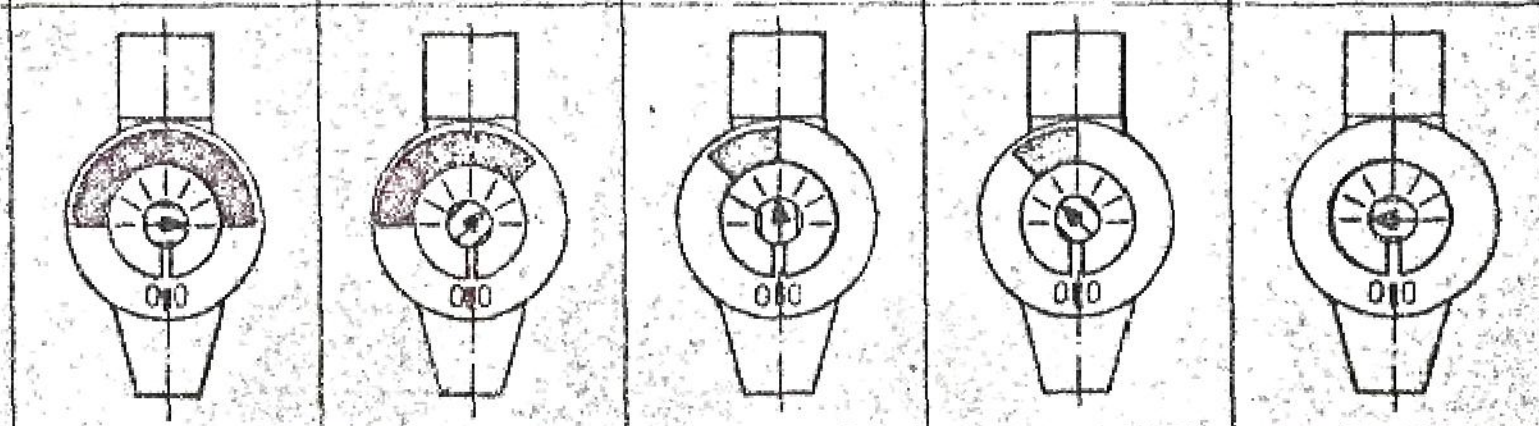


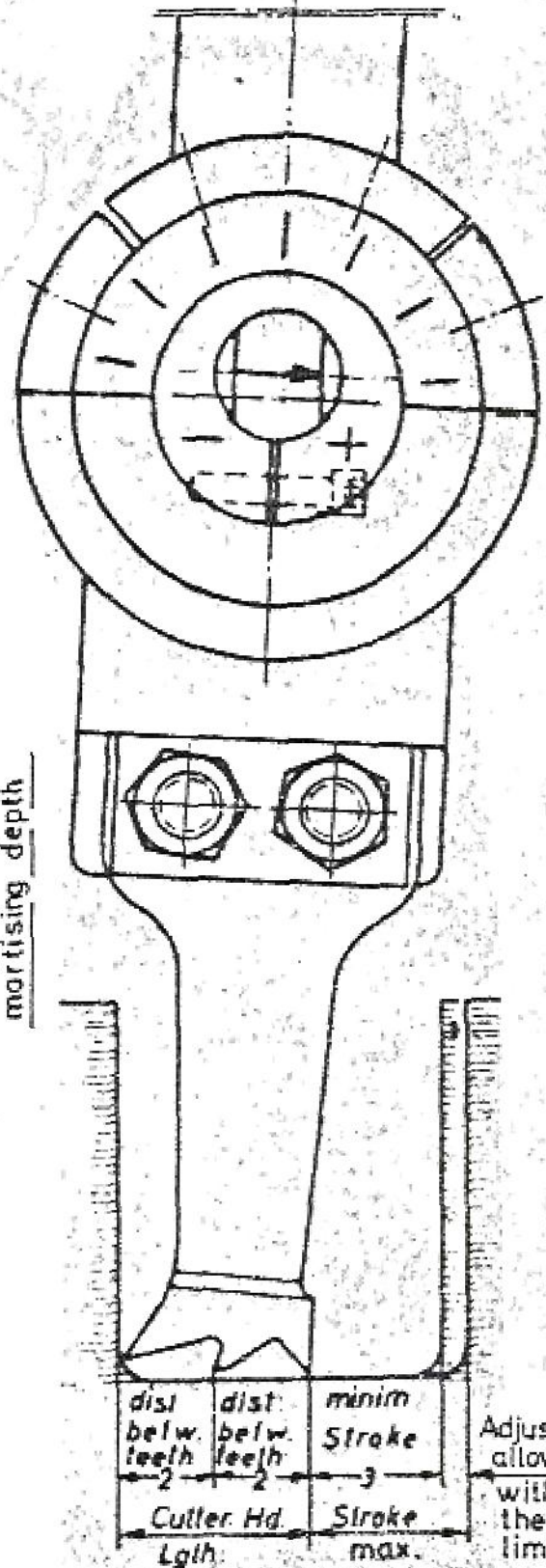
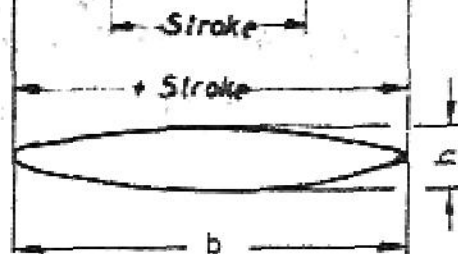
Fig.

SM 6 II

Tool Top			
35	15.9	7.55	0
45	16.95	8.05	10
55	18.0	8.55	20
65	19.05	9.05	30
75	20.1	9.55	40
85	21.15	10.05	50
95	22.2	10.55	60
105	23.25	11.05	70
115	24.3	11.55	80
125	25.35	12.05	90
135	26.4	12.55	100

tool overall length in mm

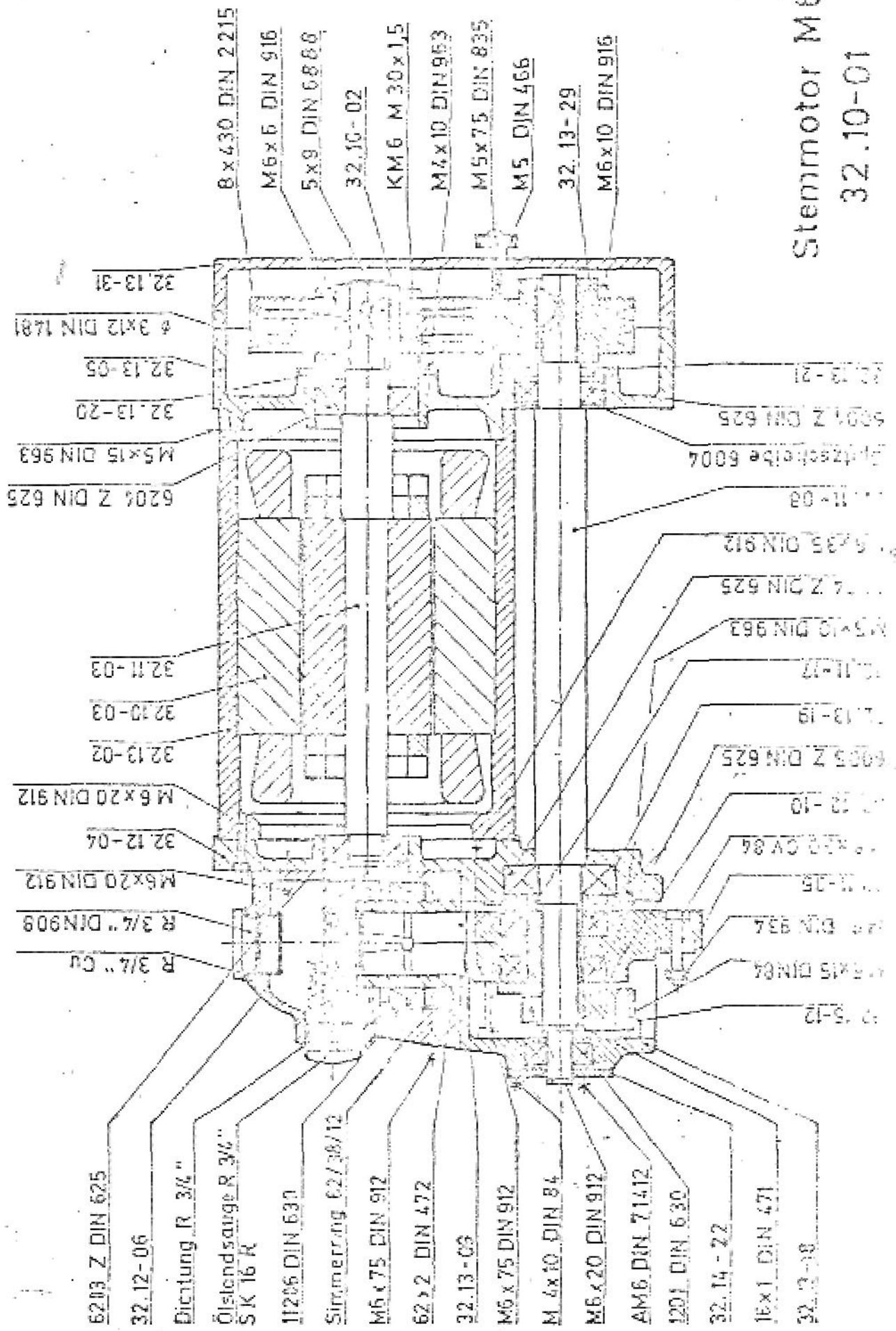
marking depth



dist. belw. teeth	2	dist. belw. teeth	2	minim. Stroke	3	Adjustmt. allowed within these limits
Cutter Hd. Lgh.		Stroke max.				

Stroke Adjustment Example:

- Distance from tooth to tooth (2) = 12 mm
 - Stroke min (3) = 18 mm
 - Stroke max (lgh. 85 mm as per Tools List) = 21 mm
- Cutting Tools with 3 Teeth
- Cutter Head Length 2 × 12 = 24 mm
 - Stroke min. = 18 mm max. 21 mm
 - Range of Slot Length Adjustment = 42 mm 45 mm



Stemmotor M6
32.10-01

Feed Unit Type VE 60/25

Design

The pneumatic-hydraulic feed unit comprises a main piston and two oil-filled braking pistons. The main piston has a diameter of 60 mm and is operated pneumatically; This is the real working piston.

The two braking pistons are arranged on either side of the main piston. The oil fill of the pistons is centrally led through a throttle check valve via a pipe system.

To compensate the volume change (piston rods retracted or extended), the rear of the piston is provided with a compensating cylinder with spring-mounted pistons.

Task

The piston rods of the braking cylinders are rigidly connected with the piston rod of the main cylinder. On extracting the main cylinder, the piston rods of the oil cylinders are also pulled out and the oil is led via the central oil pipe through the throttle valve. By opening or closing the throttle valve it is possible to steplessly regulate the feed rate.

The throttle valve has a passageway which is braked on one side only, the return line is open so that the return stroke of the cylinder, too, takes place unbraked and consequently fast. If necessary, the return stroke can be regulated by attaching a throttle check valve to brake the cylinder exhaust air.

Oil refilling

A uniform feed rate can be obtained with the unit only if the oil system is filled free from air bubbles. Insufficient oil filling is characterized by the feed movement taking place by jerks at the beginning, the piston rod "rushing" forward quickly by 10 mm or more and returning only then into a regular motion. In such a case it is necessary to refill oil. To this end, oil must be refilled by placing the cylinder in horizontal position and retracting the piston rods.

For oil refilling a device is required which forms part of the tool kit. This is a threaded rod M6 with knurled nut and a small distance tube.

The threaded rod is screw-attached into the threaded bore at the rear of the piston rod of the balancing cylinder. After inserting the distance tube and slipping on a washer, the knurled nut is screwed on. Tighten the knurled nut to such an extent that the compensating piston rod is pulled out from its former position by an additional 2 mm. Now the oil pressure within the cylinder, produced by the spring acting on the compensating piston, is eliminated.

It is now possible to remove the sealing plug (41). With uniform tightening of the knurled nut, the compensating piston rod is pulled out further and oil is refilled through the filling sockets simultaneously. The oil level should always remain visible during the filling action. With the compensating cylinder stroke completely extracted and the oil filling socket completely filled with oil, the sealing plug may be replaced.

Warning : As mentioned before, the piston rods must be completely retracted for otherwise too much oil might be filled in. As a result, the piston rods could not be retracted any more or only partly.

Oil grades recommended: BP HLP 40
Calypsol Bison SR 9
Texaco Rondo Oil HD-AAA

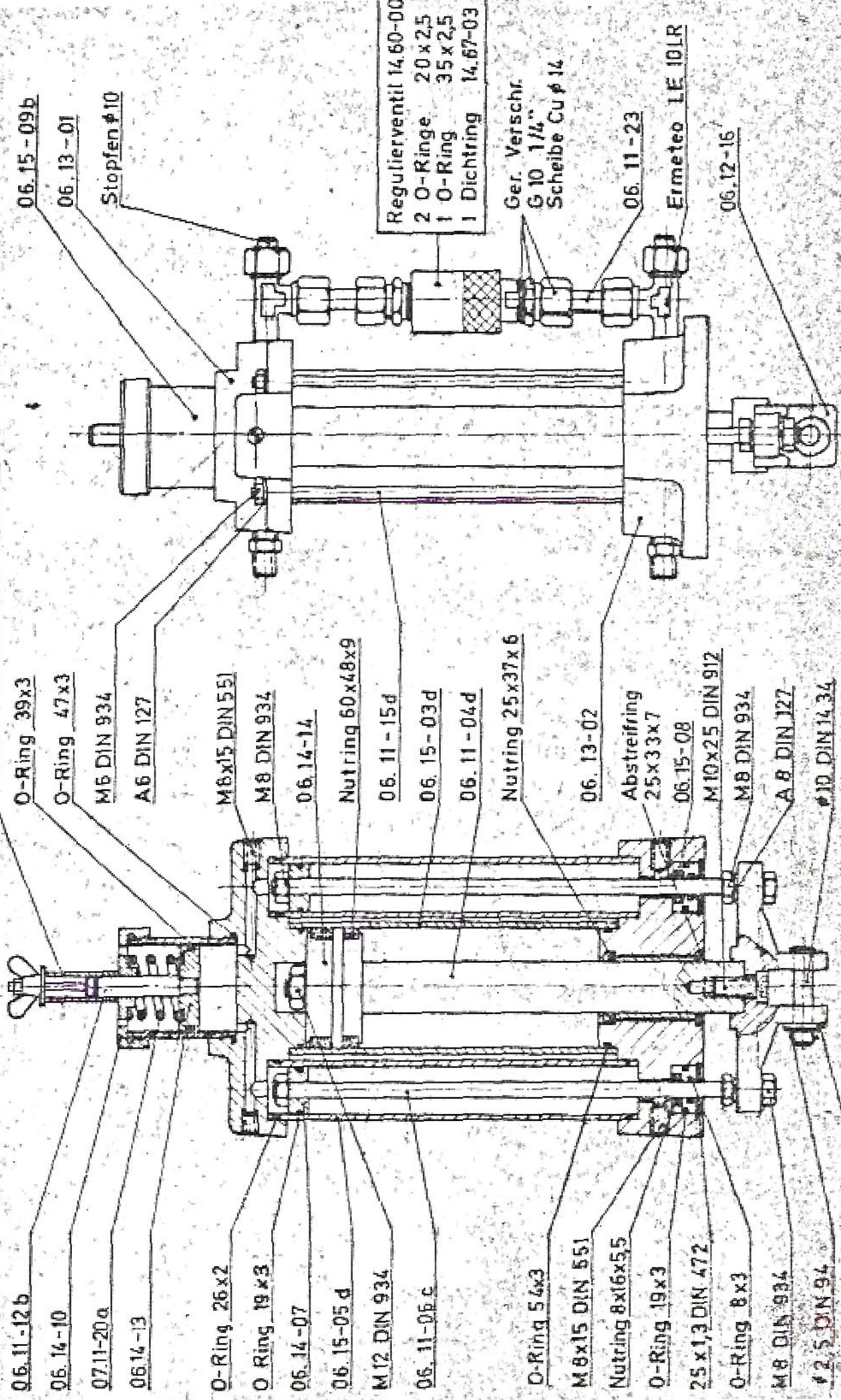
Exchanging the sealing element

If the cylinder should loose oil at the piston rods 14 after prolonged service - which may happen due to wear of the sealing elements - the complete set of sealing elements must be exchanged.

Dismantling takes place as follows:

- 1.) - Lock piston rod 1 in position by set collar 47 and move cylinder into vertical position with the compensating vessel pointing downwards.
- 2.) - Remove fork-shaped element 24 with nuts 10 and screw 23.
- 3.) - Then remove the locking rings 17 with a suitable pair of tongs, turn 2 screws into the threaded holes M4, take out set of sealing elements and exchange against a fresh set.
- 4.) - Fitting of the new set of seals takes place in the inverse order. It is absolutely essential to make sure that the set of sealing elements is fitted for rotation in the direction of the thread pitch because otherwise the seal will be damaged.
- 5.) - Then, de-aerate cylinder.

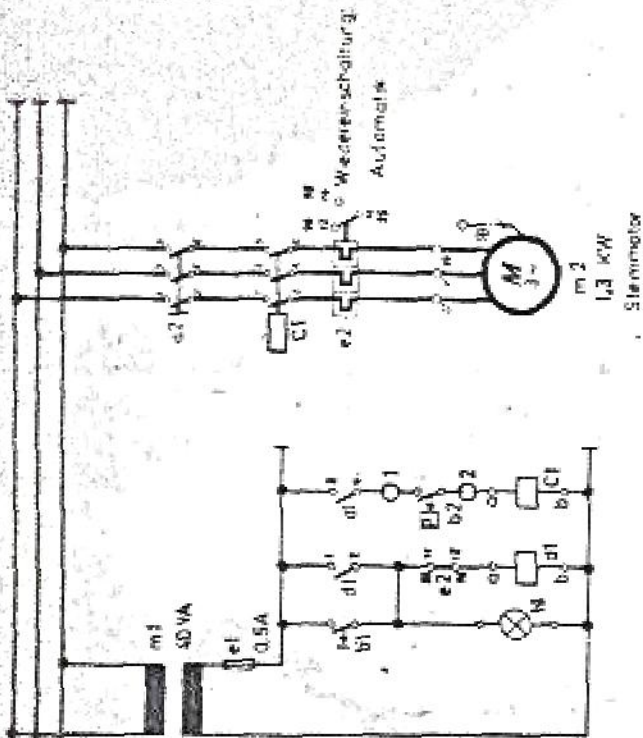
Entlüftungsvorrichtung 01. 110-01



Vorschubeinheit VE60/25/130

06.10-04

4 2 2 4 3 0 1 4 1 6



Betriebspannung (V)	220	380	415	440	500	550	600	660
Motorstrom (A)	5.3	3.0	2.6	2.3	2.1	1.9	1.75	
Zuleitungssicherung (A)	6	4	4	4	4	4	4	2
e2: 30A C100-0 A	P	M	L	L	L	L	L	L
e2: 20-...					3,7	2,1	2,1	2,1

Netzfrequenz (Hz)	50	60
Steuerspannung (V)	220	110
CLd: 3TA 2010-0A	M	J
CHL 00b-4b-M	220V 50Hz 10V 50-2	



Zuleitung
4x15mm²
Sicherung
frühe

Typ	Zusammenfassung	Type	Hersteller	Bezeichnung
1	Leuchtmittel	11-2/9/8rb	El. Moeller	ab 300 V, 660 V - Geräte
2	Leuchtmittel	11-3-2/8-1V	El. Moeller	ab 300 V, 660 V - Geräte
3	Leuchtmittel	112-KP 20	El. Moeller	Lampe siehe h 1
4	Erweiterungsschalter	28	El. Moeller	bei 200-2 bei 250
5	Schütz	3TA20 10-0A *	Siemens	nur bis 500 V Betriebsspannung
6	Schütz	DIL 00 5-40-NA	El. Moeller	
7	Schütz	wie 6	wie 6	wie 6
8	Glühbirnenüberwachung	5x20mm, 0,3A HT DIL 4157L		
9	Überstromrelais	3TA40 00-0A *	Siemens	im Schütz 3TA20
10	Sicherheitsrelais	20 ... *	El. Moeller	im Schütz DIL 00
11	Steuerspanne	2079 40	Gebr. Pral	prim. 220V Betriebsspannung sek. 110 V
12	Glühlampe	CHL 220 K		Steuerspannung 220 V
13	Glühlampe	CHL 110 L		Steuerspannung 110 V

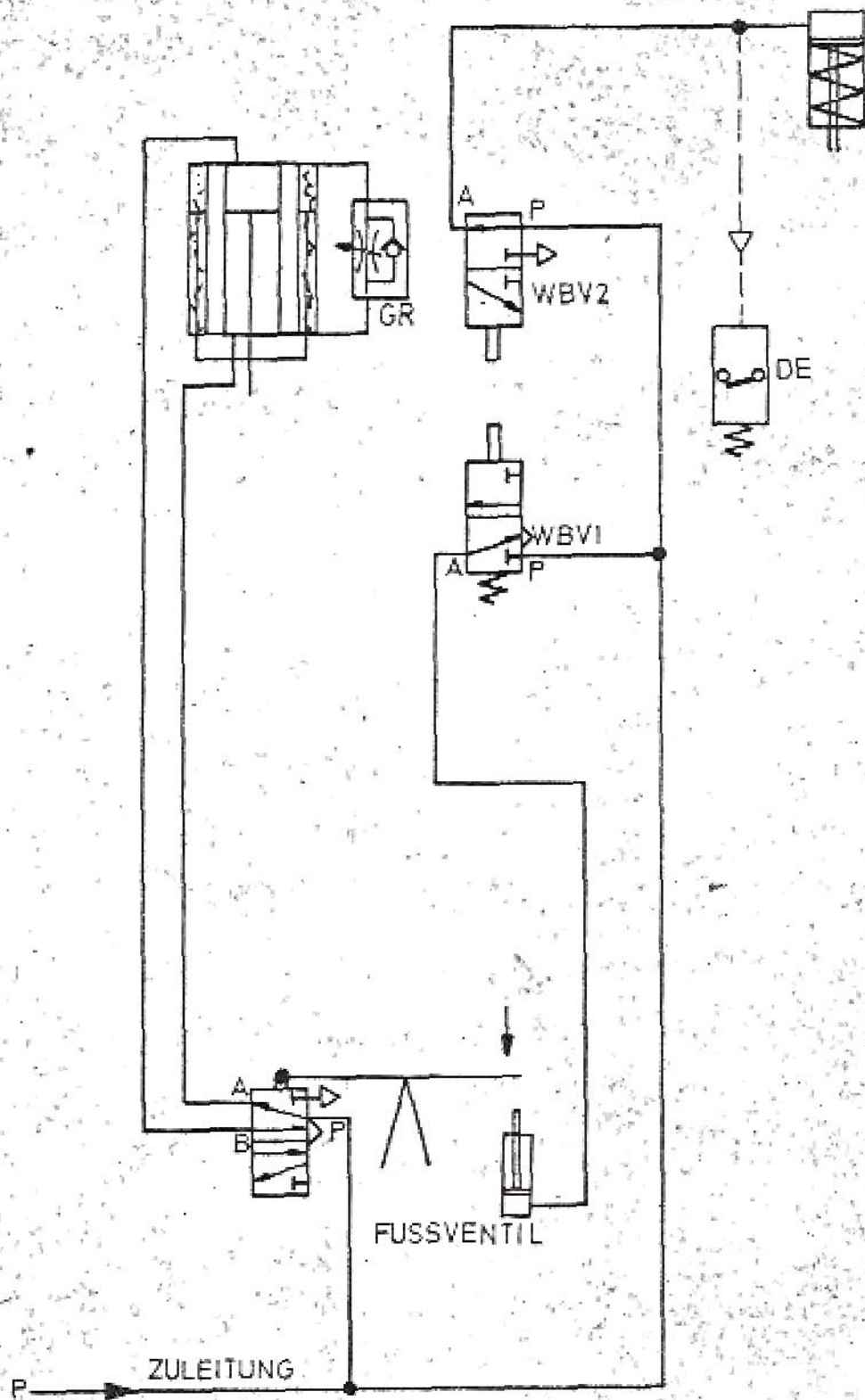
* Typenname-Ergänzung siehe Tabelle unten

Schütze 3TA20 10-0A, und Schütze DIL 00 40 sind gesammelt ausbaufähig.
Bei Betriebspannungen über 300 V nur Schütze DIL 00 5-40 verwenden.

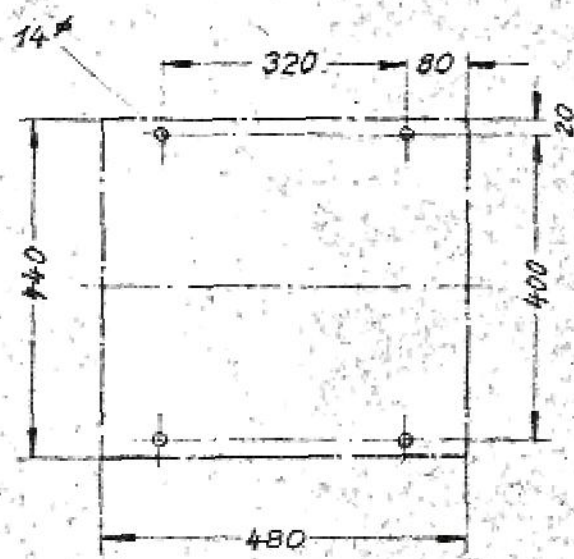
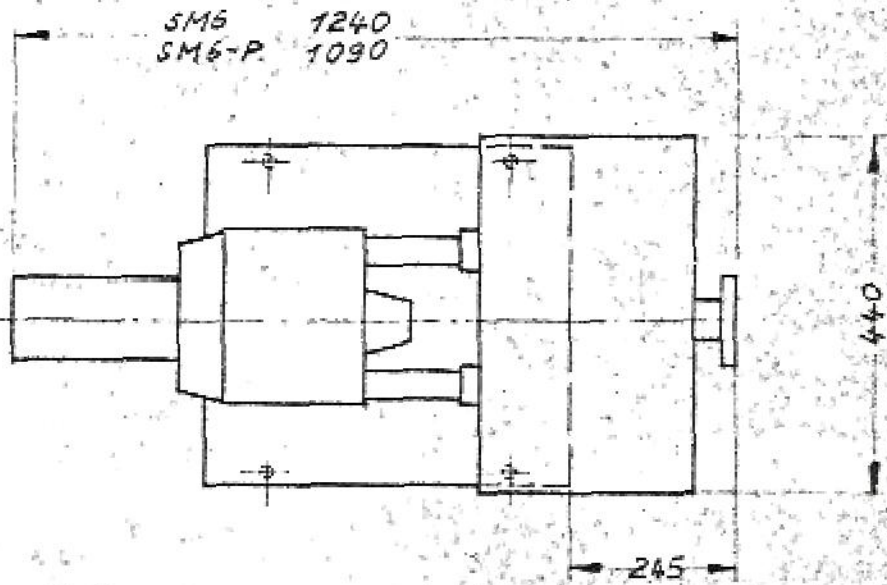
Art	Bezeichnung	Preis	Bestand	Abgabe	Abgabe	Abgabe
	Abgabe für die					
	506 / 506 P					
	112					
	28					
	3TA20 10-0A					
	DIL 00 5-40-NA					
	2079 40					
	CHL 220 K					
	CHL 110 L					
	5x20mm, 0,3A HT DIL 4157L					
	3TA40 00-0A *					
	20 ... *					
	2079 40					
	CHL 220 K					
	CHL 110 L					

ELEKTROSCHALTPLAN

3.33-01

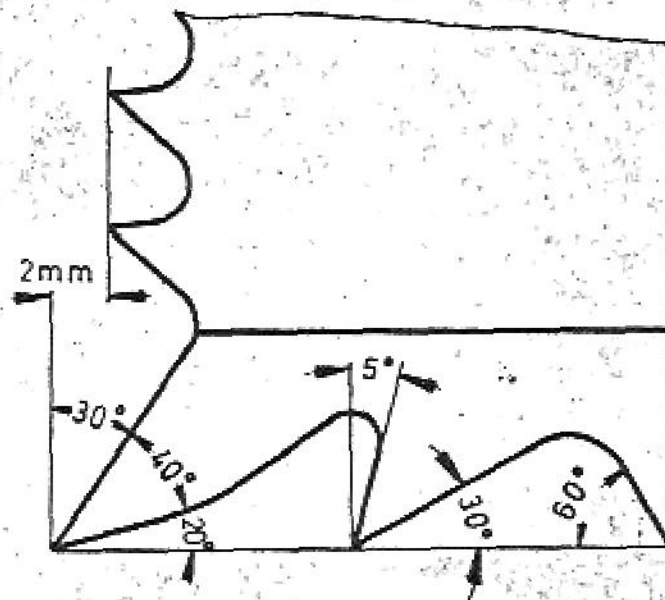


Lfd. Nr.	Stück	Benennung	Sach-Zeichng.-Nr. Normblatt	Form	Hilfszeug-Rohmaß Modell-Nr.	Gew. kg/Stück	Bemerkung
			Verwendet bei Type		Bemerkung:		
					Werkstoff	Rohmaß	kg/Stück
					Modell-Nr.		
			72	Tag	Name	Benennung	
Ind.	Änderung	Tag	Name	Gez.	20.4.	Pneumatische Steuerung	
				Gepr.		SM6 P	
				Norm.		Zeichnung-Nr.	
Formgröße DIN 7168 fein Normal 8 0,20 6 20 0,1 4 20 0,15				Max Mayer Maschinenbau GmbH		3.32-09	
							Regist.

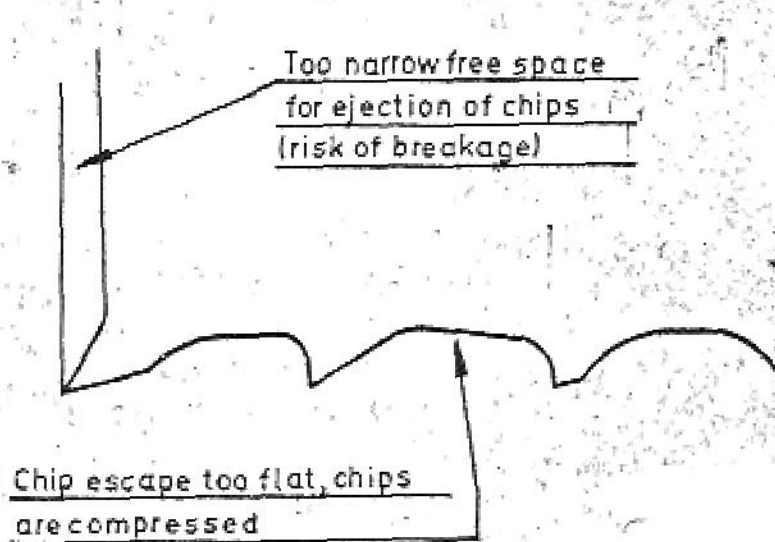


Lfd. Nr.	Stück	Benennung	Sach-Zeichg.-Nr. Normblatt	Form- mat	Maßzeug-Rohmaß Modell-Nr.	Gew. kg/Stück	Bemerkung
			Verwendet bei Type		Bemerkung:		
					Werkstoff	Rohmaß	kg/Stück
							Modell-Nr.
Ind.	Änderung	Tag	Name	Gez.	3.4.68	Benennung	
				Gepr.		Fundament- u. Flächen-	
				Norm.		plan für SM6 u. SM6-P	
Freimaße DIN 7168 fein				Zeichnung-Nr.			
Maßstab				Max Mayer			
- 5	0,05			4.33.10-01			
5 - 30	0,1			Regel.			
30 - 120	0,2						

Cutter Angles



Tool sharpened the wrong way



Greases					Oil					
	1	2	3	4	5	6	7	8	9	
Application	Self-aligning bearings till 1000 serv. hours	MG /BB5 beyond 1000 serv. hrs	Univers. purpose grease	High-speed ball bearings (high-speed motors) Boring attachments		Hydraulic oil. VE 60/25 Oil cup of condit. unit		Hydr.oil. VE 80/50	univers. machine oil	
Soap basis	Na	Na	Li	Li	Ba		HLP 9	HLP 36	DIN 51501 N 49	Standard group
Drop point °C	150	150	190	190	220	13,2	9	35.5	47	Viscosity (in- cSt) at 50°C
Penetration 0.1 mm	400-420	355	265-295	220-250	260	20 + 2.2°	1.74	4.8°	6.2°	Viscosity (in Engler degree) at 50°C
NIGI class	00	0	2	3		166	165	215	234°	Flash point °C
Temperature limits °C	-35° to +80°	-20° to +100°	-35° to +120°	-30° to +120°	-35° to +150°	-54°	-39°	-27°	-25°	Setting point °C
ARAL	F00	FD1	HL2	HL3				GFX HLP 36	Oil Y	ARAL
B P	HT0	HT2-EP	LS2	LS3			HLP40	HLP100	Energol EM125	B P
CALYPSOL	D 6024	New:D024 old:000	H 442	H 443			Bison SR 9	HLP 36		CALYPSOL
KLUEBER					Staburang NSU 12					KLUEBER
TEXACO	Marfak 00	Marfak 0	Glissan- do FT 20	Glissan- do FT 30		Capella Oil AA Waxfree	Rondo Oil HD-AAA	Rondo Oil HD-C	Wiscoma -49	TEXACO

5066P

TABLE OF LUBRICANTS

to be used on Mortising Machines RDB-5, RJS-11, DB-5, SMO-P, SMC, M2, DB-11, 2 H, Roller Mill Slotting Machine RSA-1 and Roller Mill Slotting Machine RMA-5, Cross-cut Saw AS-10, and on all types of the hardware processing machine L.F.M.

Item	Labeling points *	AGAL	H.P.	CALYSOL	ESSO	SAFOL	SA	SHET
1	SEAL-ETCHING BEARING OR OSCILLATING LEVER GUTTER (For new machine and the 2000 first operating hours) GEAR MOTOR OR MACHINES LPM, RMA-5, RSA-1		ENERGOL HTO		FTMAX 280	MARPAR 0		SHYVA or OETMAX G
2	SEAL-ETCHING BEARING OR OSCILLATING LEVER GUTTER (From 2000 operating hours) GEAR MOTOR OR: RMA-5, RSA-1	FW 2	ENERGOL HTO	GEAR GREASE G00	Roller bearing grease or ANDOK M-275	MARPAR 2		SHET Roller bearing grease or ALIDA 2
3	ALL POLYMER BEARINGS, except (Items 1 and 2)	FW 2 or M-1	ENERGOL RBR3 or LS3	WTA 702	ANDOK B or BEACON M-200	MARPAR 3		ALIDA 2 or NERITA 2 or ALANTA 2
4	ALL SLIDING WAFFS, such as table guides, advance unit, advancing arm, sectional shaft, guide columns, piston rod of advance unit, etc....	FW 2	ENERGOL RBR3 or ENERGOL HTO-PP		ANDOK B	MARPAR 3 multi-purpose		ALIDA 2 or KRYTA 2 or KPL
HYDRAULIC OILS								
5	ADVANCE UNIT VE 25/60 x 150	HDP	ENERGOL HT 2		SPYRESSO 95	SPINDR HA OILBA		J41 or VTRBA 15
6	ADVANCE UNIT VE 50/80 x 200	TLX	ENERGOL HT20		OSSTIG 50	RYVAL 011		VOLTOL or VTRPA 91

* These processes must all have the same soap base.

For the maintenance of our machines, use any of the lubricants listed above in alphabetical order; do not use any other lubricants, unless you are certain that their chemical constitution is equivalent.

PARTS LIST

CONCERNING ADVANCING UNIT TYPE VE 60 60/25/120

<u>Ref. No.</u>	<u>Unit</u>	<u>Nomenclature</u>	<u>Ref. No.</u>	<u>Unit</u>	<u>Nomenclature</u>
1	1	Rod, piston	25	1	Oil wiper 25 Ø x 33Ø x 7
2	1	Cap, equalizer	26	2	O-rings 54 x 3
3	1	Spring, piston	27	1	Seal 25 x 37 x 6
4	1	Piston, equalizer cup	28	1	Rod, piston diam. 25
5	1	O-ring 39 x 3	29	1	Tube, cylinder 65 Ø x 2.5
6	1	O-ring 47 x 3	30	1	Seal, copper 12.5 Ø x 25Ø
8	2	Screws M8 x 15 DIN 551	31	2	Seals 60 Ø x 48 Ø x 9
9	4	O-rings 26 x 2	32	1	Nut M 12
10	6	Nuts M 8	33	1	Piston diam. 60
11	2	O-rings	34	1	Flange, top, cylinder
12	2	Pistons, alumin. brake cyl.	35	4	Nuts M 6
13	2	Tubes, brake cylinder	36	4	lock washers M 6
14	2	Rods, piston, diam. 8	37	2	Screws joints 1/4", for hose
15	2	Screws M8 x 15, DIN 551	38	4	Bolts, threaded, M 6
16	2	O-rings Ø 8 x 3	39	1	Flange, bottom, cylinder
17	2	Oil wiper 8 Ø x 16 x 7	40	2	Ermeto LR 10 LR
18	2	Snap rings I 16	41	2	Stopper diam. 10
19	2	Lock washers diam. 8	42	2	Pipes, hydraul. diam. 10
20	1	Cotter diam. 2.5	43	2	Screw joints, straight, G10 1/4
21	1	Washer diam. 10			
22	1	Bolt diam. 10	44	2	Seals, copper, diam. 14
23	1	Socket head cap screw M 10 x 25	45	1	Governor
			47	1	Set Collar
24	1	Forked piece	48	1	Tube, equaliz cup

PARTS LIST CONCERNING CLAMPING CYLINDER

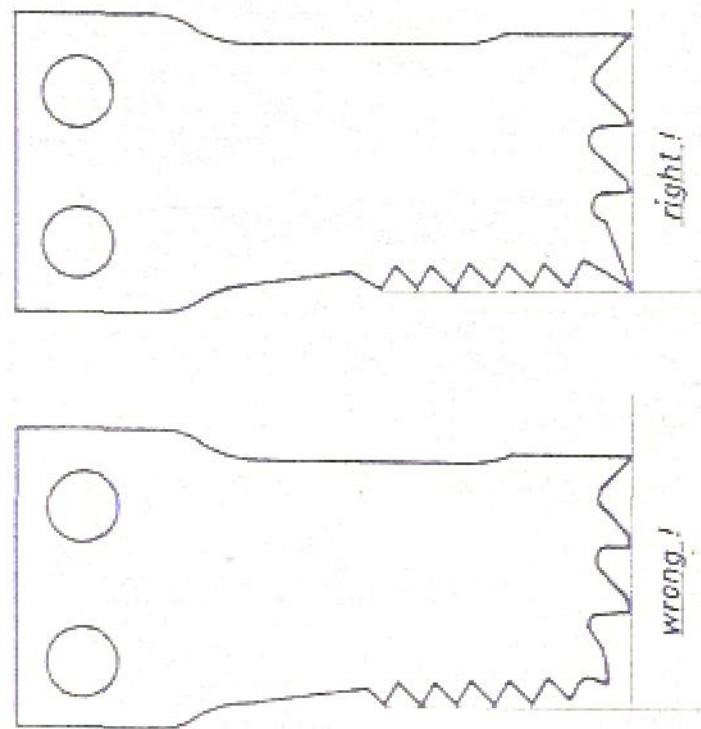
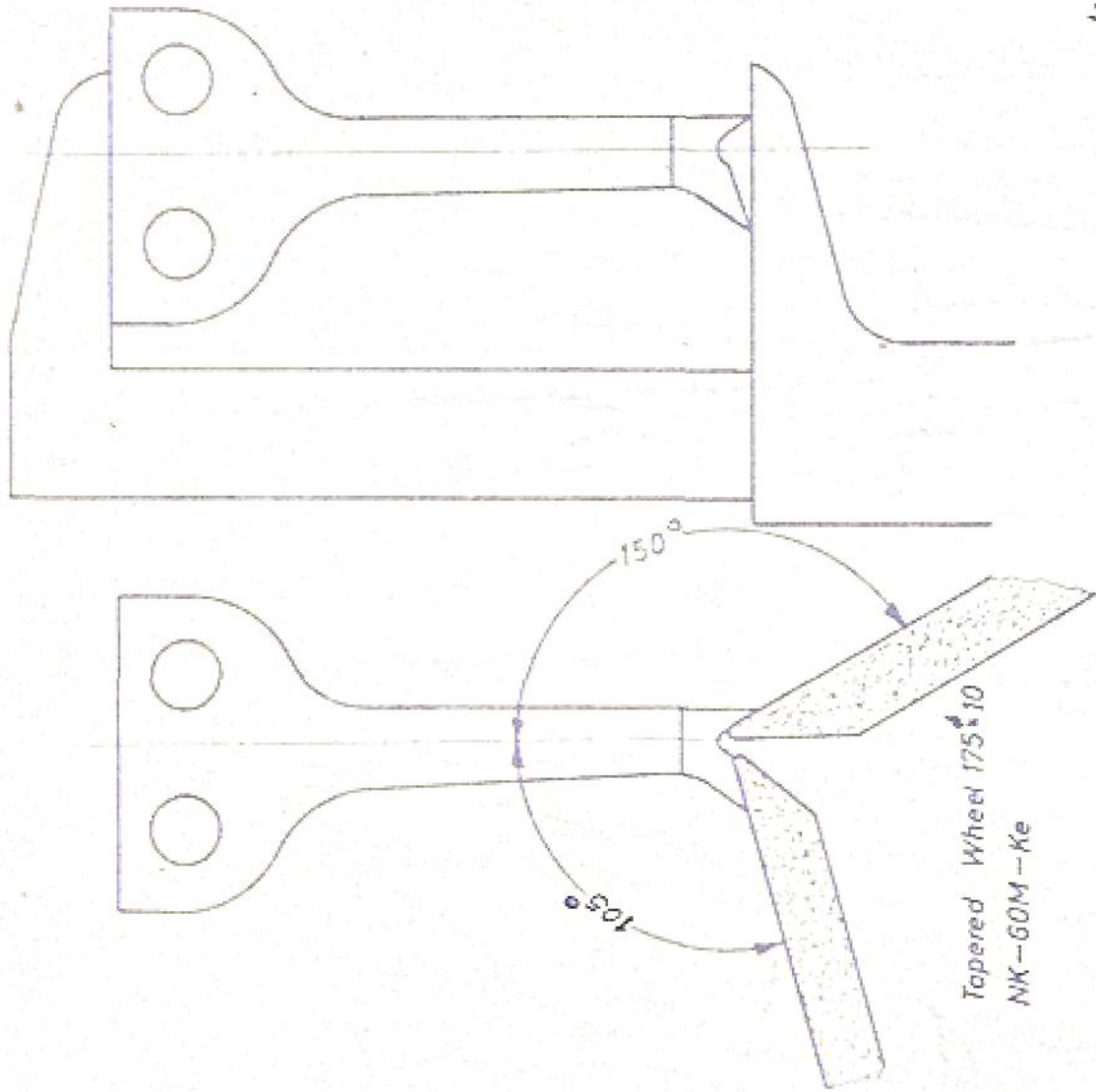
Type Sp. 60/60 (conventional type)

1	1	Tube, cylinder	9	2	Retaining rings
2	1	Head, cylinder	10	2	Spring ring
3	1	Cap, cylinder	11	1	O-ring 54 x 3
4	1	Rod, piston, diam. 16	12	1	Thrust piece
5	1	Piston, diam. 60	13	1	Spiral pin
6	1	Seal 60 x 48 x 9	14	1	Retaining shaft, diam. 24
7	1	Nut M 12	15	1	Screw joint 1/4" for hose
8	1	Spring, piston	16	8	Socket hd. cap screws M5x26

P A R T S L I S T

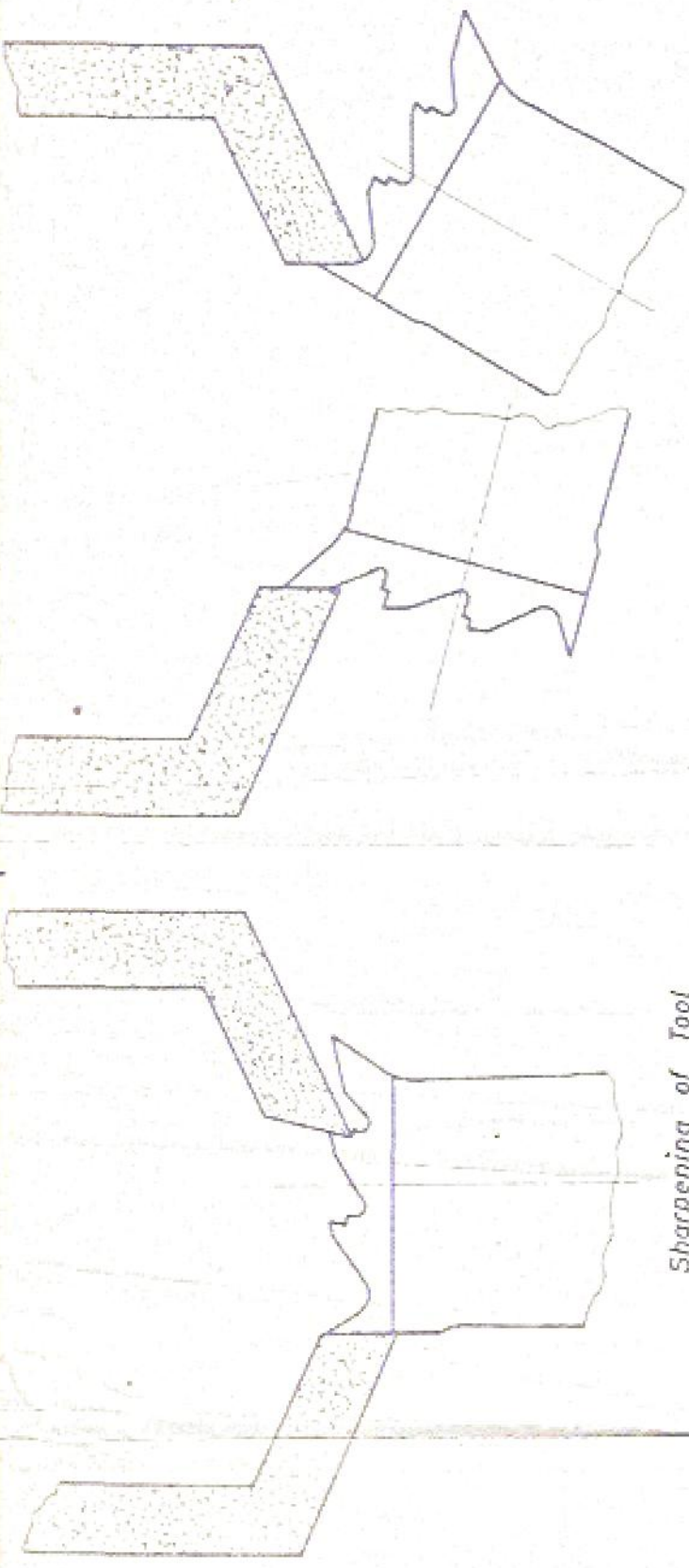
M A K A MORTISING MOTOR OF TYPE M-6

Ref.- No.	Units	Nomenclature	Ref.- No.	Units	Nomenclature
1	1	Stator, 1.8 HP/100 lg.	31	1	Oil level indicator 3/4"
2	1	Rotor 100 lg	32	1	Packing, cork 3/4"
3	1	Shaft, Rotor	33	1	Ball bearing 6203 Z
4	1	Motor casing	34	1	Packing, copper 3/4"
5	1	End Plate, front	35	1	locking screw 3/4"
6	1	Housing, self-aligning bearing	36	3	Socket Head screws M6 x 20
7	1	cap	37	2	same M6 x 35
8	1	End Plate, rear	38	1	Shaft, eccentric
9	1	cap, rear	39	1	Ball bearing 6304 Z
10	1	Oscillating Lever	40	1	same 6204 Z
11	1	Eccentric	41	1	Disk 6204
12	1	Balancing wght, eccentric	42	4	Screw, flat head M5x15/20
13	1	Balancing Weight	43	1	Pin, hollow 3 Ø x 12
14	1	Socket hd screw M6x20	44	2	V-belts 8 x 430
15	1	Snap ring A 16	45	1	Pulley, tripartite, for V-belt 108 Ø
16	1	Bearing, self-align. 1201	46	2	Spacers 0,5
17	1	Lid w/ scale 1201	47	1	Stud M6 x 6
18	1	Distancer 50 diam.	48	2	Plate springs 5 x 9
19	1	Bearing cover 6304	49	1	Hub
20	2	Ball bearings. 6005 Z	50	1	Nut, grooved M30 K 1,5
21	2	Fan head screws M5 x 15 DIN 84	51	6	Screw flat head M4 x 10
22	2	Nuts M 8	52	2	knurled nuts M5
23	1	Plate 18 x 2 x 40	53	2	Stud M5 x 70
24	3	Screw, flat head M5 x 10	54	1	Pulley, V-belt 70 diam.
25	2	Socket head screws CV 84 M8 x 30	55	1	Stud M6 x 10
26	1	Snap ring I 62	56	1	Cover, bearing 6004
27	1	Oil Seal for rot. shaft 62 diam x 38 diam.	57	1	Ball bearg. 6004 Z
28	2	Socket hd. screws M6 x 80	58	1	Oil splash ring 6004
29	2	same M6 x 16	59	4	Socket hd. screws M6 x 80
30	1	Bearing, self-aligning, 11206	60	3	Phillister hd. screws M4 x 10



too narrow free space for ejection of chips (risk of breakage)

Sharpening of Tool

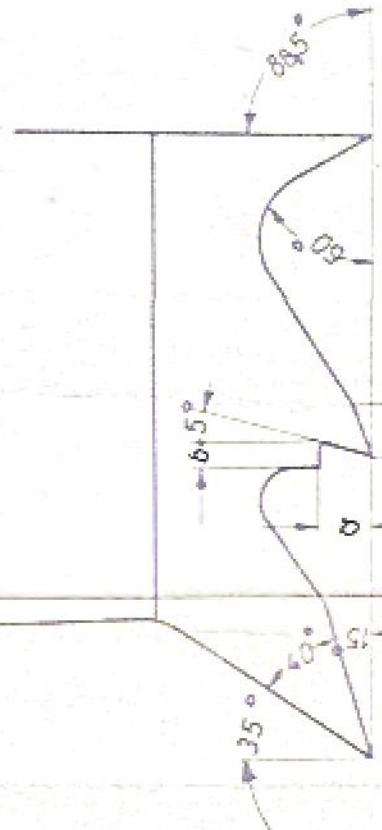


Tool sharpened the wrong way.

Chip escape too flat chips are Compressed

Too much inclination after sharpening, tool will not cut, but press.

Cutter Angles



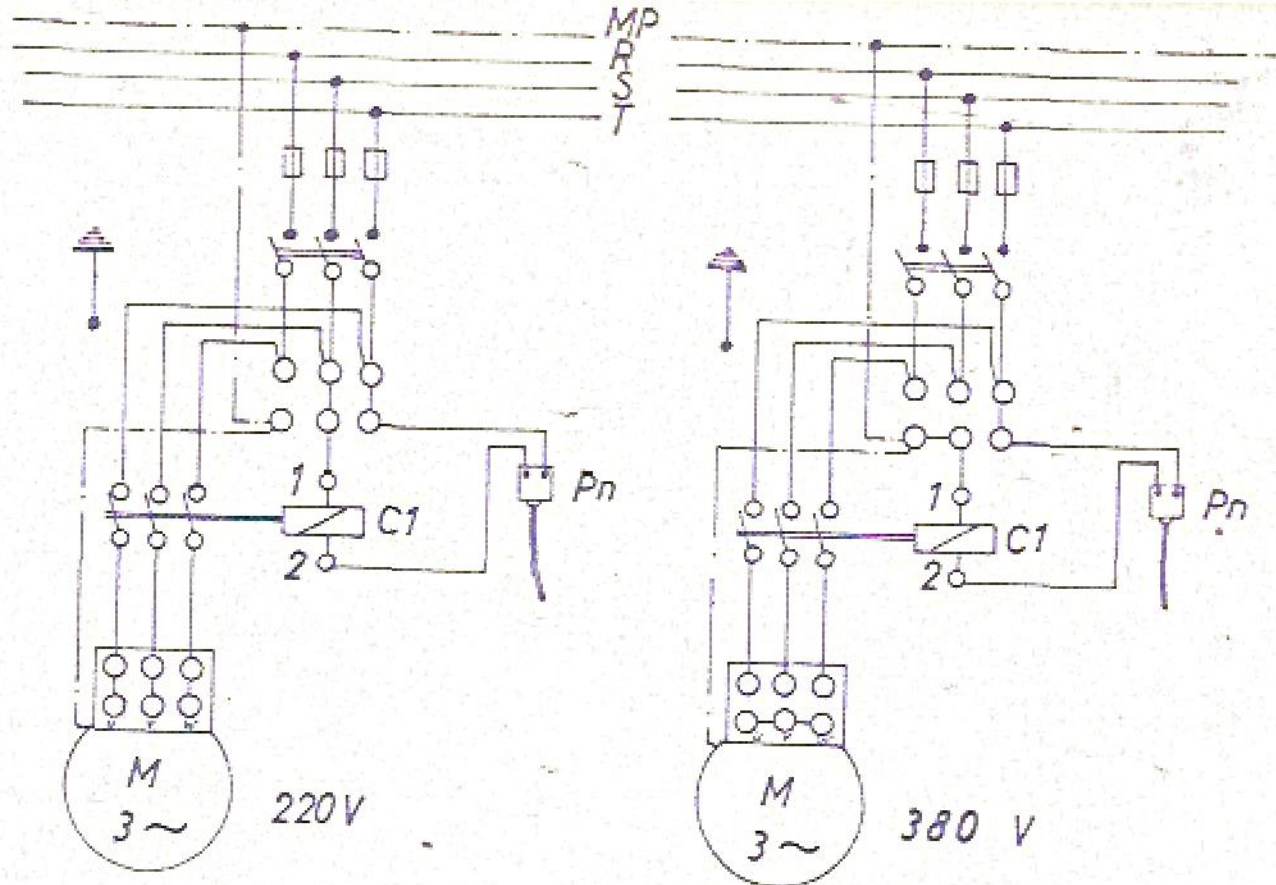
Chip Breaker

a. 2.5-3.5mm; b. ca. 1.5mm; f. 1-2mm

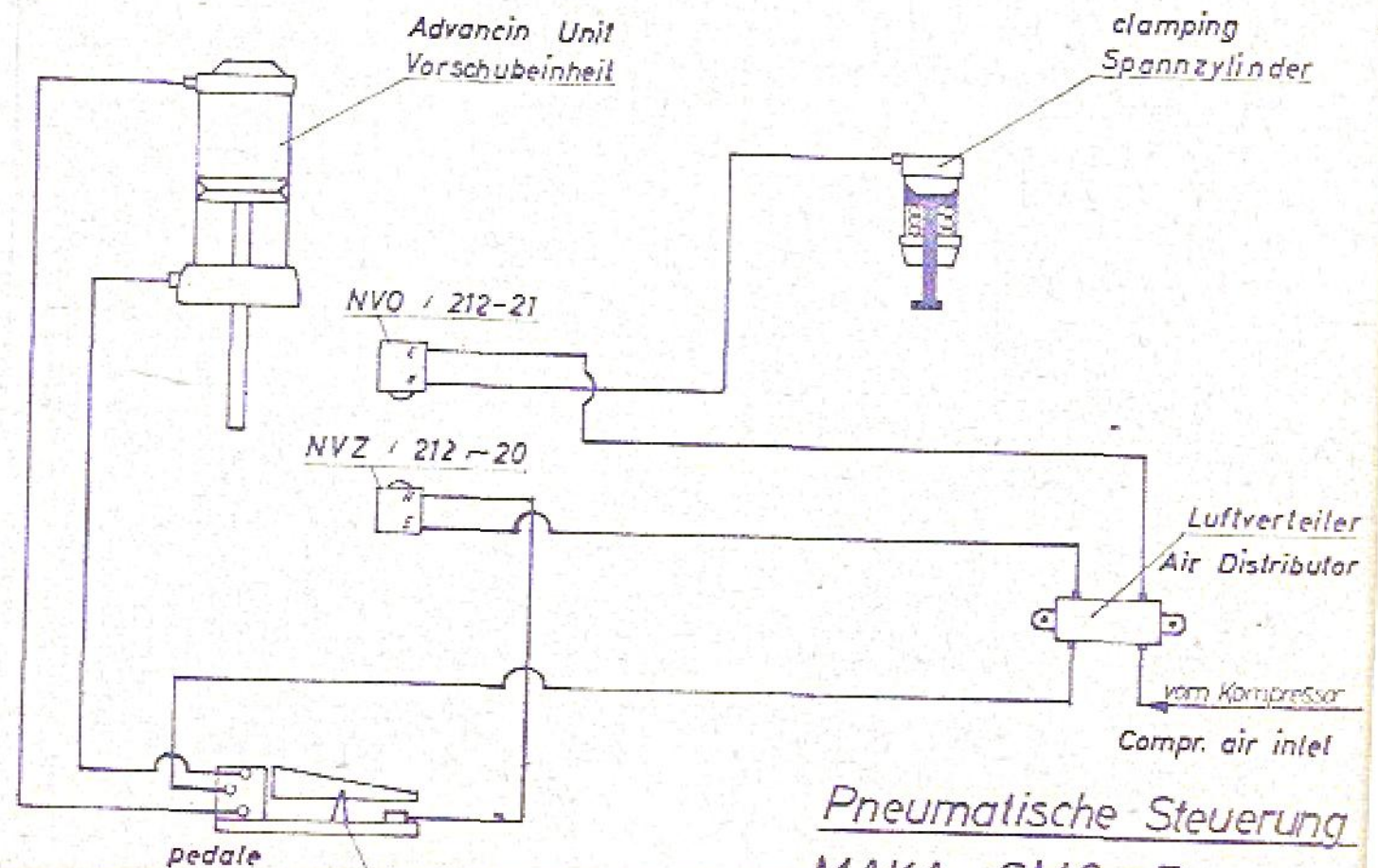
Sharpening Instruction for

MAKA

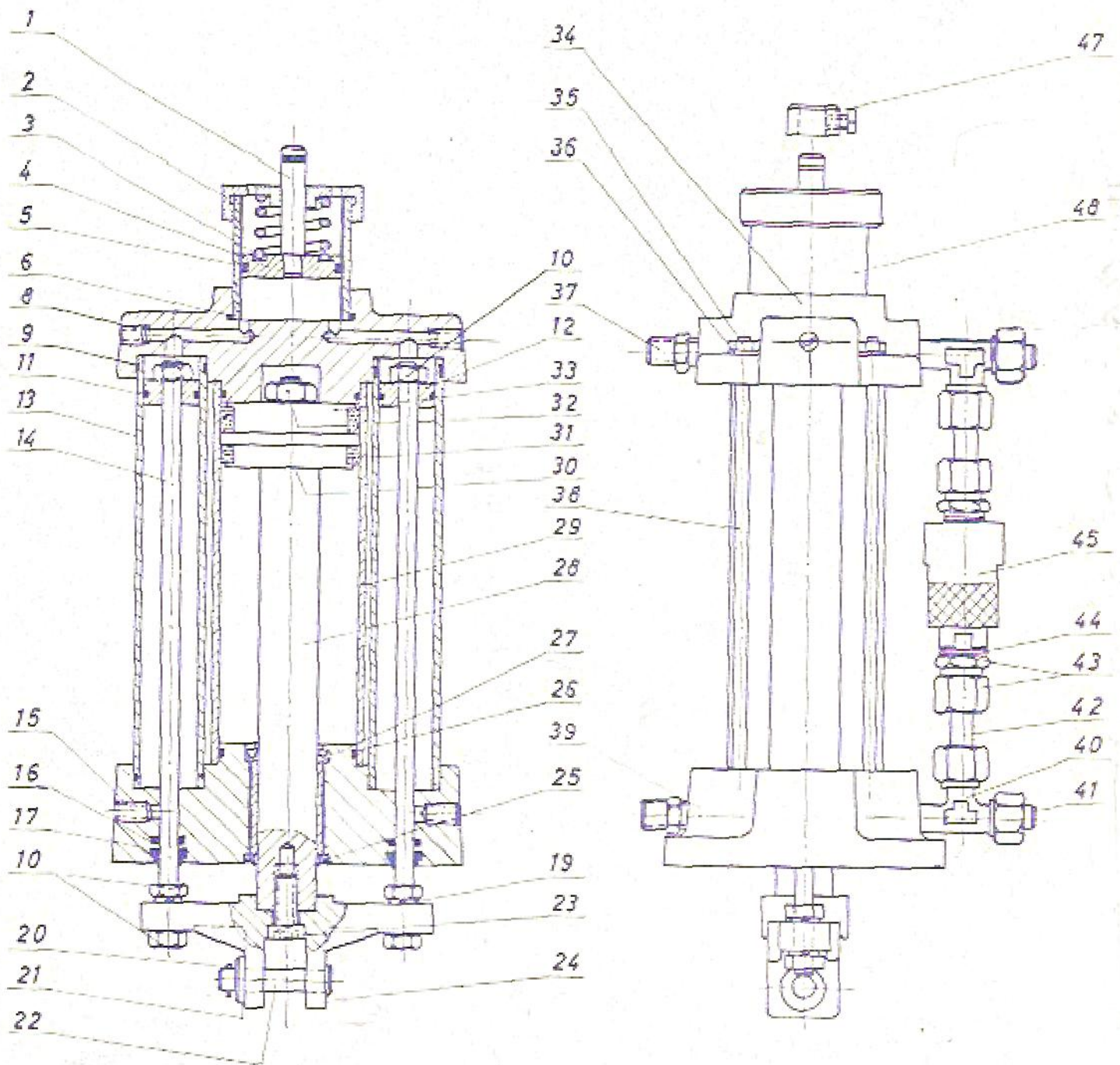
Cutter and Sawblade



*Elektrischer Schaltplan
MAKA SM6-P*



*Pneumatische Steuerung
MAKA SM6-P*



VORSCHUBEINHEIT

Typ VE 60/105 - 100