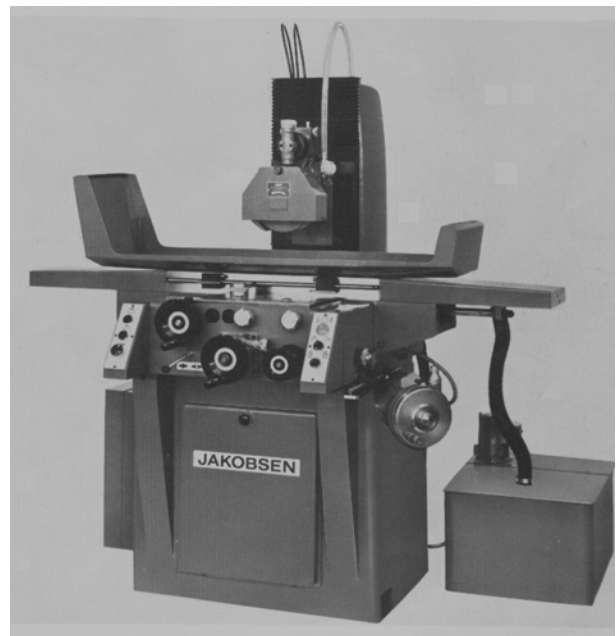


JAKOBSEN

OPERATION MANUAL



SJ25 MACHINE

Version GB

**Jakobsen Planslibemaskiner ApS
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Service@jakobsen-dk.dk**

CHAPTER 1: INSTALLATION

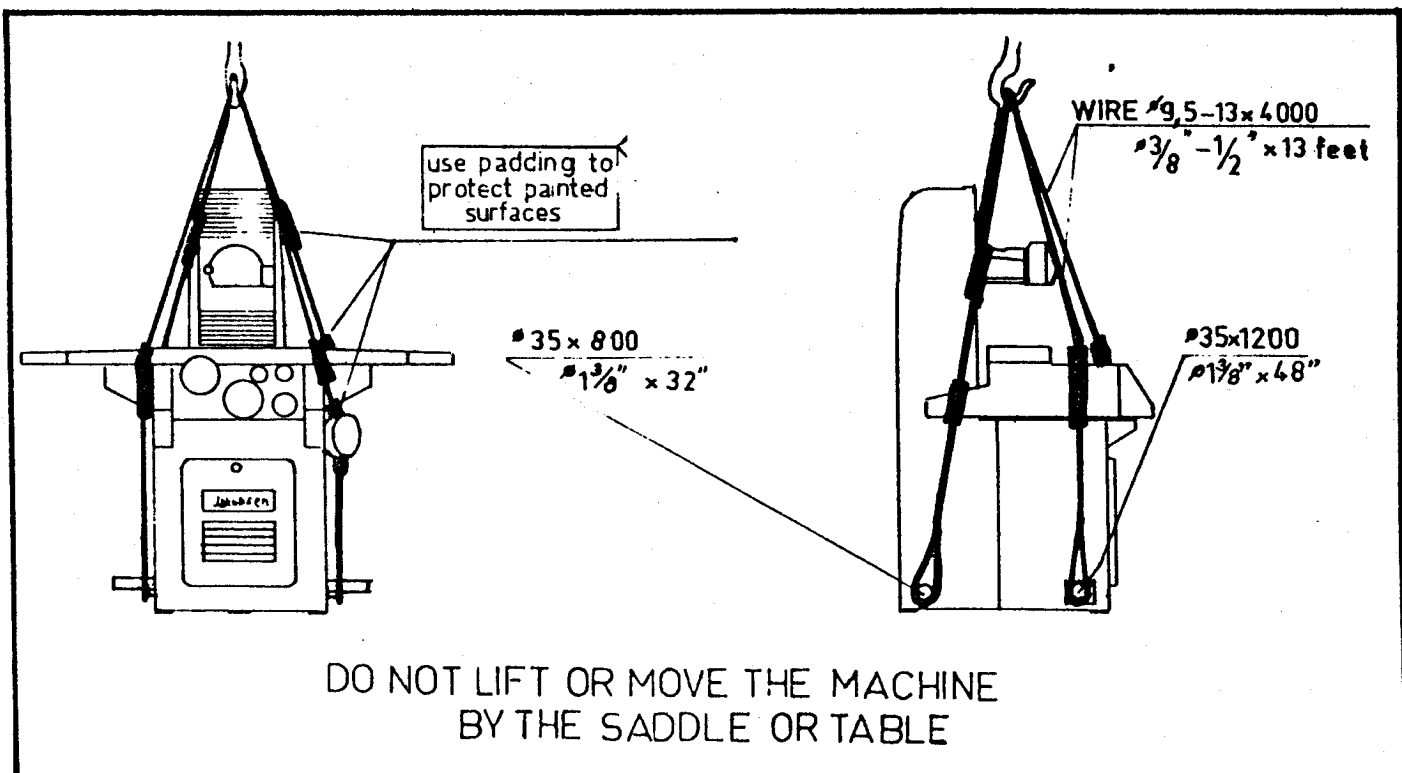
UNCRATING

Your JAKOBSEN Surface Grinder has been carefully crated for shipment to insure its accuracy when it reaches your plant. It is important that the crate is removed carefully so as not to damage the machine.

- 1) Remove table end guards, coolant tank and any other accessories, which have been attached to the bottom of the packing-case.
- 2) Inspect the machine for broken or damaged parts.
- 3) Remove the bolts attaching the machine to the bottom of the packing-case.

LIFTING INSTRUCTIONS

The machine should only be lifted in a manner illustrated below. Use two rods 1 $\frac{3}{8}$ " diameter, one 1200 mm (48") long and the other 800 mm (32"), and two straps approx. 4 m (13 ft) long.



This is the correct method of lifting the grinder

CLEANING

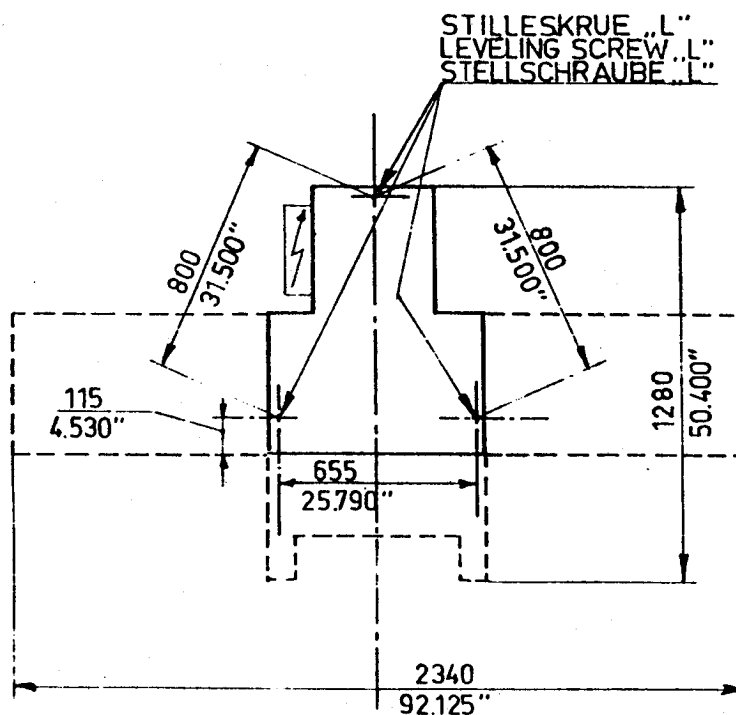
Before shipment all unpainted surfaces were coated with a rust preventive compound. This may be removed by wiping with rags saturated with paraffin oil (petroleum). It is especially important to clean the free ends of the longitudinal guide ways.

After the cleaning compound has been removed, wipe all finished surfaces with a cloth moistened with lubricating oil.

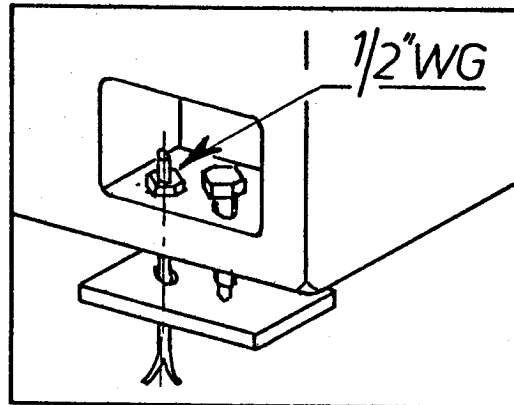
DO NOT MOVE ANY OF THE CONTROLS OR MOVING PARTS UNTIL THE MACHINE HAS BEEN THOROUGHLY CLEANED AND LUBRICATED.

INSTALLATION ON FLOOR

For maximum stability and consistent accuracy of work to be produced on this machine the foundation should be as solid as possible. A special foundation is not necessary. Any floor is suitable provided it is strong enough to support the weight of the machine without vibration.



The machine must be leveled by means of the three leveling screws (L). It is recommended to place three Steel Plates 100 x 100 x 12mm (4" x 4" x $\frac{1}{2}$ ") as baseplates under the leveling screws.

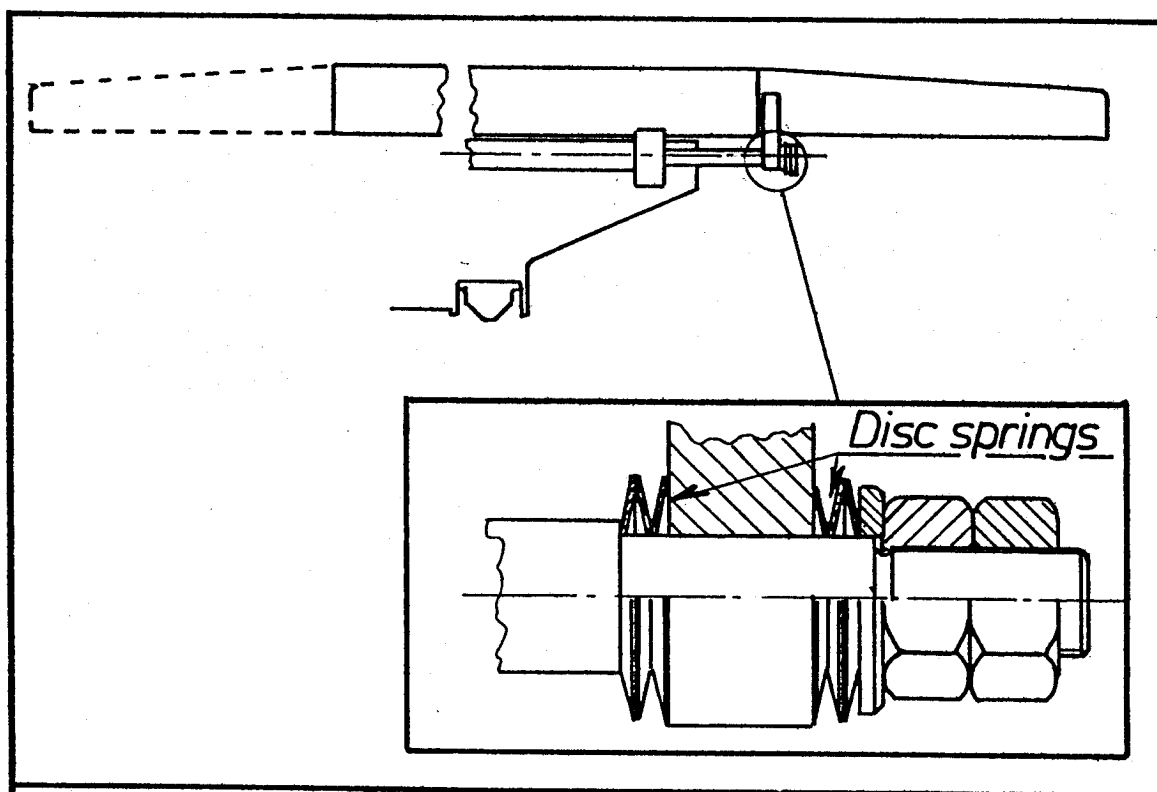


With a machine spirit level placed on the ground top surface of the table, level first the machine in the longitudinal direction and thereafter crosswise whereupon the longitudinal direction is controlled again.

NOTE: IT IS A CONDITION FOR THE ACCURACY OF THE MACHINE THAT IT IS LEVELED BY MEANS OF THE THREE LEVELING SCREWS POS. L.

ASSEMBLY

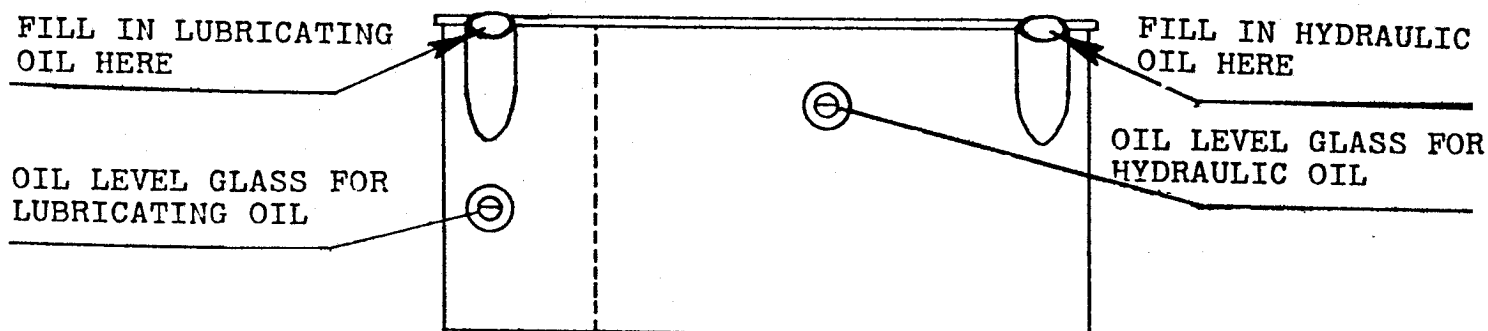
Fasten the left-hand-side table end guard to the table by means of the screws placed in the table end.



OILFILLING

Remove front cover from base of the machine and fill in Hydraulic oil at the right hand side of the oil tank to the centre of the oil level glass. The capacity of the tank is approx. 15 litres (3.4 gallons).

The lubricating oil is filled in the left hand side of the tank. The tank contains approx. 2,5 litres (0.5 gallon)



We recommend Mobiloil VACOLINE 1405 as hydraulic oil, but other Makes can also be used in accordance with the lubrication chart page 20.

As lubricating oil we recommend Mobil oil VACTRA No.2 or as stated in the lubrication chart page 20.

Regarding lubricating points and change and control of oil level, see page 20.

ELECTRICAL CONNECTIONS

Before connecting the machine to the power supply make sure that the supply corresponds with the setting of the motors stated in the control cabinet.

The power supply is connected in the control cabinet at the right hand side of the machine column.

Control the direction of rotation by means of the wheel spindle without wheel flange and wheel. The spindle should rotate clockwise as seen from the front.

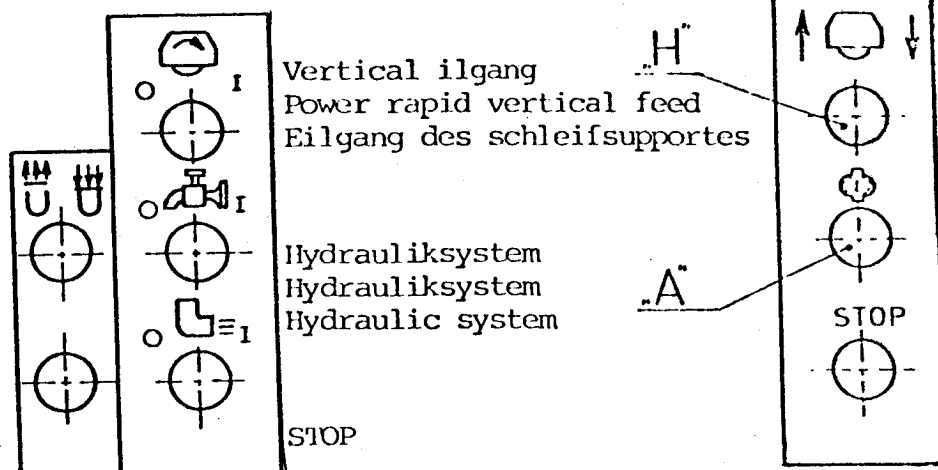
If the spindle does not rotate clockwise, two of the main phases must be interchanged and all motors will then automatically have the correct direction of rotation.

PUSH BUTTON CONTROLS

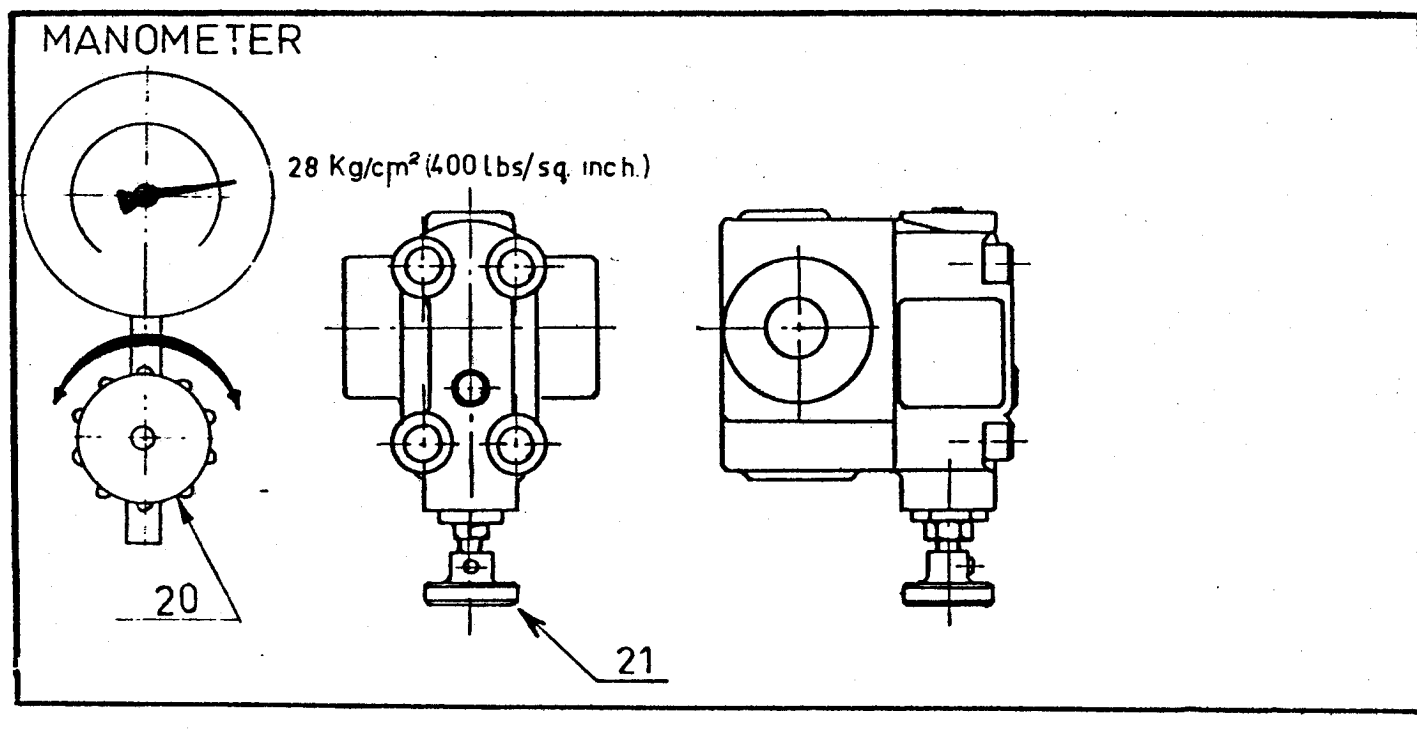
Slibeskive
Grinding wheel
Schleifscheibe

Kølevand - Støvsuger
Coolant - Dust extractor
Nasschleif - Absauger

Afmagnetisering - El-magnet
Demagnetizing - El-chuck
Entmagnetisierung -
El-magnetspannplatte

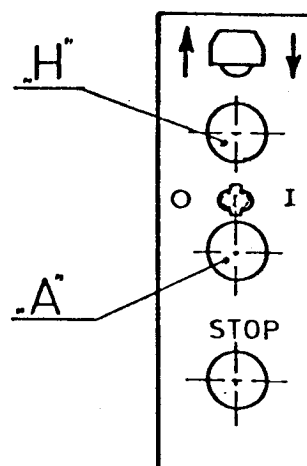
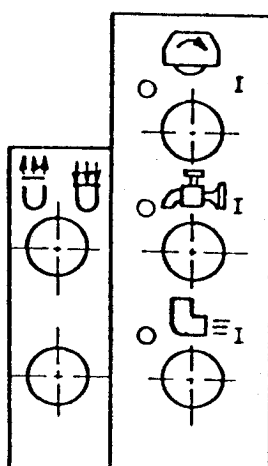


CHAPTER II:

STARTING-UP AND RUNNING IN

- 1) Start the hydraulic pump by operating push button (A)
- 2) Remove the front cover from base of the machine and turn Table Speed Control Lever (24) to blue mark position. Check oil pressure. The pressure on the gauge must be 28 kg/cm² (400 lbs/sq.in).

The pressure is adjusted by means of the regulating screw No. 21. Do not forget to shut off the pressure gauge valve (20) after checking the pressure.



THE LONGITUDINAL MOVEMENT

Hydraulic table travel

Set the table trip dogs (22) to give the required traverse length. Ensure that the table reversing lever (23) is between the dogs. Now turn the table speed control lever (24) clockwise and the table will start traversing between the dogs.

The table speed control lever has four positions:

red mark: stop position
 yellow -: min. table speed
 green -: max. table speed
 blue -: manual table feed.
 hydraulic wheel dresser

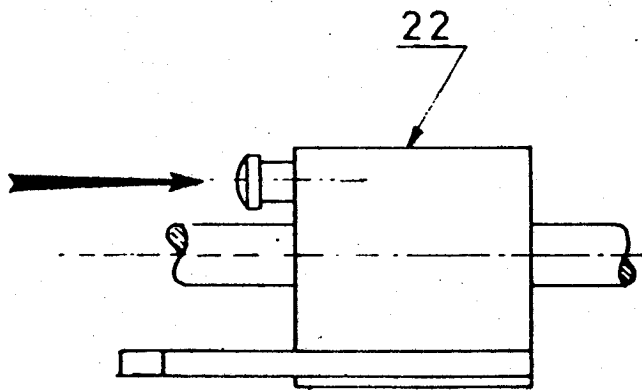
Note: If the machine is cold, maximum table speed may not be obtained until the hydraulic oil has reached operating temperature.

NOTE:

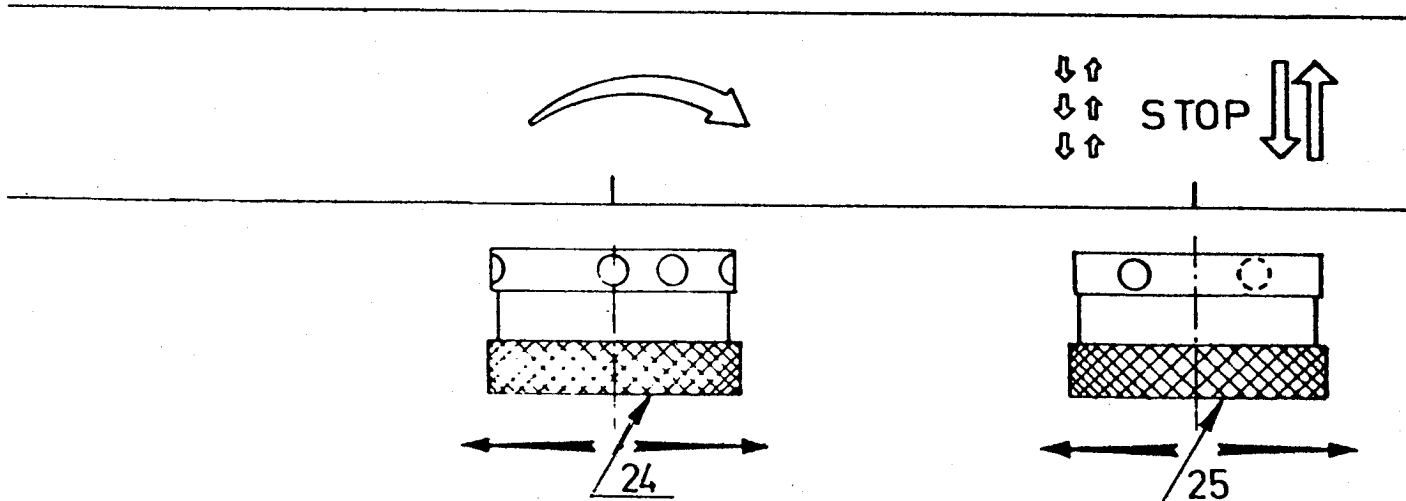
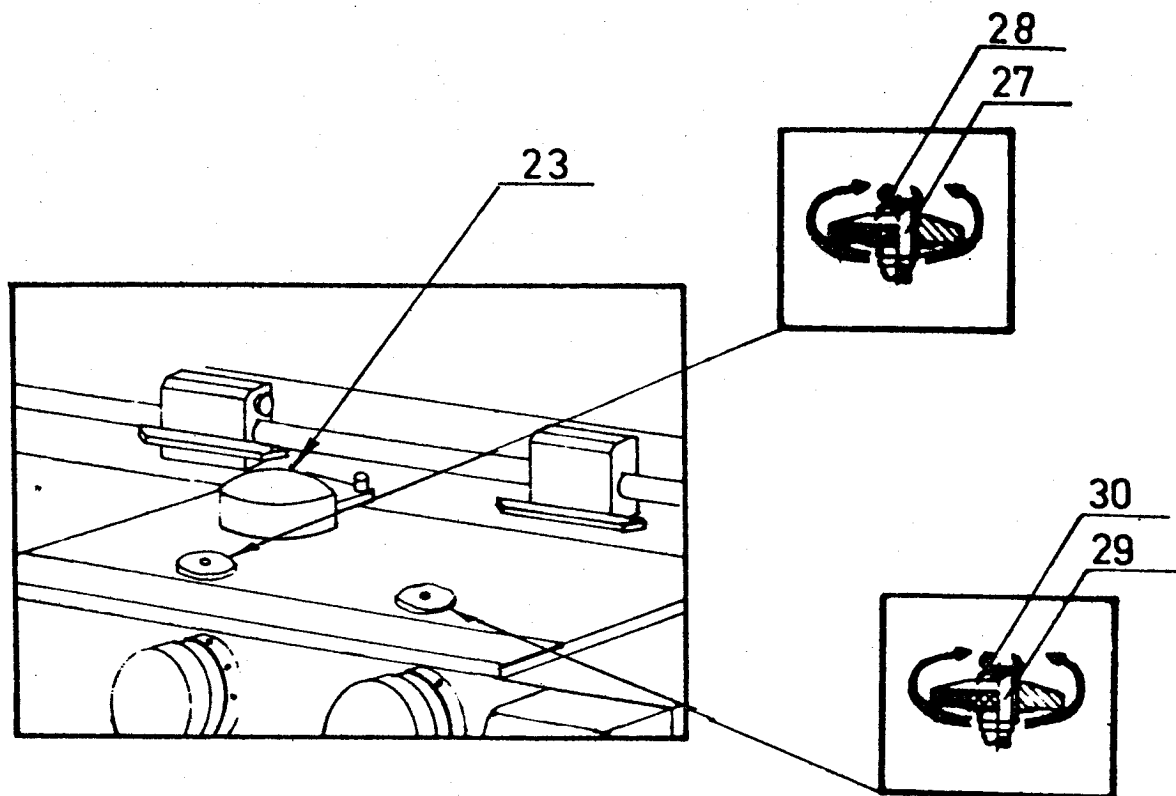
The longitudinal table cylinder is cleared of air by moving the trip dogs out in their extreme position and let the table bottom 5 - 6 times at each end at a very low speed. Whenever the motions become jerky or unstable this de-airing operation should be performed.

ADJUSTMENT OF THE TABLE OVERTRAVEL

The overtravel is the distance the table travels at the end of its stroke AFTER the dog has tripped the table reversing lever. Table 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 No. 27 (Longitudinal movement) and No. 29 (Cross movement). Loosen the lock nut (28) and turn the adjusting screw (27) slightly anticlockwise, using a screw driver, until the required overtravel is obtained. Then loosen lock nut (30) and adjust the cross movement adjusting screw (29) so that the cross saddle has travelled its full feed before the table trip dog, after having reversed the table movement, passes the table reversing lever again.

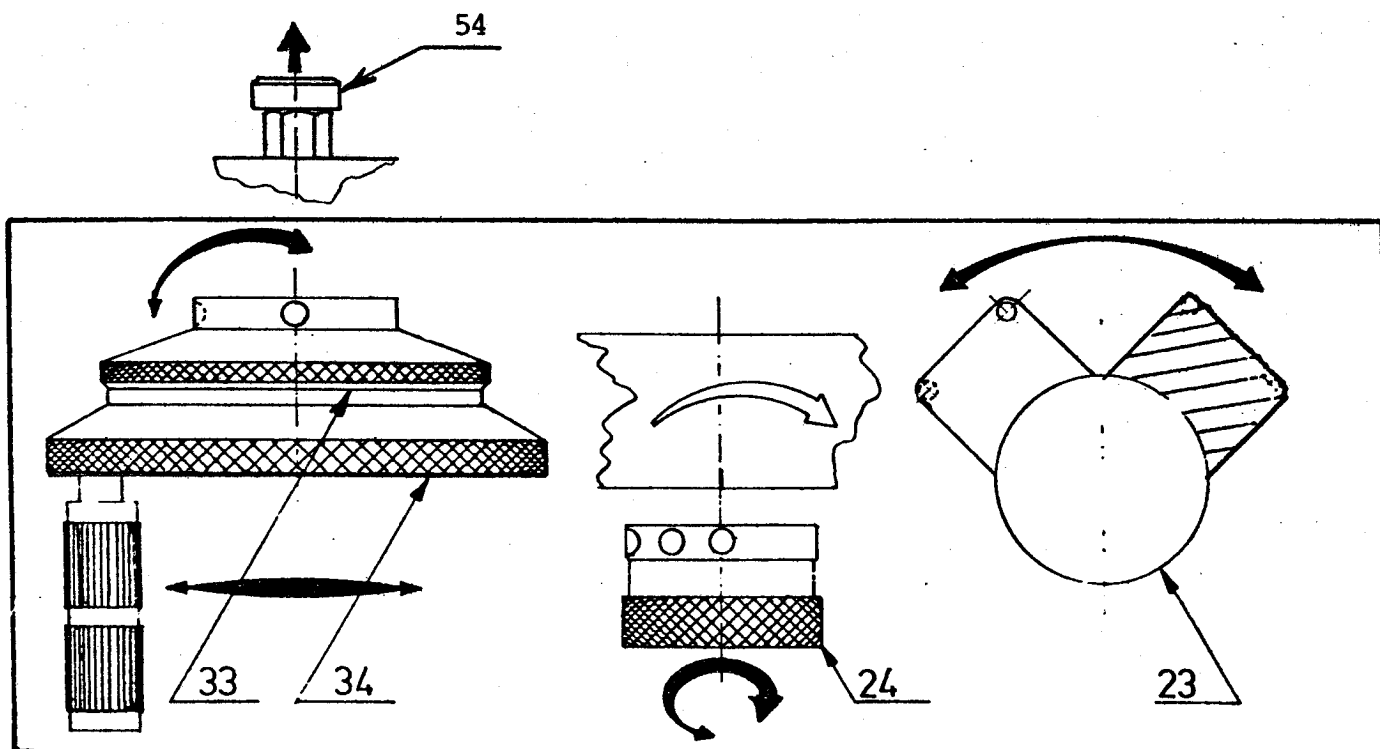


The spacing of the trip dogs determines the length of table travel. Adjust the position of each dog by pressing the button and sliding the dog along its track. Locate the trip dogs so that the grinding wheel will contact all of the work surface.



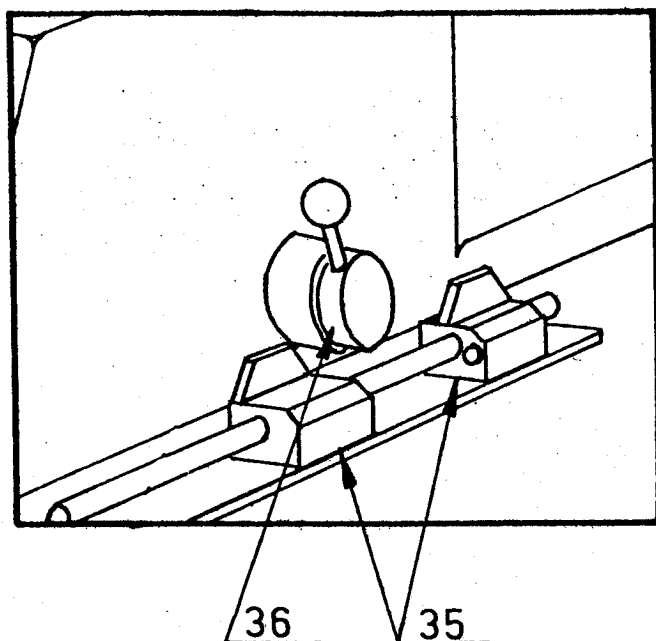
HAND TABLE TRAVERSE (Optional equipment)

If manual table travel is desired, the table speed control lever (24) must be turned anti-clockwise to the blue mark position and the table reversing lever (23) in right-hand position.

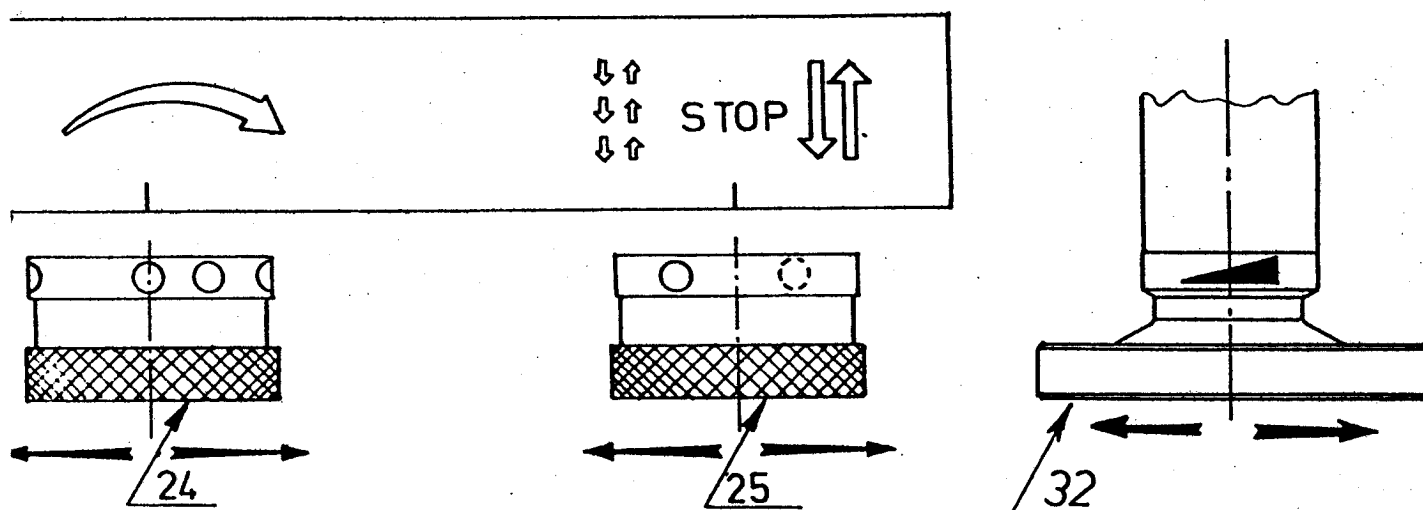


Now lift the stop pin (54) on top of the cross saddle and turn the inner handwheel (33) clockwise until the blue mark position whereafter the table is ready for manual operation by means of the handwheel (34)

DO NOT FORGET TO TURN THE INNER HANDWHEEL OUT OF ENGAGEMENT (FULLY ANTI-CLOCKWISE) AGAIN BEFORE THE HYDRAULIC TABLE MOVEMENT IS STARTED AGAIN.



Set the crossfeed trip dogs (35) for the desired total saddle travel in each direction. The saddle will automatically reverse, when the crossfeed reversing lever (36) contacts the trip dogs.



THE CROSS MOVEMENT

Hydraulic intermittent cross feed.

Set the crossfeed trip dogs (35) for the desired total saddle travel. Ensure that the cross feed reversing lever (36) is between the trip dogs.

Now turn the cross feed control lever (25) in left position and turn table speed control lever (24) clockwise.

The crossfeed is infinitely variable from 2 - 20 mm (1/16" - 3/4") by means of the cross feed increment adjusting control (32)

Hydraulic rapid crossfeed

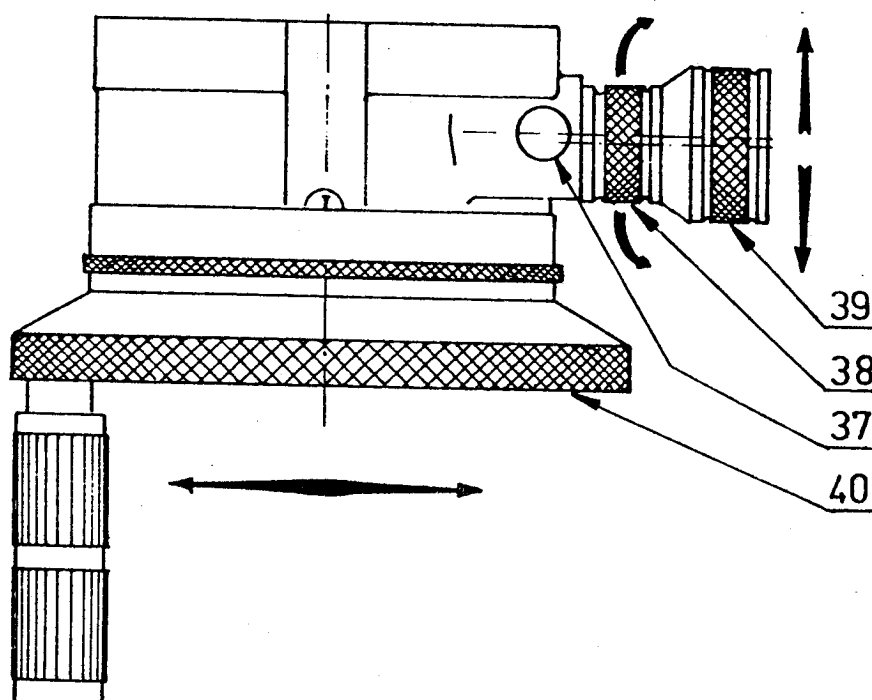
The hydraulic rapid cross movement is started by turning the crossfeed control lever (25) fully to the right.

The direction is chosen with crossfeed reversing lever (36).

NOTE:

The cross cylinder is cleared of air by placing the cross trip dogs (35) in their extreme position and let the saddle bottom 5 - 6 times in both ends at low speed, using the rapid cross movement. Whenever the motions becomes jerky or unstable this de-airing operation should be performed.

MANUAL CROSSFEED



When the manual crossfeed handwheel (40) is to be used: place the cross trip dogs (35) in their extreme position and run the saddle towards the column, using the hydraulic rapid crossfeed; leave the pump running, when changing again to hydraulic cross feed the cross saddle must manually be turned to its inside position whereafter the saddle can be moved outwards by changing direction of the crossfeed reversing lever.

FINE CROSS FEED KNOB

The manual cross feed is equipped with a worm gearing for fine adjustment, The worm is engaged by loosening the screw (37) and turn the bushing (38) until the worm is put in gear, whereafter the screw (37) is tightened again. The fine cross feed knob (39) is graduated in 0,002 mm (.0001").

When the adjustment screw is engaged the handwheel cannot be used.

VERTICAL FEED

The vertical wheel feed is operated by handwheel (41) and by placing the knob (45) with green mark position against the operator.

When placing this knob with red mark position against the operator the adjustable dial (42) will stop at zero. This position of the knob is used when you want to grind with a fixed stop (see the example below).

The adjustable dial (42) is graduated in 0,01 mm (.0005") divisions and one complete revolution of the handwheel (41) will produce 2,0 mm (.10") downfeed.

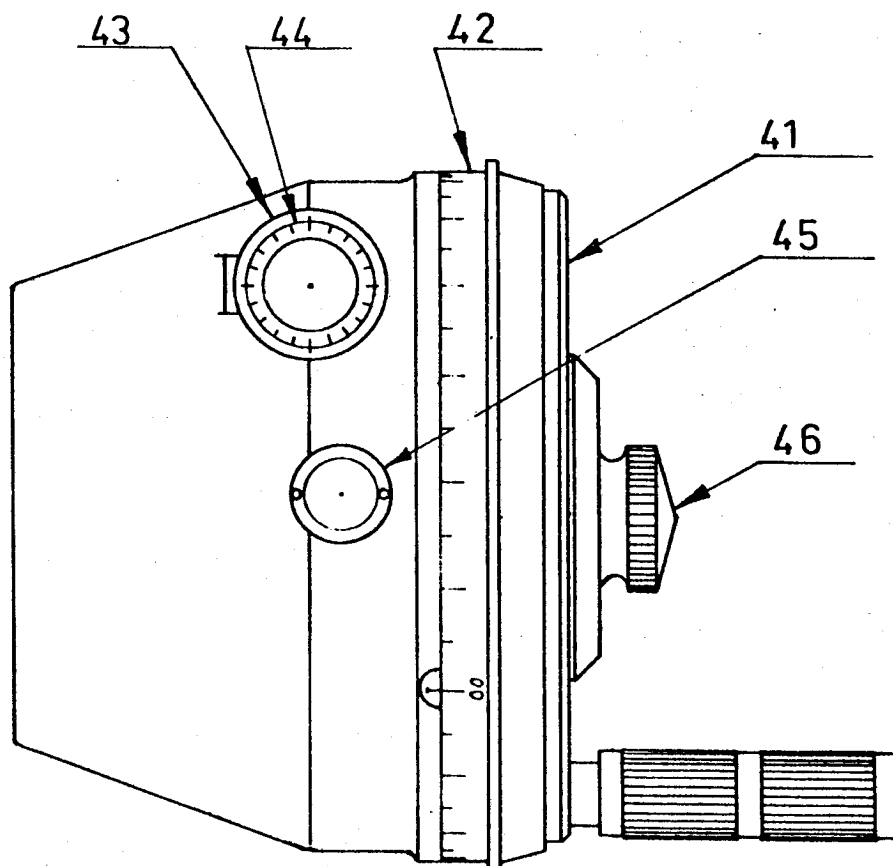
FINE VERTICAL FEED KNOB

The downfeed is equipped with a worm gearing for fine feed adjustment. The worm is engaged by turning the bushing (43) to the right until the worm is put in gear, whereafter the feed knob (44) can be used. The fine feed knob (44) is graduated in 0,001 mm (.00005") divisions.

IMPORTANT: Ensure the knob (44) is disengaged when using the downfeed handwheel (41).

EXAMPLE: suppose you, after having rough-ground and checked the work size, still want to have ground off 0,3 mm, this can be done as follows:

- 1) place the knob (45) with red mark position against the operator.
- 2) slacken the locking screw (46) and set the adjustable dial (42) on 0,3, while keeping the downfeed handwheel (41) in same position.



- 3) lock dial in position by screw (46) and grind the workpiece until the adjustable dial goes against the fixed stop (i.e. when the dial reaches zero)

V E R T I C A L F E E D

HYDRAULIC AUTOMATIC DOWNFEED (Optional equipment)

The automatic downfeed control consists in the following units:

- I a. Graduated Dial (B) for presetting downfeed from 0,2mm - 2,8 mm (.010" - .140").
- b. Graduated Dial (A) for presetting downfeed from 3,0 mm - 12,0 mm (.150" - .600").
- II a. Downfeed handwheel (C) with adjustable dial (E) and disengaging screw (D).
- b. Engaging lever (G):
 - vertical position: manual downfeed
 - forward position
 - towards the operator: hydraulic automatic downfeed
- c. Downfeed increment adjusting lever (J) 0,002 mm - 0,03 mm (.0001" - .0015")
- d. Downfeed control lever (K):
 - left position: automatic downfeed at each saddle reversal
 - right position: automatic downfeed at each table reversal (this position for plunge grinding only)
- III Trip-down mechanism for the final vertical feed rate (F)
- IV Rapid vertical feed (H)

MANUAL VERTICAL FEED

The manual vertical feed is operated by the handwheel (C). The handwheel is graduated in 0,002 mm (.0001") and one revolution of the handwheel equals 0,2 mm (.010") downfeed. Do not forget to set the engaging lever (G) in vertical position when using manual downfeed.

RAPID VERTICAL FEED (only on machines fitted with automatic downfeed)

The rapid vertical traverse of the spindle headstock is operated by the wheel up and down push button (H) on the control panel.

ENSURE THE ENGAGING LEVER (G) IS DISENGAGED (in vertical position) WHEN USING THE RAPID VERTICAL TRAVERSE.

WHEN CHANGING FROM RAPID VERTICAL FEED TO HYDRAULIC INCREMENT FEED THE ENGAGING LEVER (G) MUST NOT BE SET IN FORWARD POSITION BEFORE THE HANDWHEEL (C) IS AT REST.

HYDRAULIC AUTOMATIC DOWNFEED

The graduated dials (A) and (B) make it possible to preset the downfeed from 0,2 mm to max. 14,8 mm (.010" - .740"). The presetting is made manually and the digits on the scale-knobs (A) and (B) show directly the amount of vertical travel, which is made up as a total (summary) of the two knob's division-values.

With the scaleknob (A) on infinite (∞) the automatic downfeed will continue without automatic stop.

To turn the adjustable dial (E) loosen the disengaging screw (D) and the setting can now be made by means of the vertical divisions and zero lines on the handwheel (C).

EXAMPLE I

If you want to grind off automatically a total of 0,1 mm (.005") - a half revolution of the downfeed handwheel - :

1. set engaging lever (G) in vertical position
2. disengage the adjustable dial (E) as described above.
3. set the dial on 0,1 mm (.005") and the graduated dials (A) and (B) at zero.
4. set engaging lever (G) in forward pos. and start table travel.

EXAMPLE II

If it is desired to grind off a total of 0,5 mm (.250") automatically:

1. set engaging lever (G) in vertical position.
2. set the graduated dial (B) at 0,4 mm (.02") and (A) at zero and the remaining 0,1 mm (.005") by means of the adjustable dial (E) as mentioned above.
3. set engaging lever (G) in front position and start table travel.

EXAMPLE III

If it is desired to grind off a total of 3,70 mm (.185") automatically:

1. set engaging lever (G) in vertical position
2. set graduated dial (B) at 0,6 mm (.030") and (A) at 3.0 (.150") and the remaining 0,1 mm (.005") by means of the adjustable dial (E) as mentioned above.
3. set engaging lever (G) in front position and start table travel.

TRIP-DOWN MECHANISM FOR THE FINAL DOWNFEED RATE

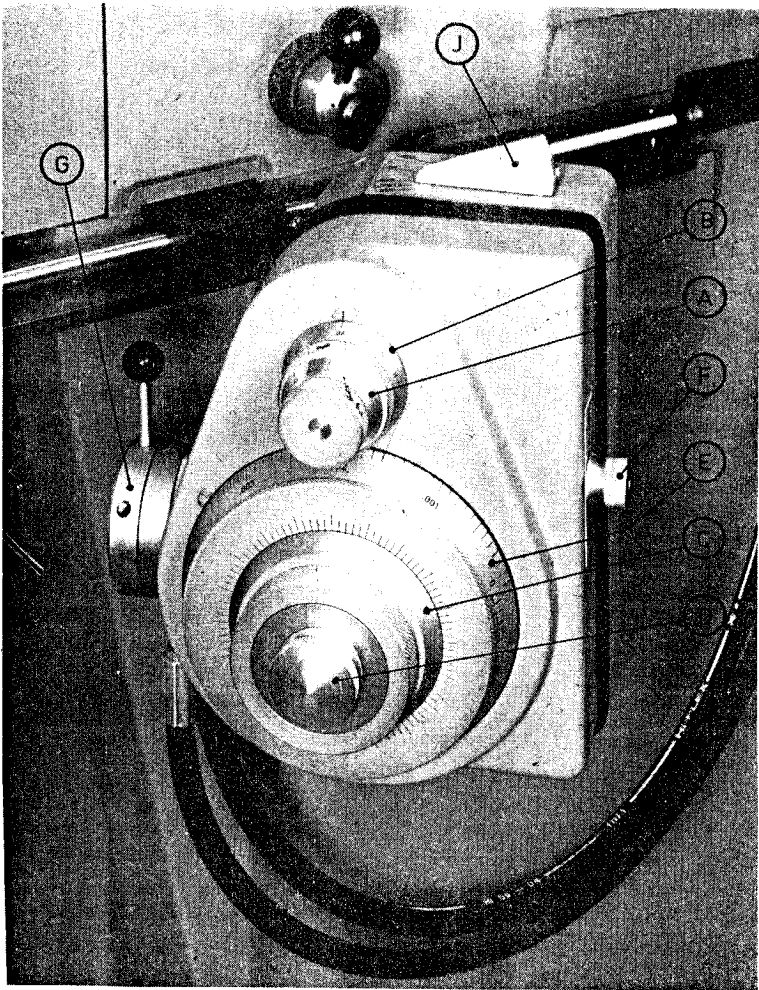
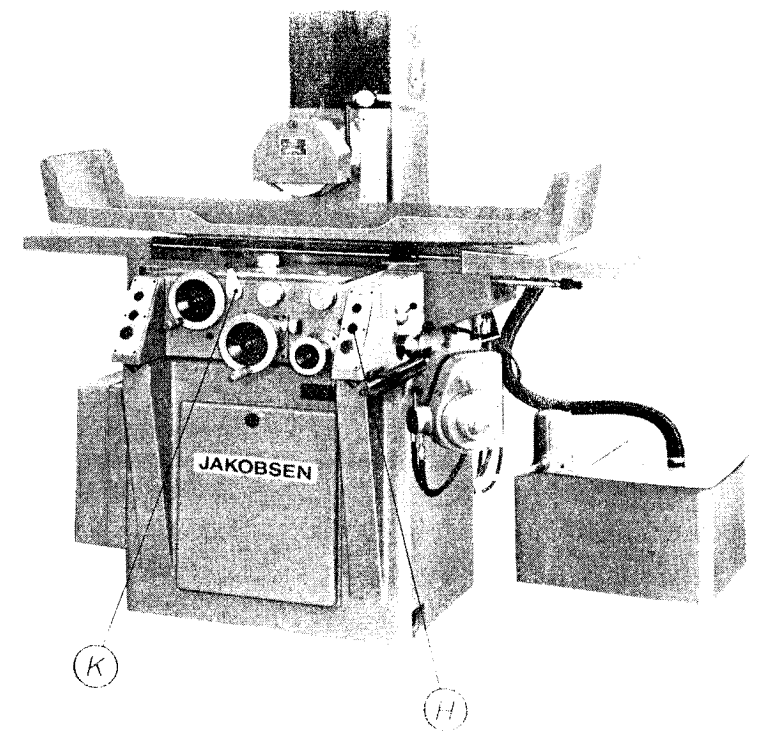
is engaged by turning the knob (F)'s BLACK POINT upwards (towards the arrows of different length).

The mechanism comes into action when the preset downfeed remains the final increment feed rate (the final pass) before stopping at zero position.

The trip-down procedure takes place through a continuous halving of the feed rate until the preset stop position is reached.

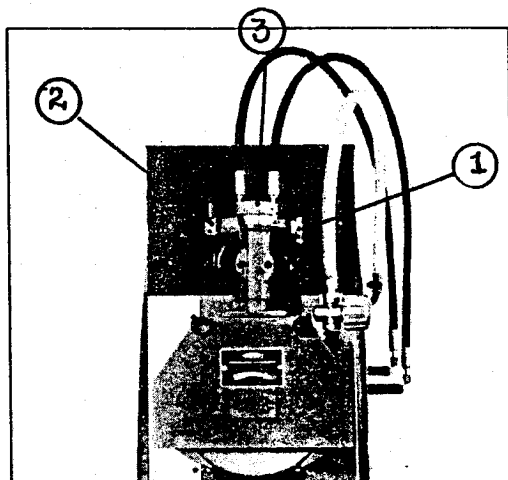
Is for instant the automatic downfeed set to operate with a feed increment of 0,03 mm (.0015") before stopping at zero the following amounts of feed will be 0,015 - 0,0075 - 0,0037 - 0,0018 - 0,0 mm (.00077" - .00038" - .00019" - .000095" - 0.0").

If the BLACK SPOT points downwards (towards the arrows of same length) the increment feed will continue to stop position without being tripped-down.



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.



Turn table speed lever (24) to blue mark position.

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) calibrated in 0,05 mm (.002") increments and the speed by which the diamond is fed across the wheel face is adjusted by means of the knob (1).

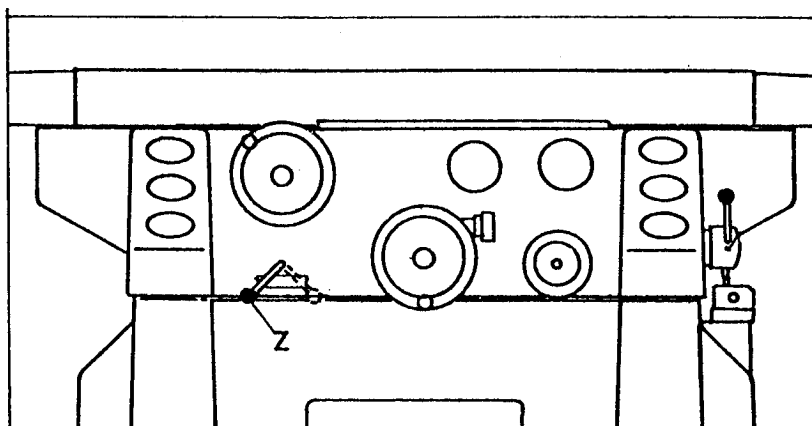
By irregular movement of the dresser, clear the cylinder of air by setting the knob (1) at max. speed and let the piston bottom 5-6 times in inner and outer position.

SADDLE LOCKING DEVICE (Optional equipment)

The locking of the cross saddle is made by turning lever (Z) to the left.

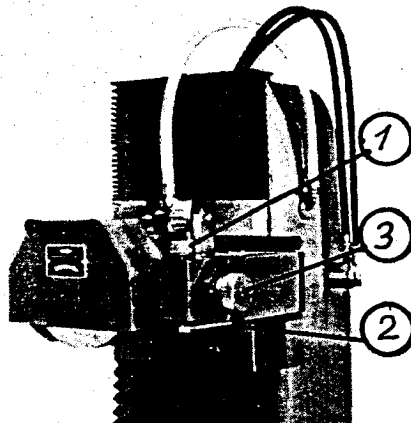
Place the saddle at the desired position by using the manual crossfeed. Lock the saddle as described above, whereafter the hydraulic table travel can be started.

DO NOT FORGET TO DISENGAGE THE LOCKING DEVICE BEFORE MOVING THE CROSS SADDLE.



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.



Turn table speed lever (24) to blue mark position.

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) calibrated in 0,05 mm (.002") increments and the speed by which the diamond is fed across the wheel face is adjusted by means of the knob (1).

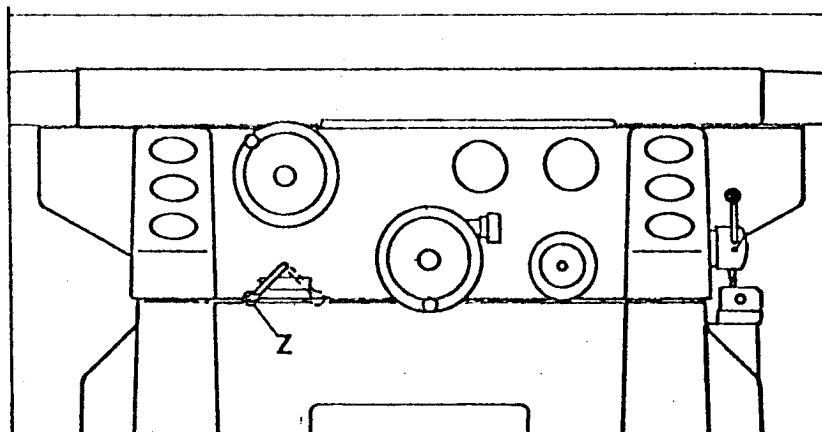
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DO NOT FORGET TO DISENGAGE THE LOCKING DEVICE BEFORE MOVING THE CROSS SADDLE:



CHAPTER 3

PREPARATION FOR OPERATION

Dressing the wheel

The grinding wheel is carefully fitted on the wheel flange and mounted on the wheel spindle, whereafter it is dressed until it is round. Eventually the sides are dressed until they are running.

The wheel is dressed by means of a diamond mounted in a holder and placed on the table or magnetic chuck. The position of the diamond on the table with respect to the grinding wheel is important for proper dressing. The diamond should be located slightly to the left of the wheel centerline (about 12 mm - $\frac{1}{2}$ "). This is a safety precaution to prevent the diamond from digging into the wheel.

The diamond is passed across the wheel by means of the hydraulic rapid cross movement. Choose the direction of the cross saddle with crossfeed reversing lever (36) and turn the crossfeed control lever (25) slightly to the right until the required feed is obtained.

FOR GOOD DRESSING IT IS ESSENTIAL THAT THE DIAMOND IS SHARP SO ABRASIVE GRAINS WILL BE COMPLETELY FRACTURED AND PROJECT FROM WHEEL BOND.

Balancing the wheel

Balancing of the wheel flange and grinding wheel is done by means of the balancing arbor and the balancing stand. Release all 3 balancing weights. Find the heaviest spot and place one of the weights here. By placing and moving the other weights symmetrically in proportion to the first placed weight the unit is balanced as carefully as possible.

To dress and balance the wheel proceed in the following manner:

1. Fit the wheel to the wheel flange and mount the unit on the wheel spindle. Note that the nut, which fastens the flange to the spindle has left hand thread.
2. Dress the wheel.
3. Remove the wheel assembly from wheel spindle and balance the wheel as described above.
4. Remount assembly on the wheel spindle and redress the wheel before putting into operation.

"Grinding in" the magnetic chuck

The surfaces of the chuck have been ground by the manufacturer but to insure accuracy, it is necessary to "grind in" the chuck on the Grinder with which it is to be used. The following procedure is recommended for a new chuck: each time the chuck is removed from the machine, the top surface should again be ground, to insure parallelism between this surface and the saddle and table ways,

- 1) carefully clean and degrease the new chuck.
- 2) Grind the top (holding) surface of the chuck first. Place the chuck on the table and block in place. Do not clamp the chuck down. Use a coarse dressed grinding wheel.
- 3) Dress the grinding wheel.
- 4) Remove chuck. Clean chuck and table surface and place chuck on the table with holding surface down. Block chuck in place. Grind bottom of chuck until it is flat.
- 5) Remove chuck and place it in normal position with holding surface up. Use table clamps this time.
- 6) Grind top surface until it is flat. The final cut should be at 0.004 mm (.0002 in) downfeed and 10 mm (.40 in) crossfeed. (With magnetism engaged)

GRINDING INSTRUCTIONS

In surface grinding the choice is between two methods: Face grinding and edge grinding.

Face grinding means grinding with a large cross feed and a small cutting depth of about 0,005 - 0,01mm (.0002"-.0004") and this will in most cases be the most economical way and will give the best planparallel result.

By edge grinding we recommend to use a large cutting depth up to .0125" (0,3 mm) and manual operated cross feed.

Which method to prefer is an individual choice and to a great extent a matter of experience depending on the material the dimension and partly on the grinding wheel used. Generally speaking it is recommended to use face grinding.

Edge grinding cannot be advised, when grinding wide surfaces, as there is a risk for the wheel to be worn out before the whole width has been ground, giving a non plan-parallel work piece.

LUBRICATION

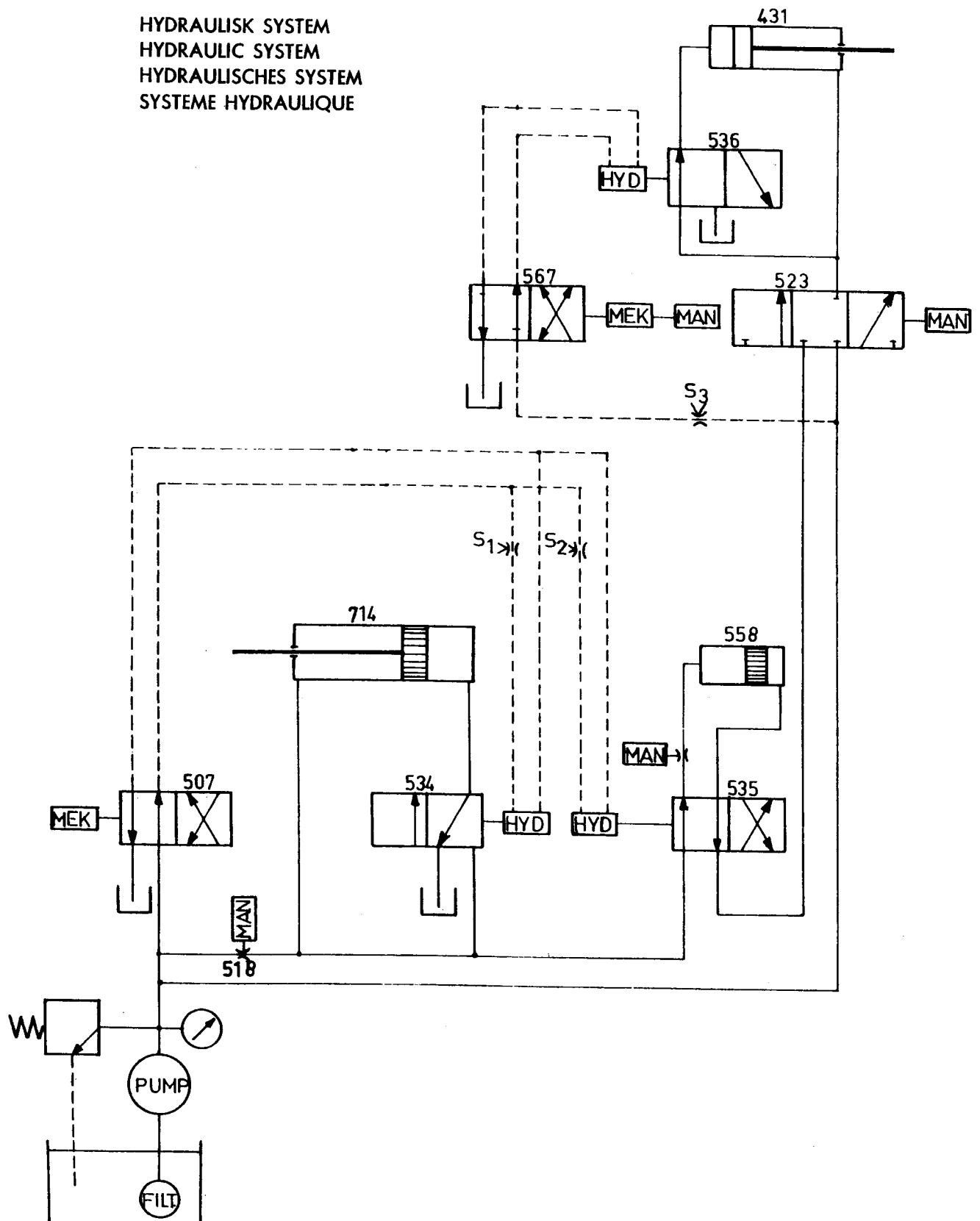
The saddle - and table ways are power lubricated by means of one lubrication pump energized by the hydraulic system.

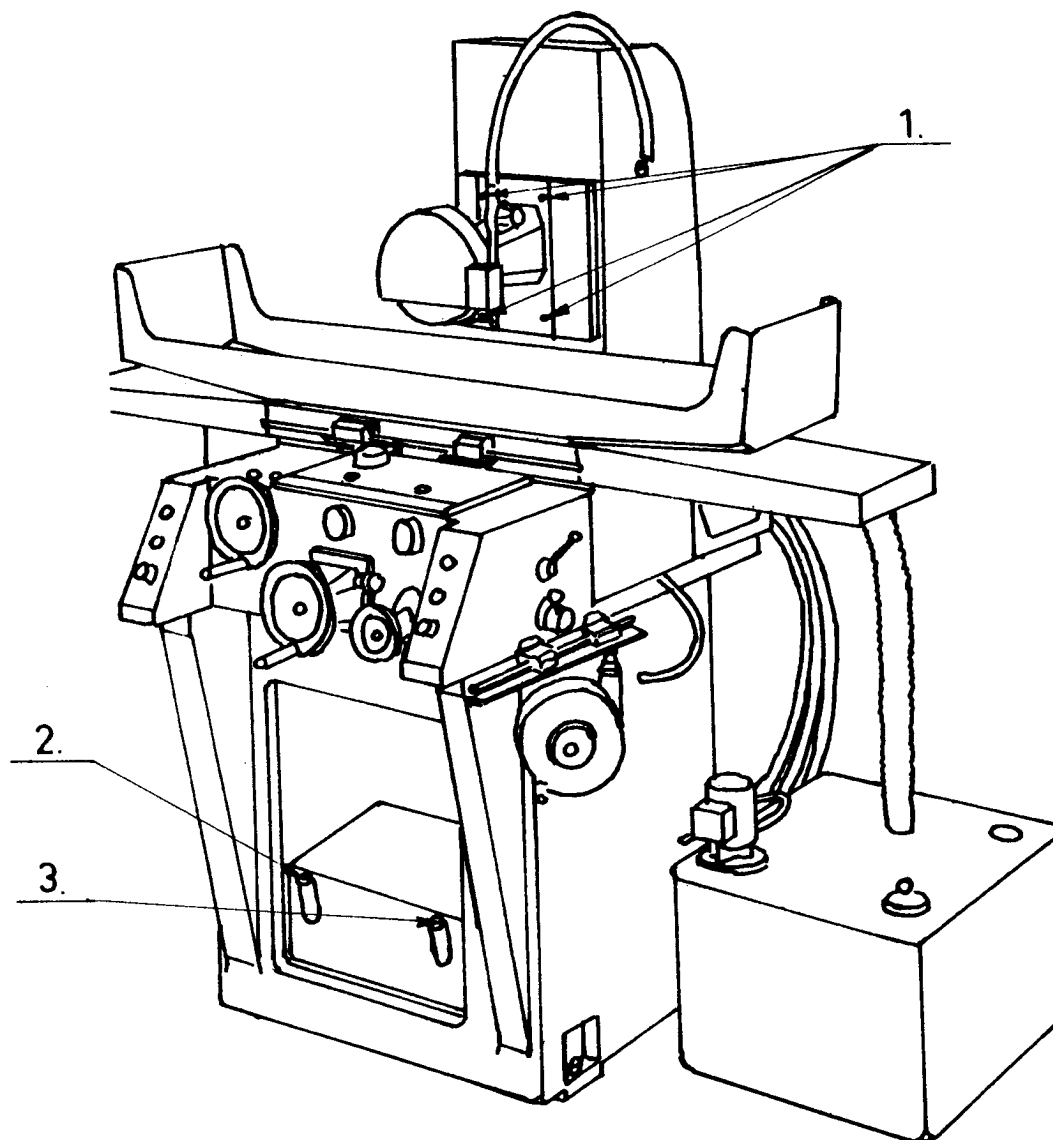
The circuits for the lubricant and the hydraulic oil are separate.

The function is checked at the control glass on top of the cross saddle.

Impulse should appear at each second table reversal.

HYDRAULISK SYSTEM
HYDRAULIC SYSTEM
HYDRAULISCHES SYSTEM
SYSTEME HYDRAULIQUE





| Pos. | Smøresteder Lubricating points Schmierstellen Lieux d'huilage | INTERVAL INTERVALLE Arbejdstimer Working hours Arbeitsstunden Heures de travail | Olie - Oil - Öl - Huile | | | | | | |
|----------|---|--|-------------------------|------------|-------------------|--------------|------------|------------|-----------|
| | | | Mobil Oil | BP Energol | Texaco | Castrol | Esso | Gulf | Shell |
| 1 | Vertikalføringer Vertical ways Vertikalführungen Guides verticaux | 48 | Vactra nr. 2 | HP 20 C | Way lubric. D | Magna BD | Febis K 53 | Gulfway 52 | Tonna 33 |
| 2 | Smørekontrol Lubrication Control Smierungskontrolle Contrôle de la lubrification | Hver måned Each month Je monat Par mois | Vactra nr. 2 | HP 20 C | Way lubric. D | Magna BD | Febis K 53 | Gulfway 52 | Tonna 33 |
| 3 | Hydraulikolie Hydraulic oil Hydrauliköl Huile hydraulique | Udskift hvert år Charge each year Jährlich umwechsel Échanger tous les ans | Vacoline 1405 | HL 80 | Regal oil A (R&O) | Hyspin 80 ss | Nuto H44 | Harmony 47 | Tellus 27 |



TEST SHEET for Surface Grinder

Model SJ

Serial No.:

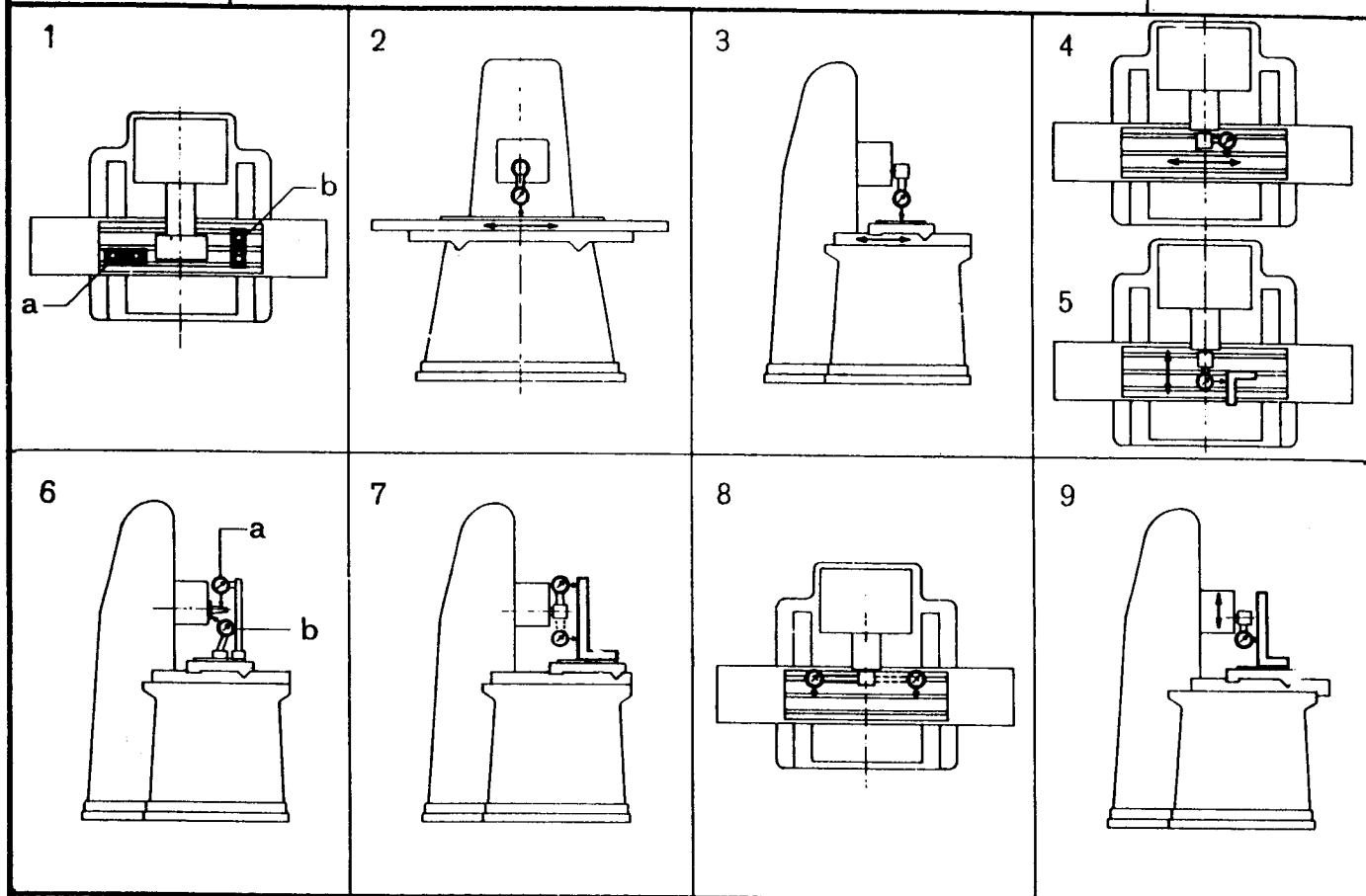
| | Test | Tolerance permitted | Tolerance measured |
|-----|--|---------------------------|--------------------|
| 1 a | Bed level – longitudinal direction | 0,02 mm in 1000 mm | |
| 1 b | Bed level – transverse direction | 0,02 mm in 1000 mm | |
| 2 | Surface of table parallel to the longitudinal travel | 0,015 mm in 1000 mm | |
| 3 | Surface of table parallel to the transversal travel | 0,01 mm in table width | |
| 4 | T-grooves of table parallel to the longitudinal travel | 0,015 mm in 1000 mm | |
| 5 | T-grooves of table at right angles to the transversal travel | 0,03 mm in 300 mm | |
| 6 a | Runout of spindle, radial | 0,01 mm | |
| 6 b | Runout of spindle, axial | 0,01 mm | |
| 7 | Grinding spindle parallel to table. Measured at 180° swivelling Arm 100 mm = 4" | 0,02 mm in 300 mm | |
| 8 | Grinding spindle at right angles to the T-grooves of table. Measured at 180° swivelling Arm 200 mm = 8" | 0,02 mm in 300 mm | |
| 9 | Vertical movement of wheelhead at right angles to the transversal direction of table | 0,02 mm in 100 mm | |
| | | | |

Kastrup, 19

.....
Warranted.....
Tested by



ILLUSTRATION TIL PRØVESKEMA
ILLUSTRATION FOR TEST CHART
ILLUSTRATION FÜR PRÜFKARTE
ILLUSTRATION POUR SCHÉMA DE CONTROL



Elektromotorer - Electrical motors - Elektromotoren - Électromoteurs

Spænding
Voltage
Spannung
Voltage

V.

Frekvens
Frequenzy
Frequenz
Fréquence

Hz.

| | HK - HP PS - chev. | omdr./min - RPM umdr./min. - rév/min. | Serie nr. — Serial no. Serien nr. — Série no. |
|--|-----------------------|--|--|
| Spindelmotor Spindlemotor Spindelmotor Moteur de l'arbre | | | |
| Pumpemotor Pumpmotor Pumpenmotor Moteur de la pompe | | | |
| Vertikalmotor Verticalmotor Vertikalmotor Moteur vertical | | | |