OPERATORS INSTRUCTION HANDBOOK

FOR THE

ELLIOTT

10 M HIGH SPEED SHAPING MACHINES

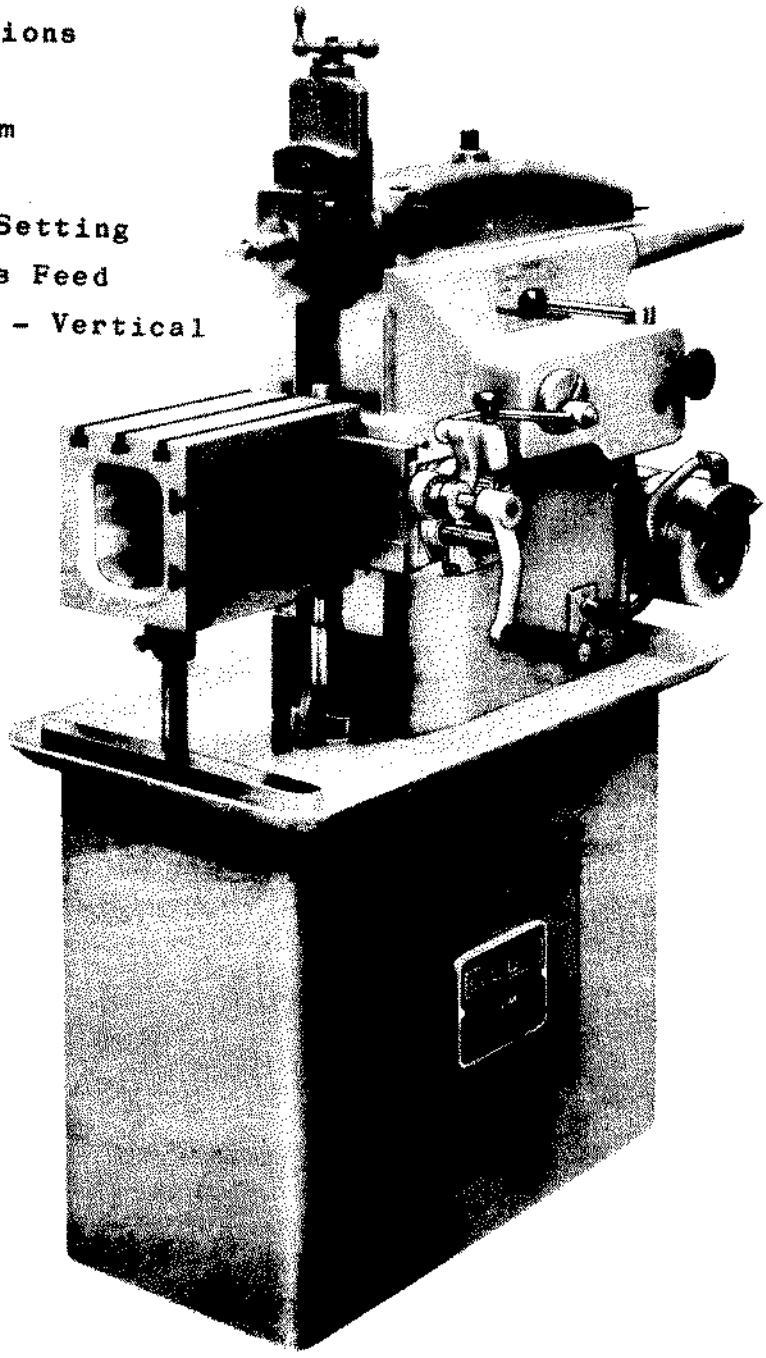
BENCH AND PEDESTAL MODELS

CAUTION

For maintenance and Operator safety the access cover to the Bull Gear has been fitted with a micro-switch. Should this cover become part open or open the machine will stop.

To re-start machine ensure door is closed and operate start switch.

Contents



Slinging

It is important to sling the machine correctly and Fig.1 shows the method we recommend.

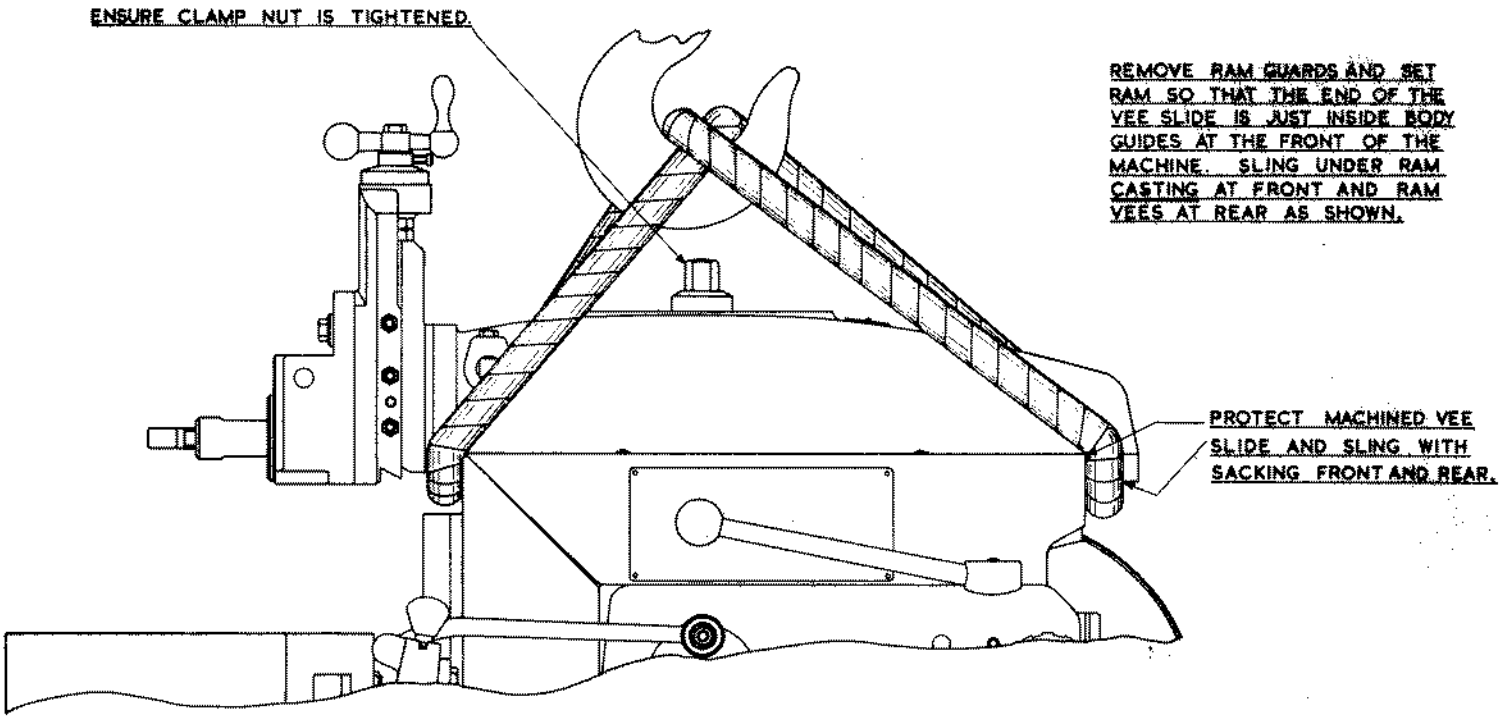


FIGURE 1

Examination

The machine should be carefully examined and any damage sustained in transit reported immediately to the responsible authority.

Cleaning

All bright surfaces are covered with a rust preventative which is soluble in ordinary machine oil. Do not allow any of the sliding parts to be moved until every trace of rust preventative has been removed.

Installation

Machines supplied complete with cabinet bases should have foundations prepared in accordance with the plan shown in figure 2.

Lower the machine complete with rag bolts or bolts and plates on to suitable metal wedges or strips so that it may be correctly levelled before grouting down. The level should be checked with a precision spirit level set in both directions on the table surface.

Similar care should be taken when installing bench models, to ensure that the machine is not strained by uneven clamping, and if necessary the bench or other support should be cross-braced to withstand the reciprocating movement of the shaper ram. A steel swarf tray can be supplied to fit under the base of the bench model.

When the machine arrives, the slides may have been tightened up for transit and after releasing these, the drive should be turned by hand to ensure that everything is free before operating the machine under power.

When the machine is connected to the electricity supply, it is necessary to check the direction of rotation of the drive, in accordance with the arrow shown on the installation drawing for engaging the clutch (Lever 'B' Fig.4).

Foundation

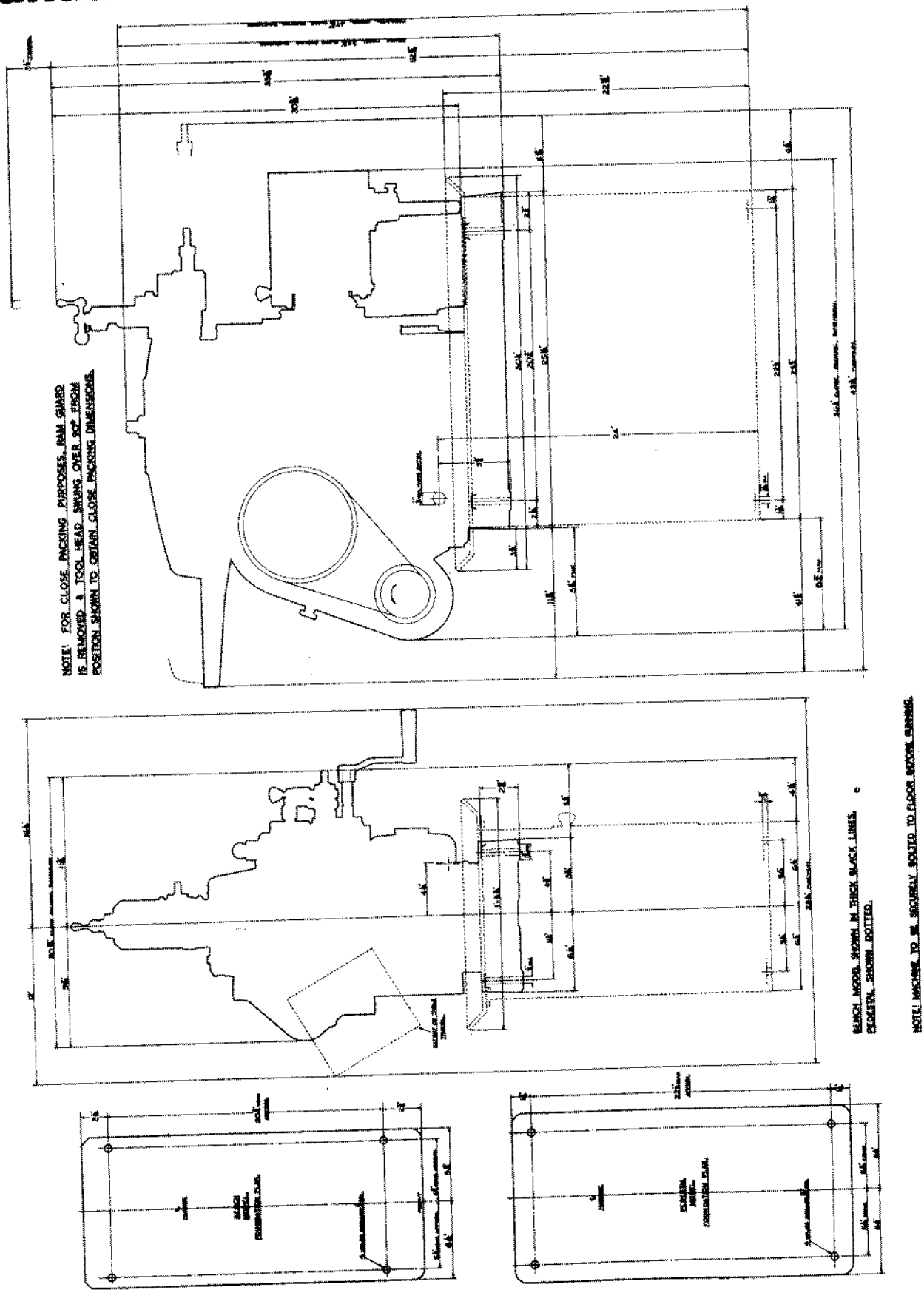


FIGURE 2

Lubrication

Ref. No.	Parts Lubricated	Lubricating Instructions and Location	Recommended Lubricant	Period
1	Ram slide	Bennet flush fitting lubricators provided	Shell Oil Vitrea 33	DAILY - more often according to duty of machine
2	Rocker arm top spindle and bearing	Oil through hole visible through slot in top of ram	Shell Oil Vitrea 33	DAILY - more often according to duty of machine
3	Rocker arm slides and die block	Open door on side of body and oil through oil hole in top of die block. Also oil slides	Shell Oil Vitrea 33	DAILY - more often according to duty of machine
4	Bull gear bearings	Bennett flush fitting lubricator provided	Shell Oil Vitrea 33	DAILY - more often according to duty of machine
5	Clutch operating gear	Bennet flush fitting lubricator provided	Shell Oil Vitrea 33	DAILY
6	Bottom rocker arm bearing and slideway	Open door on side of body and oil with oil can	Shell Oil Vitrea 33	DAILY - more often according to duty of machine
7	Tool head feed screw and slides	Raise tool head and oil screw and slides with oil can	Shell Oil Vitrea 33	DAILY
8	Elevating screw	Raise table and oil screw with oil can. Also oil screw through hole in top of screw cover	Shell Oil Vitrea 33	DAILY
9	Elevating shaft bearings	Traverse table away from operator and oil through oil holes in main slide	Shell Oil Vitrea 33	DAILY
10	Cross traverse screw and bearings	Oil through oil holes in front of main slide and oil screw thread with oil can	Shell Oil Vitrea 33	DAILY
11	Main slideways and body slideways	Clean and oil with oil can and traverse table and main slide to ensure complete lubrication	Shell Oil Vitrea 33	DAILY
12	Feed ratchet bracket	Oil bearing through oil hole in ratchet bracket and oil plunger through top of bracket	Shell Oil Vitrea 33	DAILY
13	Feed link	Oil through oil holes provided	Shell Oil Vitrea 33	DAILY
14	Vertical feed gears when fitted	Oil gears with oil can	Shell Oil Vitrea 33	DAILY
15	Main shaft and intermediate shaft bearings	4 Winkley pattern oilers provided in back cover. Rotate oiler caps to expose oil holes and fill with oil	Shell Oil Vitrea 33	WEEKLY
16	Gears	Move ram forward and apply by brush to gear teeth, through gap between ram slideways	Shell Grease Alvania 2	WEEKLY - more often according to duty of machine
17	Elevating gears	Traverse table away from operator's side to expose skew gears and apply grease with a brush	Shell Grease Alvania 2	WEEKLY
18	Motor	Grease through grease nipples provided	Shell Grease Alvania 2	Periodically
19	Clutch pulley ball bearings	These are greased before assembly and require only periodic attention	Shell Grease Alvania 2	Periodically

ALTERNATIVE LUBRICANTS			
	MOBIL	EDGAR VAUGHAN	WAKEFIELD
OIL	DTE HEAVY MEDIUM OR VACTRA HEAVY MEDIUM	COSMOLUBRIC H	PERFECTO N.N
GREASE	MOBILUX No.3	EVCO B.B No.3	SPHEEROL A.P.2

Lubrication

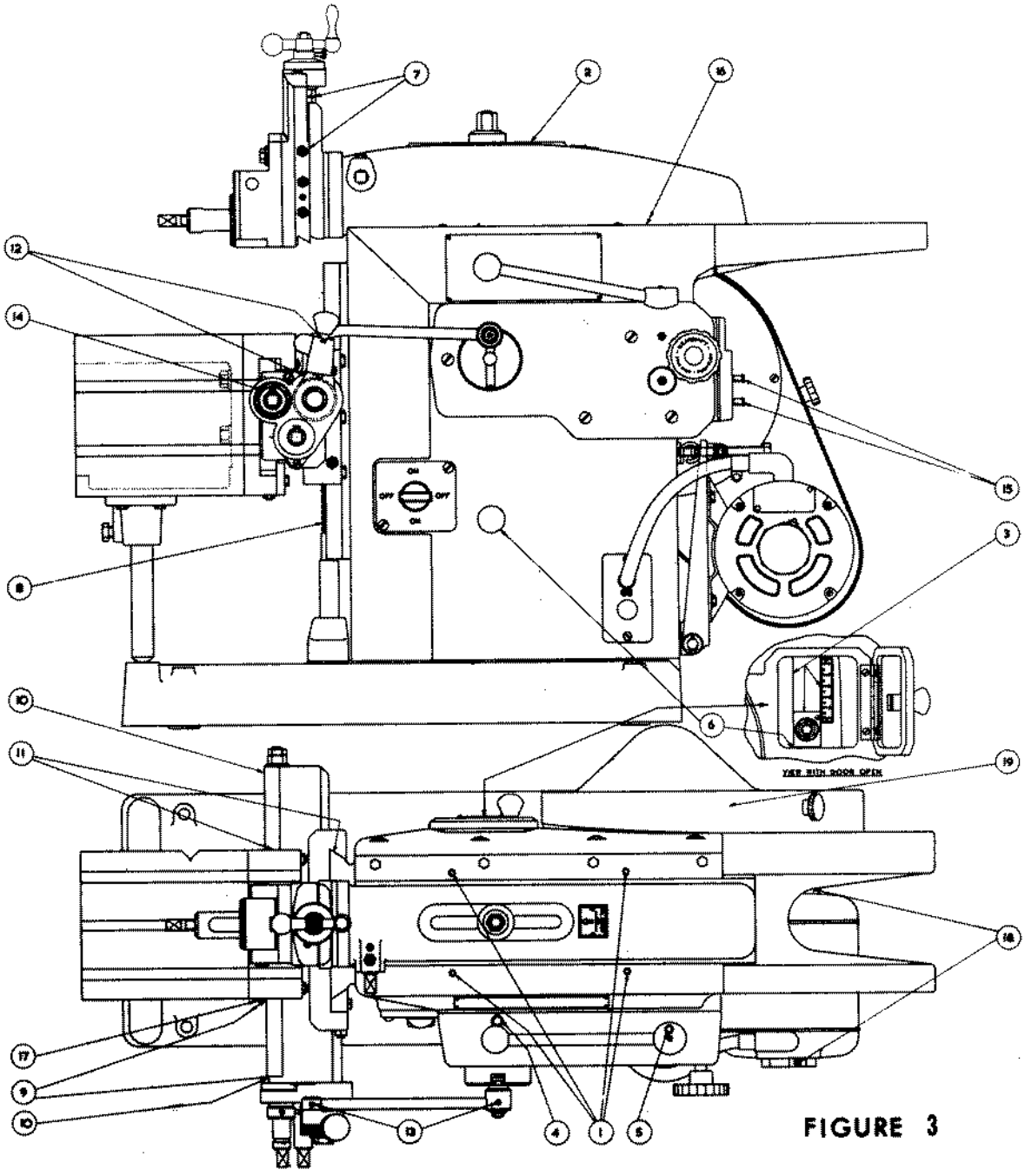


FIGURE 3

Complete lubricating instructions are given in figure III and in the descriptive chart on the opposite page, and it is advisable to give one complete service before starting up the machine for the first time.

Alternative lubricants which are officially recommended are listed in the schedule on page 6.

The application of a light or medium machine oil to all slides and bright exposed parts at the end of each working shift is an obvious but vital necessity.

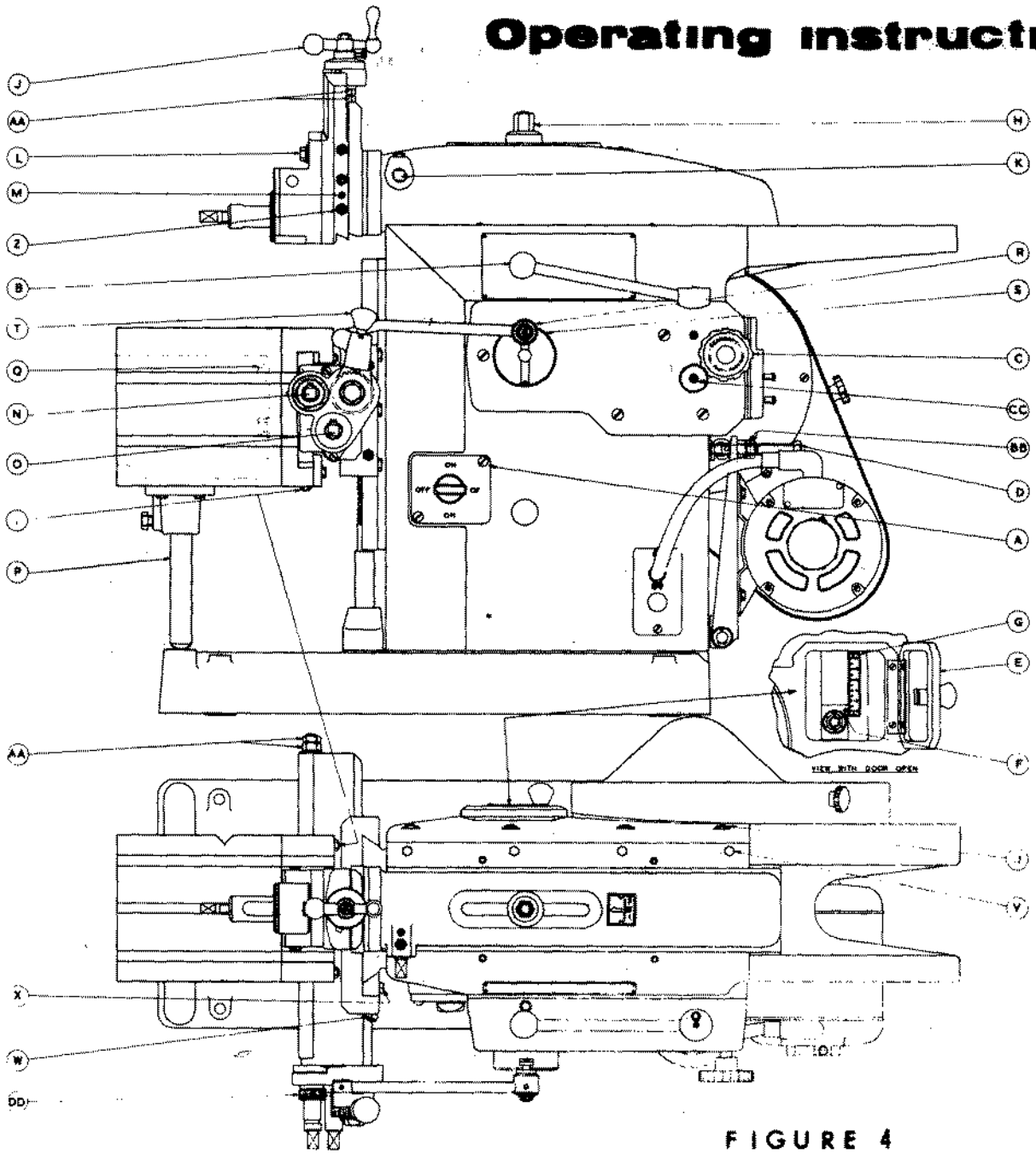


FIGURE 4

A	On/Off switch	Q	Table release nuts
B	Clutch lever	R	Feed link eye
C	Gear change plunger	S	Tee-slotted cam
D	Motor adjusting bolt	T	Feed plunger
E	Door	U	Ram slide adjusting screws
F	Die block	V	Ram slide holding down screws
G	Rocker arm	W	Main slide adjustment screws
H	Ram clamp nut	X	Main slide holding down screws
J	Tool feed handle	Y	Cross slide adjustment screws
K	Tool head clamp	Z	Tool head adjustment screws
L	Clapper box adjustment	AA	Tool slide and cross slide locknuts
M	Tool slide locking screw	BB	Motor locknuts
N	Table cross feed shaft	CC	Clutch adjustment screw
O	Table vertical feed shaft	DD	Slip on gear
P	Table support bar		

DRIVE

The power is transmitted by a vee rope from a $\frac{3}{4}$ h.p motor at the rear of the body to the two-stepped pulley and clutch unit, and then through a two speed gear train to the bull gear, rocker arm and ram, giving a final choice of four speeds as shown on the speed chart.

The motor is of the modern silicone insulated type designed to run efficiently at working temparatures up to 105° C. The various controls are shown in figure IV.

The motor is controlled by the switch 'A' on the side of the machine and the final drive is engaged by the clutch lever 'B' which is pulled outward to engage and is pushed inward to disengage the clutch.

Vee rope changes of speed are effected by removing the cover at the rear side of the machine, and if necessary using the box spanner on the motor adjusting bolt 'D' temporarily to reduce the centre distance of the drive. The gear change is made by appropriate positioning of the push/pull knob 'C'. Gear changes should never be made with the gears in motion. If engagement cannot be effected because of the position of the teeth, the clutch should be used to "inch" the input shaft, and then a second attempt should be made.

SETTING THE RAM

To alter the stroke length the machine should be stopped during a forward stroke with the front extremity of the ram dovetails approximately coincident with the front casting wall of the body, in which position the rocker arm will be vertical.

Access to the die block is gained by opening the door 'E' on the rear side of the machine, and after releasing the die block nut, the block itself can be moved so that the small arrow 'F' indicates the stroke length now required against the scale 'G' on the rocker arm. Make sure that the die block is securely re-locked.

To adjust the position of the ram, as distinct from the stroke length, release the clamp 'H' on top of the machine, push the ram to the required position, and re-tighten the nut securely. When setting for a long stroke with the ram well back, the operator

should ensure that the tool slide is not in such an extended and swivelled position as would cause the tool to foul the front of the column at the end of the return stroke.

TOOL SLIDE

The tool feed is applied through the ball handle 'J', and increments can be read from the graduated dial which is marked with divisions corresponding to 0.001". There is a locking screw 'M' which clamps the tool slide through the gib strip and this should always be released before attempting to move the slide. The slide assembly can be swivelled for machining inclinded surfaces, after releasing the toolhead clamp 'K' which unlocks by clockwise rotation, after releasing the socket head screw, which can be seen immediately above the clamp itself. Swivelling of the clapper box to give effective relief when shaping vertical walls, or to vary the normal approach angle of the tool, is achieved simply by releasing the hexagon screw 'L' and setting as required.

MACHINE TABLE - SETTING

To elevate or lower the work table, the support bar 'P' should be freed by releasing the hexagon nut on the bracket immediately above it, after which hand adjustment is available by using the swape on the shaft end 'O'. When the adjustment is made for pre-setting purposes only, the support bar should be re-clamped, so that it can support the table whilst the cut proceeds, but if automatic vertical feed it to be used, (this involves extra equipment), then it will be advisable to raise the support bar into its fully retracted position. The same will apply if the table is to be swivelled relative to the cross slide, this being achieved by releasing the three clamping nuts 'Q' located inside the table casting.

Hand traverse of the work table in the horizontal plane is effected by applying the swape to the shaft end 'N'

AUTOMATIC CROSS FEED

This derives from a pawl and ratchet movement and the increment per stroke can be varied from .0066" (one tooth) to 0.026" (4 teeth) by altering the position of the crank pin 'R' on the crank disc 'S'. The automatic feed can be stopped, or made to operate in the opposite direction simply by withdrawing the plunge 'T' and allowing it to return at 90° or 180° from the original position. It s important that the feed should be applied during the return stroke of the ram, therefore the crank pin should always be set in that part of the tee slotted disc or crank which gives this effect. For this reason it is necessary to re-set the crank pin on to the opposite side of the disc when the direction of feed is reversed.

Should the table be traversed to either extreme end of the cross slide until the nut contacts the casting wall, damage to the machine is prevented by means of a slipping ratchet wheel. To re-engage the ratchet all that is required is the withdrawal of the plunger 'T' and replacement at 180° from its original position, this reverses the feed and allows the nut to traverse away from the casting wall.

If desired the nut can also be traversed away from the wall manually, before attempting this ensure that the plunger 'T' is in the disengaged position.

AUTOMATIC FEED - VERTICAL

Automatic vertical feed to the cross slide and the table is now available as an extra on this machine, although it should preferably be fitted when the machine is built. When this feature is required, the pawl and ratchet arrangement which normally fits on to the end of the cross screw, is carried on a dead pin, or stub shaft, which is parallel to the screw and to the elevating shaft, and is positioned equidistant from both. The intermittent movement is transmitted either to the cross screw 'N' or to the elevating shaft 'O', by sliding the driving gear 'DD' on to one or the other and locking it to the shaft by means of a radial grub screw which engages the groove in the shaft.

On the vertical movement the same protection is provided as for the cross movement.

The extremes of travel are reached when the top or bottom of the cross slide casting is within 5/16" of the respective end of the dovetail slide on the body.

Damage is likely to occur when using vertical feed unless the support bar 'P' is unclamped, or fully retracted into the work table, as recommended in the notes on "SETTING".

Maintenance

The ram slideways are fitted with a gib strip which may be adjusted to compensate for wear, and to maintain the accuracy of the machine, by means of the four grub screws 'U', the holding down screws 'V' being slackened off whilst the re-setting is done. After making these adjustments the slides should be lubricated through the flush fitting oilers, and it should be checked that no abnormal temperature rise occurs, because this would indicate excessive tightening.
The vertical slides on the front of the body carry the cross slide and table assembly, and here the same procedure is used in that the three holding down screws 'X' are freed whilst the adjustment is made through the two screws 'W'.

The saddle to cross slide shears are controlled in exactly the same way through six adjusting screws 'Y' which are located underneath. The tool slide gib can be re-set by three screws 'Z', after ensuring that the lock 'M' is fully released. All the locknuts on the adjusting screws, and all the clamping screws must be firmly tightend before putting the machine back into operation. Excessive end float in either the tool slide screw or the cross slide screw can be eliminated by means of the locknuts 'AA'. The working centre distance of the vee rope drive can be re-set by backing-off the locknuts 'BB' on the motor baseplate, and adjusting the screw 'D' to take up belt stretch. If the two locknuts are then run up to the boss on the baseplate and locked to each other, they will constitute a setting stop which will permit the same degree of tensioning to be obtained after every speed change. In the vee rope drive, the pulleys have been so designed that the alternative ratios operate correctly at a common centre distance.

Adjustment of the clutch spring, to restore its load carrying capacity, should not be necessary until the machine has had considerable use, but if the need arises, increased thrust can be applied through the hexagon screw on the end of the clutch assembly, which is readily accessible by removing the drive cover '19'. Adjustment to release the drive may need to be carried out rather more frequently by a quick and simple operation. The socket set screw 'CC' is removed from the clutch operating shaft, whereupon a similar set screw will be found remaining in the tapped hole, and this should be backed-off very slightly so that when the clutch is in the "ENGAGED" position, a small amount of free movement can be felt at the clutch operating lever before encountering the main spring pressure. It then remains only to replace the first set screw, lock it against the inner one, and re-check that the free movement is still present at the clutch lever.

Tooling

An Elliott all steel unbreakable swivel base machine vice having jaws 3½" wide and being suitable for this machine, can be supplied by the manufacturers. Alternatively an Elliott patented semi steel vice, also with swivel base, 3" wide jaws, and offering full width support for the work, is available on request.

Specification

SPECIFICATION		
Maximum stroke	10"	254 mm
Number of speeds	4	4
Ram strokes per minute	46–67–85–122	46–67–85–122
Tool head down feed	3½"	88·9 mm
Maximum tool section	⅝" × ⅝"	15·75 mm × 18·9 mm
Table top surface	10·3/16" × 6·15/16"	258·5 mm × 176·25 mm
Table side surface	8½" × 7½"	215·9 mm × 190·5 mm
Maximum table to ram	7½"	196·8 mm
Minimum table to ram	⅜"	9·5 mm
Vertical travel	7½"	187·3 mm
Longitudinal traverse	11"	279·4 mm
Length of main slide	14·13/16"	374·5
Auto cross feed (Standard)	4–0·004" to 0·016"	4–0·100 to 0·400 mm
Auto cross feed and Auto vertical feed when power vertical feed is fitted	4–0·0066 to 0·264"	4–0·168 to 0·600 mm
Power of motor	¼ hp	¼ ch
Speed of motor (Sync)	1000 rpm	1000 tr/min
Space required (both models)	43·3/16" × 28·1/16"	996·8 mm × 711·2 mm
BENCH MODEL—Net weight	670 lb	304 Kg
Gross weight	856 lb	367 Kg
Case dimensions	43" × 47" × 32"	109 × 119 × 81 cm
Code word	TENMB	TENMB
PEDESTAL MODEL—Net weight	750 lb	330 Kg
Gross weight	1008 lb	457 Kg
Case dimensions	62" × 47" × 32"	157 × 119 × 81 cm
Code word	TENMP	TENMP

STANDARD EQUIPMENT. Necessary operating handles, box spanner and tommy bar. Operator's Instruction Handbook.

EXTRA EQUIPMENT. Power vertical feed to the table, Elliott All Steel Swivel Base Machine Vice, 3½" width of jaws, Swarf tray for bench mounted machines.

The manufacturers hereby reserve the right to modify the design of the machine and equipment, at any time, without notice and also alter the materials of which it is constructed. Nothing in these particulars should be deemed to form part of any contract for the sale of machine or equipment.

Printed in England

Component Parts List

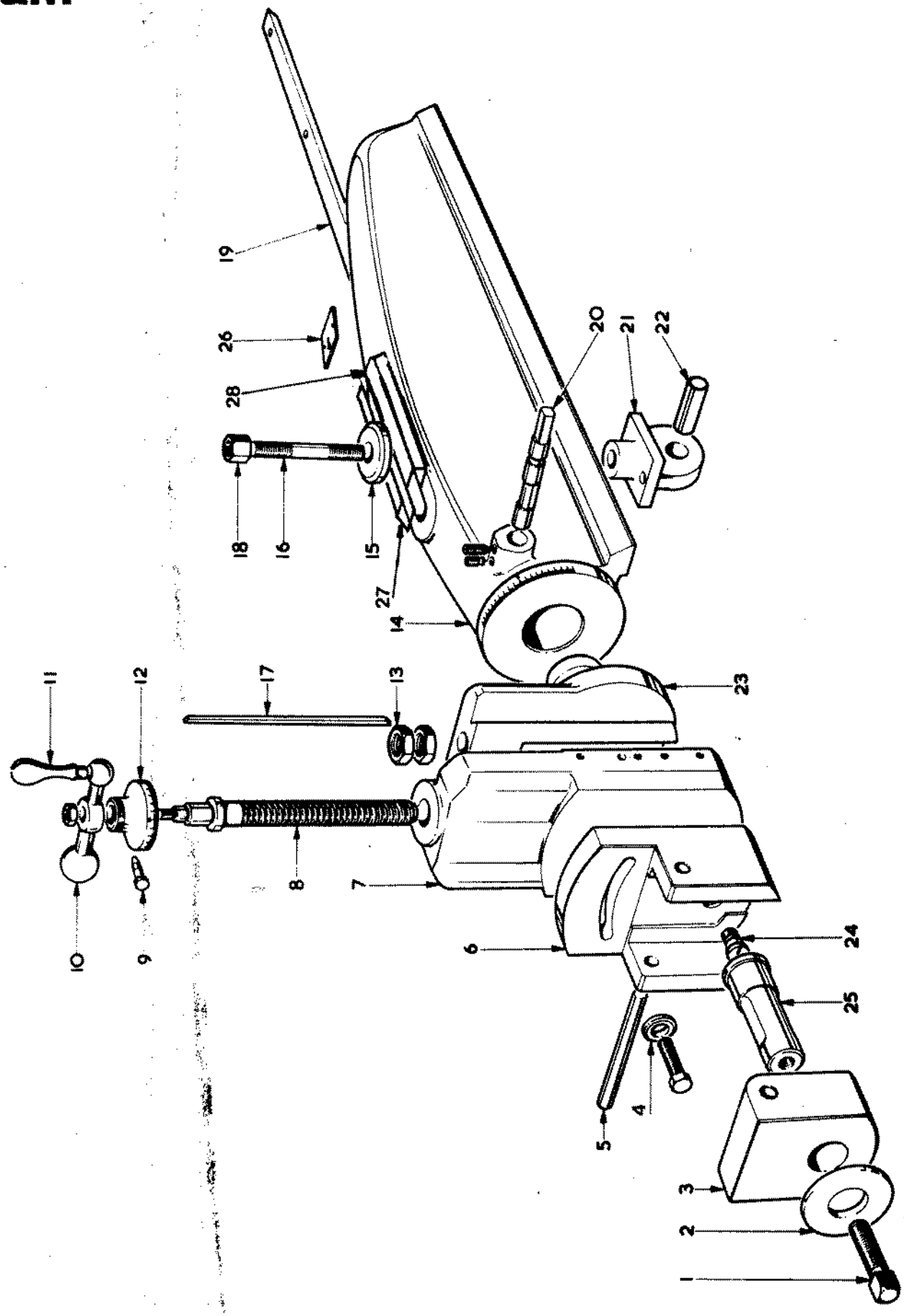
OF THE

ELLIOTT

10 M HIGH SPEED SHAPING MACHINES
BENCH AND PEDESTAL MODELS

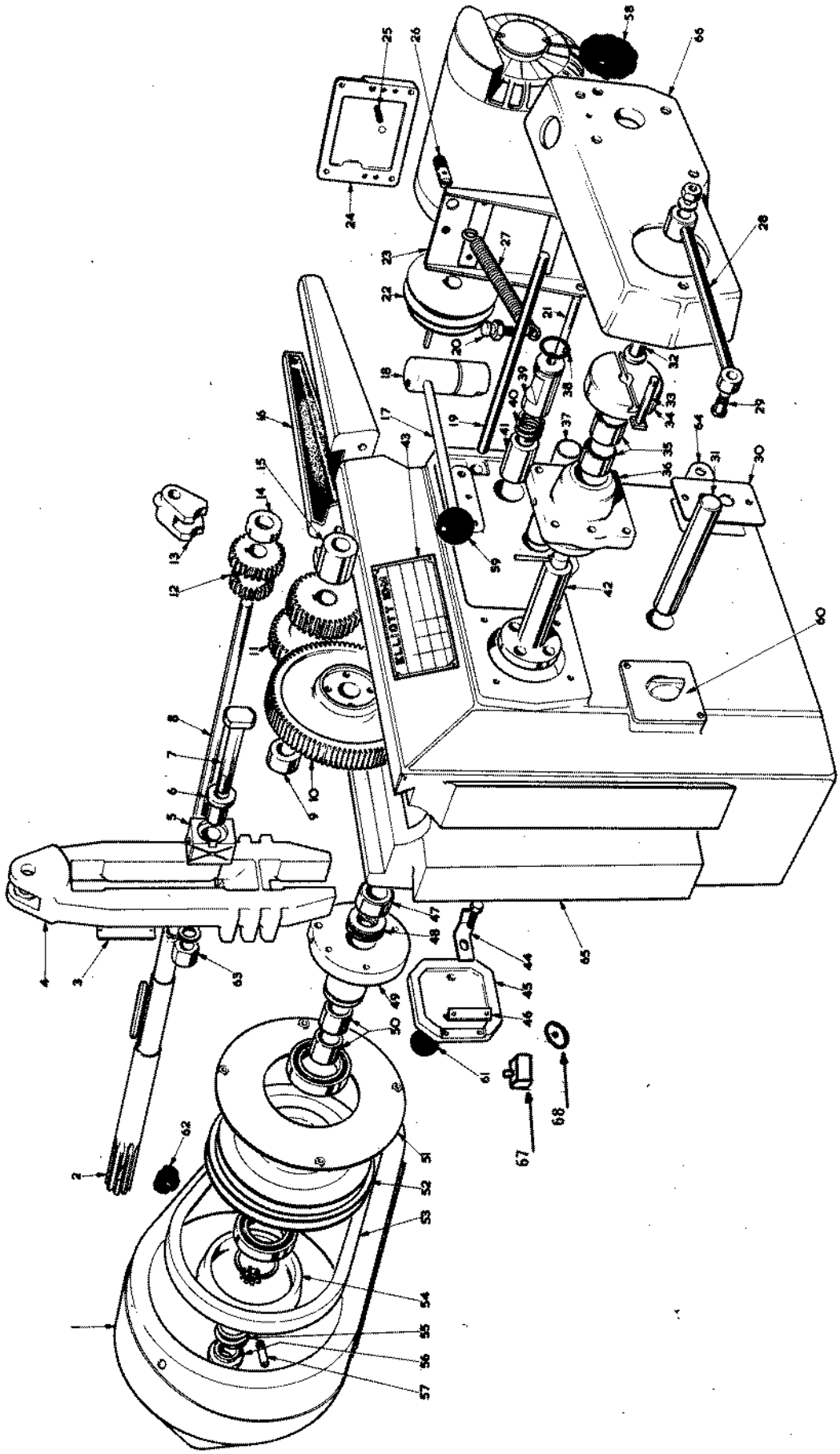
Please always supply machine serial number when ordering spare parts.

Ram



Illus. No.	Part No.	DESCRIPTION
1	2614361	Screw
2	-	Washer
3	2614689	Swing base
4	2614416	Collar
5	2614687	Taper pin
6	2614688	Swivel base
7	2614672	Tool box slide
8	2614692	Screw spindle
9	2614389	Screw
10	2614384	Ball crank
11	2614385	Handle
12	2614388	Graduated collar
13	2614363	Locknuts
14	2614669	Ram body
15	2614387	Clamping collar
16	2614695	Clamping screw
17	2614365	Toolslide strip
18	2614693	Nut
19	2614817	Ram packing strips
20	2614362	Locking cam
21	2614281	Pivot bracket
22	2614342	Top spindle
23	2614673	Swivel head
24	2614691	Pivot screw
25	2614359	Tool holder
26	2614417	Oiling instruction plate
27		LH Ram adjustment guard
28		RH Ram adjustment guard

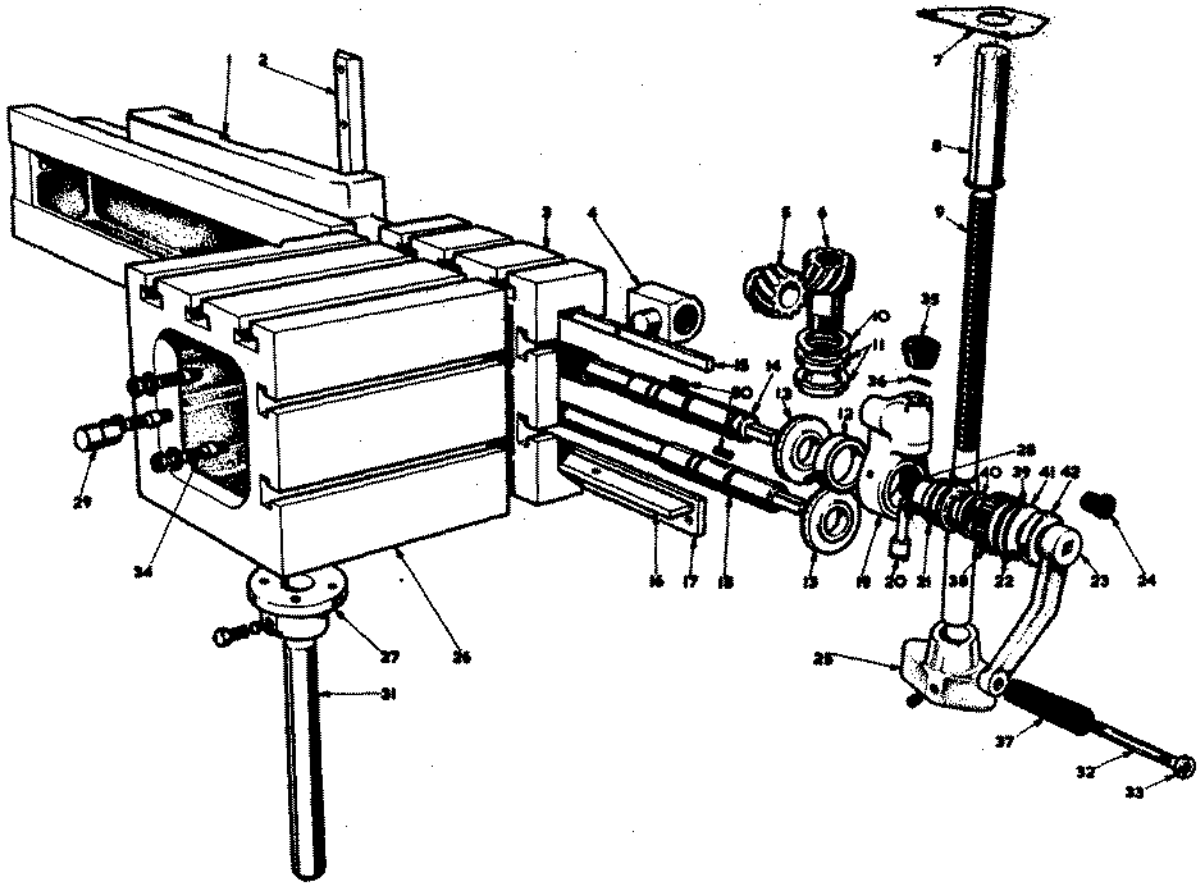
Main Assembly



Illus. No.	Part No.	DESCRIPTION
1	2614755	Belt guard
2	2614746	Driving shaft
3	2614312	Stroke indicating plate
4	2614677	Rocking arm
5	2614712	Top die
6	2614713	Bush
7	2614714	Tee bolt
8	2614744	Clutch rod
9	-	Oilite bearing. B.S.75
10	2614268	Bull gear
11	2614278	Idler gear
12	2614311	Sliding gear
13	2614679	Gear shift fork
14	2614741	Locating collar
15	2611131	Oilite bearing
16	2614828	Ram guard
17	2614751	Clutch lever
18	2614749	Clutch cam
19	2614754	Gear selector rod
20	2614815	Spring anchor
21	2614774	Motor base pin
22	2614283	Motor pulley
23	2614765	Motor base
24	2614686	Rear cover
25	2614299	Spring
26	2614816	Spring anchor
27	2614717	Motor base spring
28	2614726	Self act arm
29	2614836	Pin
30	2614831	Conduit entry plate
31	2614711	Bottom spindle
32	2614357	Bush
33	2614358	Tee bolt
34	2614719	Self act disc
35	-	Glacier bronze bushes
36	2614674	Bull gear bracket
37	2614743	Idler gear shaft

Illus. No.	Part No.	DESCRIPTION
38	-	'O' Ring O.S.19
39	2614748	Clutch operating spindle
40	2614718	Spring
41	-	Oilite bearing G.H.5
42	2614351	Bull gear spindle
43	2614776	Speed change plate
44	2614296	Spring clip
45	2614684	Door
46	2614685	Hinge
47	2614742	Locating collar
48	-	Thrust bearing
49	2614696	Bearing bracket
50	-	Oilite bearing B.S.71
51	2614758	Back cover
52	2614683	Clutch pulley
53	-	Vee belt
54	2614282	Clutch cone
55	2614297	Clutch spring
56	2614336	Retaining washer
57	2614288	Screw
58	-	Handwheel. Patt.No.32 2½" dia. ⅜" Whit.
59	-	Knob. Patt.No.28.1¼" Spherical ⅜" U.N.C
60	-	Klockner P.E.10. Rotary switch
61	-	Knob. Patt.No.19. 1¼" dia. 5/16" U.N.C
62	-	Handwheel Patt.No.32. ⅜" U.N.C
	2614756	Setscrew for handwheel. Part No.60
	2614835	Spring for belt guard
	2614682	Bench model base
	2614759	Swarf tray
	-	Link chain for guard No.1844
63	2614693	Nut
64	2614769	Bracket
65	2614698	Main body
66	2614716	Control case
	2614813	Cabinet stand
	2614812	Door for cabinet
	2614296	Spring for door
67		Micro switch
68		Cam for micro switch

Table Assembly



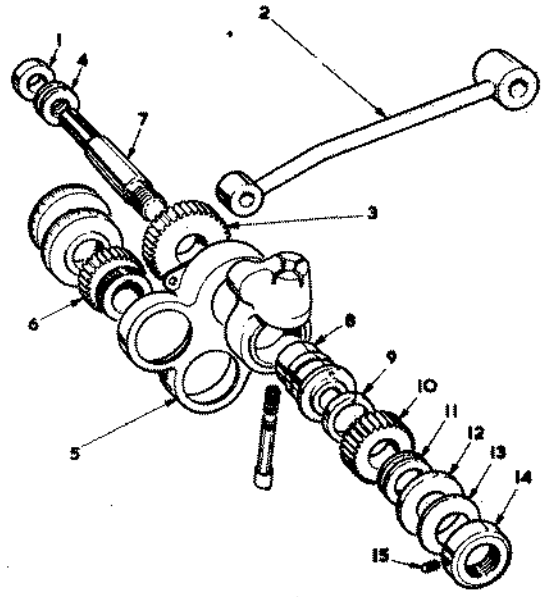
Illus. No.	Part No.	DESCRIPTION
1	2614715	Main slide
2	2614678	Packing strip
3	2614257	Cross slide
4	2614255	Cross slide nut
5	2614327	Gear
6	2614326	Gear
7	2614763	Chip guard
8	2614762	Cover
9	2614699	Table raising screw
10	2614291	Thrust washer
11	2614289	Locknuts
12	2614733	Retaining collar
13	2614837	Graduated collar
14	2614735	Cross traverse screw
15	2614349	Top adjusting strip
16	2614348	Bottom adjusting strip
17	2614347	Keep strip
18	2614736	Table raising shaft
19	2614727	Ratchet bracket
20	2614332	Pawl
21	2615239	Drive sleeve
22	-	4 dog set screw ¼" UNC x 5/8"
23	2614269	Handle for traverse screw
24	-	Plastic plug No.411
25	2614697	Bracket
26	2614256	Table
27	2614259	Table support bracket
28	2614298	Spring
29	2614369	Cross slide pin
30	2614737	Keys
31	2614738	Table support 'B'
32	2614369	Bar for handle stem
33	2614372	Nut for handle
34	-	Studs 1.5/8" long 7/16" UNC
35	-	Knob. Patt.No.19 1½" dia 3/8" Whit.
36	-	Taper pin 1/8" dia x 7/8" long
37	-	Handle. Patt No.1.
38	2615234	Ratchet
39	2615238	Pressure plate
40	2615236	Friction disc
41	1303/16	Belle ville washer
42	2615235	Adjusting nut

Not illustrated.

Additional parts for table support - pedestal models

Illus. No.	Part No.	Description
	2614739	Table support 'P'
	2614747	Table support strip
	2614813	Cabinet stand

Vertical Feed Gear



Illus. No.	Part No.	DESCRIPTION
1	2615275	Drive collar
2	2614725	Self act arm
3	2614731	Gear for ratchet
4		INA washer AS 2035 INA Brg. AXK 2035
5	2614789	Guard for feed gears
6	2614728	Slip gear
7	2615276	Fulcrum pin
8	2615239	Drive sleeve
9	2615236	Friction disc
10	2615234	Ratchet
11	-	INA washer AS 2035 INA brg. AXK 2035
12	2615268	Pressure plate
13	1383/16	Belle ville washer
14	2615235	Adjusting nut
15	-	½ dog set screw ¼" UNC x 5/8"