

METRIC	ENGLISH	
860mm x 200mm	34" x 8"	SIZE OF TABLE
710mm x 200mm	28" x 8"	WORKING AREA
480mm 140mm 340mm 200mm	19" 5.5" 13.5" 8"	TABLE TRAVEL - LONGITUDINAL CROSS VERTICAL-PLAIN UNIVERSAL
3		No. of TEE SLOTS
No. 30 INTERNATIONAL		SPINDLE TAPER - STANDARD
1.5 kw	2 H.P.	MAIN MOTOR
0.25kw	0.33 H.P.	FEED MOTOR (WHEN FITTED)
18 8	8 8	No. of SPINDLE - SPEEDS - VERTICAL
52-2019 R.P.M. 80-1102 R.P.M.	80-1102 R.P.M. 52-2019 R.P.M.	RANGE OF SPINDLE SPEEDS - VERTICAL
8		No. of POWER FEEDS
17.5-120mm/min.	0.7-5 inches/min.	RANGE OF POWER FEEDS
0.025mm	0.001"	DIALS GRADUATED
62kg 27kg		NET WEIGHT STANDARD

HORIZON

VERTICAL, HORIZONTAL

PLAIN & UNIVERSAL

MILLING MACHINES

INSTRUCTION MANUAL

Power is supplied by a 2 H.P. (1.5kw) electric motor mounted on a hinged base-plate in the base or column of the machine.

The base and column are securely bolted together and may be considered as one unit.

The base contains the coolant tank and pump (when fitted).

The rear cover on the column when opened operates a micro switch which isolates all the electrical circuits in the machine, thus preventing accidental contact with moving parts etc.

AT A GLANCE SPECIFICATION

	ENGLISH	METRIC
SIZE OF TABLE	34" x 8"	860mm x 200mm
WORKING AREA	28" x 8"	710mm x 200mm
TABLE TRAVEL - LONGITUDINAL	19"	480mm
CROSS	5.5"	140mm
VERTICAL-PLAIN	13.5"	340mm
UNIVERSAL	12"	300mm
No. of TEE SLOTS	3	3
SPINDLE TAPER - STANDARD	No. 30 INTERNATIONAL	No. 30 INTERNATIONAL
MAIN MOTOR	2 B.H.P.	1.5 Kw
FEED MOTOR (WHEN FITTED)	0.33 B.H.P.	0.25Kw
No. of SPINDLE - HORIZONTAL	18	18
SPEEDS - VERTICAL	8	8
RANGE OF - HORIZONTAL	25-2039 R.P.M.	25-2039 R.P.M.
SPINDLE SPEEDS VERTICAL	80-3105 R.P.M.	80-3105 R.P.M.
No. of POWER FEEDS	8	8
RANGE OF POWER FEEDS	0.7-5 inches/min.	17.5-126mm/min.
DIALS GRADUATED	0.001"	0.025mm
NETT WEIGHT - HORIZONTAL	1380 lbs	625Kg
STANDARD - VERTICAL	1240 lbs	570Kg

GENERAL INFORMATION

Power is supplied by a 2 H.P. (1.5Kw) electric motor mounted on a hinged base-plate in the base or column of the machine.

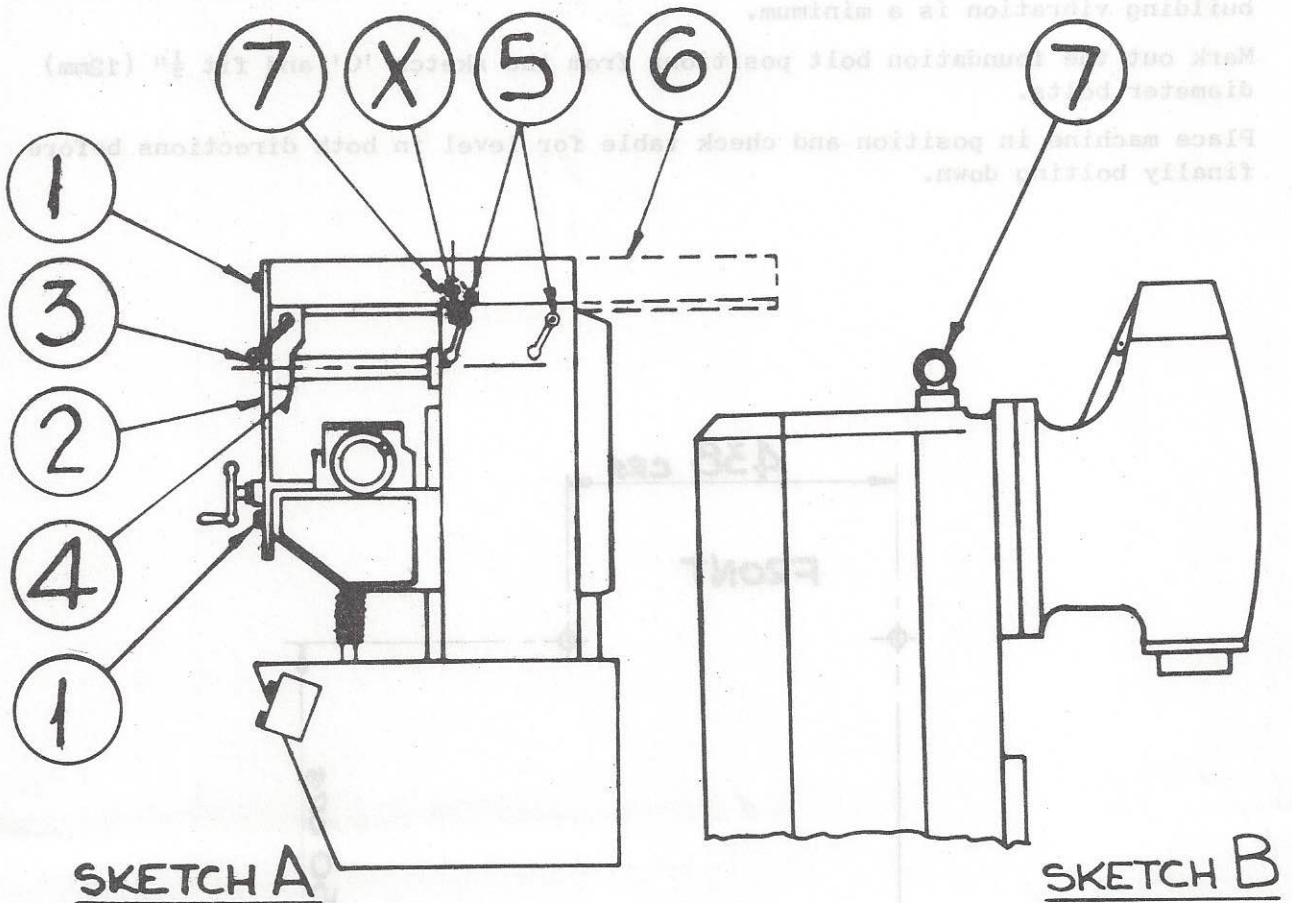
The base and column are securely bolted together and may be considered as one unit.

The base contains the coolant tank and pump (when fitted).

The rear cover on the column when opened operates a micro switch which isolates all the electrical circuits in the machine, thus preventing accidental contact with moving belts etc.

LIFTING INSTRUCTIONS

FOR SAFETY IT IS ADVISABLE TO LIFT THE MACHINE AS INSTRUCTED BELOW



HORIZONTAL MACHINES (SKETCH A)

- (a) Remove screws (1) and steady brace (2) (when fitted).
- (b) Release lever (3) and remove arbor support (4) from overarm.
- (c) Release the two levers (5) and slide back the overarm (6) until a $\frac{5}{8}$ " (16mm) tapped hole can be seen at point 'X'. Clamp the overarm in position with rear lever (5).
- (d) Locate and screw the eyebolt provided (7) fully into tapped hole.
- (e) With the use of suitable equipment the machine may now be lifted.
NOTE! ENSURE THAT TOP SLIDES ARE NOT DAMAGED BY LIFTING EQUIPMENT.
- (f) When the machine is in the desired position remove the eyebolt and carefully slide the overarm forward ensuring that the front clamping piece (5) does not foul the overarm slides.
- (g) Replace arbor support, tighten lever (3), refit steady brace and screws (1).

VERTICAL MACHINES (SKETCH B)

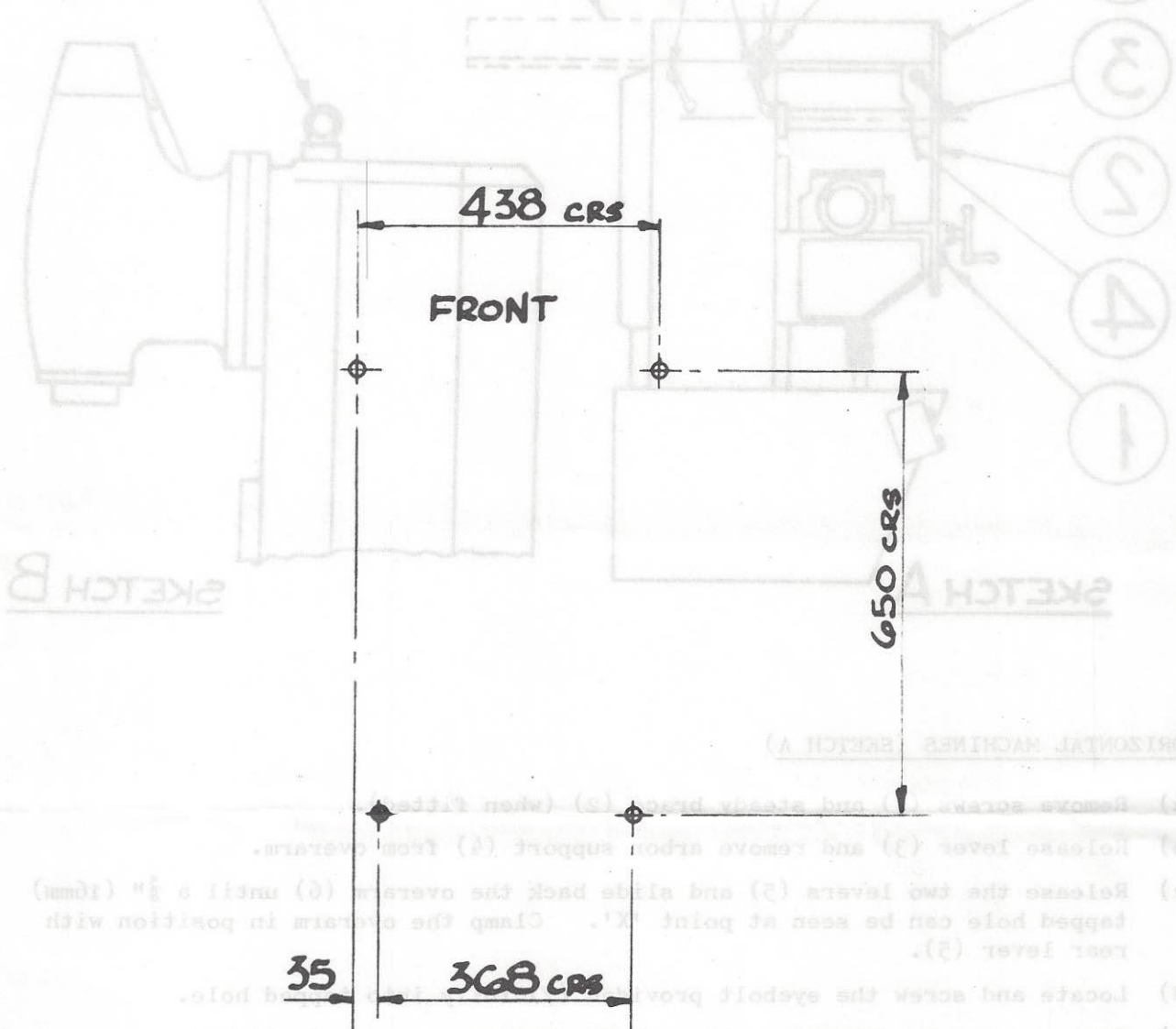
Damage may be incurred if the machine is lifted incorrectly therefore the eyebolt (7) has been incorporated for safe lifting. After the machine has been installed the eyebolt may be removed.

INSTALLATION

A concrete foundation is the most suitable giving a solid base at all points. If the machine has to be installed on an upper floor it should be placed where building vibration is a minimum.

Mark out the foundation bolt positions from the sketch 'C' and fit $\frac{1}{2}$ " (12mm) diameter bolts.

Place machine in position and check table for level in both directions before finally bolting down.



FOUNDATION BOLT CENTRES

SKETCH C.

Damage may be incurred if the machine is lifted incorrectly therefore the eyebolt (7) has been incorporated for safe lifting. After the machine has been installed the eyebolt may be removed.

CONTROLS AND LUBRICATION POINTS

SEE SKETCHES 'D & E' FOR HORIZONTAL AND 'F & G' FOR VERTICAL

CONTROLS

- (1) Coolant Pipe ON/OFF tap (when coolant equipment fitted)
- (2) Vertical Head Spindle drawbolt guard (Vertical Only)
- (3) Spindle Clutch Lever (when fitted - Horizontal Only)
- (4) Vertical Slide Gib locking levers
- (5) Vertical traverse handwheel
- (6) Cross traverse handwheel
- (7) Three speed gear selector (Horizontal only)
- (8) Arbor support locking lever (Horizontal only)
- (9) Longitudinal traverse handwheel
- (10) Longitudinal traverse locking levers
- (11) Retractable table feed stop
- (12) Spindle start button
- (13) Table power feed stop button (when fitted)
- (14) Table power feed start button (when fitted)
- (15) Table feed direction switch (when fitted)
- (16) Coolant Pump ON/OFF switch (when fitted)
- (17) Spindle Reverse switch (when fitted)
- (18) All Functions Stop button
- (19) Power feed clutch (when fitted)
- (20) Adjustable cutter guard (when fitted)
- (21) Spindle back gear Hi/Low change selector
- (22) Cross slide locking levers
- (23) Table feed stops
- (24) Low voltage lighting (when fitted)
- (25) Isolator switch for Low voltage lighting (when fitted)
- (26) Isolator switch main supply
- (27) Overarm Locking levers (Horizontal Only)

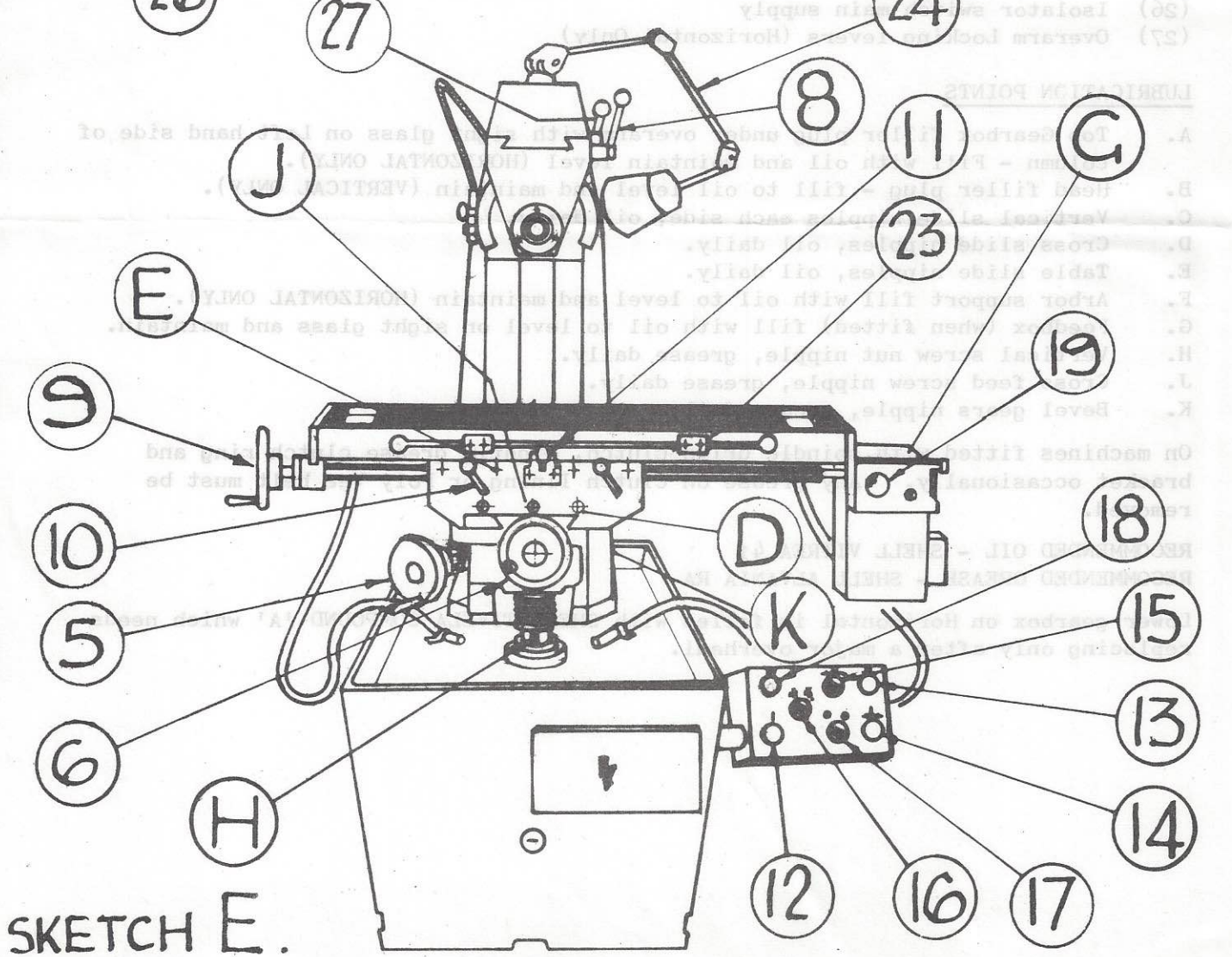
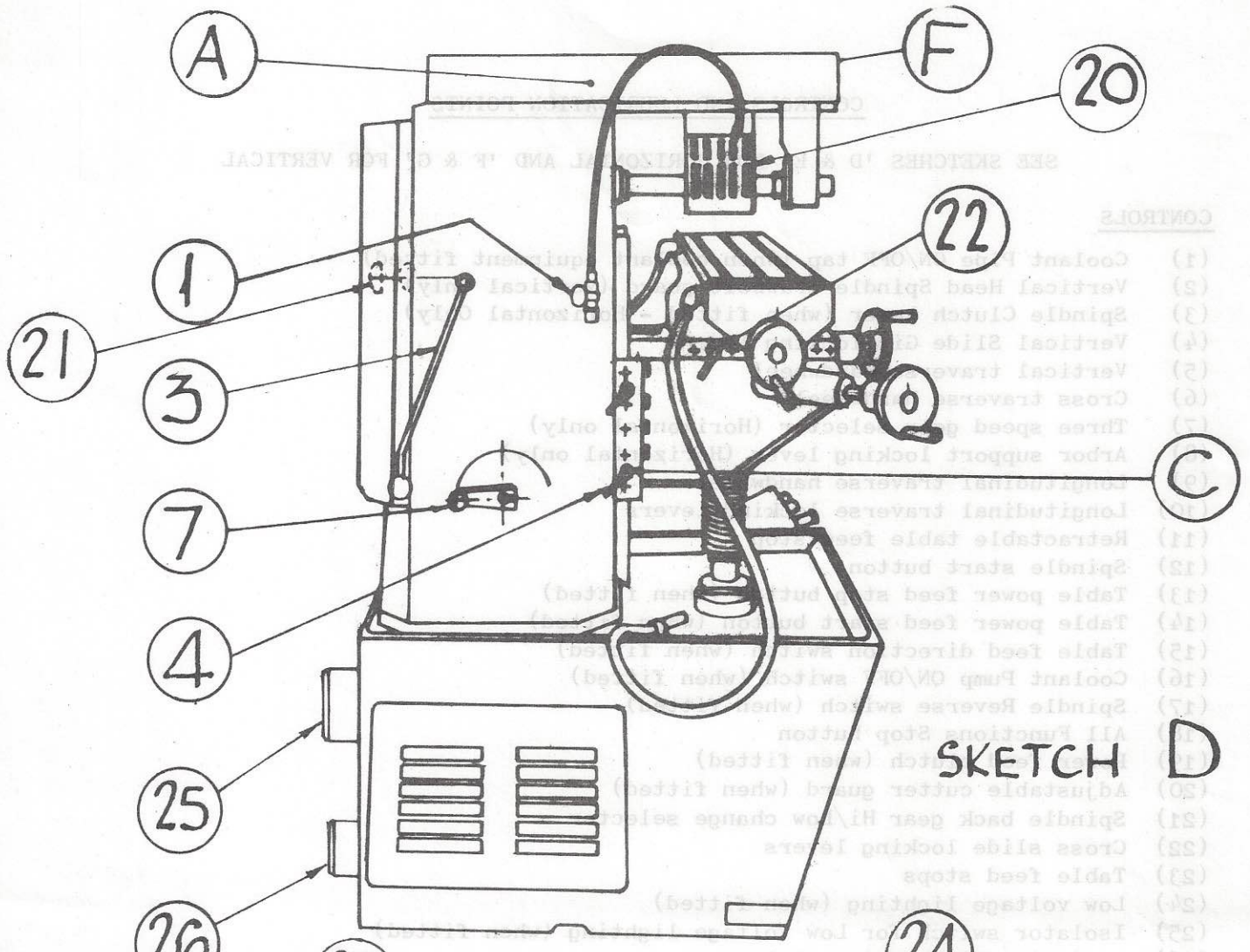
LUBRICATION POINTS

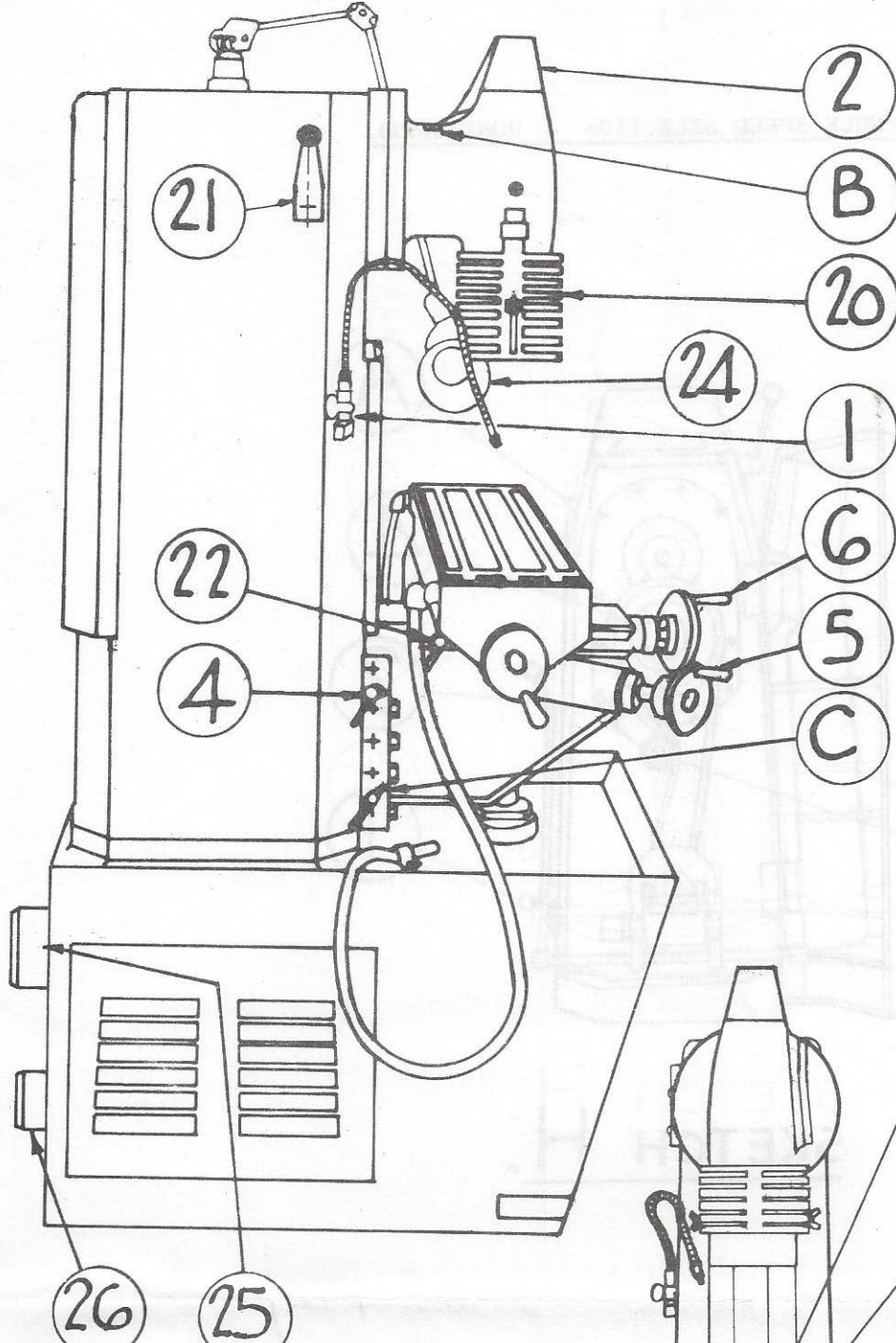
- A. Top Gearbox filler plug under overarm with sight glass on Left hand side of column - Fill with oil and maintain level (HORIZONTAL ONLY).
- B. Head filler plug - fill to oil level and maintain (VERTICAL ONLY).
- C. Vertical slide nipples each side, oil daily.
- D. Cross slide nipples, oil daily.
- E. Table slide nipples, oil daily.
- F. Arbor support fill with oil to level and maintain (HORIZONTAL ONLY).
- G. Feedbox (when fitted) fill with oil to level on sight glass and maintain.
- H. Vertical screw nut nipple, grease daily.
- J. Cross feed screw nipple, grease daily.
- K. Bevel gears nipple, grease daily.

On machines fitted with spindle drive clutch, lightly grease clutch ring and bracket occasionally. Any grease on clutch lining or Poly Vee belt must be removed.

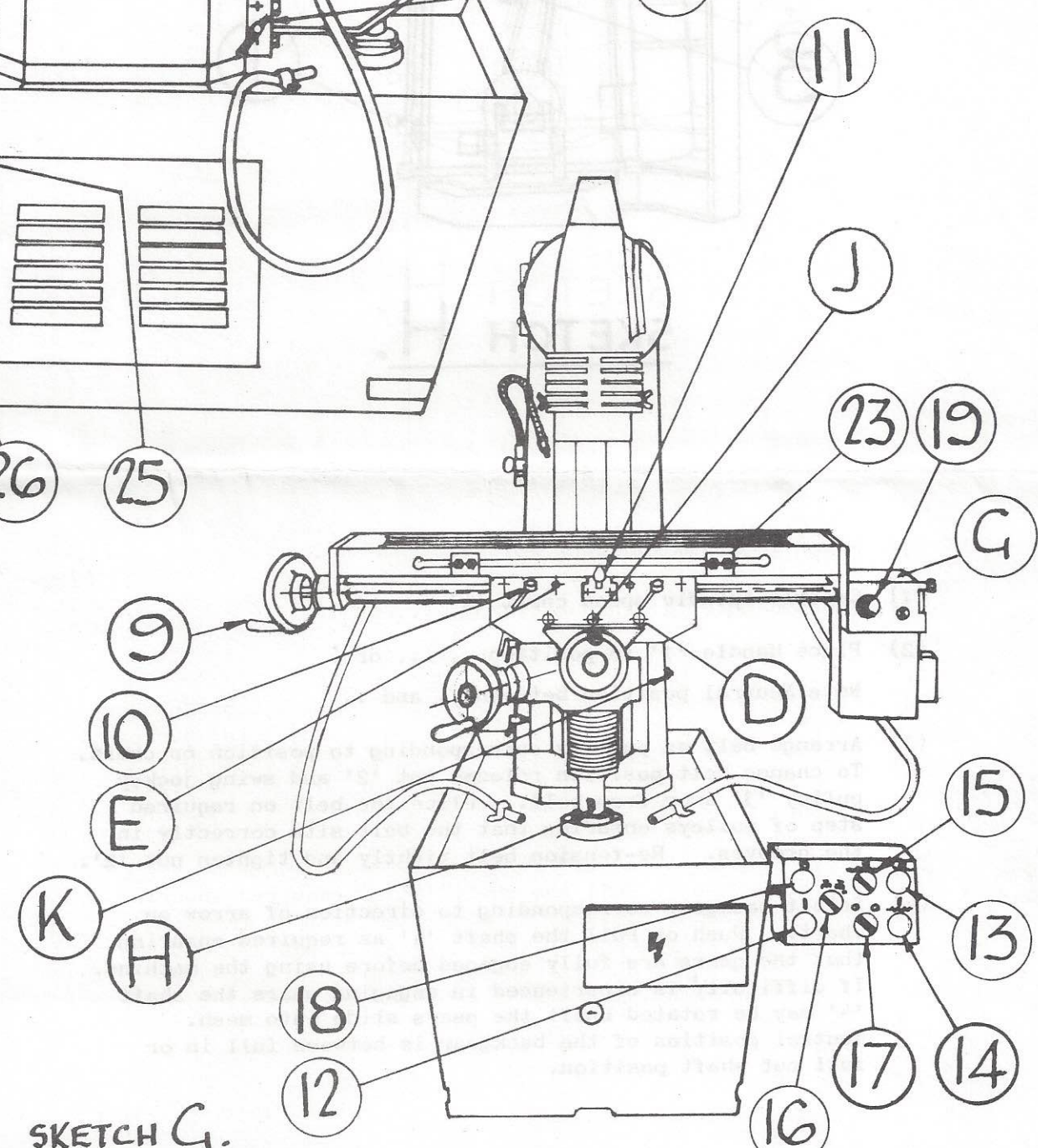
RECOMMENDED OIL - SHELL VITREA 41
RECOMMENDED GREASE - SHELL ALVANIA RA

Lower gearbox on Horizontal is filled with SHELL TIVELA COMPOUND 'A' which needs replacing only after a major overhaul.



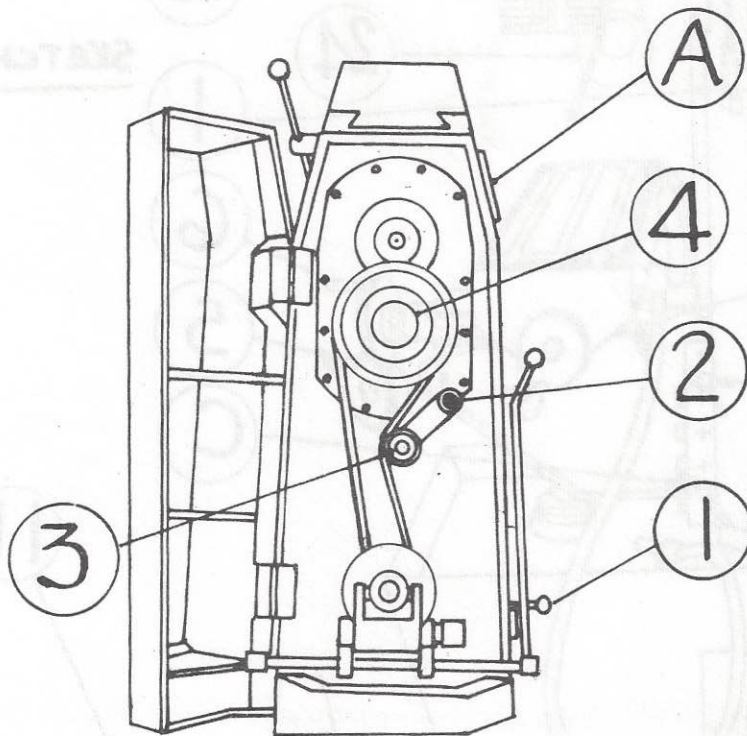


SKETCH F.



SKETCH G.

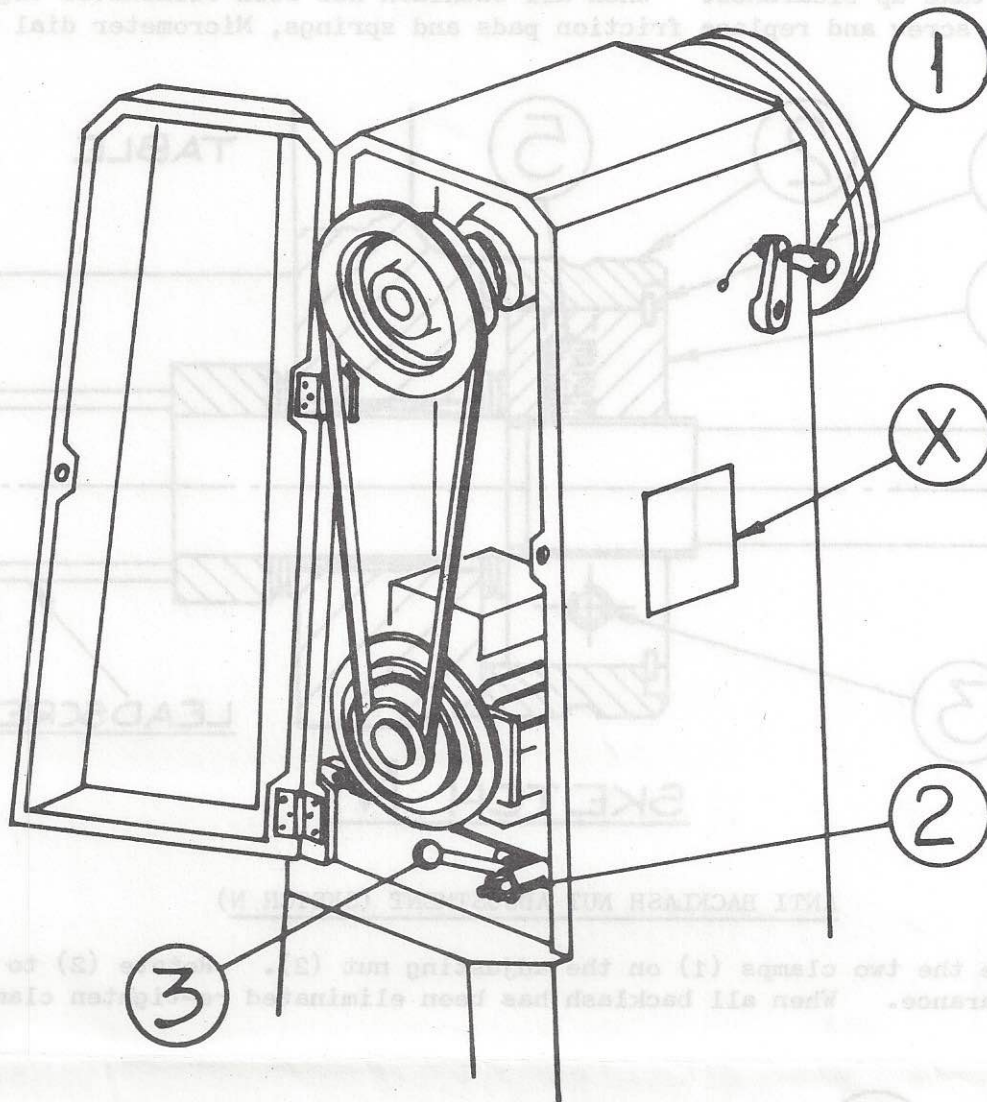
SPINDLE SPEED SELECTION - HORIZONTAL



SKETCH H.

- (1) Consult Spindle speed chart 'A'
- (2) Place Handle '1' in position ., . ., or ∴
Note Neutral position between ., and ..
- (3) Arrange belt on pulleys corresponding to position on chart. To change belt position release nut '2' and swing jockey pulley '3' away from belt. Place the belt on required step of pulleys ensuring that the belt sits correctly in the grooves. Re-tension belt tightly and tighten nut '2'.
- (4) Select backgear corresponding to direction of arrow on chart. Push or Pull the shaft '4' as required ensuring that the gears are fully engaged before using the machine. If difficulty is experienced in engaging gears the shaft '4' may be rotated until the gears slide into mesh. Neutral position of the backgear is between full in or full out shaft position.

SPINDLE SPEED SELECTION - VERTICAL

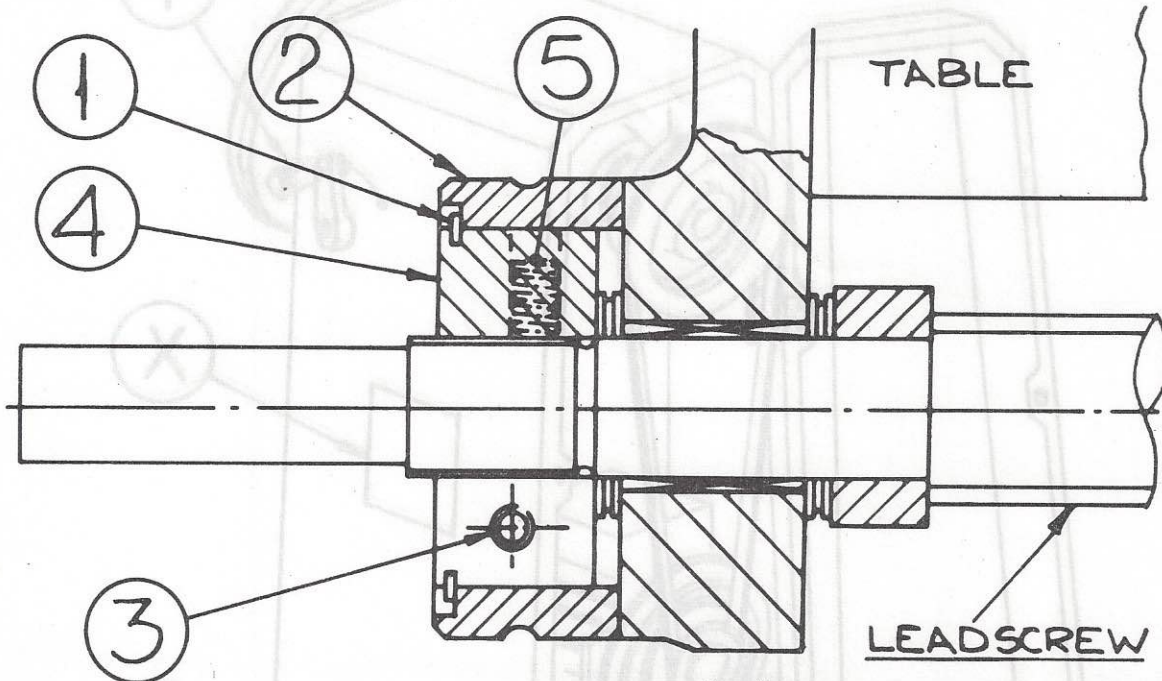


SKETCH J

- (1) Consult spindle speed chart 'X'
- (2) Place handle '1' in position 'A' or 'B' indicated on chart. Note! Neutral position between A and B if required.
- (3) Arrange belts on pulleys corresponding to positions on chart. To change belt position, support weight of motor by holding handle '3' whilst slackening nut '2'. Lift handle '3' and tighten nut '2' to take the weight of the motor while the belt is being changed to the pulley required. With the belt in the grooves selected, release nut '2' and lower the motor to tension the belt. Tighten nut '2' and close rear door.

ANTI BACKLASH ADJUSTMENT LEFTHAND ENDPLATE (SKETCH M)

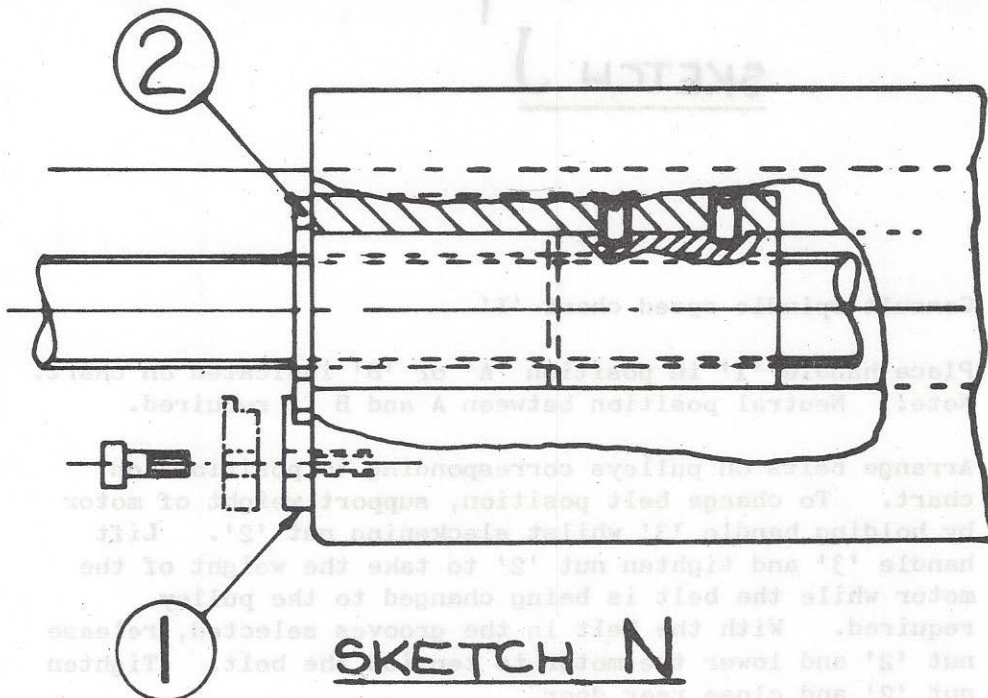
Remove circlip (1) and carefully slide Micrometer dial (2) back to expose locking screw (3). NOTE! care to be taken to ensure that spring loaded pads (5) do not fly out when (2) is pulled back. Rotate inner dial ring (4) to take up clearance. When all backlash has been eliminated tighten locking screw and replace friction pads and springs, Micrometer dial and circlip



SKETCH M

ANTI BACKLASH NUT ADJUSTMENT (SKETCH N)

Release the two clamps (1) on the adjusting nut (2). Rotate (2) to take up clearance. When all backlash has been eliminated re-tighten clamps (1)



SKETCH N

KNEE AND SADDLE GIB-STRIPS (SKETCHES P AND Q)

To adjust gib-strips for wear the following procedure must be adopted. Slacken clamp lever, loosen screws (1) and nuts (2) slightly and screw in screws (3) as required, tighten screws (1) every so often to ensure that screws (3) are not being over-tightened. It is as well to oil slides before adjusting the gibs as this will affect the movement of the knee or saddle. Tighten screws (1) and nuts (2) securely once adjustment is complete.

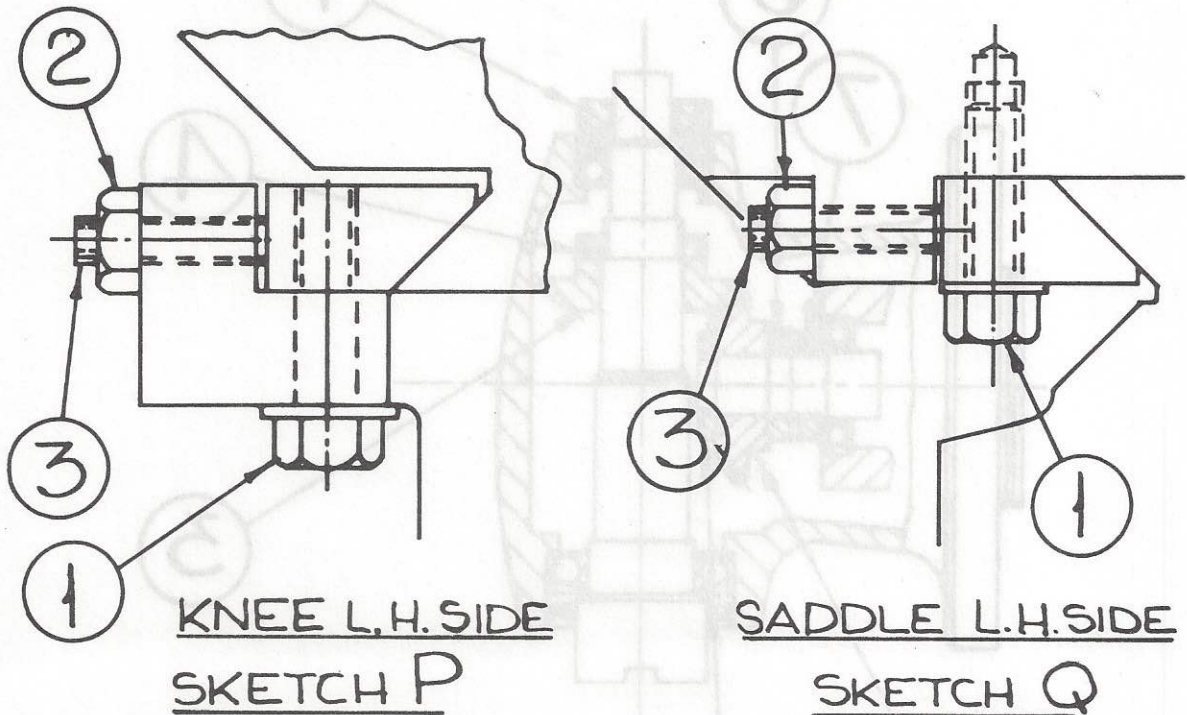
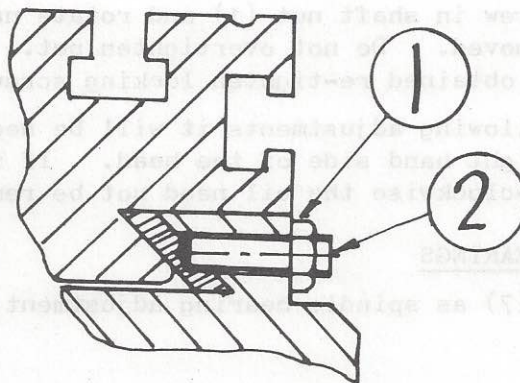


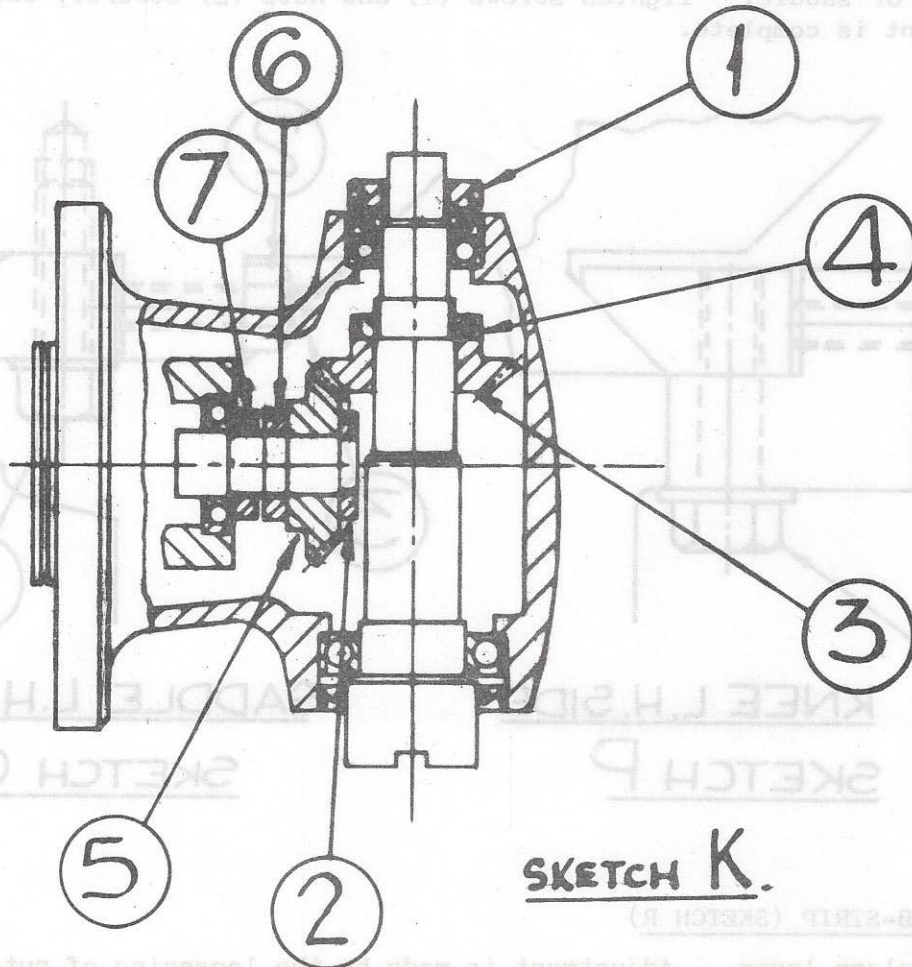
TABLE GIB-STRIP (SKETCH R)

Slacken clamp lever. Adjustment is made by the loosening of nuts (1) and the adjustment of screws (2). There are no clamp screws to loosen, only the adjusting screws. Oiling of ways before adjusting helps as in knee and saddle gib-strip adjustment. After adjustment nuts (1) must be re-tightened.



HEAD ADJUSTMENT INSTRUCTIONS - VERTICAL MACHINES ONLY

To adjust gib-strips for wear the following procedure must be adopted. Slacken clamp lever, loosen screws (1) and nuts (2) slightly and screw in screws (3) as required, tighten screws (1) every so often to ensure that screws (3) are not being over-tightened. It is as well to oil slides before adjusting the gibs as this will affect the movement of the knee or saddle. Tighten screws (1) and nuts (2) securely once adjustment is complete.



SKETCH K.

SPINDLE BEARINGS

Slacken locking screw in shaft nut (1) and rotate nut until endfloat of spindle is just removed. Do not overtighten nut. When minimum clearance has been obtained re-tighten locking screw.

Note! For the following adjustments it will be necessary to remove the cover on the right hand side of the head. If the head is swivelled a few degrees anti-clockwise the oil need not be removed.

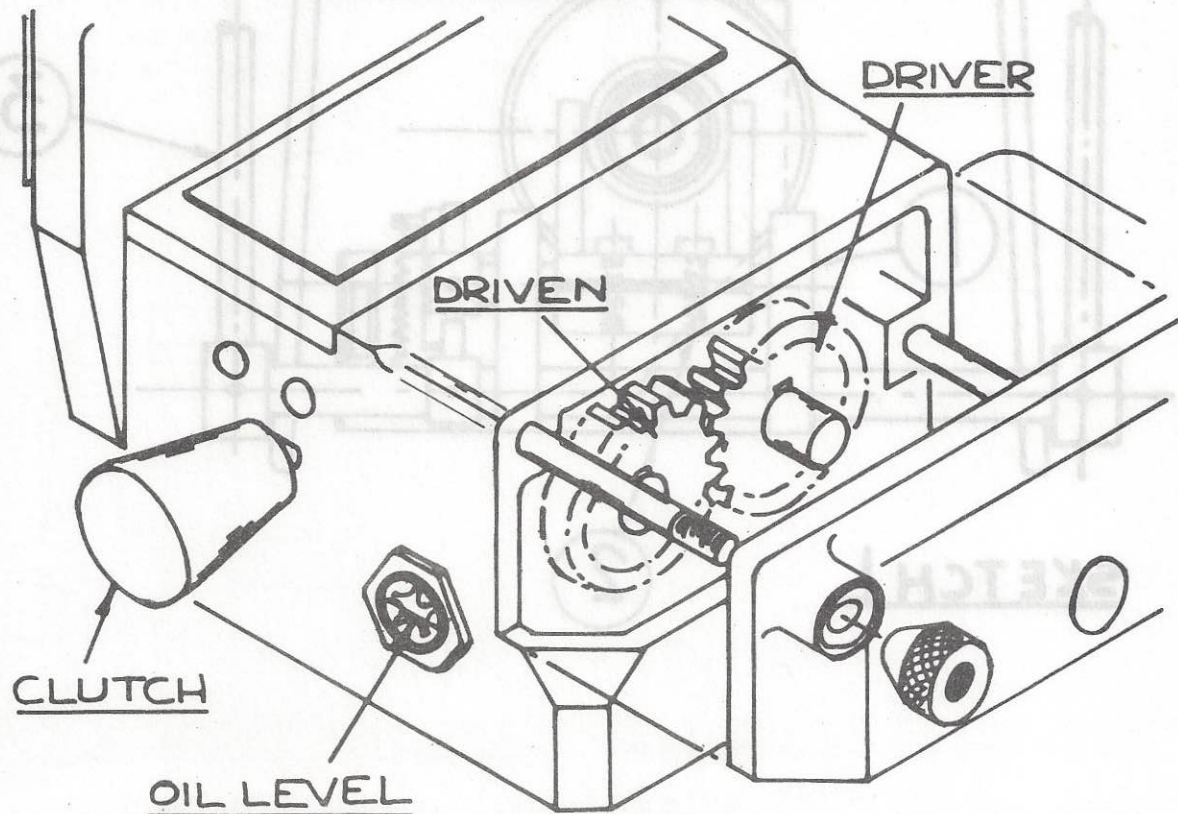
HORIZONTAL SHAFT BEARINGS

Adjustment by nut (7) as spindle bearing adjustment.

BEVEL GEARS

Gear (3) adjusted by nut (4). Gear (5) adjusted by nut (6) and clamped by nut (2). Tighten all nut locking screws after adjustment is complete.

LONGITUDINAL POWER FEED TRAVERSE (WHEN FITTED)



The feed is powered by a .25Kw Electric Motor. Operation of this is by push buttons and reversing switch mounted on the main control panel.

The gearbox is fitted at the right hand end of the table and can power the table through 457mm (18") of movement.

The table may be controlled by the following means:-

- (1) Mechanical Clutch in feed gearbox. Move lever from right to left to disengage drive and left to right to engage.
- (2) Stopping power feed motor by depressing 'stop' button on control panel.
- (3) Stopping the main motor (all functions stop).
- (4) Stopping the spindle by means of the spindle clutch (when fitted to Horizontal only).
- (5) Setting the stops on the front of the table as follows:

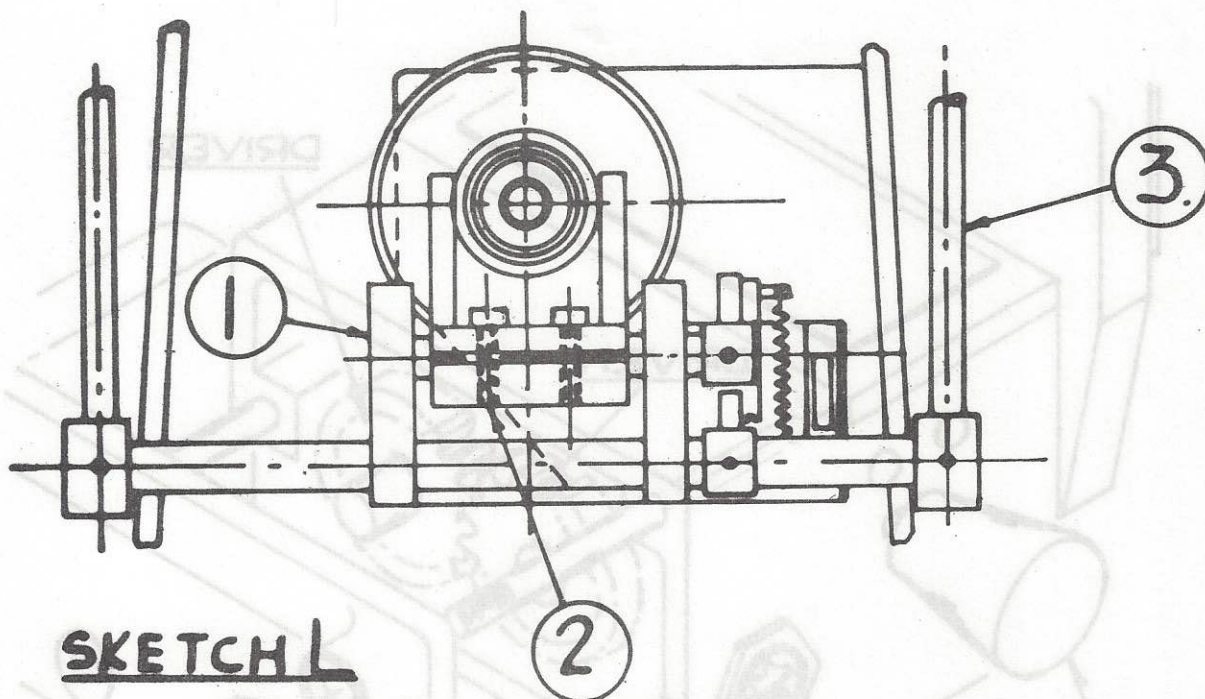
Set the fixed stops securely in the required position relative to cutter. Raise the retractable table stop and feed the table under power. On reaching the stop, the slipping clutch will operate and ensure positive positioning every time. The slipping clutch also gives overload protection and is self-resetting.

Rate of feed is varied by means of 'Pick-Off' gears in the end of the feed gearbox. Range of feed speeds 17.5-126mm/min. (.697-4.95 in./min.) for 50 cycle motors and 20-145mm/min. for 60 cycle motors.

Consult Gear Ratio chart for determining required speed.

SPINDLE DRIVE CLUTCH - HORIZONTAL ONLY

(WHEN FITTED)



Adjustment for wear on cone clutch lining

As the clutch lining wears the clutch operating lever will move nearer the front of the machine. As there is a limit to the extent this movement can be tolerated, the adjustment is carried out as follows:-

The clutch fork (1) is held in position on its spindle by two clamp screws (2). The clutch fork being split at the rear end to allow this to be adjusted. Loosen screws (2) and move the operating lever (3) towards the back of the machine to the required operating position, retightening screws (2) completes the job.

COOLANT EQUIPMENT (WHEN FITTED)

This can be fitted as an extra to all models. An electric pump is mounted inside a tank which is integral with the machine base. Tank capacity three gallons (13.64 litres).

The coolant nozzle is fitted to a flexible 'stayput' tube screwed into the column with a tap connection.

If the flow of coolant fails check the filter at the pump inlet for blockage.

Occasional cleaning-out of the tank is necessary, pumping out as much of the coolant as possible. Access to the tank is by removal of louvred base cover plate. After removal of all silt swarf etc., refill with clean coolant. This should be carried out once a year.

ELECTRICAL EQUIPMENT - OPERATING NOTES

- (1) The machine cannot be started unless the rear door is completely closed.
- (2) On machines fitted with spindle reversing, the reverse switch automatically isolates the spindle drive when operated and must be in the extreme right or left position on restarting the machine.
- (3) On machines fitted with power feed, the longitudinal traverse cannot be brought into operation unless the spindle motor is running and the main drive clutch (IF FITTED) engaged.

ELECTRICAL CONNECTIONS

The only electrical connections necessary upon installation are the link to the main supply made to the isolator mounted at the rear of the machine and an adequate connection to the Earth terminal in the side of the isolator.

GENERAL OPERATING NOTES

- (1) Check the oil levels before running the machine.
- (2) Check that the cutter and arbor are clear of work and free to rotate before running the machine.
- (3) Select required speed before starting. Do not change gear while the machine is running.
- (4) Use only hand pressure to operate handwheels. If this is insufficient, check for obstructions to movement, e.g. table stops, cutter etc.
- (5) Switch off at isolator before inspecting wiring or switches.
- (6) Check that drive belts are correctly located in pulley grooves and that tension is sufficient to drive machine.
- (7) Keep pulley grooves free from grease and oil by cleaning with white spirit or carbon tetrachloride (c.t.c.).
- (8) CLEAN DOWN MACHINE AFTER USE.

WHEN ORDERING REPLACEMENT PARTS PLEASE QUOTE MACHINE No., ELECTRICAL SUPPLY AND ANY OTHER RELEVANT DETAILS.

FOR INFORMATION REGARDING ACCESSORIES, ATTACHMENTS ETC. FOR EXTENDING THE CAPABILITIES OF YOUR HORIZON MILLING MACHINE CONTACT THE MANUFACTURERS:-

A.E.W. Engineering Co. Ltd.,
Horizon Works, Dereham Road,
Costessey, Norwich, NOR 46J.

Telephone: Costessey 2118
Telex : 97254
Cables : Milmac Norwich

Note: Illustrations may not be binding as to detail, and the manufacturers reserve the right to modify any design or specification in the light of experience, market trends or new developments.

