

INSTRUKTIONSBOG
OPERATION MANUAL
BETRIEBSANLEITUNG



618 / 824 / 1026 / 1032 / 1424 / 1432 / 1832

PRÆCISIONS-PLANSLIBEMASKINE
PRECISION SURFACE GRINDING MACHINE PRÄZISIONS-
FLACHSCHLEIFMASCHINE

PORSCHVEJ 2 , DK 7100 VEJLE
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INSTALLATION OF MACHINE

Uncrating

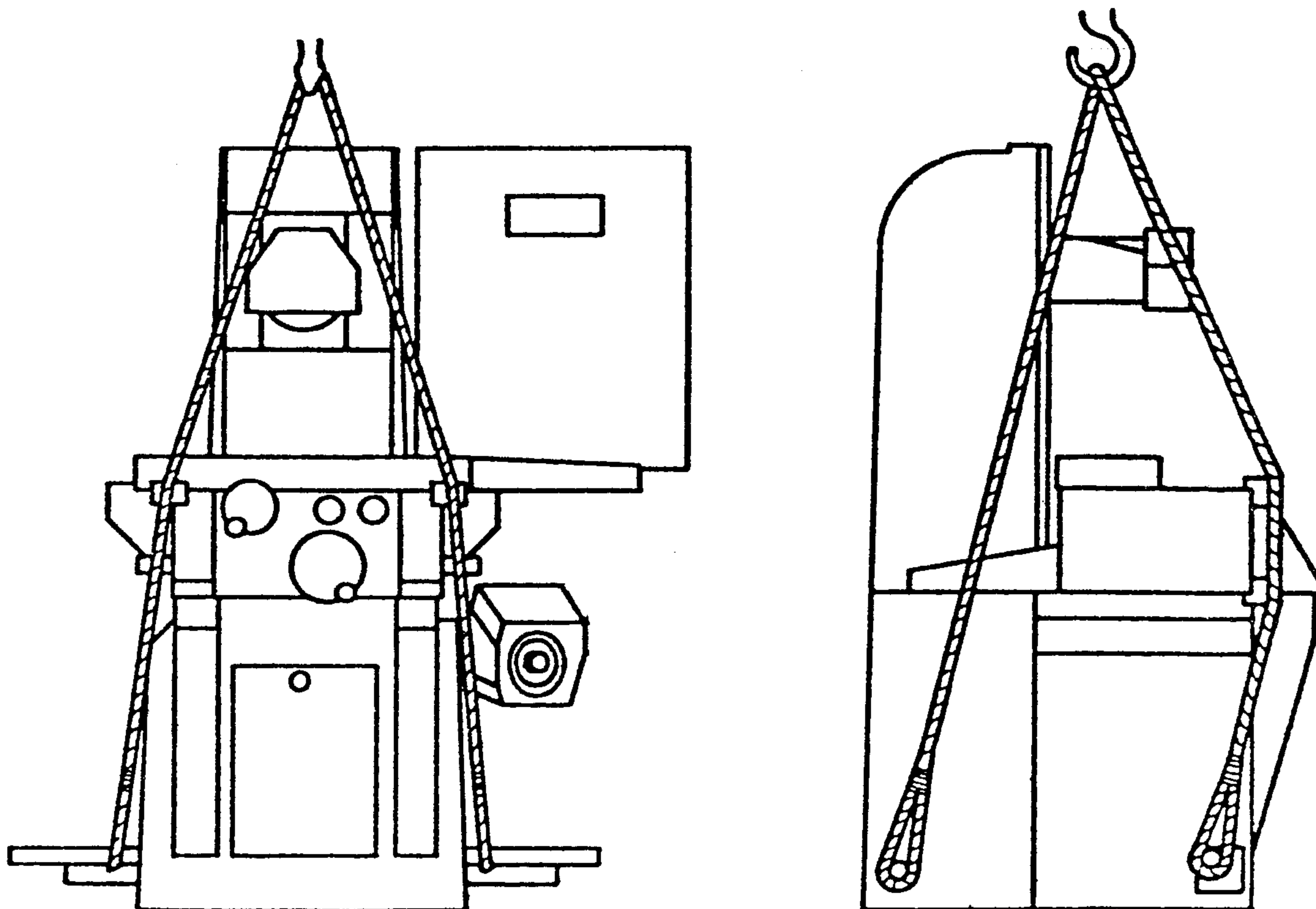
Your JAKOBSEN surface grinding machine has been carefully crated for shipment to insure its accuracy when it reaches your factory. It is important that the packing be removed carefully so as not to damage the machine and bypacked parts.

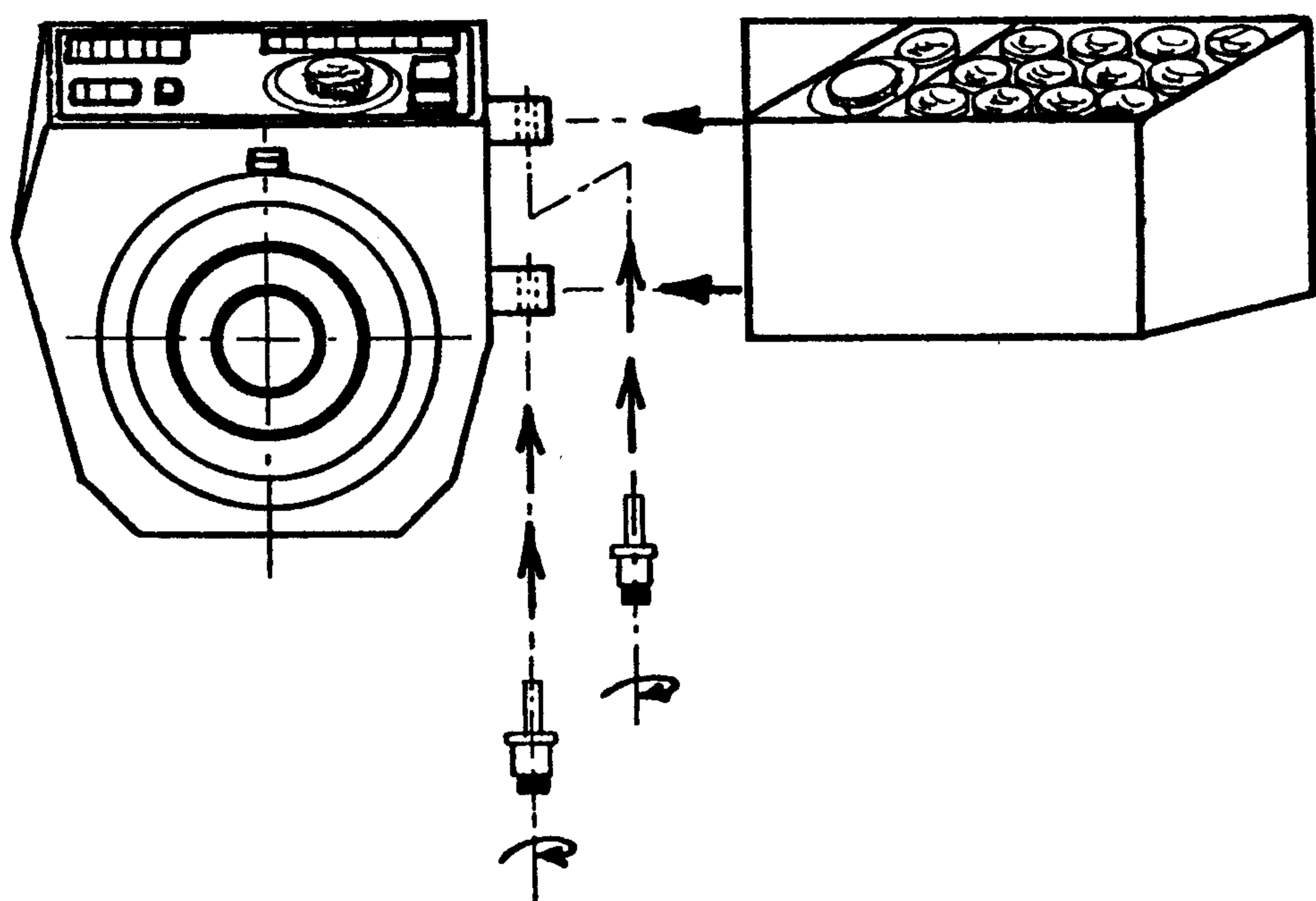
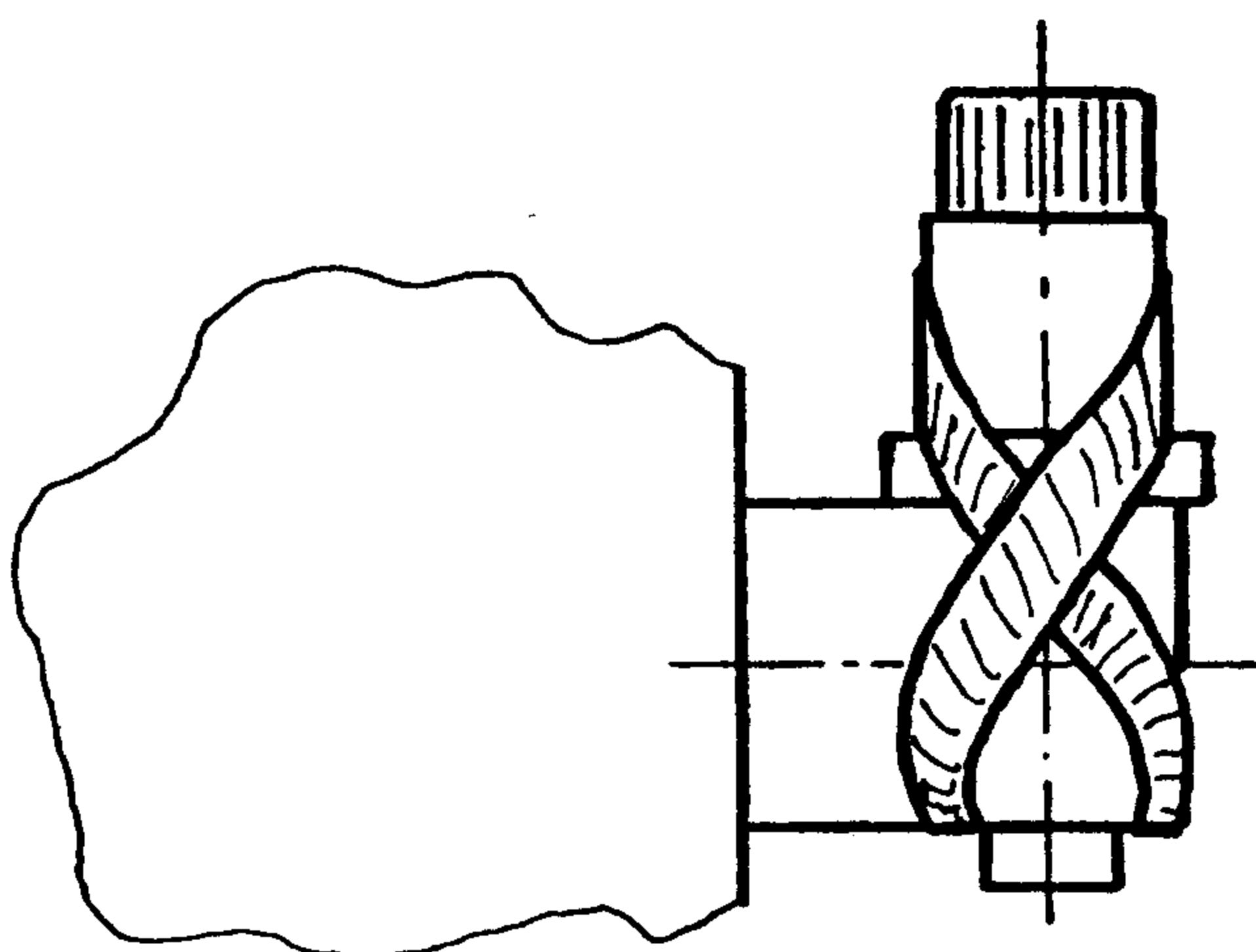
By opening the packing be sure not to damage the control panel.

- 1) Dismantle the endcover of table, coolant tank, and other accessories attached to the bottom of the packing.
- 2) Inspect the machine and equipment for broken or damaged parts.
- 3) Remove the bolts attaching the machine to the bottom of the packing.

LIFTING INSTRUCTION

The machine should be lifted as shown below. Use two iron rods with a diameter of 1 3/4" and a length of 1100 and 1300 mm respectively, and two straps approx 6 meter long.





DEGREASING

Before the machine was packed all unpainted surfaces have been protected against corrosion. This anti-corrosive liquid can be removed with paraffin. It is especially important to clean the free surfaces of the guideways.

The ribbed rubber plate for protecting top surface of cross saddle must not be washed off with paraffin.

After degreasing, lubricating oil must be applied to all machined surfaces.

NONE OF THE MACHINE MOVEMENTS MUST BE ACTIVATED BEFORE DEGREASING AND LUBRICATION OF THE GUIDEWAYS HAVE TAKEN PLACE.

INSTALLATION ON FLOOR

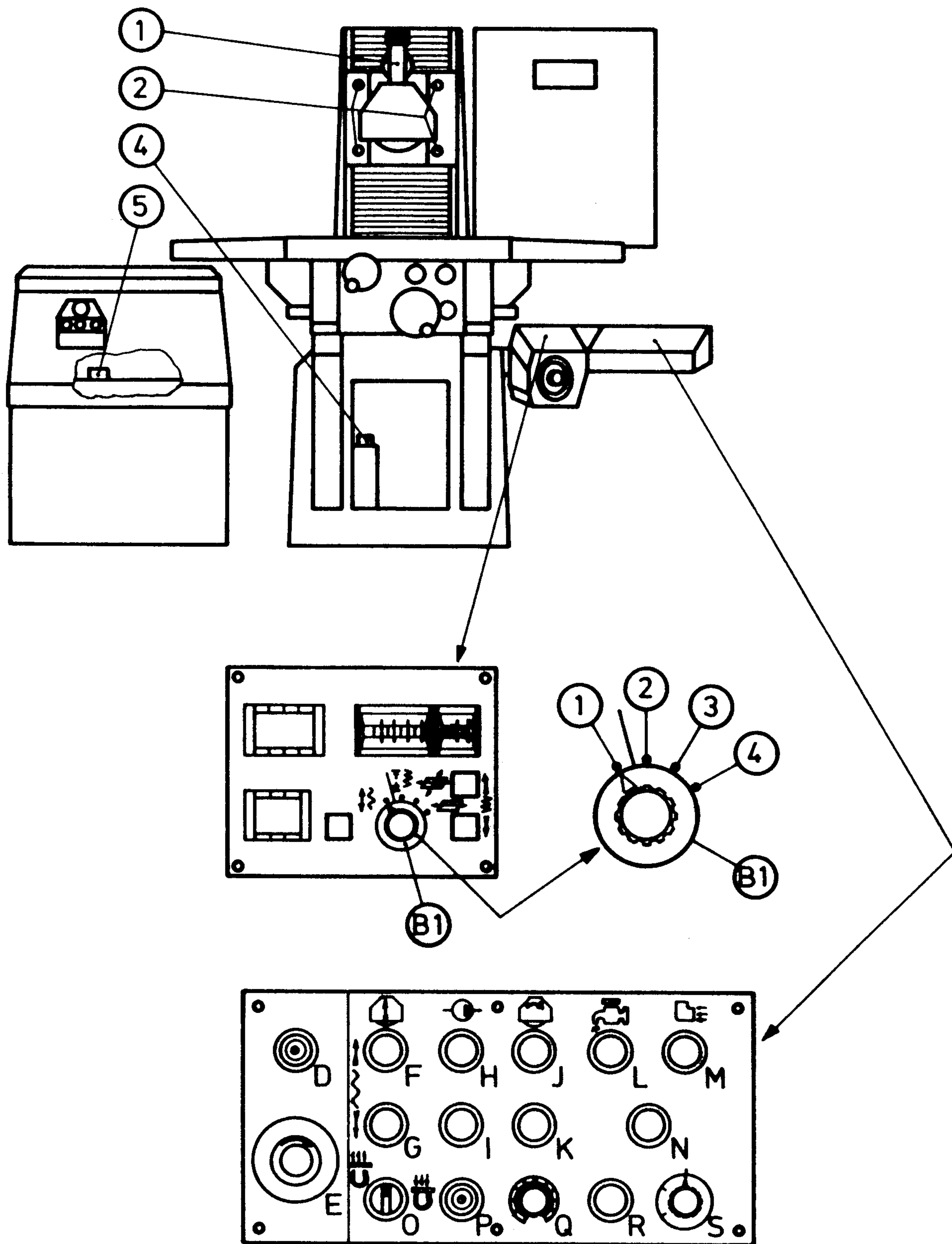
The machine should be placed on a solid non-vibrating floor. No special foundation is required, and any floor can be used provided it is sufficiently strong to carry the weight of the machine without vibrations. See Foundation plan page 16.

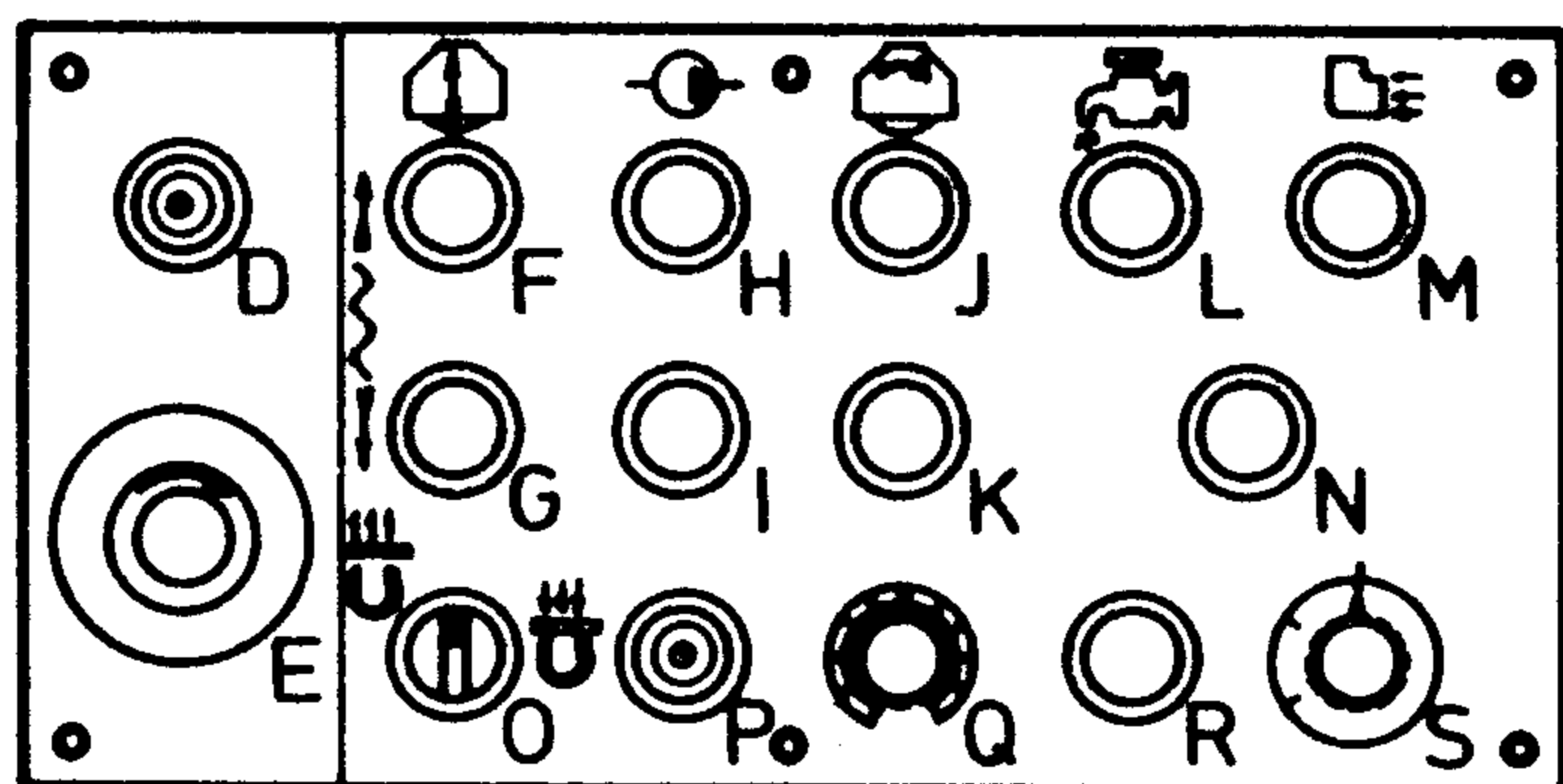
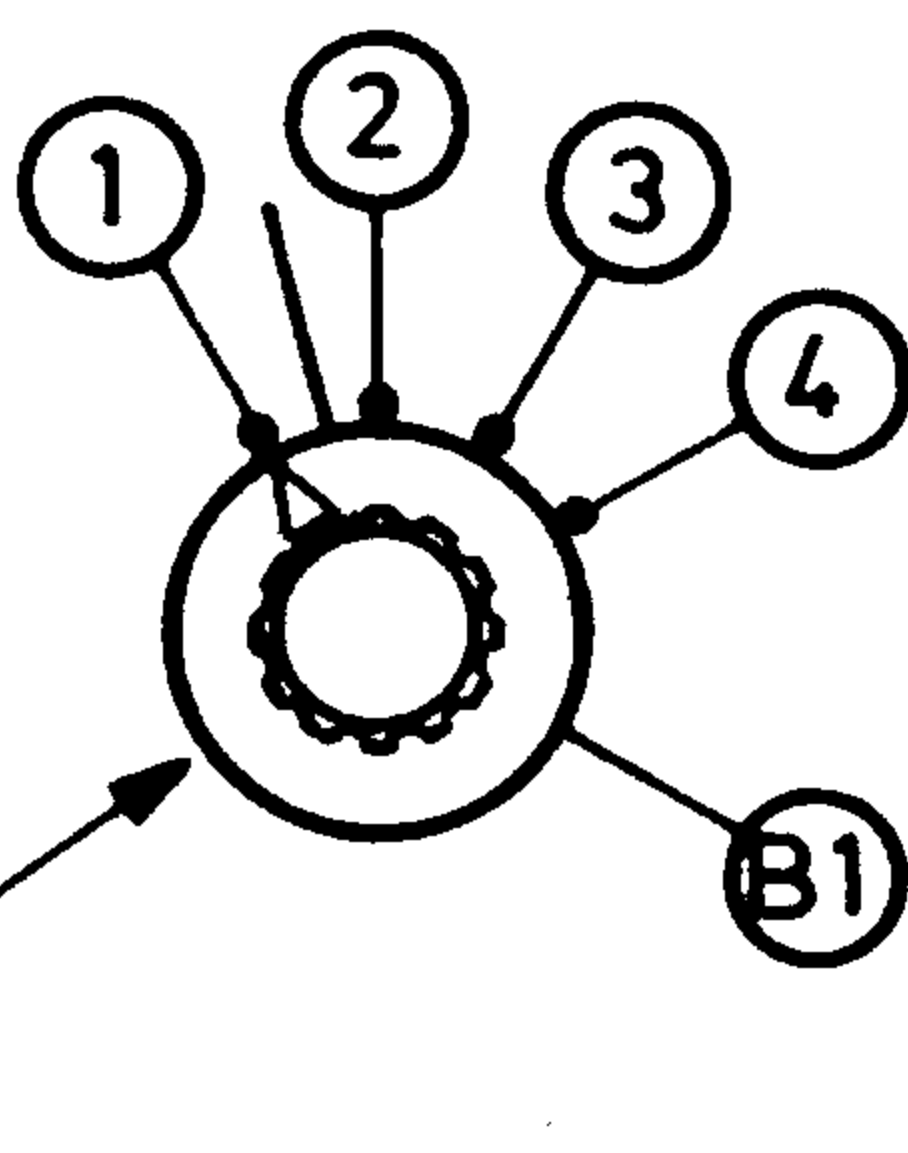
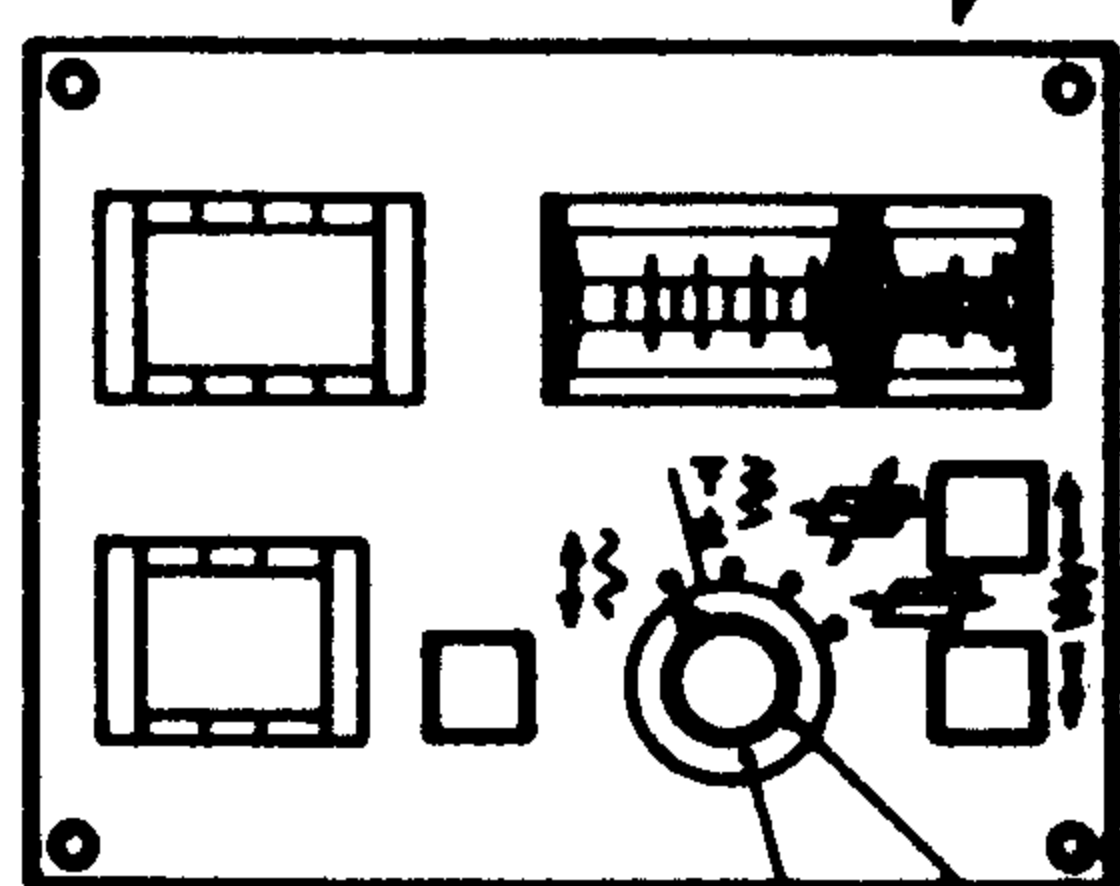
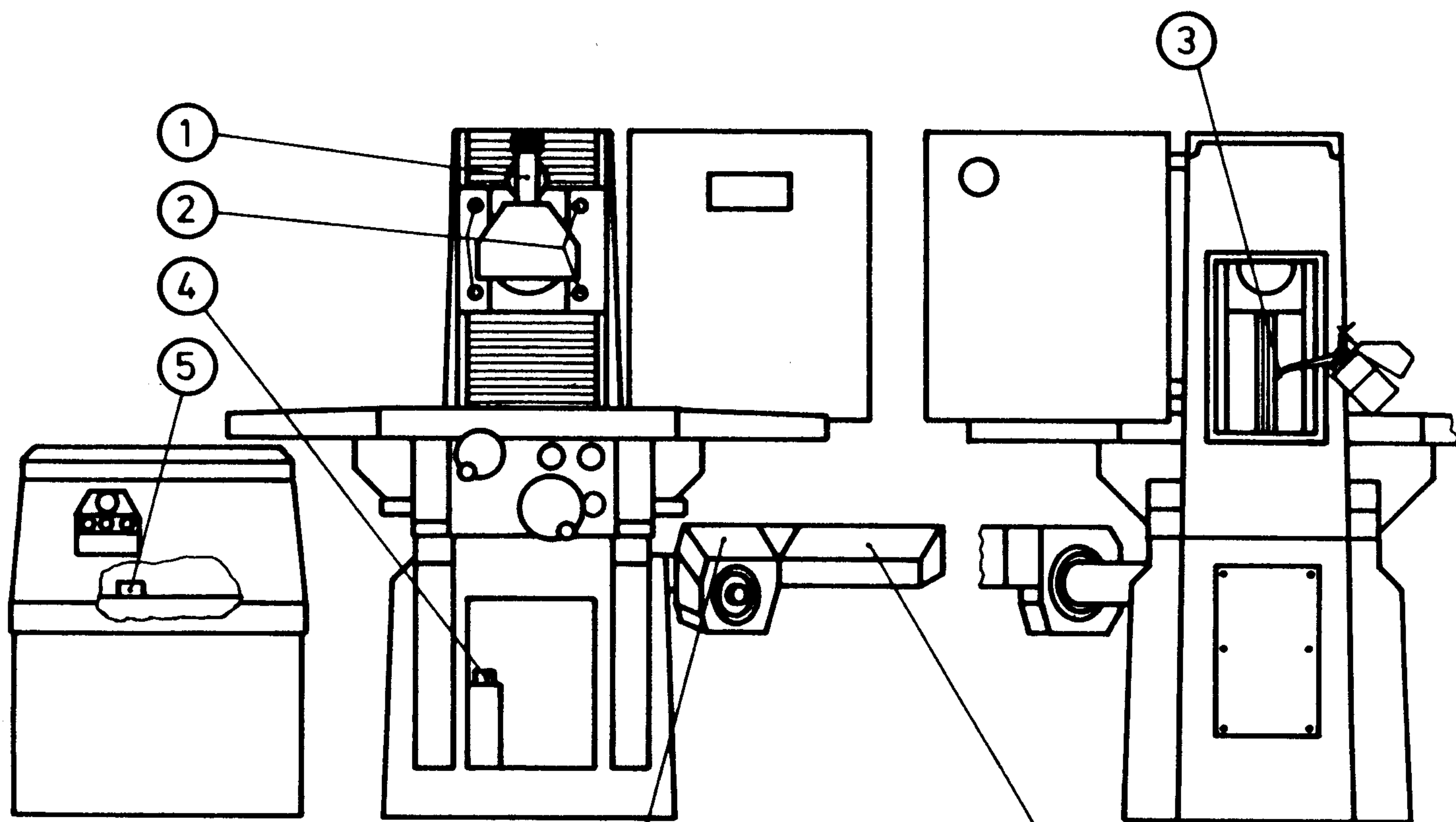
The machine must be aligned by means of the three adjustment screws (L). It is recommended to place steel shims approx. 100x100x12 mm provided with a shallow hole in the middle as base for the adjustment screws.

The alignment is carried out by means of a precision machine level which is placed on the table surface. First the machine is aligned in the longitudinal direction of the table, then in transverse direction after which the longitudinal direction is recontrolled.

ASSEMBLY

- 1) Mount the endcover of table with the screws placed at the end of the table.
- 2) Mount the left-hand piston rod of the longitudinal cylinder by inserting the threaded end into the stuffing box. Avoid damaging the gasket in the stuffing box.
- 3) Place the hydraulic power station as shown on foundation plan page 16.
- 4) Mount all hydraulic hoses between the hydraulic power station and the machine in symmetrical order. Remove all seal plugs from hoses before mounting.
- 5) Connect from hydraulic power station all electrical cables according to numbers and the electrical diagram.
- 6) Mount the el-control box to downfeed housing by means of the eccentrics, which are fastened with tape to the guidepins.





OIL FILLING

Remove the front cover of the machine and fill up with lubricating oil till the middle of the oil-level glass. The container holds approximately 5 liter. Pos. 4.

Remove the upper cover of the hydraulic power station and fill up with approx. 110 liter hydraulic oil. Pos. 5.

As lubricating oil we recommend MOBIL OIL VACTRA No. 2 or as stated in the lubrication chart page 15.

As hydraulic oil we recommend MOBIL OIL VACOULINE 1405, but other products may be used as well, see lubrication chart page 15.

LUBRICATION

The table- and saddle guideways are lubricated automatically by means of a lubricating pump which is driven by impulses from the hydraulic system. The function is controlled through the control glass on the upper side of the cross saddle and an impuls will show by each turn of the table at one side.

All moving parts which are not lubricated in accordance with the lubrication chart, page 15, are running in sealed pre-lubricated bearings. Lubricate only when parts are dismantled for inspection.

ELECTRICAL CONNECTIONS

Before the machine is connected to the main supply it is necessary to insure that it corresponds to the voltage of the motors as stated in the electrics control cabinet.

The Main switch is placed at the back of the control cabinet.

Control the direction of rotation by means of the up- and down switch for rapid vertical feed (push buttons F and G with selector switch B.1 in pos. 1).

Note: El-chuck (optional equipment) must be switched on before up- and down switch for rapid vertical feed can be operated (0).

In case the symbols do not correspond to the movements, two phases of the mains connection must be interchanged, and all motors will automatically have the correct direction of rotation.

NEVER USE THE GRINDING WHEEL MOTOR TO CONTROL THE DIRECTION OF ROTATION.

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LUBRICATION

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The vertical leadscrew is lubricated by means of an oil can filled with VACTRA No. 2 once a week. To enter into the lubricating point demount cover on column and move wheelhead to extreme upper position.

All moving parts which are not lubricated in accordance with the lubrication chart, page 15, are running in sealed pre-lubricated bearings. Lubricate only when parts are dismantled for inspection.

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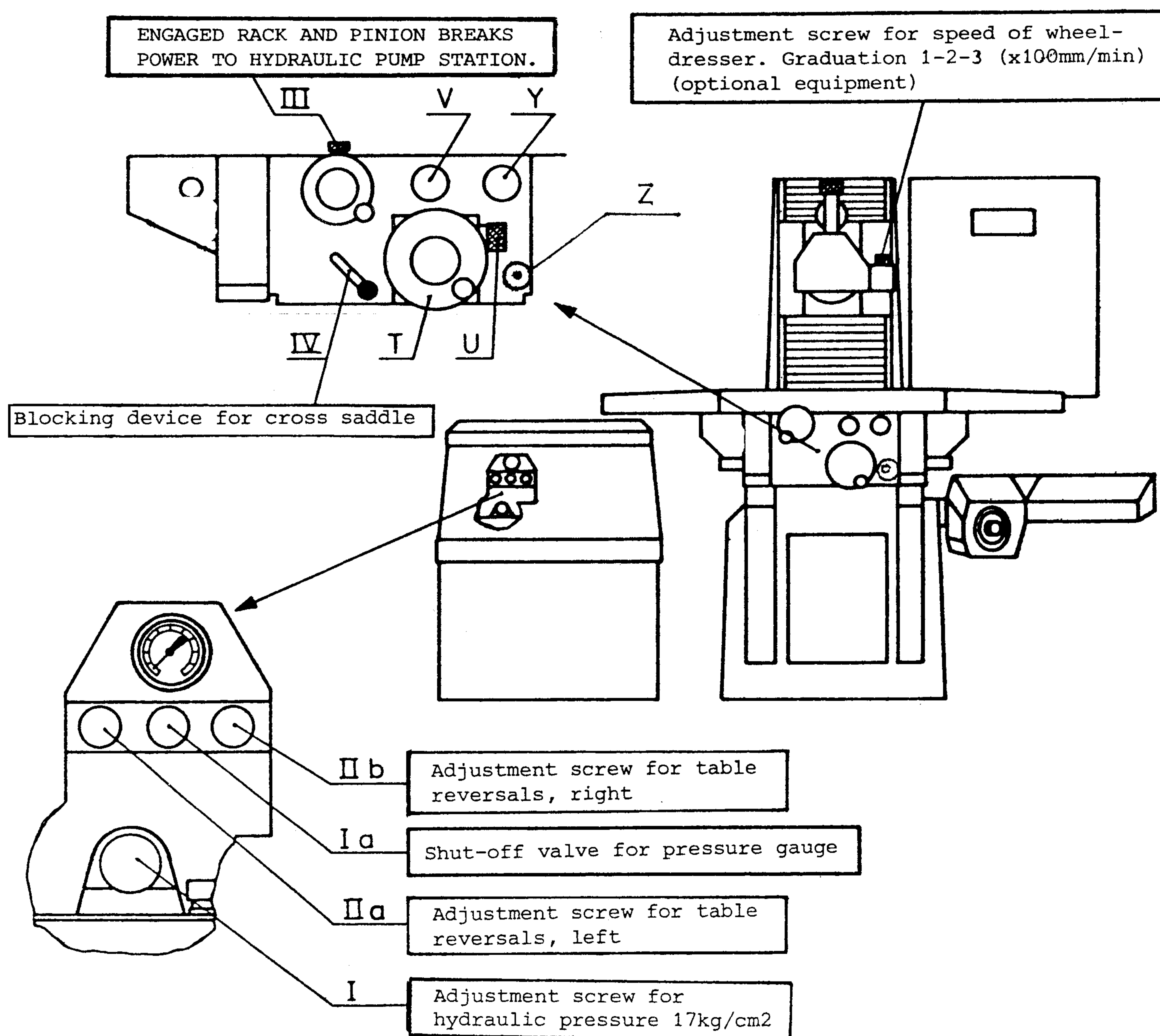
Note: El-chuck (optional equipment) must be switched on before up- and down switch for rapid vertical feed can be operated (0).

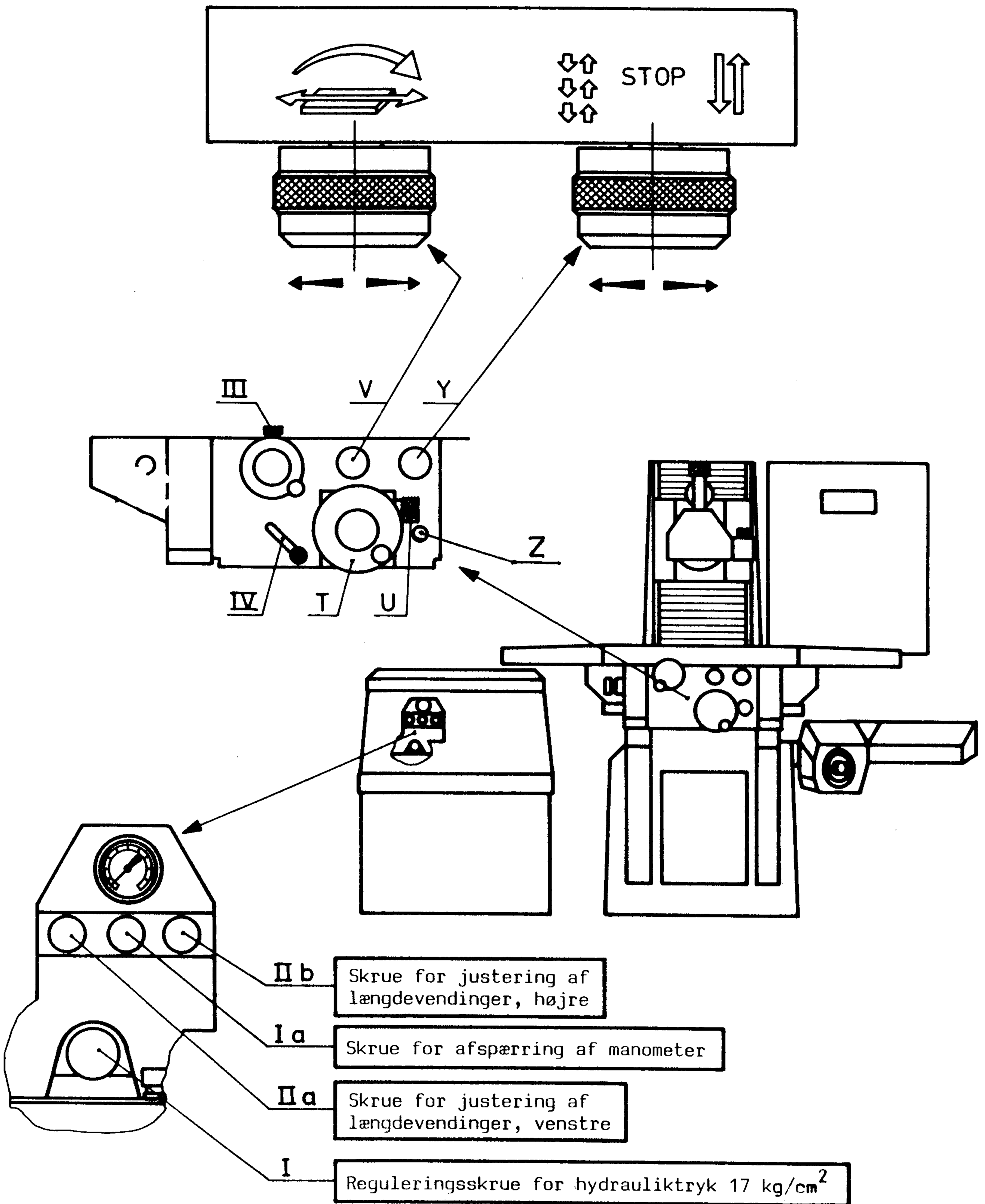
In case the symbols do not correspond to the movements, two phases of the mains connection must be interchanged, and all motors will automatically have the correct direction of rotation.

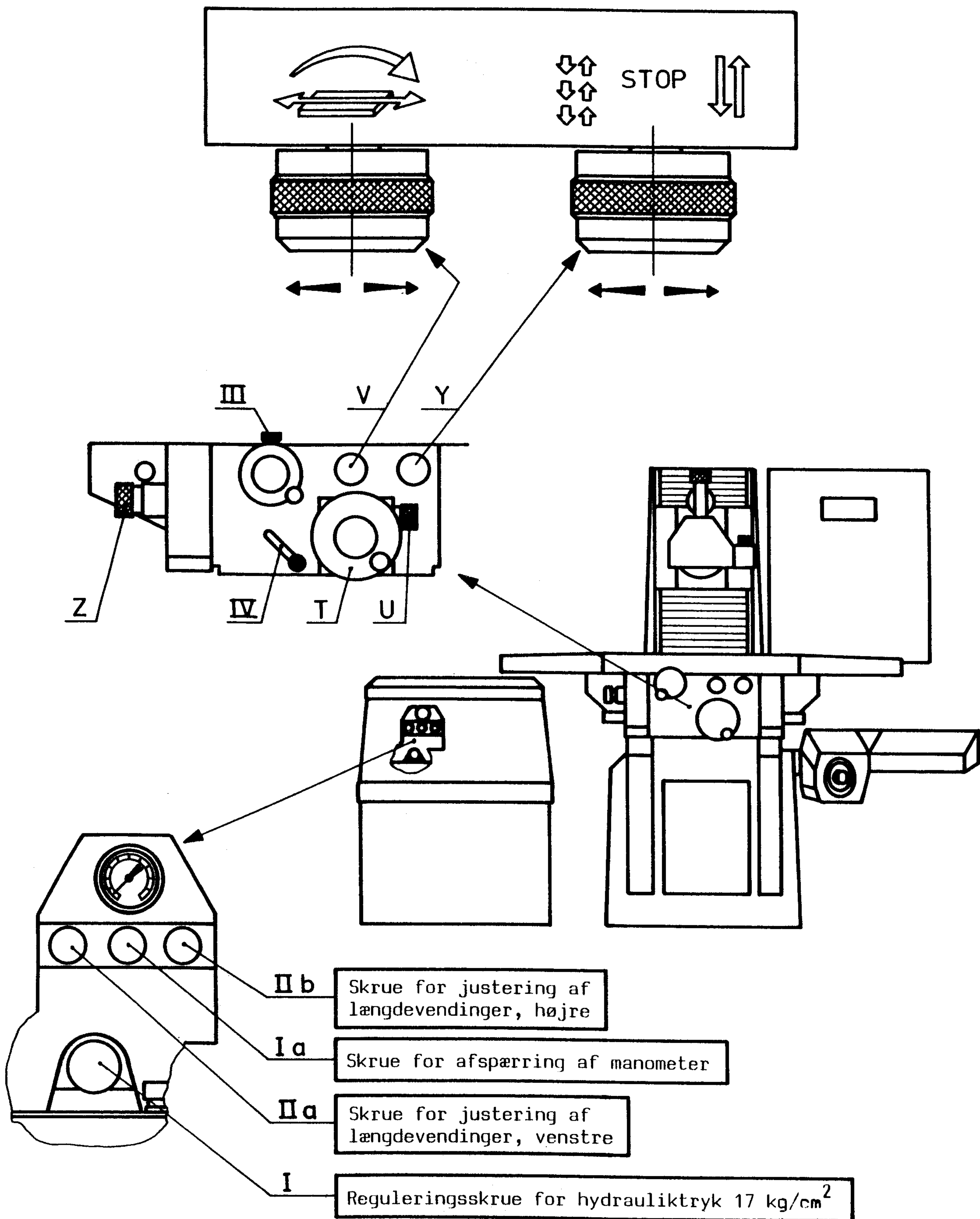
NEVER USE THE GRINDING WHEEL MOTOR TO CONTROL THE DIRECTION OF ROTATION.

OPERATION OF MACHINE CONTROLS

- T. Handwheel for manual cross feed
- U. Fine adjustment screw for manual crossfeed
- V. Handle for regulation of table speed
- Y. Handle for regulation of rapid cross feed, continuous cross feed, and intermittent cross feed
- Z. Adjustment-screw for intermittent cross feed rate 2-30mm
- III. Locking device for engagement of manual table control







DEAIRING OF THE HYDRAULIC SYSTEM

Longitudinal table movement

1. Set handle for regulation of table speed (V) on minimum speed.
2. Place table stop dogs in their extreme position and let table move to end positions

Cross movement

1. Set handle for regulation of cross feed (Y) on maximum speed (green mark to right-hand position)
2. Place saddle stop dogs in their extreme position and let saddle move to end positions
3. Turn handle (Y) to position for intermittent cross feed (green mark to left-hand position)
4. Set handle (Z) on max. cross feed rate
5. Adjust handle (V) to a middle speed rate
6. After 30 minutes operation the hydraulic system will be completely deaired.

TABLE MOVEMENT

Hydraulic table movement

Set the table stop dogs to give the required traverse length. Turn handle for regulation of table speed (V) clockwise and the table will start traversing between the stop dogs.

The handle for regulation of table speed (V) has three positions:

Red mark: Stop position

Green mark: Maximum table speed

Blue mark: Hydr. rapid cross feed and continuous crossfeed.

NOTE: When the machine is started up in the morning set handle for regulation of table speed (V) at a low speed rate until oil has fully circulated. If the machine is cold, maximum table speed may not be obtained until the hydraulic oil has reached operating temperature.

Manual table movement

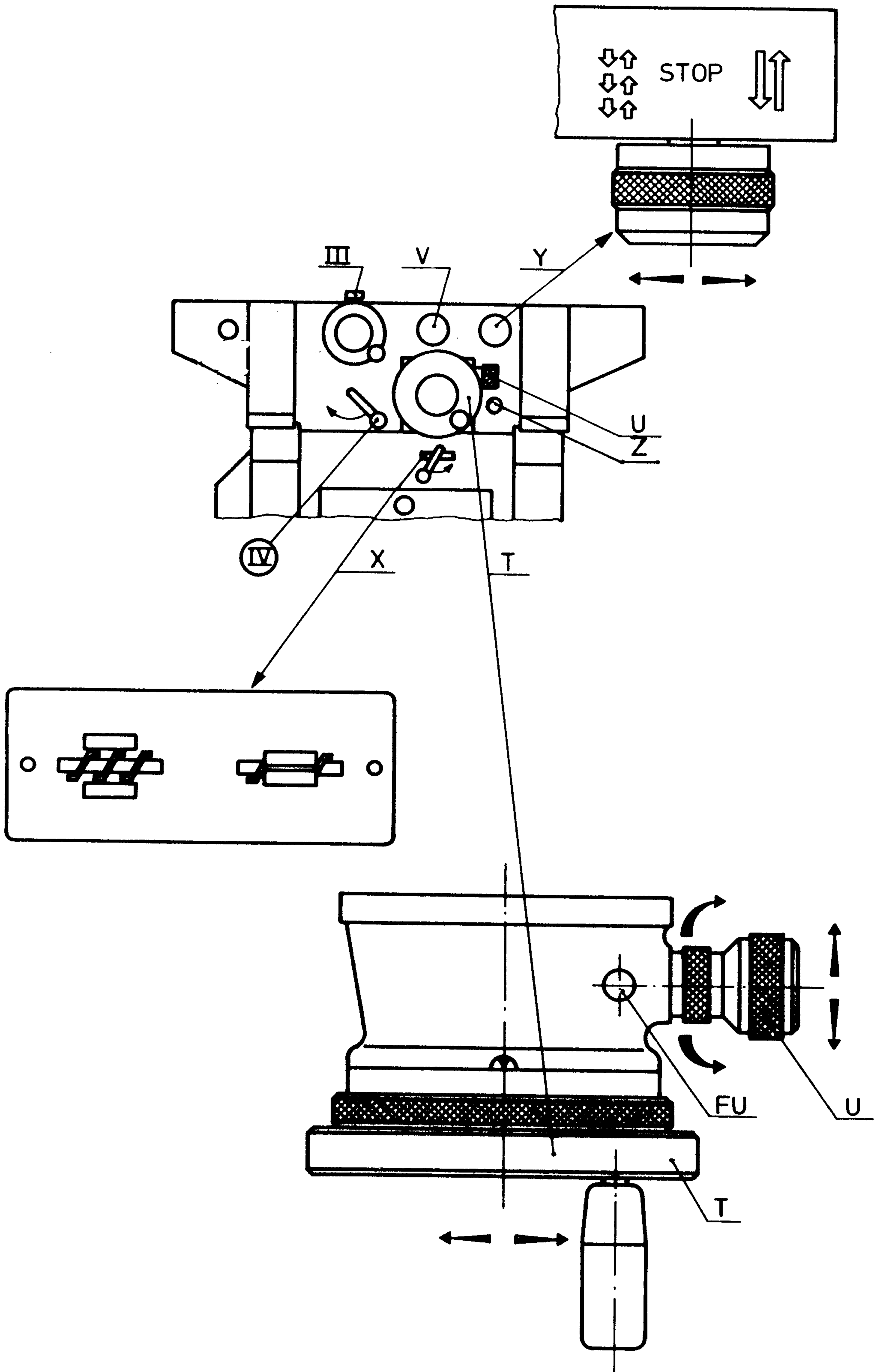
Engagement of the manual table control is made by lifting up the locking device III page 5; turn the inner handwheel to the right as shown by symbols, whereafter the handwheel for manual table control can be operated. Handle (V) in RED mark position.

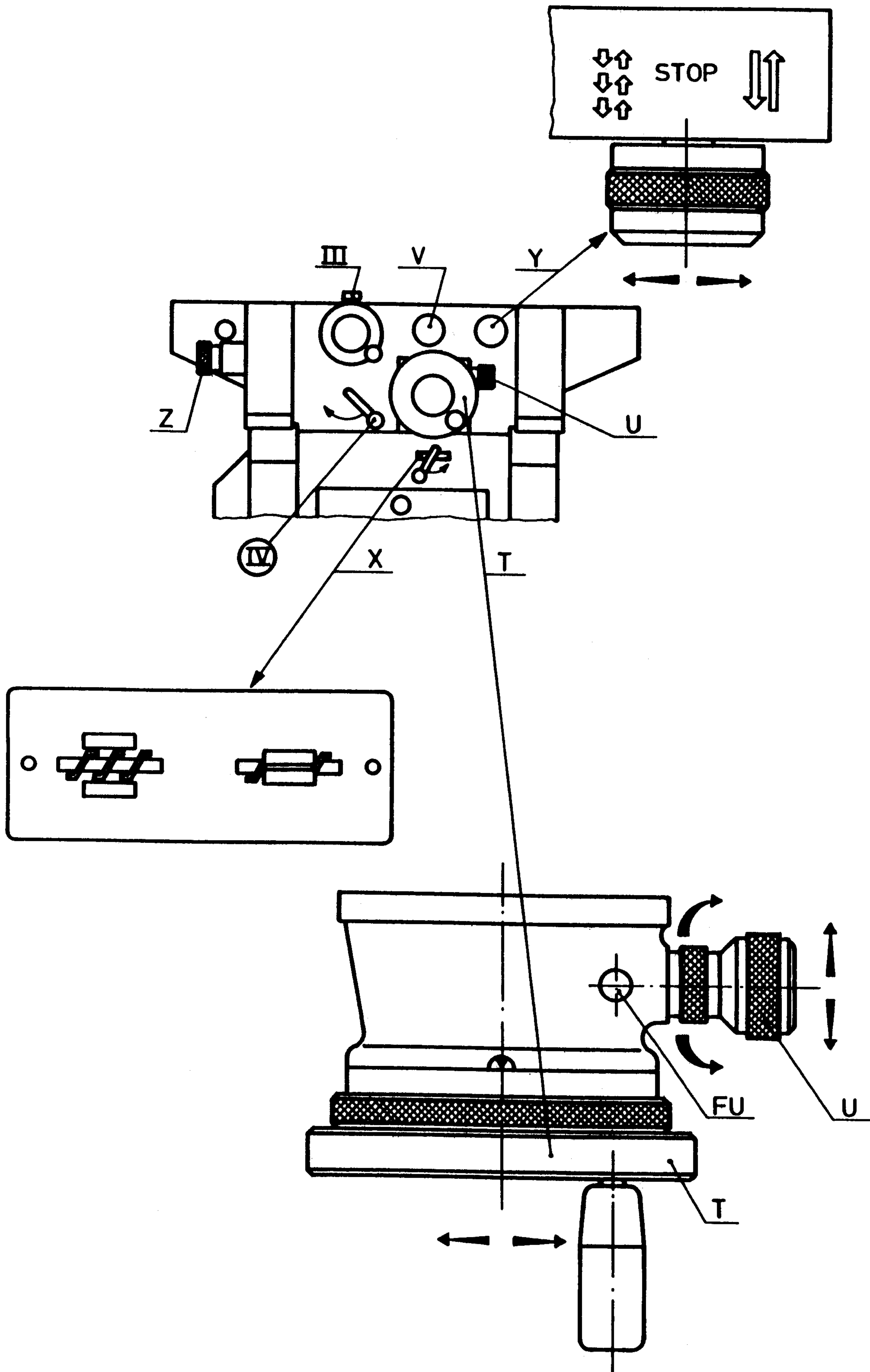
Adjustment of table overtravel

The overtravel is the distance the table travels at the end of its stroke after the stop dog has activated the proximity switches. This overtravel will be greater at high table speeds and when the machine is cold. The overtravel can be adjusted (reduced) by means of the adjusting screws IIa and IIb.

Loosen the coverscrew and turn adjusting screw anticlockwise until the desired overtravel has been obtained.

Max. load on table: **150 kg**





CROSS SADDLE MOVEMENT

Hydraulic intermittent cross feed

Set the cross feed stop dogs for the desired total saddle travel.

Turn handle (Y) to position for intermittent cross feed (GREEN mark to left-hand position).

The cross feed rate is infinitely variable from 2-30mm by means of the cross feed increment adjusting handle (Z).

Hydraulic rapid cross feed - continuous cross feed

The rapid cross feed is started by turning handle (Y) to right-hand position and handle (V) to BLUE mark position.

The continuous cross feed is infinitely adjusted by handle (Y) between STOP and MAX. SPEED position (GREEN mark to right-hand position)

By normal surface grinding with continuous cross feed the table will stop immediately when handle (V) for regulation of table speed is turned to RED mark position and it is thus possible to maintain the pre-set speed of the continuous fd. when starting up the table movement again.

Manual cross feed

The manual cross feed is operated by turning handle (Y) to STOP position, engage lever (X) as shown by symbols, and the saddle can now be moved by means of the handwheel (T).

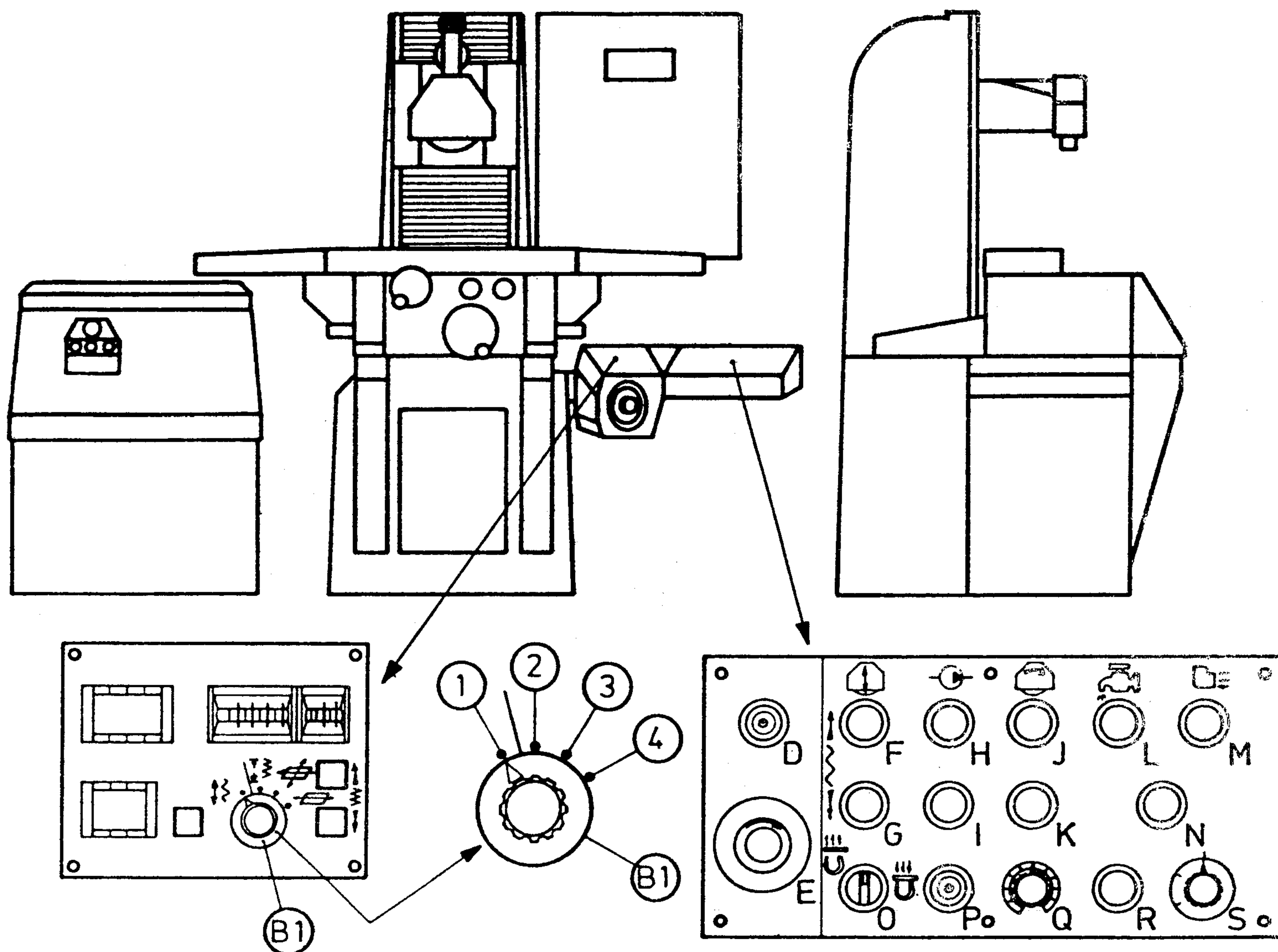
WHEN DRESSING THE WHEEL UNDER MANUAL CROSS FEED OPERATION THE HANDLE (V) SHALL BE TURNED TO BLUE MARK POSITON.

Fine cross feed

The manual cross feed (T) is equipped with a worm gearing for fine adjustment. The worm is engaged by loosening the screw (FU) and turn the bushing until the worm is put in gear, whereafter the screw (FU) is tightened again.

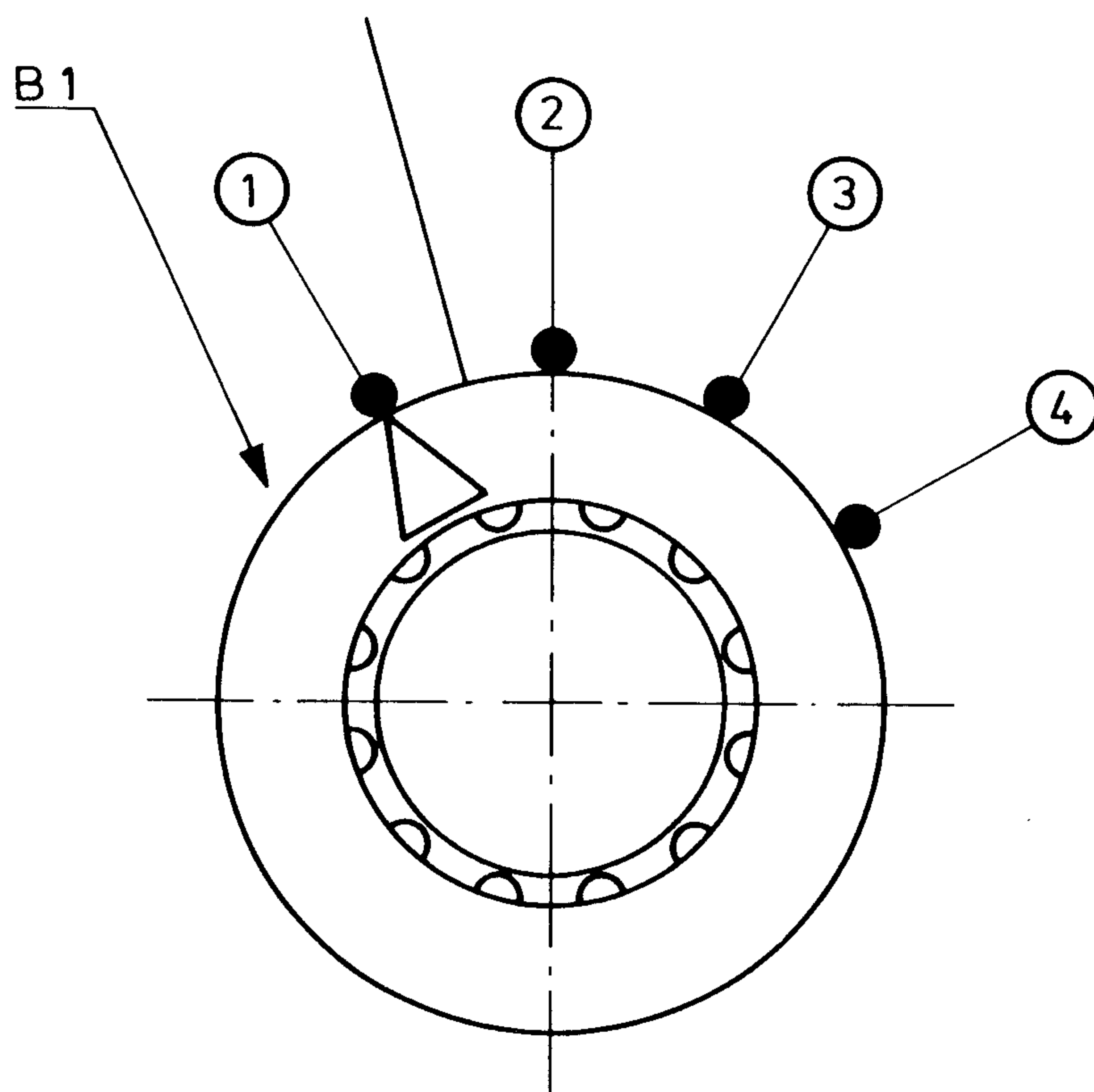
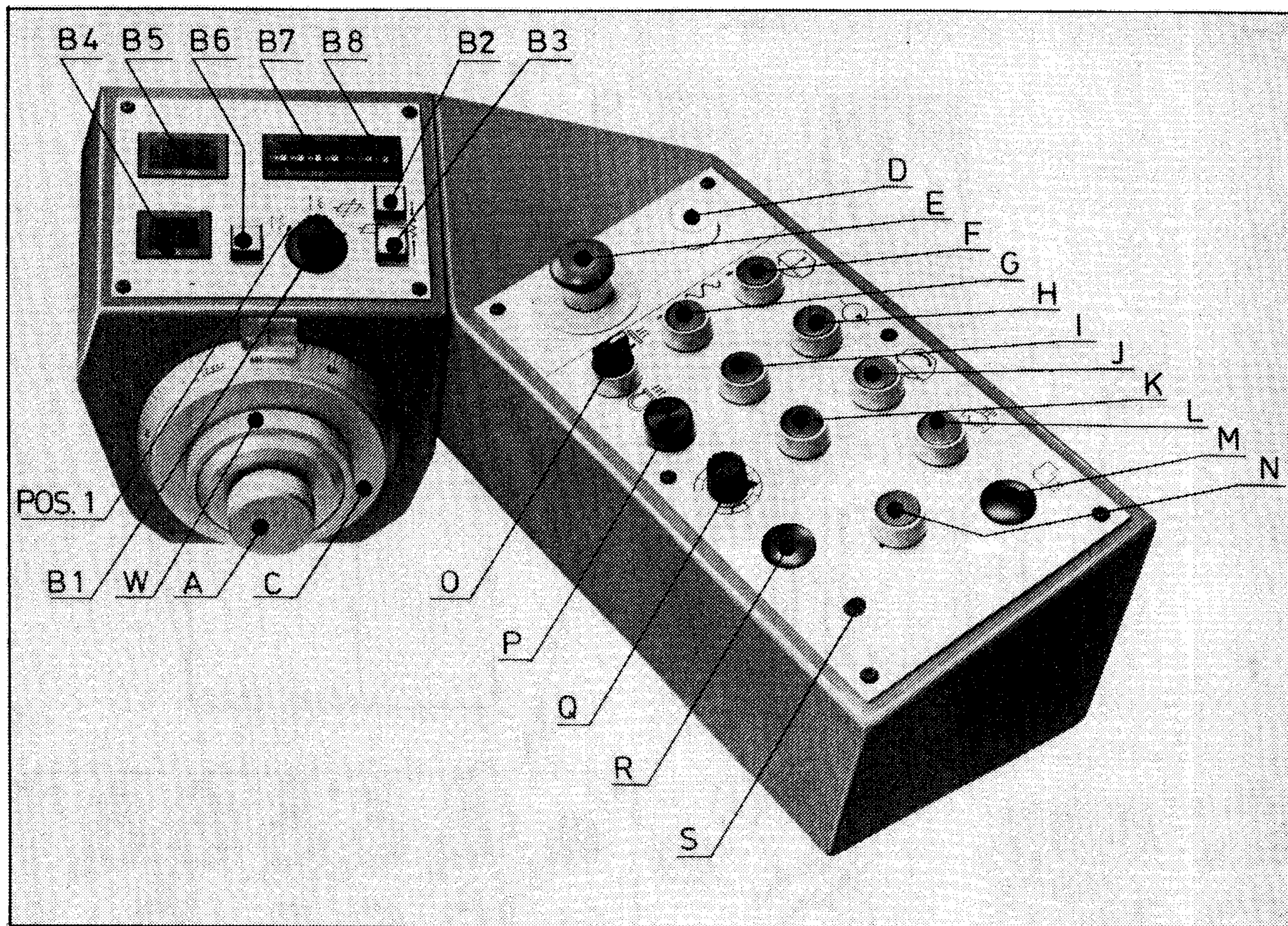
The fine cross feed knob (U) is gratuated in 0,002mm (.0001").

When the worm is engaged the handwheel (T) cannot be used.



CONTROL PANEL, LOWER

- D. Indicator lamp
- E. Emergency stop
- F. Rapid vertical feed, up (selector switch B.1 in pos. 1 } function only when el-
- G. Rapid vertical feed, down (selector switch B.1 in pos. 1 } chuck is switched on
- H. Start of hydraulic power station
- I. Stop of hydraulic power station
- J. Start of grinding wheel
- K. Stop of grinding wheel
- L. Start of coolant
- M. Start of dust exhauster (optional equipment)
- N. Stop of coolant/dust exhauster
- O. Switch for el-chuck (see symbols) (optional equipment)
- P. Indicator lamp for el-chuck
- Q. Potentiometer for holding power adjustment of el-chuck (optional equipment)
- R. Start of frequency converter for infinite variation of wheel speed. (optional equipment)
- S. Potentiometer for adjustment of wheel spindle speed



VERTICAL MOVEMENT

The vertical movement can be operated either by hand or by automatic downfeed

Manual downfeed

The manual vertical feed is operated by the handwheel (W). The adjustable dial (C) is graduated in 0,002 mm (.0001") and one complete handwheel revolution will produce 0,2 mm (.01") downfeed. The adjustable dial is released by means of the knob (A) and it will now be possible to set this dial at any position by at the same time keeping the handwheel (W) in a fixed position.

Automatic downfeed

The automatic downfeed consist of the following controls:

Selector switch B.1:

- Pos. 1: Power rapid vertical feed (activate push buttons (F) and (G) on control panel)
- Pos. 2: Continuous vertical feed through stepping motor (10 mm/min).
Wheel up by activating green button (B.2)
Wheel down by activating red button (B.3)
- Pos. 3: Automatic downfeed at every saddle reversal
- Pos. 4: Automatic downfeed at every table reversal

Push button (B.2) and B.3)

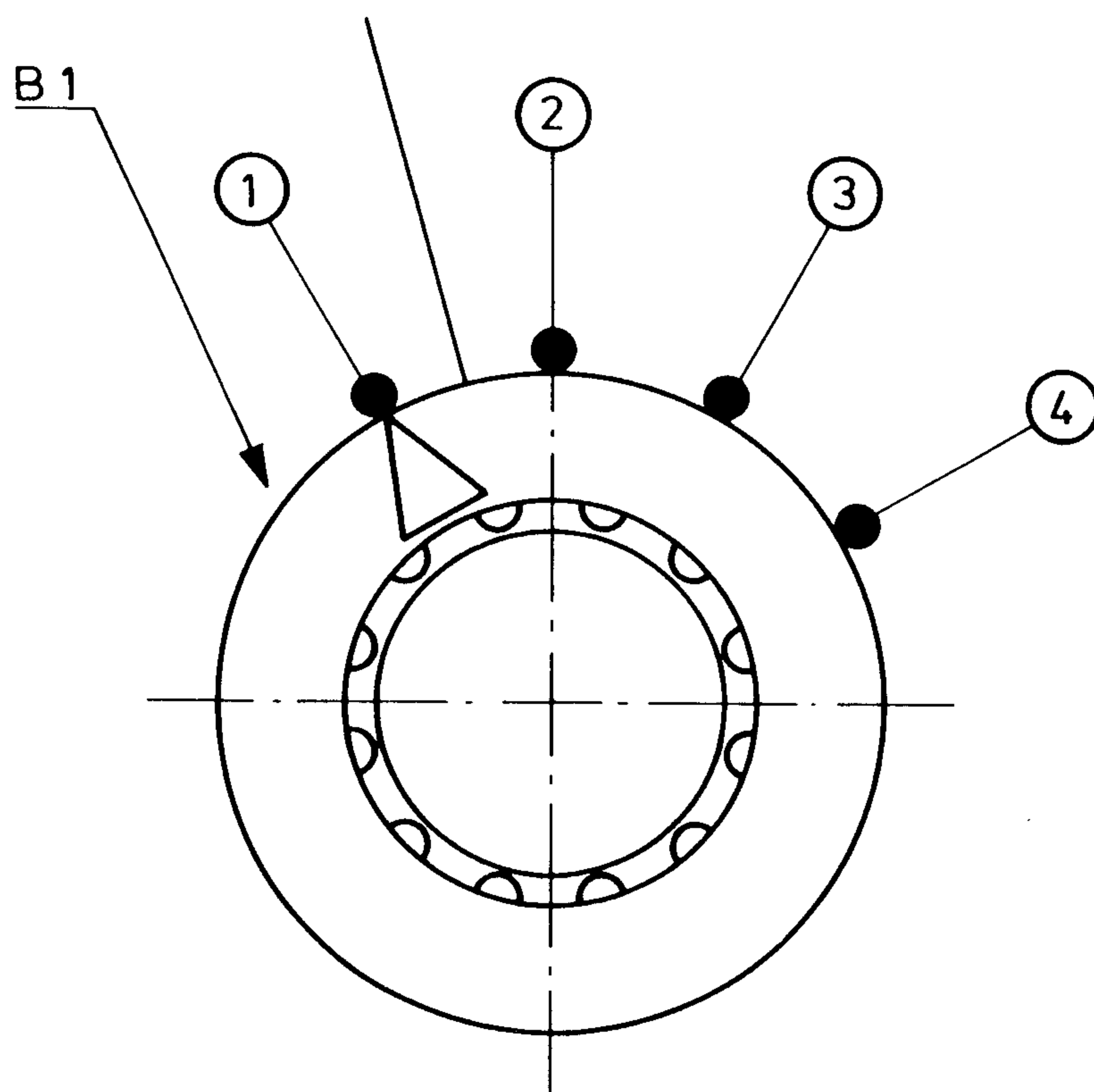
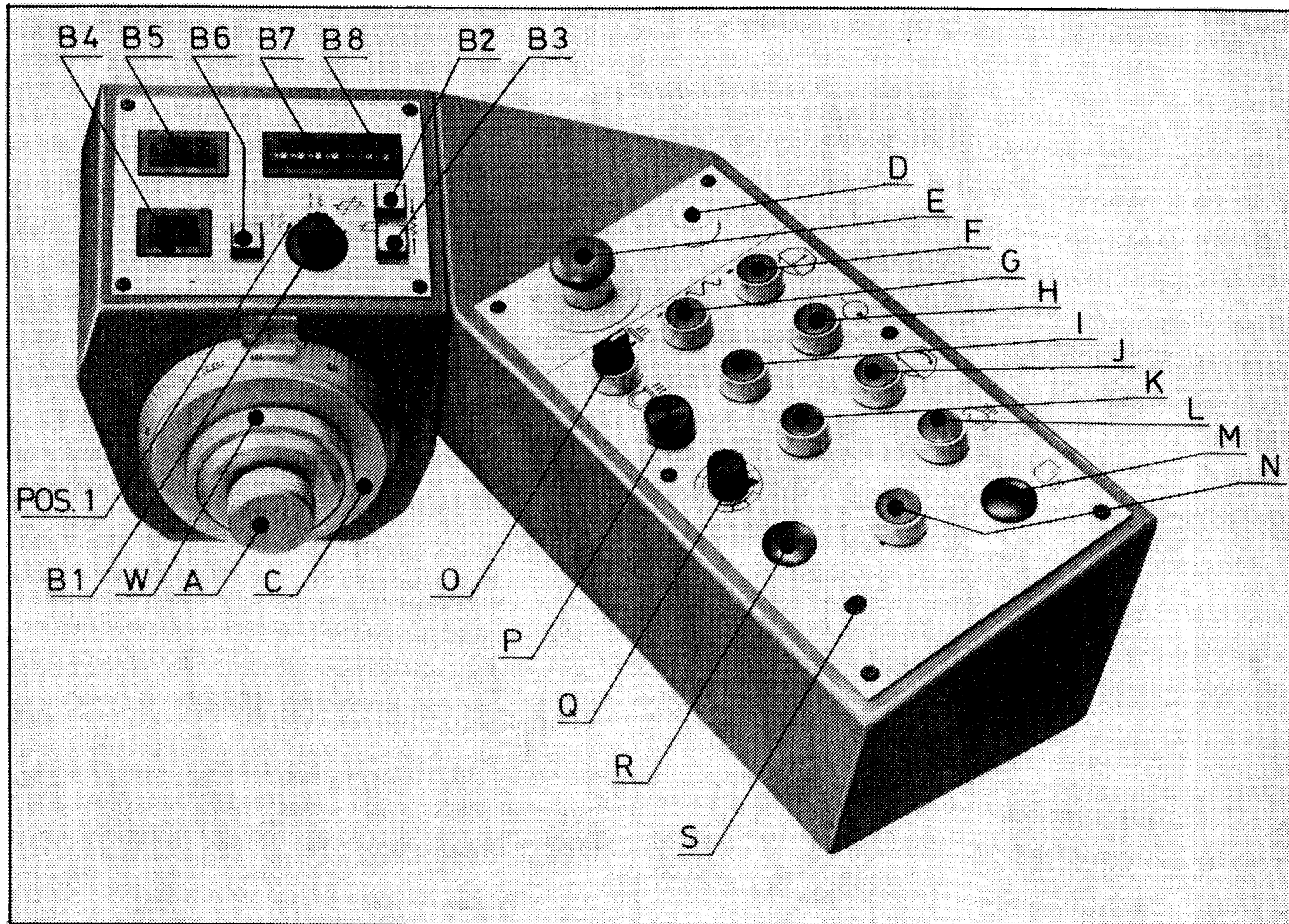
Start- and stop button for automatic downfeed when selector switch (B.1) is in Pos. 3-4.

Handwheel revolution counter (B.4)

Digital readout for every 0,1 mm (.01") movement of downfeed handwheel in both directions. This system works independently of the automatic downfeed and can be reset by means of reset button (B.6).

Digital display (B.5)

The display shows total downfeed area (counts back to zero).



Reset button (B.6)

Reset button for handwheel revolution counter (B.4).

Decade switch (B.7)

4-digits decade switch for presetting the overall downfeed - total downfeed area - in 0,001 mm (:0001").

Decade switch (B.8)

2-digits decade switch for selecting downfeed rate (in 0,001 mm - .0001").

When the selector switch (B.1) is moved from position 2 to 3 the red button (B.3) will light up and the display (B.5) will show zero.

The automatic downfeed is started by activating the green button (B.2). The total downfeed set on the decade switch (B.7) will be loaded into display (B.5).

For every table- or saddle reversal the value in (B.5) will be reduced by the feed rate set in μ m or tenths (.0001") on decade switch (B.8).

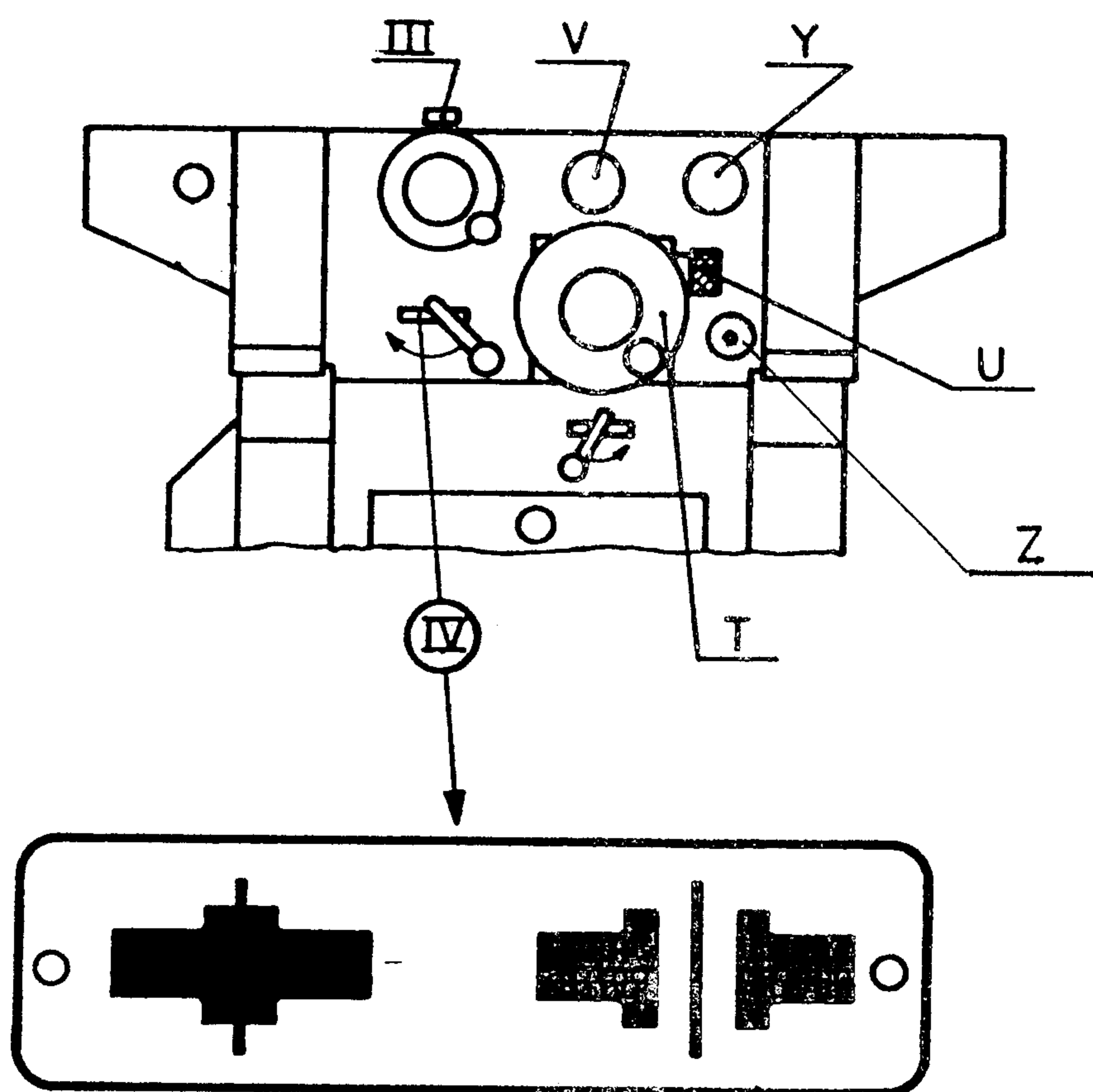
By activating the red button (B.3) during the grinding operation the automatic downfeed will stop untill being started again by activating the green button (B.2).

DOUBLE SADDLE LOCKING DEVICE

The locking of the cross saddle is made by turning the lever (IV) to the left - as shown by symbols, when the desired position of the cross saddle has been reached.

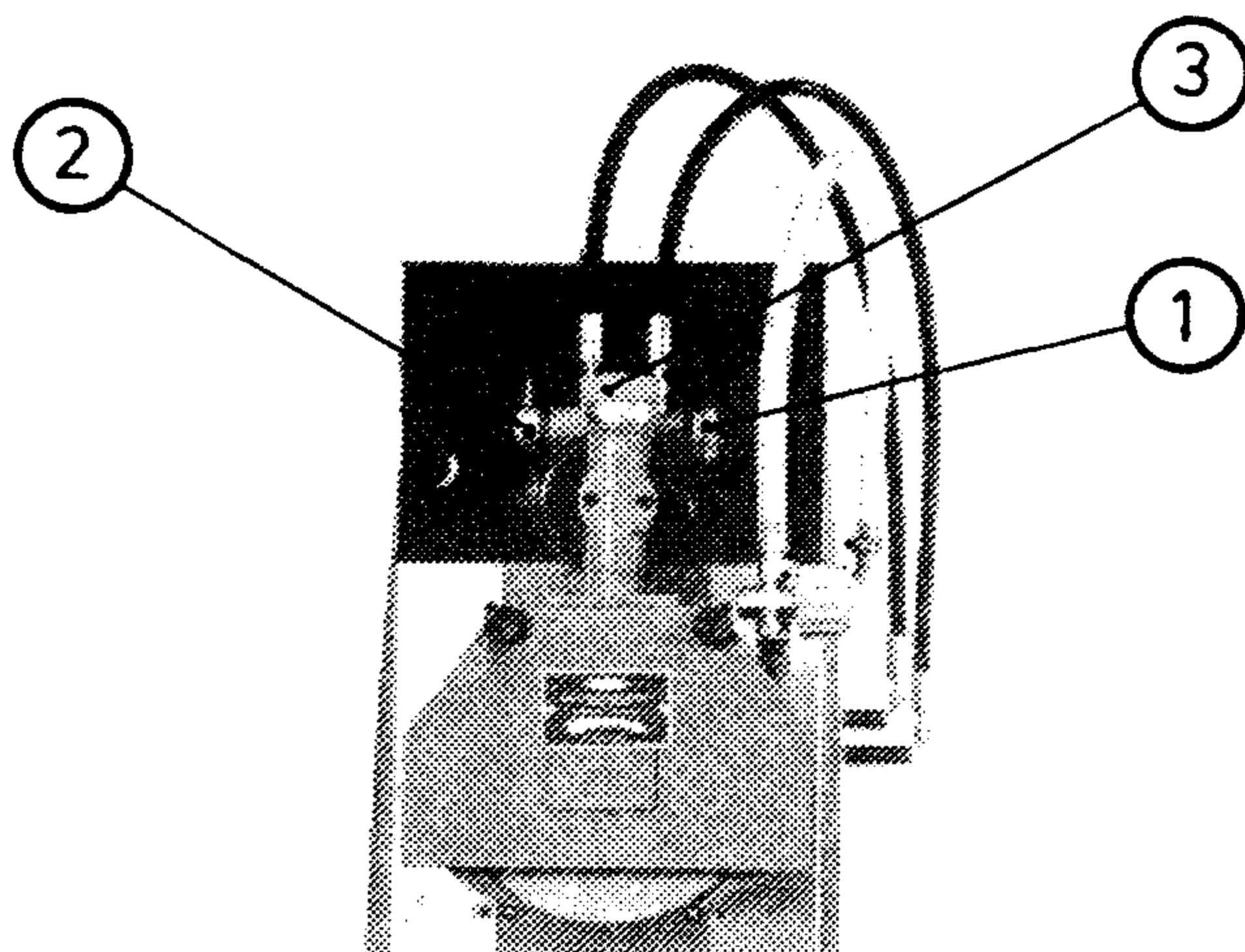
By positioning the cross saddle use the manual cross movement as described on page 7.

BE SURE THAT THE LOCKING MECHANISM HAS BEEN DISENGAGED BEFORE MOVING THE SADDLE.



HYDRAULIC WHEEL DRESSING ATTACHMENT (Optional equipment)

The hydraulic wheel dresser is mounted on top of the wheel spindle assembly and permits straight-line dressing of wheels up to 25 mm (1.000") width.



Feed the diamond across the wheel by turning the lever (2) to forward position (towards the operator).

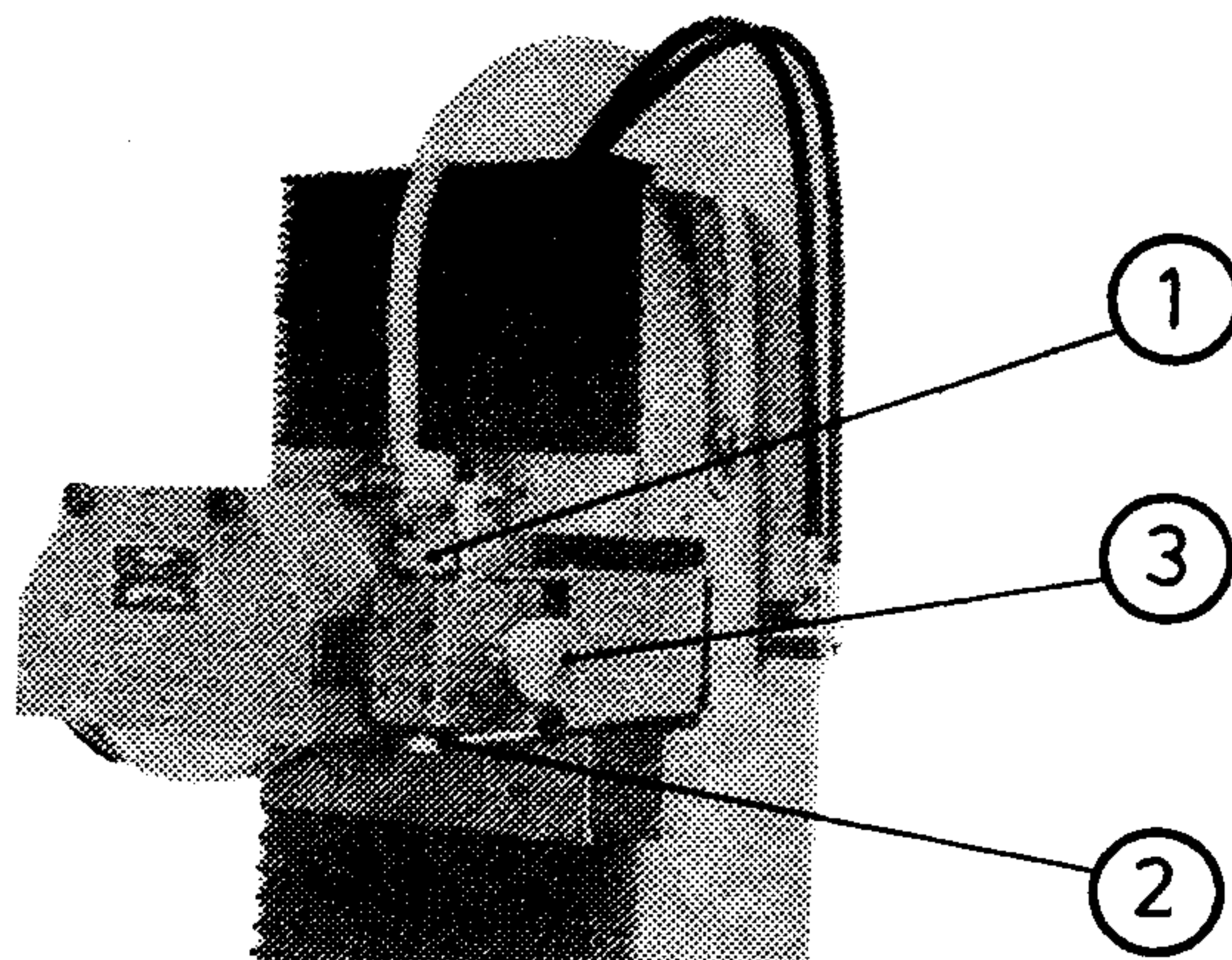
The diamond is fed down vertically by means of the knob (3) and the speed by which the diamond is fed across the wheel face is adjusted by means of the knob (1).

By irregular movement of the dresser, clear the cylinder of air by setting the knob (1) at max. speed and let the piston bottom 5-6 times in inner and outer position.

WHEN DRESSING THE WHEEL IN A PLUNGE GRINDING OPERATION
THE HANDLE (V) FOR REGULATION OF TABLE SPEED MUST BE
TURNED TO BLUE MARK POSITION.

HYDRAULIC WHEEL DRESSING ATTACHMENT (optional equipment)

The Hydraulic wheel dresser is mounted on the right-hand side of the wheel spindle assembly and permits straight-line dressing of wheels up to 38 mm (1.500") width.



Feed the diamond across the wheel by turning the lever (2) to forward position (towards the operator).

The diamond is fed down vertically by means of the knob (3) and the speed by which the diamond is fed across the wheel face is adjusted by means of the knob (1).

By irregular movement of the dresser, clear the cylinder of air by setting the knob (1) at max. speed and let the piston bottom 5-6 times in inner and outer position.

WHEN DRESSING THE WHEEL IN A PLUNGE GRINDING OPERATION THE HANDLE (V) FOR REGULATION OF TABLE SPEED MUST BE TURNED TO BLUE MARK POSITION.

Note:

THE DRESSER WILL BREAK POWER TO HYDRAULIC PUMP MOTOR IF DRESSER NOT LOCKED FIRMLY IN DRESSING POSITION OR PLACED IN REAR POSITION AGAINST STOP.

IT IS RECOMMENDED AT LEAST ONCE A MONTH TO SCREW OUT FULLY THE DIAMOND-HOLDER FROM DRESSERHEAD BY MEANS OF THE KNOB (3). LUBRICATE DIAMONDHOLDER WITH LUBRICATION OIL AND REMOUNT SAME IN DRESSERHEAD.

BALANCING OF GRINDING WHEEL

The grinding wheel is mounted on the hub and dressed until it is round. Eventually the fuses are dressed until they are running.

ALWAYS USE SHARP DIAMONDS FOR EFFICIENT DRESSING.

Instruction in use of the hydraulic dresser, see page 12 and 13.

Balancing of grinding wheel

Balancing of hub and grinding wheel takes place by means of a balancing arbor and a balancing stand, while all balancing weights are removed from the hub. When the heaviest place has been found, place on of the weights 180° from this point, and by placing and moving the other weights symmetrically in relation to the first one, the unit is balanced as carefully as possible.

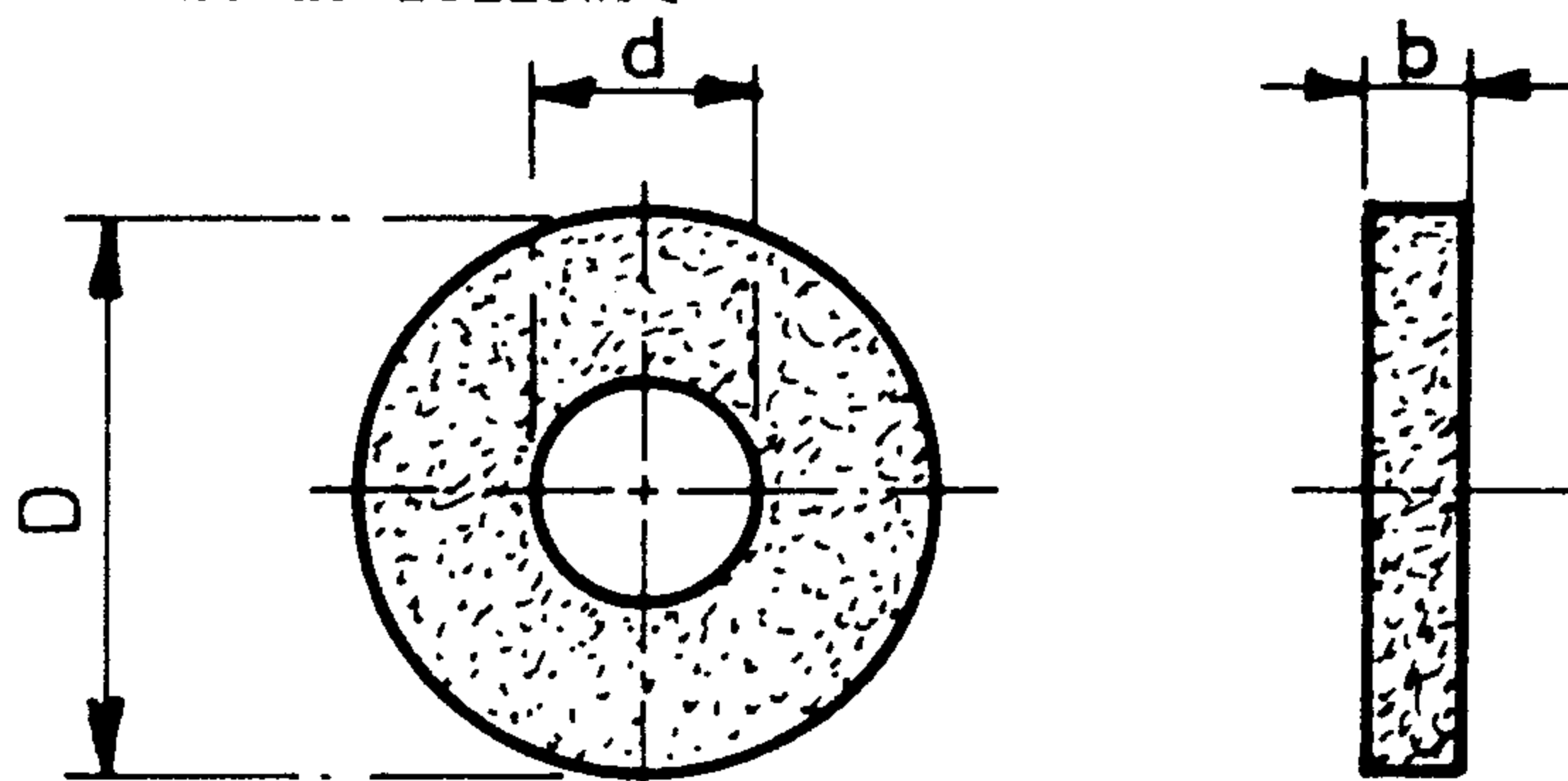
For dressing and balancing of the grinding wheel the following procedure is suggested:

1. Mount the grinding wheel on the hub and place the whole unit on the wheel spindle.
Attention: the nut which holds the hub to the wheel-spindle has left-hand thread.
2. Dress the grinding wheel.
3. Remove the wheel assembly from the wheelspindle and balance the wheel as described above.
4. Remount assembly on the wheel spindle and redress wheel before starting grinding.

GRINDING WHEELS

The machine is supplied with a general purpose wheel suitable for most materials. It will however be recommendable to contact a wheel manufacturer to get advice in selecting the right type of wheel for any particular job.

The wheel sizes are as follows:



TYPE SJ	Hz	D	d	STANDARD b	EXTRA b
618	50	200	76,2	25	38
618	60	8"	3"	1"	1½"

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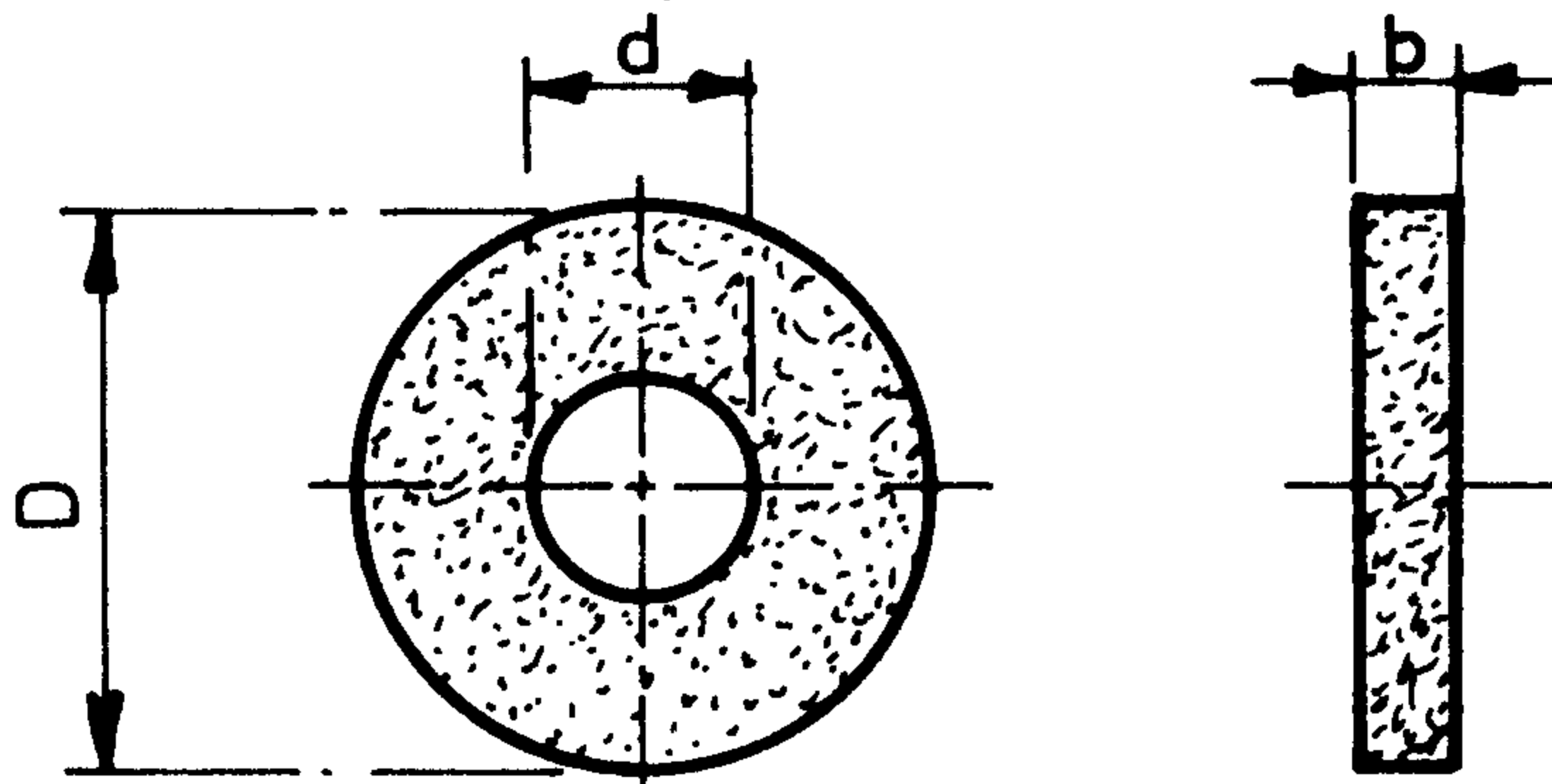
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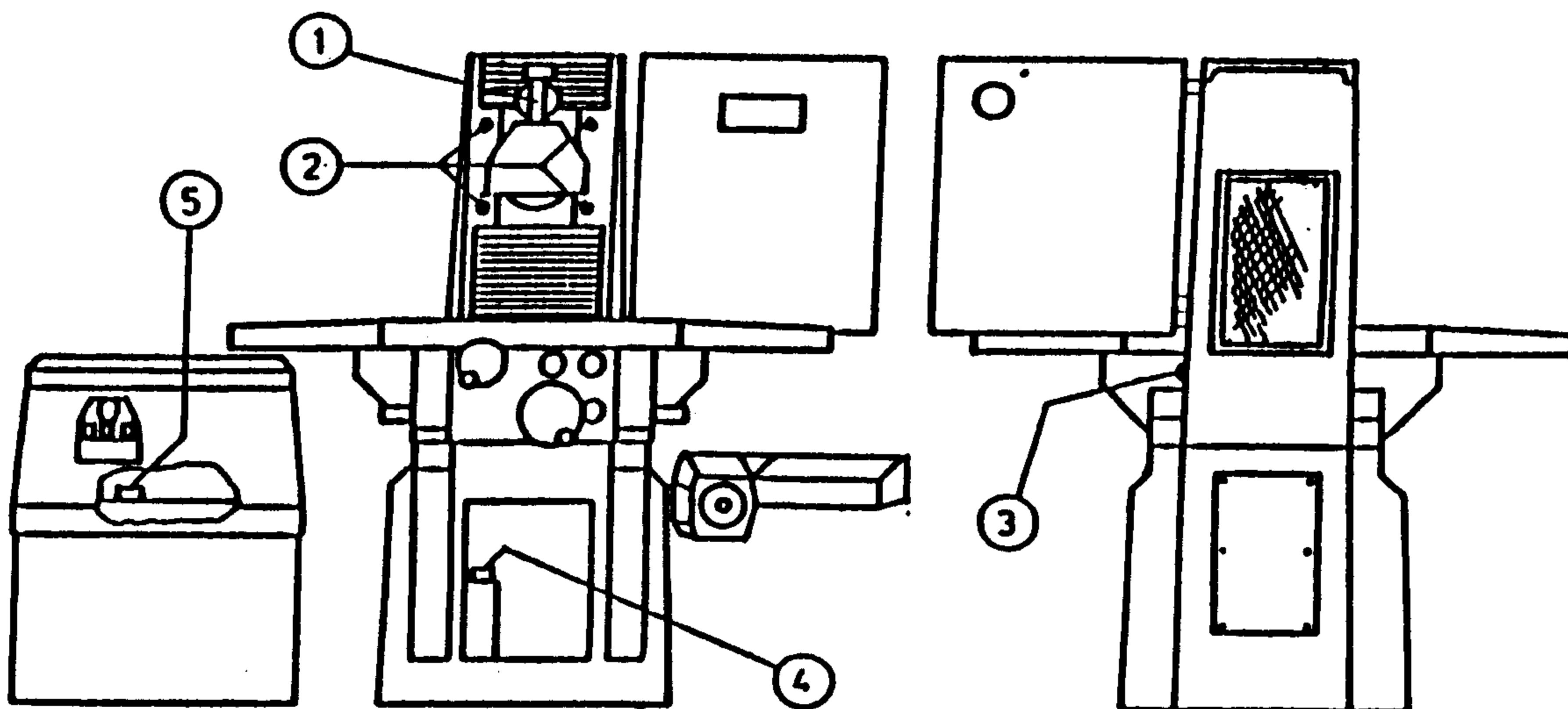


TYPE SJ	Hz	D	d	STANDARD b	EXTRA b
1026/1032	50/60	350mm	127mm	40mm	50mm
1424/1432	50/60	350mm	127mm	50mm	76mm

**SMØRESKEMA
LUBRICATION SYSTEM
SCHMIERTABELLE**

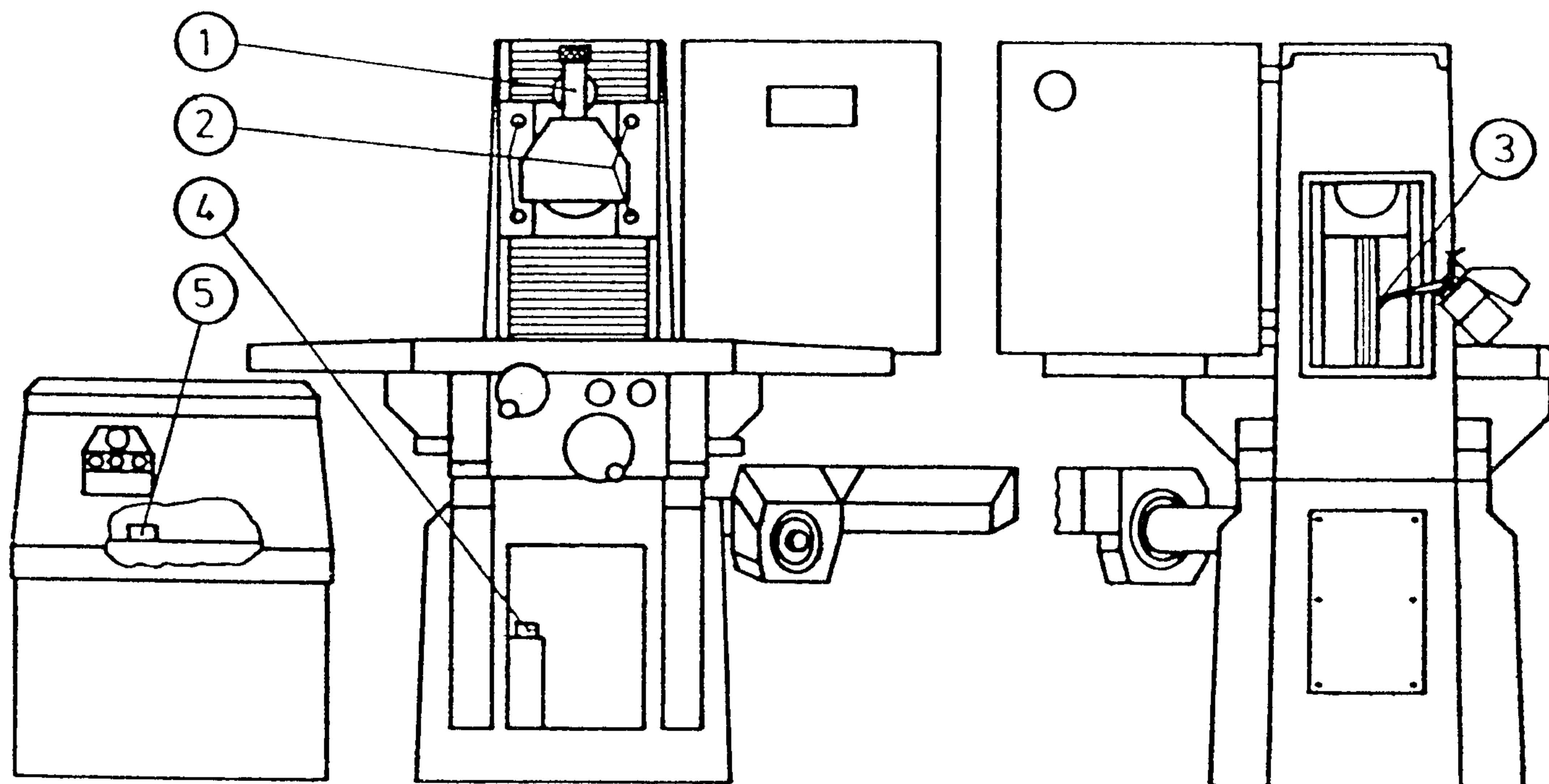
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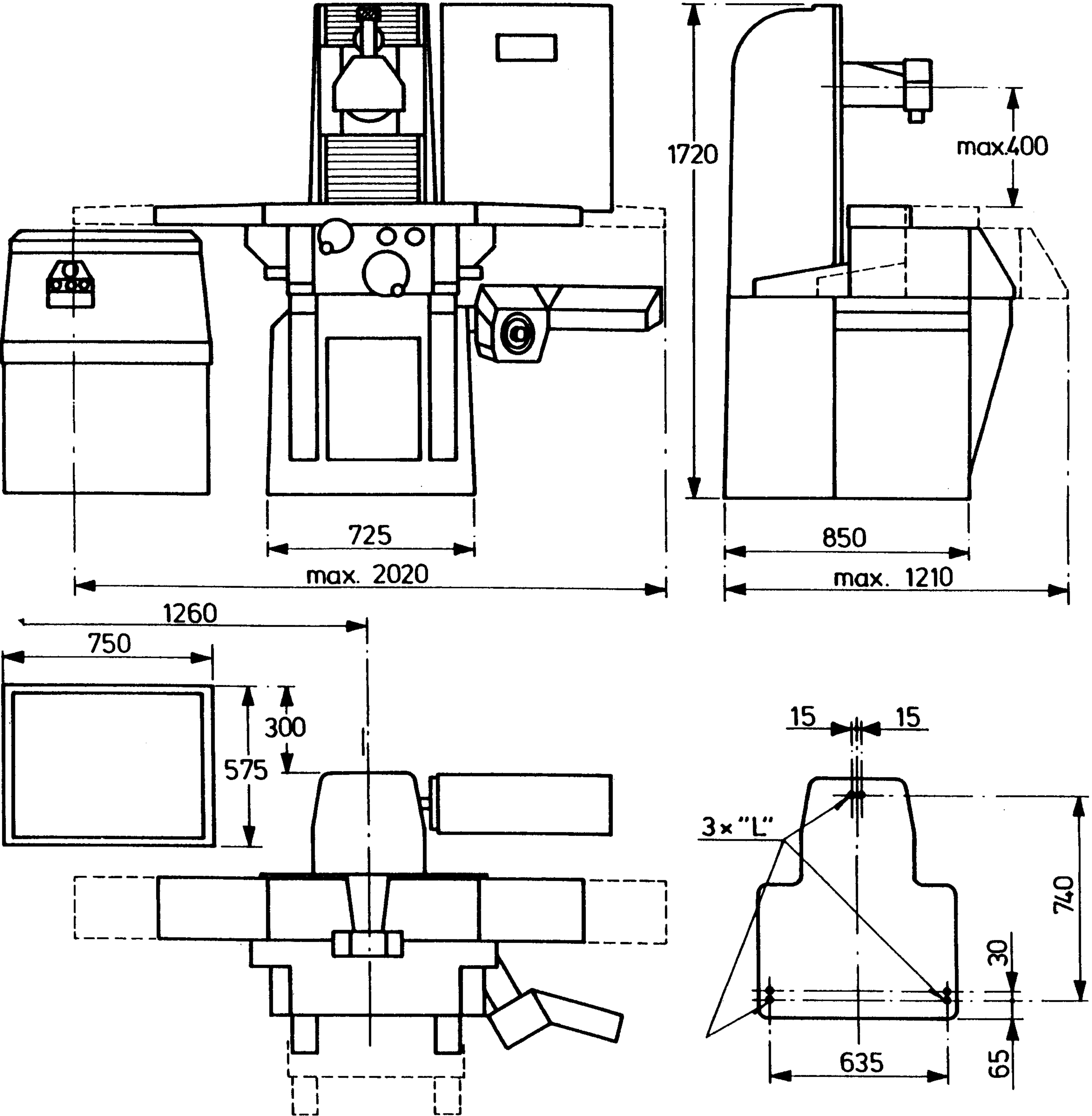
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POS.	SMØRESTEDER LUBRICATION POINTS SCHMIERSTELLEN	INTERVAL INTERVAL INTERVALLE	MOBIL	SHELL	ESSO	Q 8	TEXACO	CASTROL	BP	
1.	AFRETTER WHEEL DRESSER ABRICHTER	HVER UGE WEEKLY JEDE WOCHE	VACTRA NR. 2	TONNA T. 68	FEBIS K. 68	WAGNER Q8 68	WAY LUBRIC 68	MAGNA 68 BDX	MACCURAT 68	
2.	SPINDELSLÆDE SPINDLE SLIDE SPINDELSCHLITTEN	HVER UGE WEEKLY JEDE WOCHE								
3.	VERTIKALSPINDEL VERTICAL LEADSCREW VERTIKALSPINDEL	HVER UGE WEEKLY JEDE WOCHE								
4.	SMØREOLIEBEHOLDER LUBR. OIL TANK SCHMIEROLBEHÄLTER	HVERT AR YEARLY JÄHRLICH								CAPACITY 5 LITR.
5.	PUMPESTATION HYDR. PUMP UNIT HYDRAULIKSTATION	HVERT AR YEARLY JÄHRLICH	VACUOLINE 1405	TONNA T. 32	NUTO H. 32	HAYDN Q8 46	REGAL R&O 32	MAGNA GC 32	HLP-D 32	CAPACITY 110 LITR.

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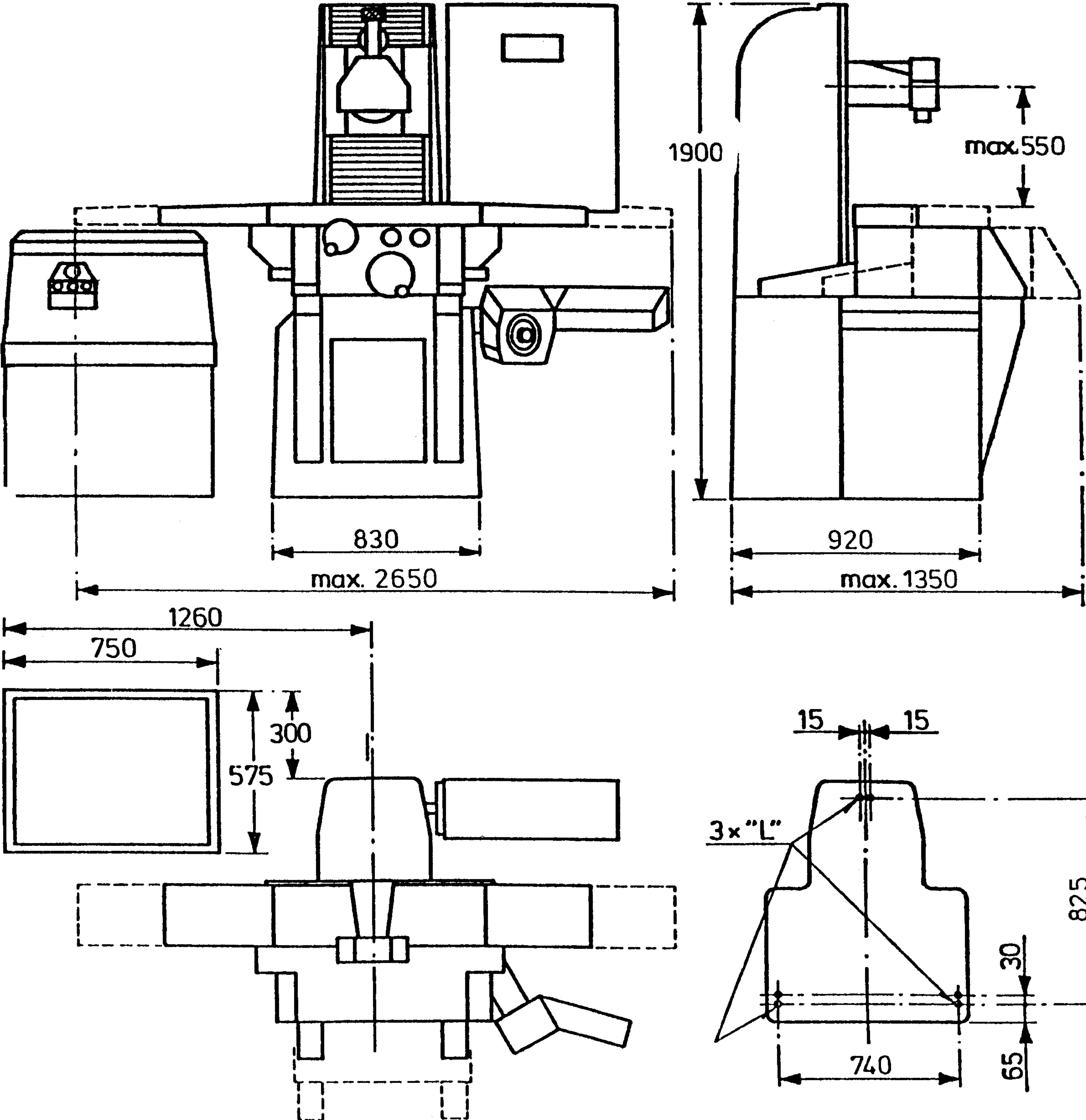


			OLIE - OIL - ÖL						
POS	SMØRESTEDER LUBRICATION POINTS SCHMIERSTELLEN	INTERVAL INTERVAL INTERVALLE	MOBIL	BP	TEXACO	CASTROL	ESSO	GULF	SHEEL
1	AFRETTER WHEEL DRESSER ABRICHTER	HVER UGE WEEKLY JEDE WOCHE	VACTRA NR2	MACCURAT 68	WAY LUBRIC D	MAGNA BD 62	FEBIS K 68	GULF WAY 52	TONNA 68
2	SPINDELSLÆDE SPINDELSLIDE SPINDELSCHLITTEN	HVER UGE WEEKLY JEDE WOCHE	VACTRA NR2	MACCURAT 68	WAY LUBRIC D	MAGNA BD 62	FEBIS K 68	GULF WAY 52	TONNA 68
3	VERTIKALSPINDEL VERTICAL LEADSCREW VERTIKALSPINDEL	HVER UGE WEEKLY JEDE WOCHE	VACTRA NR2	MACCURAT 68	WAY LUBRIC D	MAGNA BD 62	FEBIS K 68	GULF WAY 52	TONNA 68
4	SMØREOLIEBEHOLDER LUBRICATION OIL TANK SCHMIERÖLBEHÄLTER	UDSKIFT HVER ÅR ONCE A YEAR JÄHRLICH UMWECHL	VACTRA NR2	MACCURAT 68	WAY LUBRIC D	MAGNA BD 62	FEBIS K 68	GULF WAY 52	TONNA 68
5	PUMPESTATION HYDRAULIC PUMP UNIT HYDR. PUMPENEINHEIT	UDSKIFT HVER ÅR ONCE A YEAR JÄHRLICH UMWECHL	VACUOLINE 1405	HLP-D 32	REGAL OIL A	MAGNA GC 32	NUTO HP 32	HARMONY 47	TONNA 32
									CAPACITY 110 LITRES

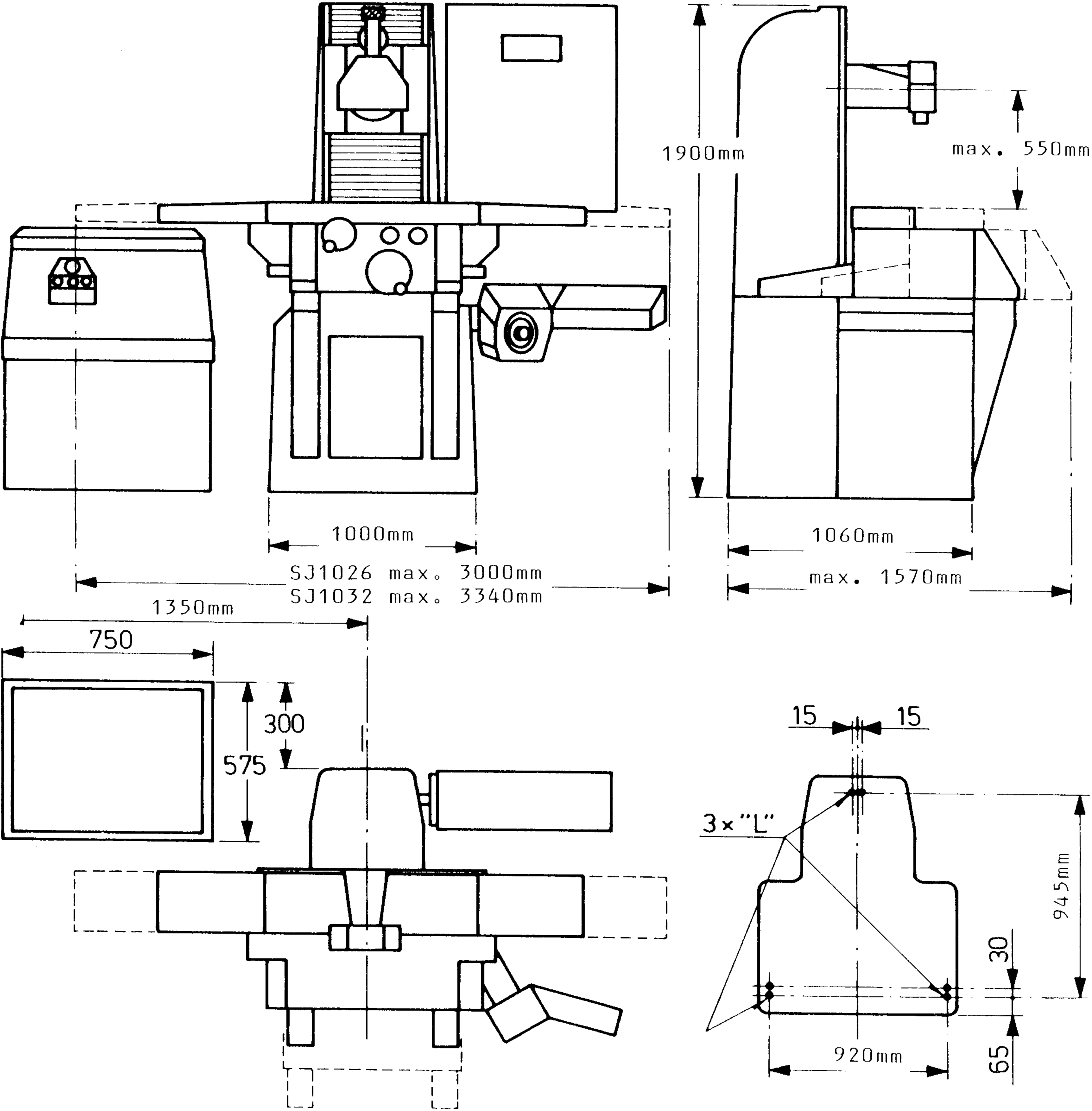
618	FUNDAMENTSPLAN FOUNDATION FUNDAMENT	16 22
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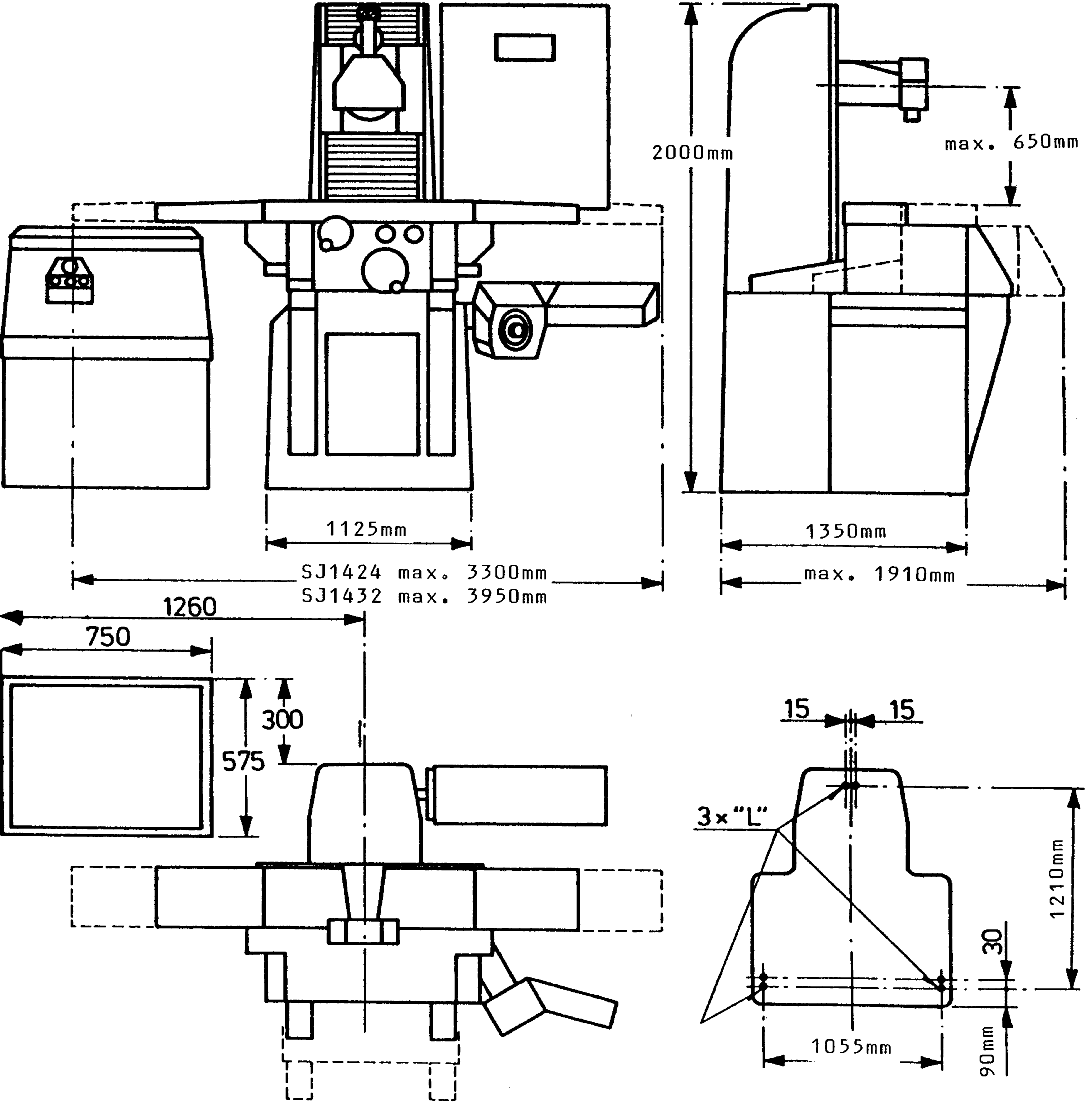
824	FUNDAMENTSPLAN FOUNDATION FUNDAMENT	16 22
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SJ1026/ SJ1032	FUNDAMENTSPLAN FOUNDATION FUNDAMENT	16 23
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SJ1424/ SJ1432	FUNDAMENTSPLAN FOUNDATION FUNDAMENT	16 23
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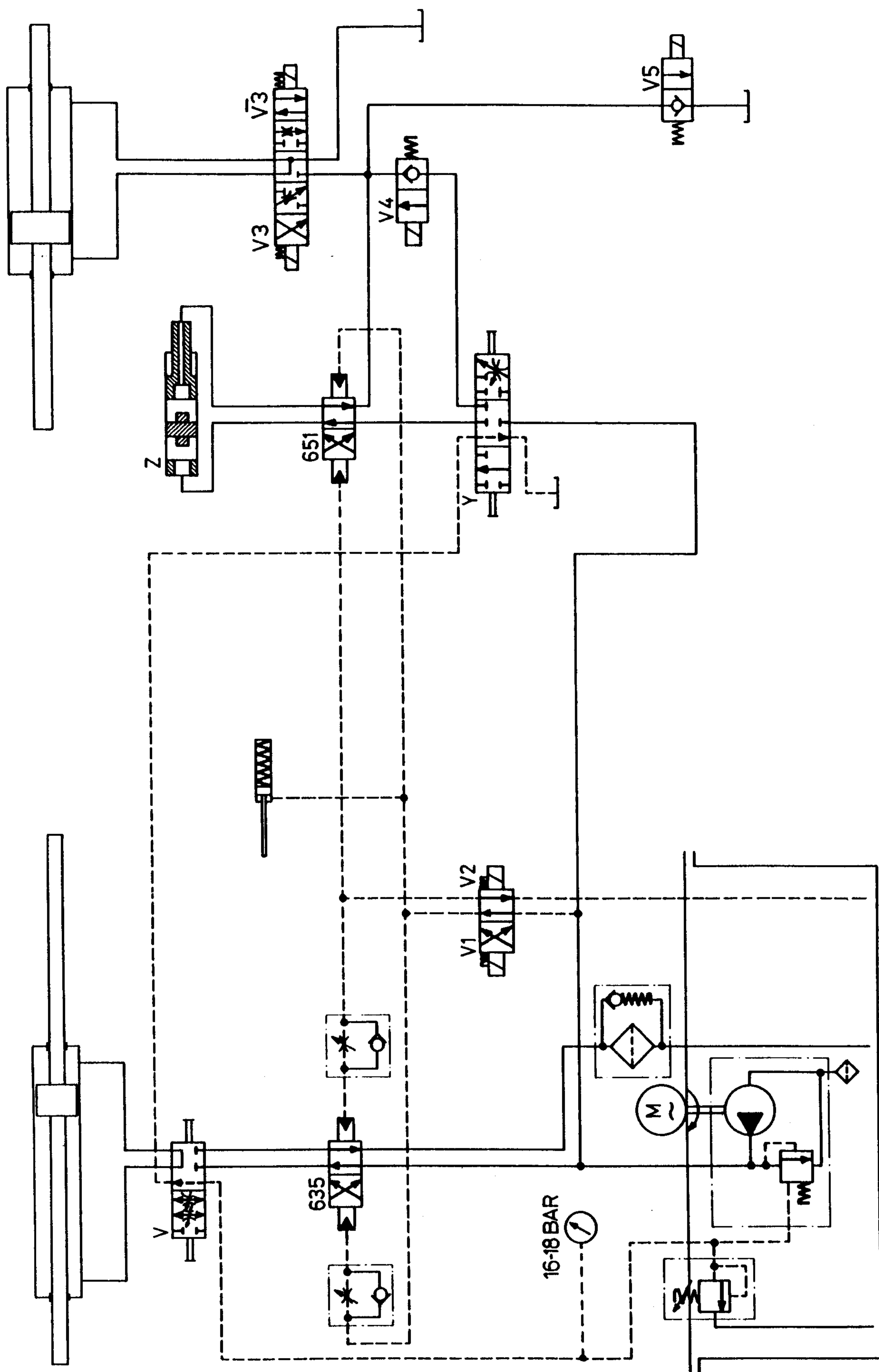
VALVE FUNCTIONS

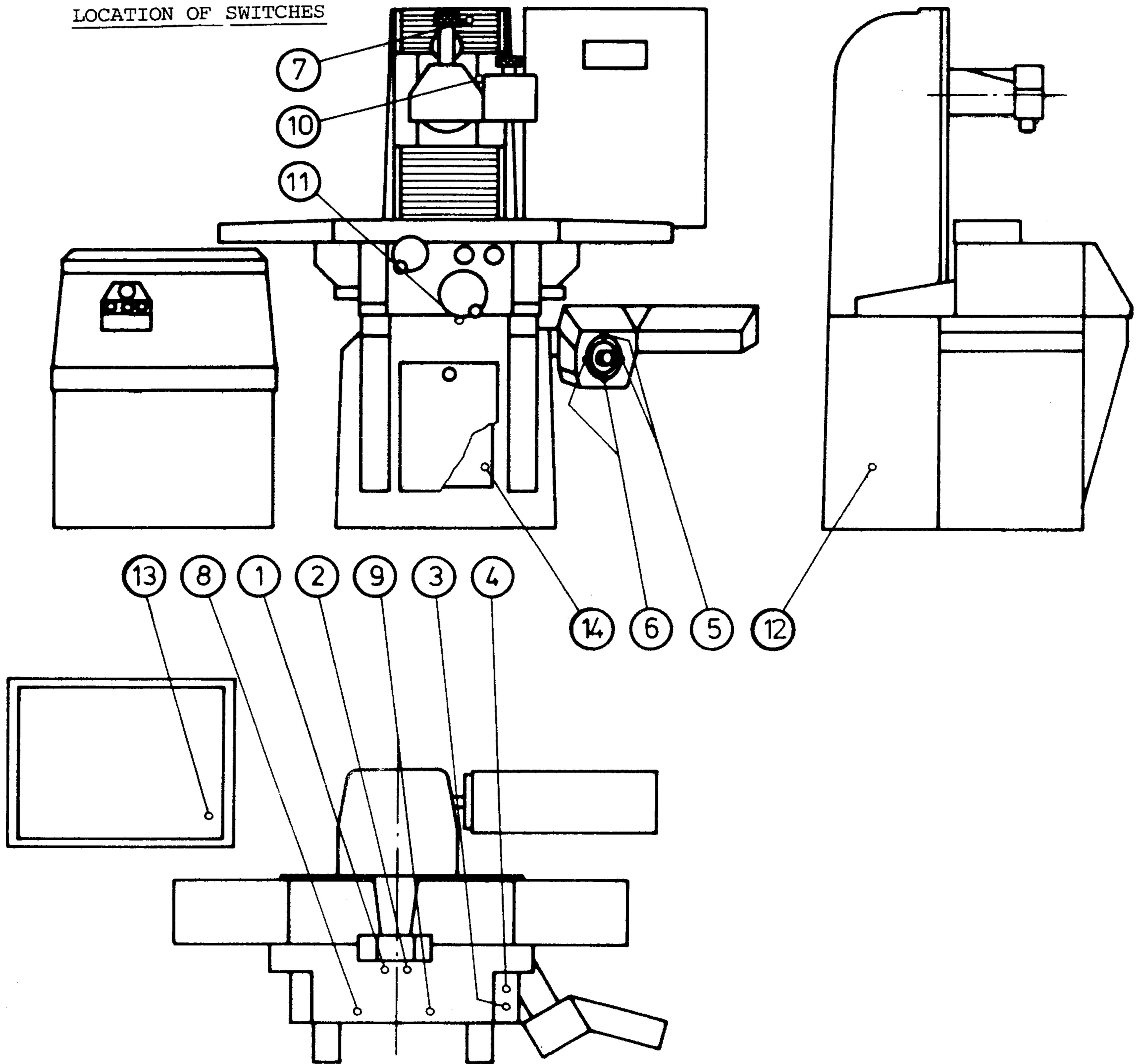
	RED MARK:	STOP, manual table movement
V : Speed valve, table movement	BLUE MARK:	Continuous cross feed
	GREEN MARK:	Max. table speed
V1:	Magnetic valve f. longitudinal movement, right	
V2:	Magnetic valve f. longitudinal movement, left	
$\overline{V3}$:	Magnetic valve f. directions of cross movement	
V3		
V4:	Magnetic valve f. stop of continuous cross movement	
V5:	Magnetic valve for relief of cross movement	
X :	Handle for manual cross feed	
	Continuous movement	
Y : Speed valve, cross movement	STOP	
	Intermittent	
Z :	Impuls valve, cross movement	

HYDRAULISK SYSTEM
HYDRAULIC SYSTEM
HYDRAULISCHES SYSTEM

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LOCATION OF SWITCHES

pos.	S	Operation	Type
1	HEST	Proximity switch, table reversal, right	Turck B.1 2-G14-40
2	VEST	Proximity switch, table reversal, left	- -
3	BEST	Proximity switch, saddle reversal, back	- -
4	YEST	Proximity switch, saddle reversal, front	- -
5	OEST	Revolution indicator, upper - right	- -
6	NEST	Revolution indicator, lower - left	
7	Q 1	Switch, for vertical movement, upper position	
8	Q 2	Switch, Activated by manual table control	
9	Q 3	Switch, for stop of continuous cross feed	
10	Q 4	Switch, dresser in rear position	
11	Q 5	Switch, activated by manual cross feed	
12	BOX 1	Terminal box, in column	
13	Box 2	Terminal box, hydr. power station	
14	Box 3	Cabinet, electronics for auto. downfeed	

TROUBLE SHOOTING

Machine not grinding parts flat.

1. Excessive heat expands work. Adjust coolant application, downfeed too excessive, table speed too slow, wheel dressed too fine, diamond-tip not sharp.
2. Chuck may not be flat.

Chatter (vibration) marks on work.

1. "Outside" vibrations from other machinery.
2. Grinding wheel not properly balanced.
3. Worn out or too fine dressed wheel.
4. Diamondtip not sharp.
5. Coolant not turned off by stopped wheel creating out of balance condition.

Discoloured spots on work from overheating.

1. Table speed too slow.
2. Not enough coolant or coolant not applied properly.
3. Wheel too hard.
4. Worn out or too fine dressed wheel.
5. Diamondtip not sharp.
6. Downfeed too excessive.

Cross feed lines on work

1. Dresser may need to be realigned

Grain marks on work

1. Wheel too soft
2. Coolant not filtered properly

Hydraulic movements.

1. Check that hydraulic pump is running.
2. Check whether pressure relief is in action. (handle (V) in RED MARK and handle (Y) in STOP position)
3. Check whether cross movement is set for manual crossfeed
4. Check that voltage to magnetic valves is correct.
5. Check proximity switches for table- and saddle reversal.
6. Check power supply.

AC-Motors

1. Check whether an overload has disengaged.
2. Check all fuses.
3. Check whether manual table control has disengaged.
4. Check whether side-mounted wheeldresser is in correct position. (Optional equipment).
5. Check whether el-chuck is engaged (optional equipment).
6. Check main supply.

Vertical movement

(Re specification of components: see E1-diagram - components for box. 3).

Power rapid vertical movement:

1. Check RL2 on stepping motor control.

Continuous movement by stepping motor.

1. Check tooth-belt
2. Check stepping motor control.

For replacing the driver unit

1. Remove plugs TB4 and TB6
2. Unscrew wires to TB6 terminal 9 (blue) and terminal 10 (red).
3. Remove screws A and B. Driver unit can now be removed.
4. Remove ground connections C and D.

No automatic vertical feed.

1. Check continuous movement of stepping motor.
2. Check whether feedimpulses from table reversals appear. (15 volt in 2 mS)
3. Check automatic downfeed mechanism.

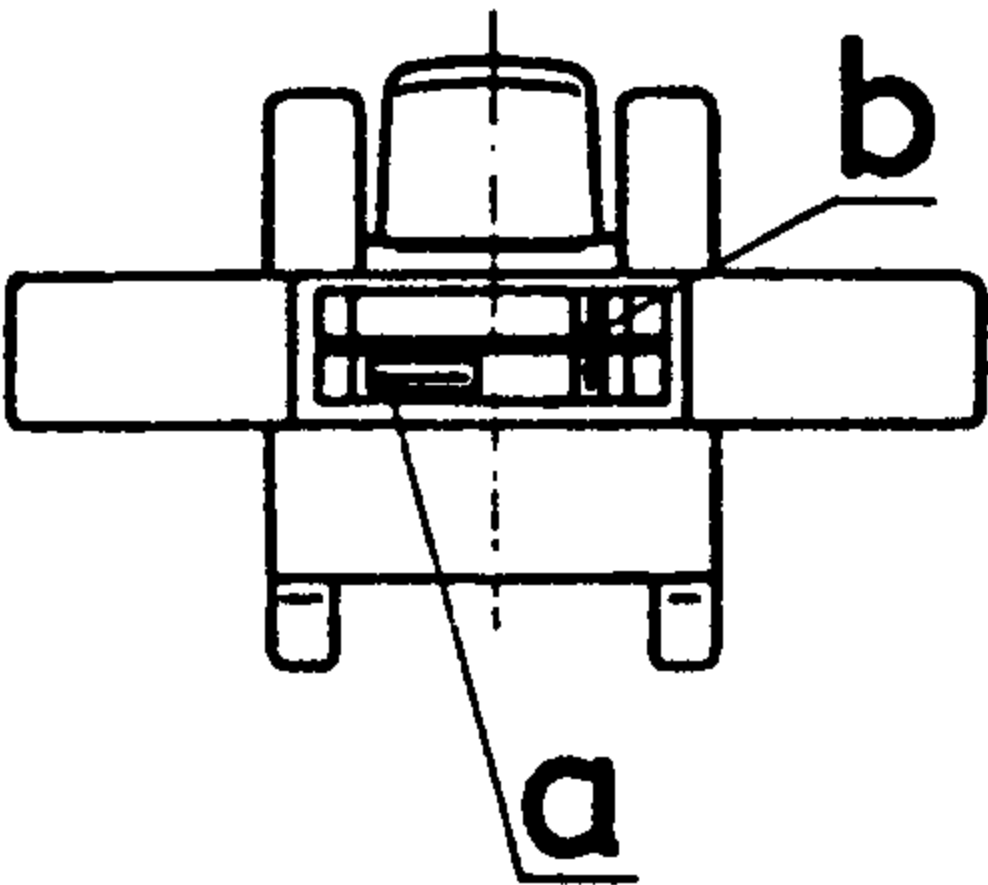
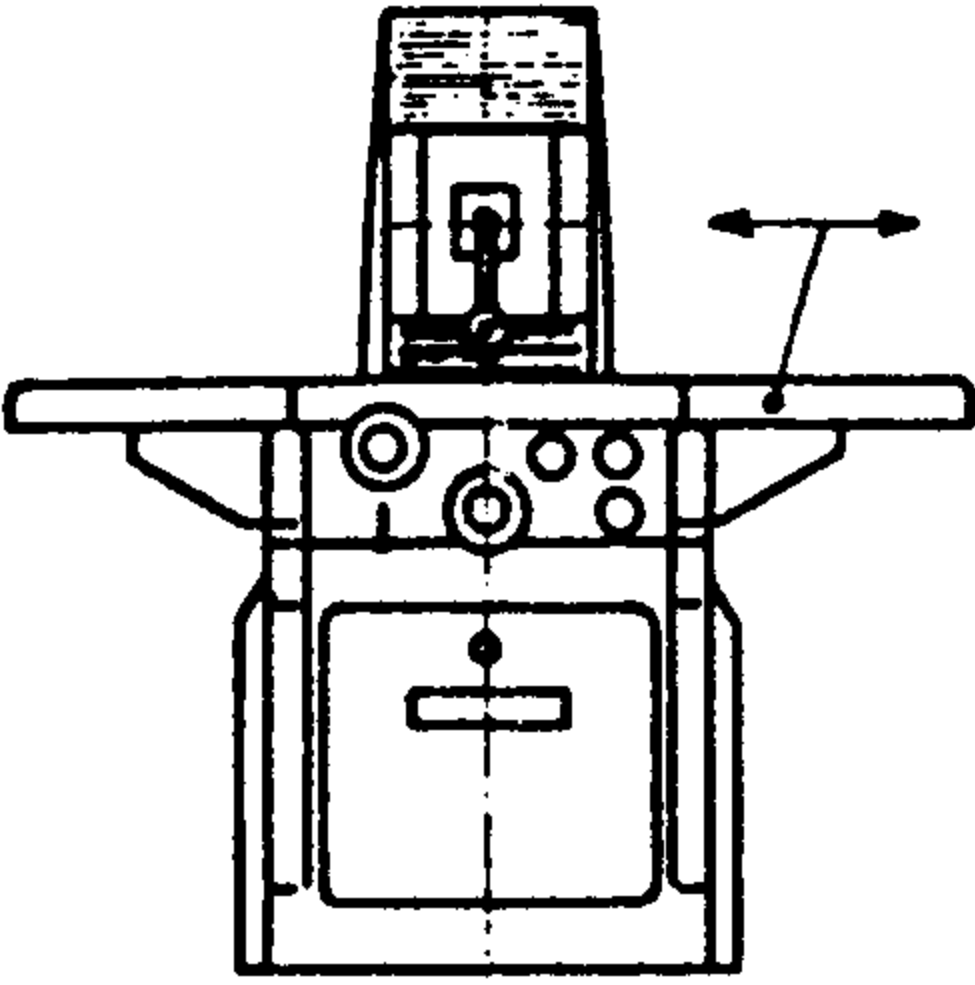
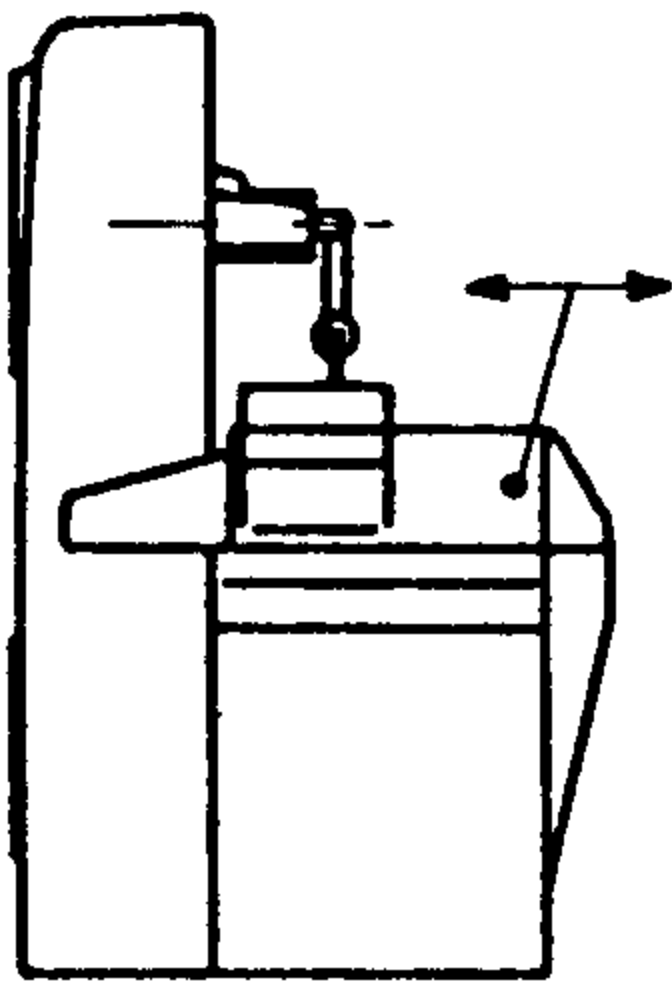
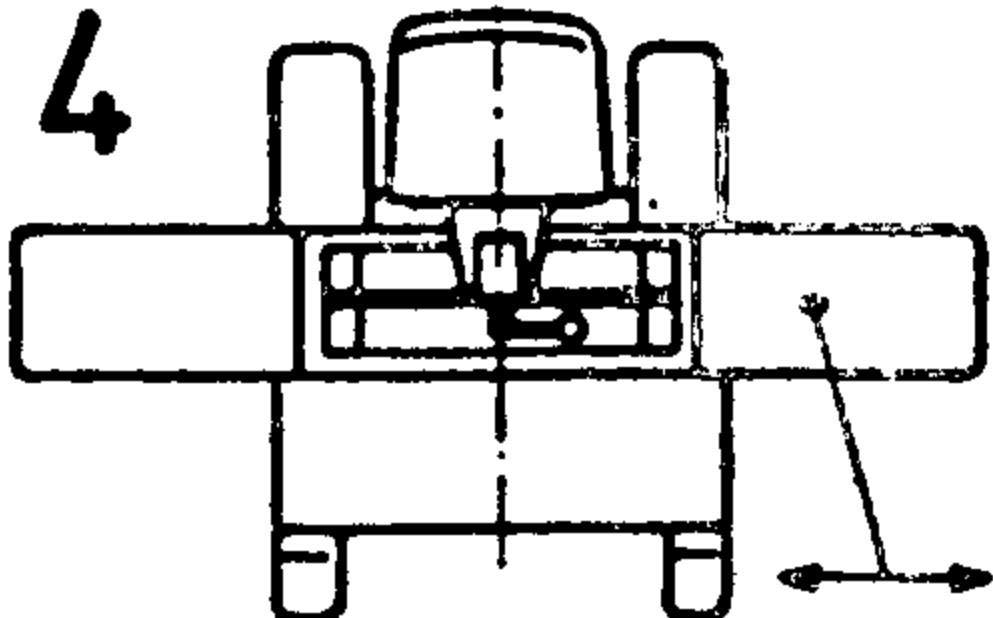
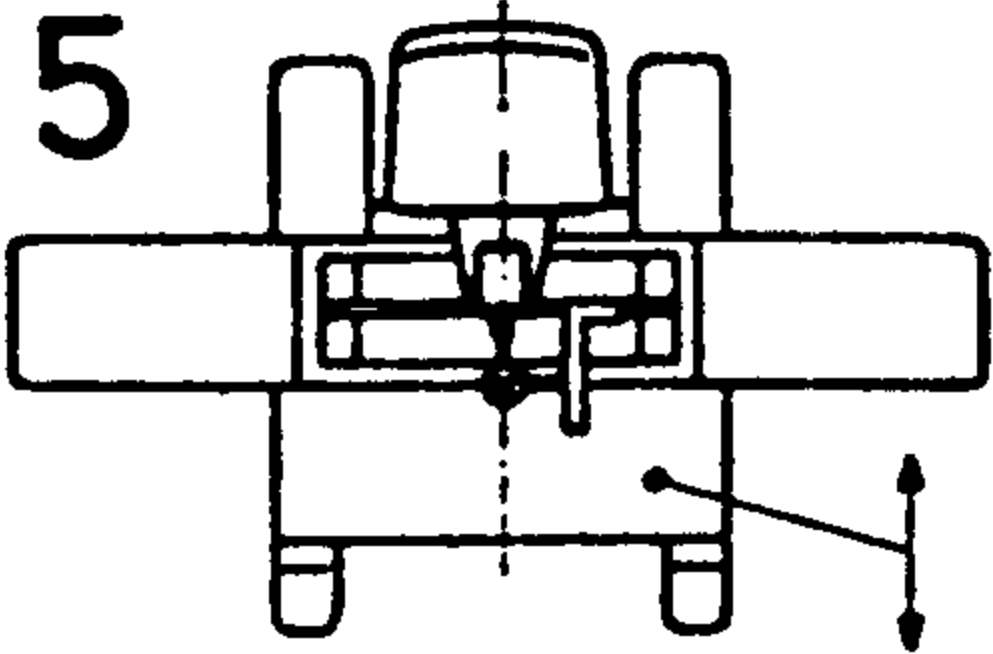
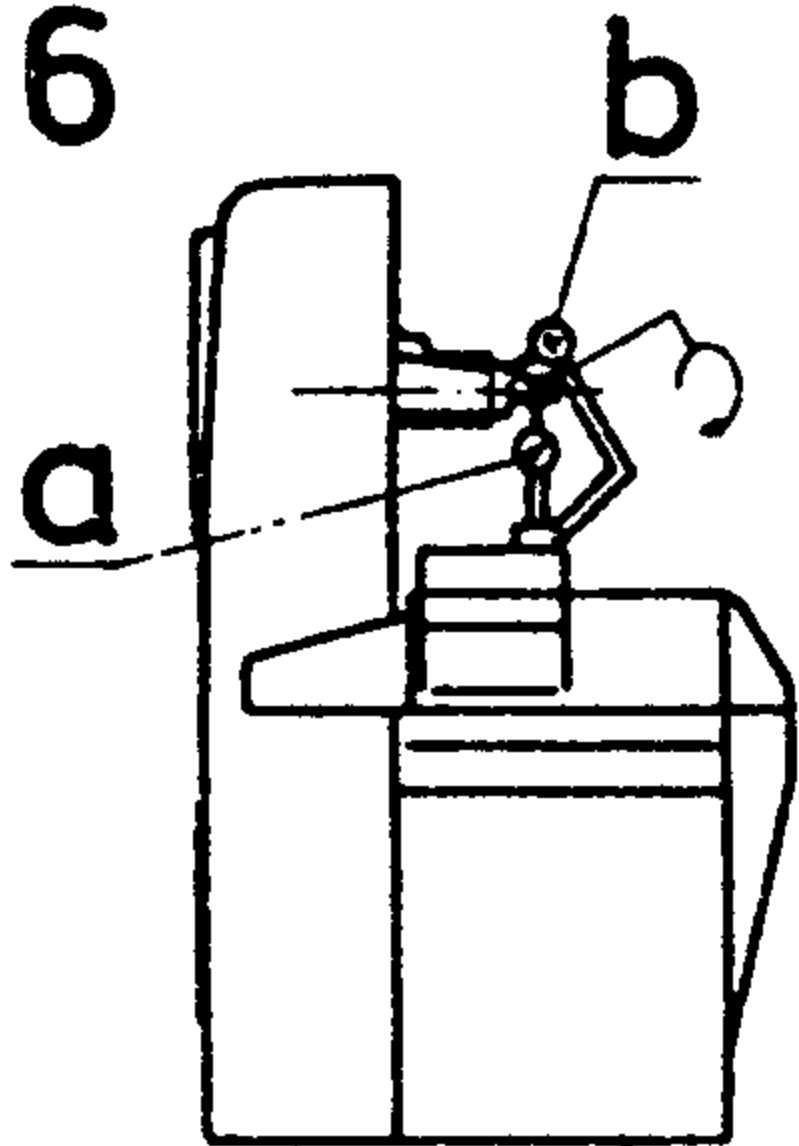
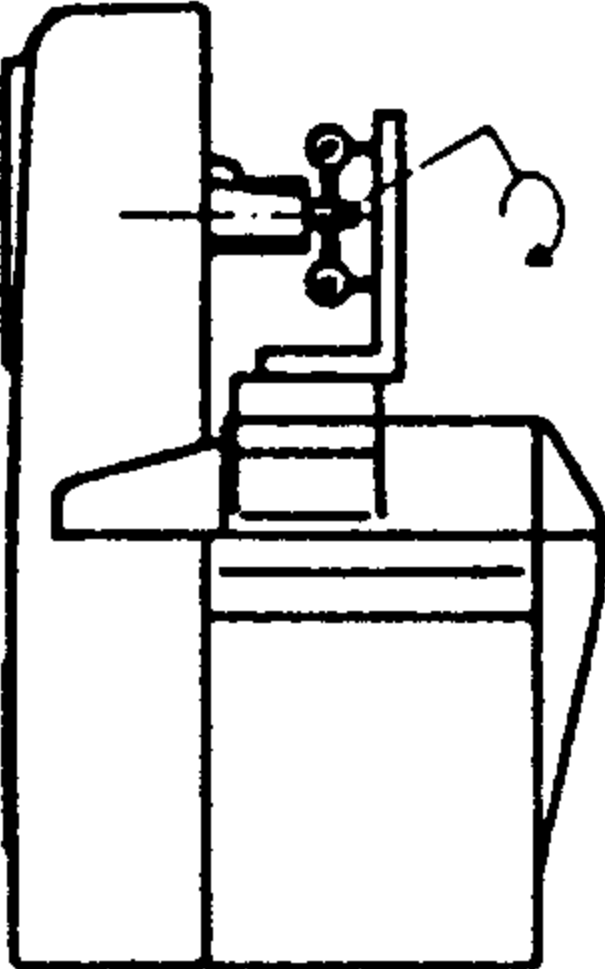
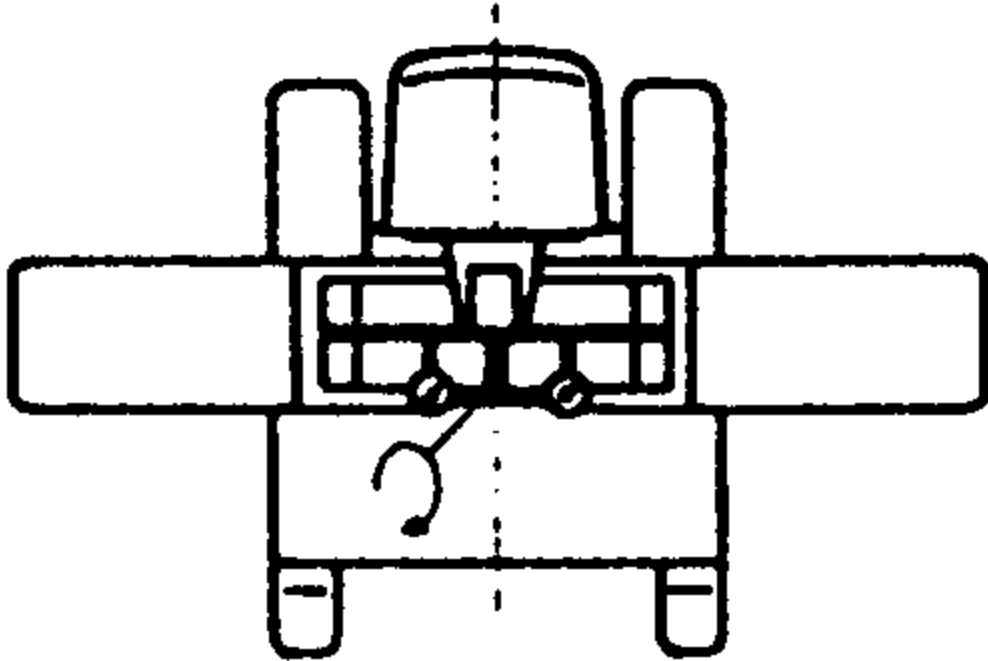
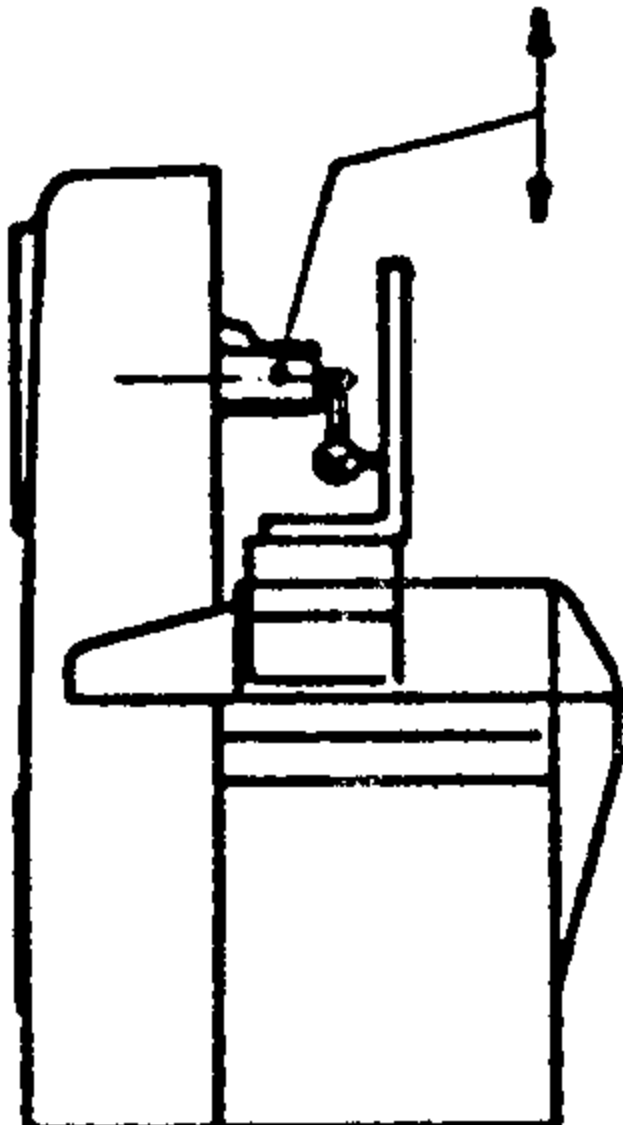
	Test	Tolerance permitted	Tolerance measured
1 a	Bed level – longitudinal direction	0.0008" in 40"	
1 b	Bed level – transverse direction	0.0008" in 40"	
2	Surface of table parallel to the longitudinal travel	0.0006" in 40"	
3	Surface of table parallel to the transversal travel	0.0004" in table width	
4	T-grooves of table parallel to the longitudinal travel	0.0006" in 40"	
5	T-grooves of table at right angles to the transversal travel	0.0012" in 12"	
6 a	Runout of spindle, radial	0.0004"	
6 b	Runout of spindle, axial	0.0004"	
7	Grinding spindle parallel to table. Measured at 180° swivelling Arm 100 mm = 4"	0.0008" in 12"	
8	Grinding spindle at right angles to the T-grooves of table. Measured at 180° swivelling Arm 200 mm = 8"	0.0008" in 12"	
9	Vertical movement of wheelhead at right angles to the transversal direction of table	0.0008" in 4"	
	Accuracy testing of machine in operation:		
	Fine grinding:	0.0004" in 40"	
	Coarse grinding:	0.0012" in 40"	

Kastrup,

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Warranted

Tested by

	ILLUSTRATION TIL PRØVESKEMA ILLUSTRATION FOR TEST CHART ILLUSTRATION FÜR PRÜFKARTE								
1		2		3		4		5	
6		7		8		9			
Elektromotorer - Electrical motors - Elektromotoren									
Spænding Voltage Spannung			V	Frekvens Frequency Frequenz		Hz			
	HK-HP-PS	omdr/min - RPM umdr/min	Serie nr. - Serial no. Serien nr.						
Spindelmotor Spindlemotor Spindelmotor									
Pumpemotor Pumpmotor Pumpenmotor									
Vertikalmotor Verticalmotor Vertikalmotor									