

# myford

**254**  
**plus**

High Speed Centre Lathe

INSTALLATION OPERATION  
MAINTENANCE & PARTS LISTING

**WARNING**

Unless you are familiar with the techniques  
necessary to operate this machine, do not  
use it until you have sought instruction/  
training from a qualified person.

MYFORD LIMITED  
BEESTON • NOTTINGHAM • ENGLAND

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**254  
plus**

High Speed Centre Lathe

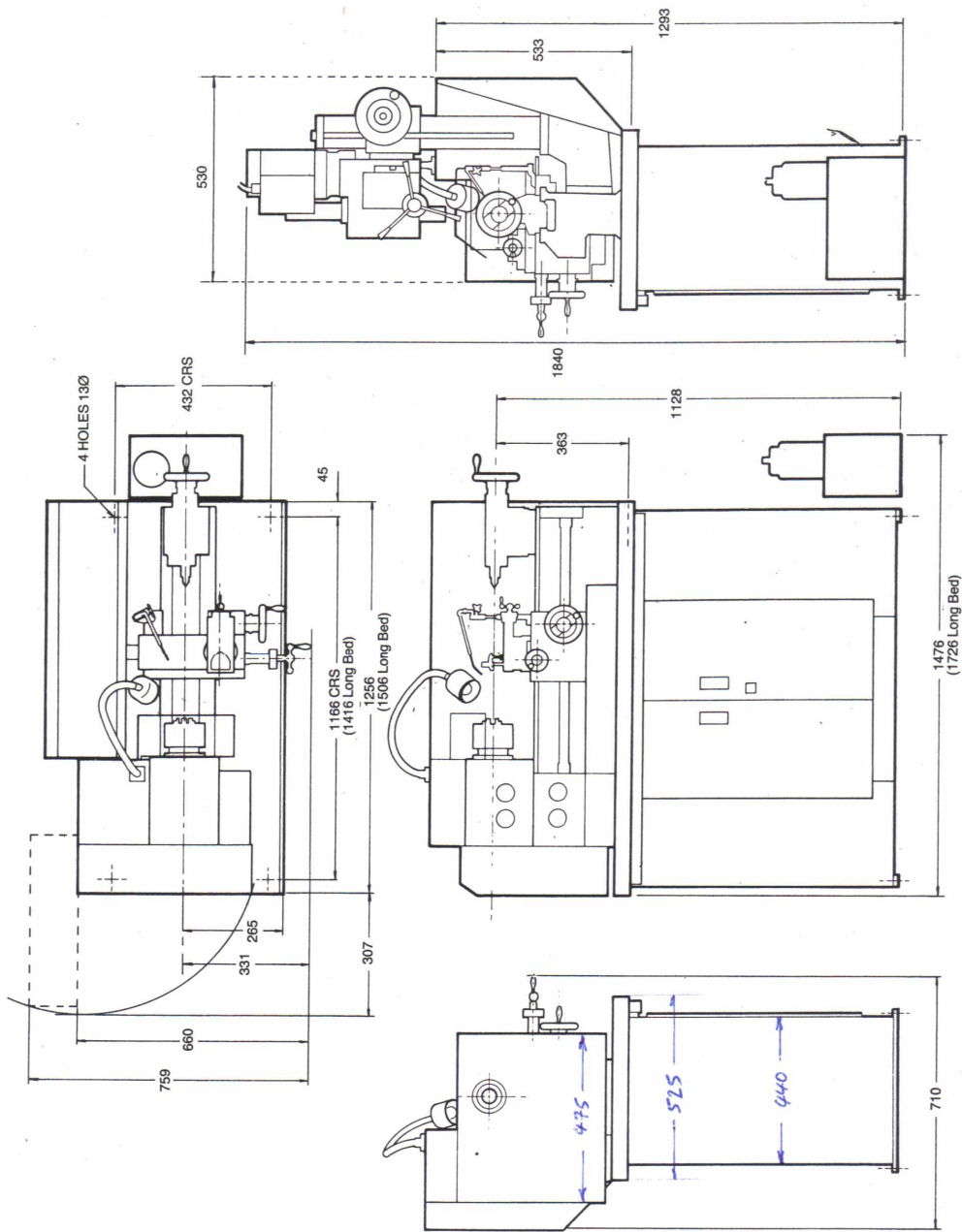
INSTALLATION OPERATION  
MAINTENANCE & PARTS LISTING

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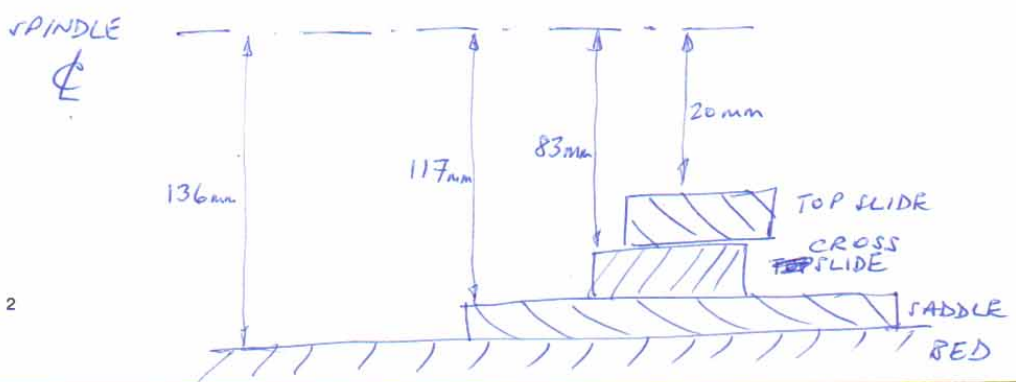
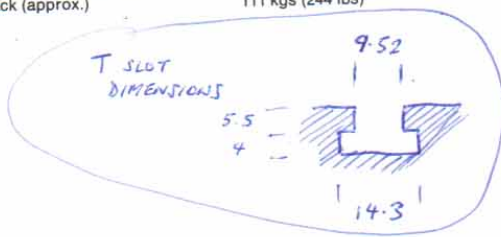
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**SECTION 1**

### Myford 254 plus

Centre Height	136mm (5 1/4")
Swing over Bed	280mm $\varnothing$ (11" $\varnothing$ )
Bed	Square shears induction hardened
Maximum distance between centres	550mm (21 3/4") or 800mm (31 1/2")
Headstock spindle speeds 254 plus (10)	53 to 2000 r.p.m.
Headstock spindle speeds 254V plus	35 to 2000 r.p.m.
Headstock spindle taper	No. 4 M.T.
Headstock spindle bore	26mm $\varnothing$ (1" $\varnothing$ ) A3 BS 4442 modified
Swing over saddle	234mm (9 1/8")
Swing over cross-slide	166mm (6 1/2")
Cross-slide travel	162mm (6 3/4")
Topslide travel	85mm (3 3/8")
Topslide swivel	360°
Height from topslide to centres	20mm (3/4")
Tailstock barrel travel	70mm (2 3/4")
Tailstock barrel taper	No. 2 M.T.
Leadscrew	3mm or 8 t.p.i.
Screwcutting range via 15 speed gearbox	5.0 to 0.25mm or 4 to 56 t.p.i. with one change
Longitudinal feeds per rev.	.032 to 0.04mm or .026" to .0019" with one change
Power cross feeds per rev.	Approx. 1/2 of Longitudinal
Motor	3/4 h.p. Single Phase; 1/2 h.p. Three Phase
Enclosed oil bath lubrication to headstock, gearbox and apron	
Enclosed leadscrew clutch	
Feed shaft fitted overload clutch	
Bench lathe motorised (approx.)	211 kgs (464 lbs)
Cabinet stand (approx.)	92 kgs (202 lbs)
Cabinet stand with doors and splash back (approx.)	111 kgs (244 lbs)



# ATTENTION

## General Safety Rules

**READ THE MANUAL CAREFULLY**, especially familiarise yourself with the operation of the headstock and apron controls. Note the points on centre lathe practice set-out on page 4 of the manual.

**EARTHING** Make sure that the lathe and the cabinet are electrically connected to a satisfactory earthing point. If a two-pronged connector is used, an additional earthing wire should be run.

**SWITCH 'OFF' BEFORE PLUGGING-IN** the connector, to avoid accidental starting.

**ALWAYS TURN THE SPINDLE BY HAND** before switching on the motor. This will avoid damage to the bed, saddle or cross-slide by swinging chuck jaws, workpiece faceplate bolts etc.

**CHECK THAT ALL HOLDING AND LOCKING DEVICES ARE TIGHTENED**, and that all keys and wrenches are clear of the moving parts of the machine.

**KEEP THE WORK AREA TIDY** – cluttered machine trays and work benches invite accidents.

**AVOID LOOSE APPAREL** – wear suitable protective clothing. Loose cuffs and neck-ties are particularly dangerous.

## General Points on Centre Lathe Practice

- (1) Clean and oil your machine after use.
- (2) When holding work in a chuck, grip as much of the material as possible. If thin flanged work is to be held, give support to the tool thrust by inserting a ring or collar between chuck body and workpiece. The pressure on the jaws can be eased and so prevent straining of the chuck to avoid what is commonly known as "Bell Mouth Jaws".
- (3) Do not grip irregular shaped material in a three-jaw chuck. Use a four-jaw chuck for rough material.
- (4) Do not swing offset jobs on the faceplate without balancing by counterweight. A piece of shaped lead clamped to the faceplate opposite the offset material will give the necessary balance to most jobs. Swinging unbalanced work places an unnecessary load on bearings and causes ovality on work being turned.
- (5) After your work has been clamped to faceplate, pull the machine round by hand and test tool and slide clearance to avoid damage by swinging bolts etc.
- (6) When roughing out heavy stock, use the tailstock centre for support. This helps the chuck's life of accuracy and takes away some of the load applied to spindle and bearing. Remember that the tailstock centre has the friction of the rotation workpiece to withstand and must be kept lubricated; also that when work being turned becomes heated, it expands, giving an added pressure to the contact faces. Check your work freedom at periods during the turning operation, slightly slackening the tailstock pressure when necessary. Very little trouble should arise with "burned up" centres if these points are watched. A hardened centre, when it "burns up", needs accurate regrinding and often the hardened particles of steel become embedded in the work being turned, causing unlimited complications unless removed.
- (7) When knurling, do not force knurling tool into work with too great a pressure, as strain is placed upon feedscrew and nut. Use lubricating oil freely during knurling operation.
- (8) Do not leave the key in your headstock chuck. Nasty accidents occur should the lathe be switched on accidentally.
- (9) Always wipe spindle, flange and chuck register faces clean before mounting chucks, faceplates, etc.
- (10) Always clean out the spindle taper before inserting centres.
- (11) A small mark on the headstock centre with a corresponding mark on the front face of the spindle nose enables the position of location for trueness to be maintained. Do not forget that the headstock centre (live centre) must run true and should be turned in position when correction is necessary.
- (12) Except for occasional oiling, the tailstock requires very little attention. It is, however, important that its original accuracy is maintained. The following points will assist in avoiding unnecessary tailstock troubles: When turning between centres, see that the barrel is as far in the tailstock body as possible. This will give greater rigidity and lessen the load on the body bore when machining. When drilling, see that the drill starts in a truly centred hole, as any swing on a fairly large drill causes unnecessary wear on the sliding barrel.
- (13) When setting gear trains, do not mesh the changewheels too tightly.
- (14) Always remember that your 254 lathe is a valuable machine tool and no effort should be spared to maintain its quality and accuracy.



# INSTALLATION



Fig. 1

## Serial Number

This will be found stamped on a plate attached to the tailstock end of the bed. Fig. 1.

## Shipment

Whilst the precautions taken when preparing machines will vary according to the means of transport, the bright parts of all machines are protected with rust preventative. In addition, the saddle is locked in position by means of the saddle clamp, (19), page 13.

## Overseas Shipment

In the case of machines for overseas shipment, in order to avoid possible damage to other cargo, the oil will have been drained from the headstock, the gearbox and the apron. These reservoirs must be replenished in accordance with the instructions given under "Lubrication" page 28.

## Shortages

Check the packing note carefully against the equipment delivered with the machine and report any shortage immediately to the supplier from whom the machine was purchased.

**Note:** The standard equipment supplied with each machine includes work drive peg, Nr. 4-2 M.T. Sleeve and Nr. 2 M.T. centre (unhardened) for headstock, Nr. 2 M.T. centre (hardened) for tailstock, spanners, hexagon keys, oil gun, plastic plug for cross-slide and special key for main spindle coupling.

## Cleaning

As already stated, all bright parts are protected with rust preventative. All traces of this should be removed with either White Spirit, Turpentine or Turpentine Substitute before slides, tailstock, tailstock barrel etc. are moved.

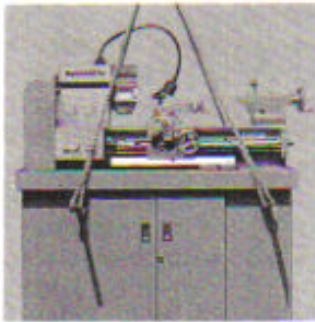


Fig. 2

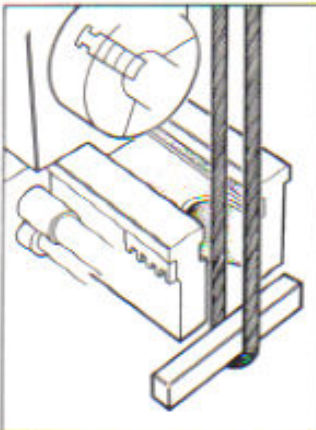
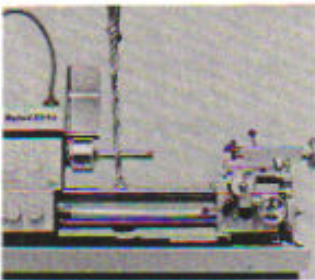


Fig. 3

### Lifting

#### (Cabinet mounted lathes)

The cabinet stand of the machine is provided with holes for lifting bars for slinging. These bars should be 25mm (1") diameter x 900mm (36") long. Provision should be made to prevent the bars from sliding when the machine is lifted.

Use only ROPE SLINGS as shown in Fig. 2. The cabinet mounted lathe weighs approximately 315kg (694lbs).

### Lifting

#### (Bench lathes)

The bench lathe can be lifted using a rope sling around the lathe bed cross-webbing as shown in Fig. 3. The rope sling should also be engaged with a piece of stout bar material protruding from the lathe chuck by a suitable amount. This will stabilise the machine and prevent any tendency to 'roll'.

The tailstock and carriage should be placed at the extreme right of the lathe bed to minimise imbalance in the longitudinal direction. See Fig. 3.

**N.B. Under no circumstance should the lathe be lifted by the headstock spindle.**

### Foundation

Unless the machine is accurately installed on a rigid foundation its accuracy will be impaired.

It should, preferably, rest on reinforced concrete of appropriate thickness. When laying the base, due provision should be made for foundation bolts in accordance with the outline drawing. The holes in the base of the pedestal are for 12mm diameter bolts.

### Electrics

All 254 lathes are supplied complete with motor and switch gear.

All models are equipped with a complete electrical safety package which provides isolation from the mains that can be locked for security, thermal overload and no-volt release protection.

Control is through forward/reverse/stop push-

buttons, and a transformer powers the 110 volt control circuit. An additional 12 volt tapping for a safe work light is provided.

Safety switches are incorporated in the controls enclosure, and are arranged to cut the motor supply if either the drive guard or chuck guard are opened.

All models are equipped with a cover plate, on the top surface of the electrical controls enclosure which can be removed to expose the mounting holes for the safe work light which may then be retro-fitted without difficulty.

### Erection (Cabinet mounted lathes)

The four cabinet foot holes are for cabinet-to-floor fixing only. (See Fig. 4 for spacing of the cabinet screwing bolts).

Lower the machine into position on the cabinet and shim the four cabinet feet until all four are supported. (The cabinet may be tilted slightly towards the chip-tray drain plug to encourage effective drainage.)

Secure the cabinet to the floor.

The machine is located by the four cone pointed levelling screws in countersinks on the chip-tray ④. The machine bed is secured to the cabinet by means of the two 12mm studs ① which pass through the two chip-tray stack pipes ② and screw into the two central threaded holes ③ under the lathe bed after the machine has been placed on the cabinet, and the washer ⑤ and self-locking nuts ⑥ fitted. (See Fig. 5).

(Use two M12 standard nuts on each stud in turn to tighten the studs in position).

These studs and nuts are to prevent lateral movement and should not be overtightened as this may lead to increased resonance from the cabinet. Where machines are delivered fitted to a cabinet stand it may be necessary to re-adjust the tension on these studs.

### Erection (Bench mounted lathes)

If a work bench is to be used, its construction should be compatible with the weight of the machine, and the bench-top should be at least 30mm (1¼") thick – a bench top height of 765mm (30") is suitable for a man of

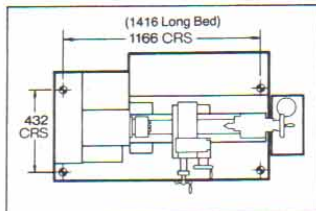


Fig. 4

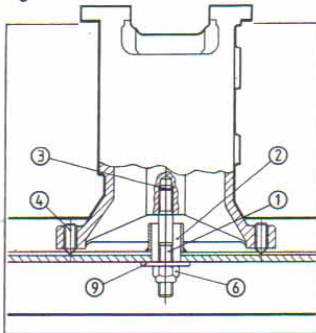


Fig. 5  
Section through cabinet stand top showing machine securing screws and levelling 'Jack' screws.

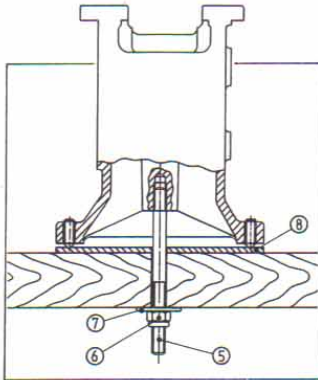


Fig. 6  
Section through lathe bed mounted on a bench showing securing stud, bench support plate etc.

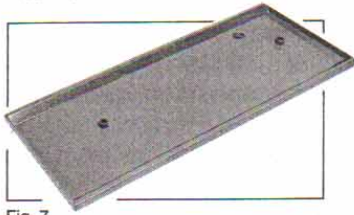


Fig. 7

average height. Alternatively, arrange the height so that the lathe topslide is at elbow height.

The machine should be set on two transverse steel plates of sufficient thickness to prevent local crushing of the wood bench top and distortion of the lathe bed when tightened-down.

A kit comprising two threaded studs (5), self-locking nuts (6), large washers (7) and mounting plates (8) suitably drilled to pass the studs is available – No. 95/073.

The studs are long enough to accommodate a bench top thickness of 75mm (3") and may be shortened as required for thinner bench tops. The studs should be screwed into the holes on the underside of the bed, using two standard M12 nuts, after the machine has been placed on the bench. The washers are then placed against the underside of the bench and the self-locking nuts fitted and tightened.

Alternatively, a chip tray, similar to the cabinet top, and modified for bench top installation, is available, Catalogue Nos. 95/031 & 95/032. This tray incorporates the two transverse mounting plates with drain plug facility which must be accommodated in the bench top. See Fig. 7.

### Levelling

If the lathe is not properly levelled, the lathe bed may be twisted, resulting in misalignment of the headstock and tailstock, causing the lathe to turn and bore taper.

---

ACCURATE WORK CANNOT BE EXPECTED IF  
THE LATHE IS NOT LEVEL.

---

### Levelling with a Spirit Level

A spirit level which is sufficiently sensitive to read 0.1mm in 1M (0.001" in 10 ins.) is required.

Slacken the two 12mm nuts (C) (Figs. 5 & 6).

Place the level longitudinally on the machine bed See Fig. 8 and adjust the four levelling screws until a true reading is obtained. Place the level across the bed and adjust the four levelling screws until a true reading is obtained – both close to the headstock and close to the tailstock end of the bed.

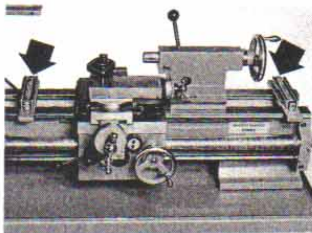


Fig. 8

Tighten the machine securing nuts ⑥, check with the level again, and re-adjust if necessary.

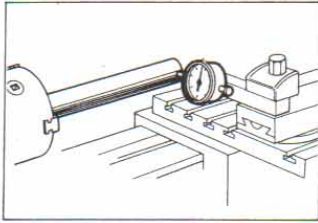


Fig. 9

### Levelling with a Dial Test Indicator

If a precision level is not available, use a dial test indicator in the following manner:-

With the 12mm machine securing nuts ⑥ slackened (Fig. 5 and 6), grip a piece of 25mm (1") diameter precision ground bar in the chuck, with approximately 200mm (8") protruding, and set the dial indicator to read off the side of the ground bar at its' extreme end. See Fig. 9.

Rotate the headstock spindle by hand, and adjust the indicator dial so that the zero mark lies midway between the extremes of the pointer movement.

Any distortion of the machine bed, during the tightening of the securing nuts ⑥ will be shown, by the dial indicator.

Adjust the levelling screws ④ (Fig. 5) so that, when the securing nuts ⑥ are finally tight, the dial indicator still reads zero.

### Checking the Levelling

Turn a test piece as shown in Fig.10. The test piece should be approximately 25mm (1") diameter and 100mm (4") to 150mm (6") long. It should be relieved in the middle so that approximately a 12mm (1/2") length is left at each end for test turning.

Take a very light finishing cut (.05mm or .002") across both collars, without the use of the tailstock and without alteration of the tool setting.

Measure the diameter of each end with a micrometer.

If the ends are not the same, further adjustment of the levelling screws ④ (Fig. 5) is required.

If the diameter of the test piece is larger at the free end, the FRONT levelling screw at the tailstock end should be screwed down.

If smaller at the free end, the REAR levelling screw at the tailstock end should be screwed down.

### Re-adjustment

It may be necessary to re-adjust the levelling screws ④, from time to time, if the lathe is mounted on a wooden bench.

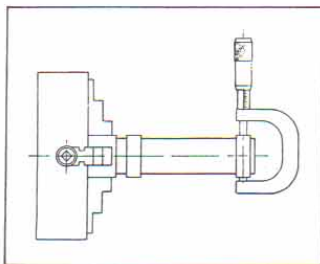


Fig. 10  
Test Piece with two collars

**SECTION 2**

Notes

# OPERATION

SECTION 3

## 254 plus Lathe Operation Controls

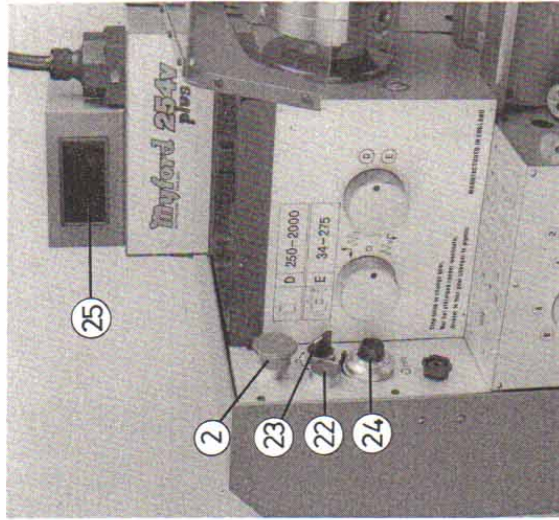
(non varispeed and varispeed models)

1. Headstock drive motor start button – forward
2. Headstock drive motor stop button
3. Headstock drive motor start button – reverse
4. Headstock reduction gear shift knob
5. Gearbox drive reverse shift knob
6. Belt tension lever
7. Gearbox pitch change knobs
8. Spindle drive coupling
9. Engagement lever – leadscrew nut
10. Feed engagement lever
11. Selector knob – longitudinal or cross traverse motions
12. Set-over screw (one front, one rear)
13. Tailstock clamp lever
14. Tailstock barrel locking lever
15. Saddle clamp
16. Top slide base securing screw (one front, one rear)
17. Main isolator
18. Leadscrew drive clutch
19. Feedshaft overload protection coupling
20. Simple electrics:- headstock drive motor D.O.L. start, stop and reverse switch
21. Tailstock bed stop

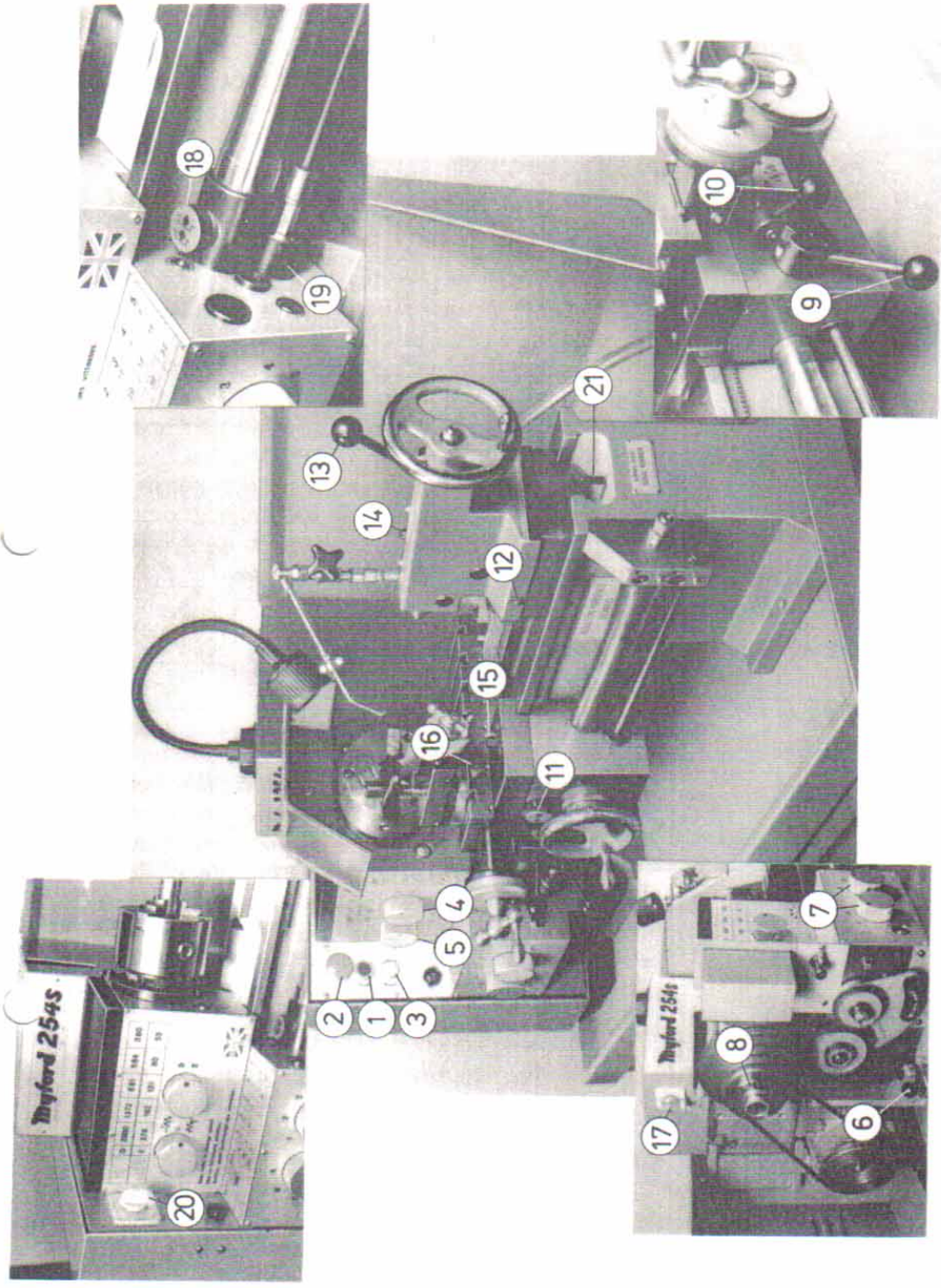
### Alternative controls (varispeed model only)

2. Headstock drive motor stop button
22. Headstock motor start button
23. Headstock motor reverse switch
24. Speed control knob
25. Digital speed indicator display

Alternative lathe operation controls for the 254v plus (varispeed model)







**SECTION 3**

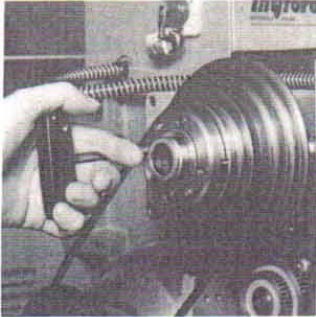


Fig. 11 Disengaging spindle-pulley coupling

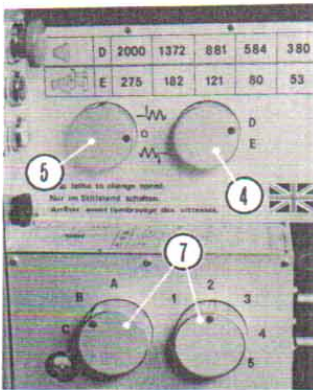


Fig. 12 Headstock Controls and pitch change controls

### Headstock Speed Changing

(not varispeed model)

The Headstock speed range consists of 5 ungeared, (direct belt-driven), speeds and 5 speeds through the headstock reduction gears.

To change from direct to geared speeds, the spindle-pulley coupling should be disengaged by unscrewing (anti-clockwise) the two socket screws located in the end face of the coupling body until the screws are 'locked'. (Fig. 11). Holes are provided in the drive guard to permit operation of the coupling key through the guard when closed.

The Headstock reduction gears can then be engaged by means of the control knob ④, Fig. 12. The engagement will be assisted if the main spindle is turned slightly by hand.

Re-engagement of the main spindle coupling, after disengagement of the reduction gears, is accomplished by screwing-in (clockwise), the two coupling screws until 'locked'.

### Headstock Speed Changing

(varispeed model)

The headstock speed range is infinitely variable from 250 to 2,000 r.p.m. in "open drive" and from 35 to 275 r.p.m. through the headstock reduction gears.

To change from direct to geared speeds, the spindle-pulley coupling should be disengaged by unscrewing (anti-clockwise) the two socket screws located in the end face of the coupling body until the screws are 'locked'. (Fig. 11). Holes are provided in the drive guard to permit operation of the coupling key through the guard when closed.

The Headstock reduction gears can then be engaged by means of the control knob ④, Fig. 12. The engagement will be assisted if the main spindle is turned slightly by hand.

Re-engagement of the main spindle coupling, after disengagement of the reduction gears, is accomplished by screwing-in (clockwise), the two coupling screws until 'locked'.

### Leadscrew Drive Reverse

This is accomplished by manipulation of the control knob ⑤ Fig. 12 (assist engagement by turning slightly the main spindle by hand).

### Selection of Feeds and Pitches

This is accomplished via the two control knobs ⑦ Fig. 12 on the front of the gearbox. (Assist engagement by slightly turning the main spindle.)

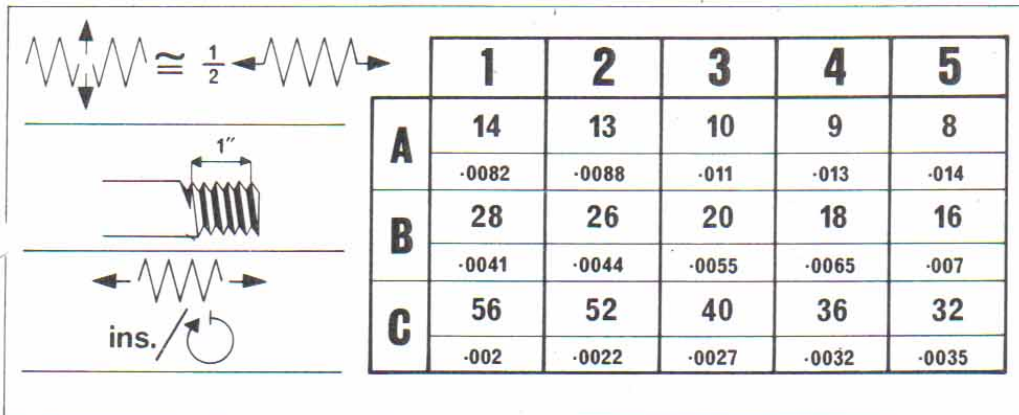


Fig. 13 Machine Chart – 254 Imperial

### Screwcutting and Power Feeds

#### 254 Imperial Lathes

The standard equipment of Imperial machines includes 3 changewheels.

The reproduction of the machine chart shows the thread pitches and fine feeds obtained when using the standard input changewheel train. (Fig. 14).

NOTE: The leadscrew drive reverse should not be shifted during thread-cutting operations, as such movement may alter the position of the headstock spindle relative to the leadscrew, thereby causing split threads.

#### Additional INCH Pitches – 254 Imperial Lathes

The following input changewheel trains (Fig. 15) will provide inch pitches in addition to the range indicated on the machine chart. (Fig. 13).

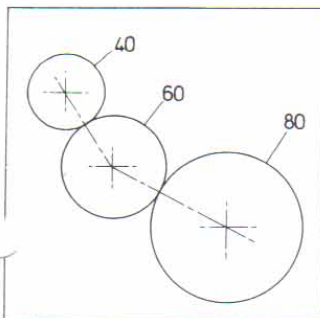


Fig. 14 Standard input trains for 254 Imperial

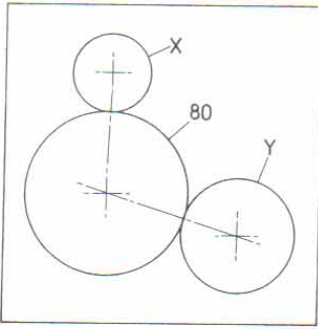
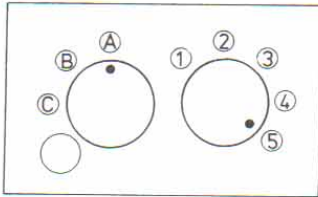


Fig. 15



Gearbox Selectors

INCH PITCHES	'X'	'Y'	GEARBOX SELECTOR POSITIONS	
			A	5
4	40	40	A	5
4.5	40	40	A	4
5	40	40	A	3
5.5	40	55	A	5
6	40	60	A	5
6.5	40	40	A	2
7	40	40	A	1
7.5	40	60	A	3
9.5	40	38	B	3
10.5	40	60	A	1
11	40	55	B	5
12	40	60	B	5
13.5	40	60	B	4
15	40	60	B	3
19	40	38	C	3
19.5	40	60	B	2
21	40	60	B	1
22	40	55	C	5
24	40	60	C	5
27	40	60	C	4
30	40	60	C	3
39	40	60	C	2
42	40	60	C	1

Note: Additional 40, 38 and 55 gears are extra to the standard set.

### Thread Dial Indicator – 254 Imperial Lathe

The Thread Dial Indicator is attached using tapped hole provided in the right hand of the apron, (Fig. 16).

1. For even number threads the clasp nut can be engaged at any numbered mark on the dial.
2. Odd number threads should always be engaged at the same number or any alternate number.
3. For half threads per inch, always engage the same number.
4. For other threads, m/m sizes, etc., it is recommended that the clasp nut should not be disengaged.

**Note:** Threads that are exact multiples of the leadscrew pitch (8 t.p.i.) do not require the use of an indicator.

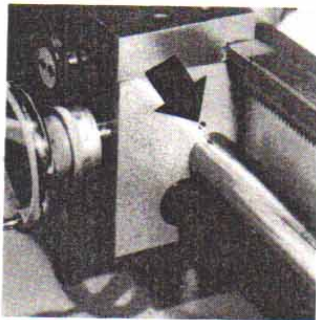


Fig. 16 Thread Dial Indicator Mounting

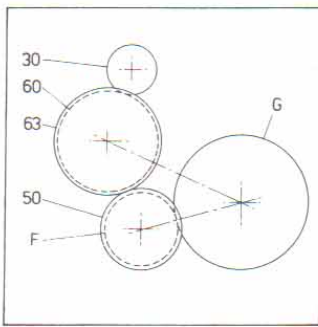
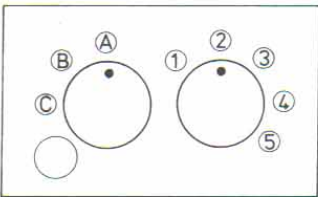


Fig. 17



Gearbox Selectors

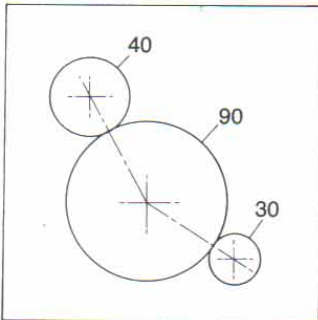
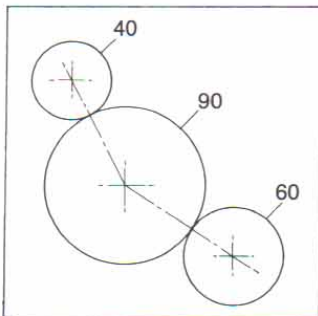


Fig. 18 Standard input trains for 254 metric lathes

### Metric Pitches – 254 Imperial Lathe

The chart shows metric pitches using extra gears 28, 30, 35, 45, 50 and 63T plus one extra complete changewheel stud assembly.

The accessory thread dial indicator supplied for 254 Imperial lathes is not effective when cutting metric threads.

Note: For all metric pitches the leadscrew clasp nut must not be disengaged for the whole of the screwcutting operation. The lathe should be reversed electrically, (reversing switch), to return the carriage to the thread starting point.

mm/ $\frac{1}{\text{inch}}$	'F'	'G'	GEARBOX SELECTOR POSITIONS	
0.2	28	80	C	1
0.25 (13 B.A.)	35	80	C	1
0.3	30	80	C	3
0.35 (10 B.A.)	35	80	C	3
0.4	28	80	B	1
0.45	45	80	C	3
0.5	35	80	B	1
0.6	30	80	B	3
0.7	35	80	B	3
0.75	45	60	C	5
0.8	28	80	A	1
0.9 (1 B.A.)	45	80	B	3
1.0 (0 B.A.)	35	80	A	1
1.2	30	80	A	3
1.25	50*	80	B	5
1.4	35	80	A	3
1.5	45	60	B	5
1.75	35	40	B	5
1.8	45	80	A	3
2.0	50*	80	A	3
2.4	45	60	A	3
2.5	50*	80	A	5
2.8	35	40	A	3
3.0	45	60	A	5
3.5	35	40	A	5

\*For 1.25, 2.0 and 2.5mm pitches, the 50T gear on stud 'F' is used as an idler between the 63T gear and the gear indicated at 'G'.

## 254 Metric Lathes

The standard equipment of metric lathes includes 4 changewheels.

The reproduction of the machine chart shows the thread pitches and fine feeds obtained when using the standard input changewheel trains.

	40 90 — 60					40 90 — 30				
	3	5	2	4	1	3	5	2	4	1
<b>A</b>	2.5 0.4	2.0 0.32	1.75 0.28	1.5 0.24	1.25 0.2	5.0 0.8	4.0 0.64	3.5 0.56	3.0 0.48	2.5 0.4
<b>C</b>	1.0 0.16	0.8 0.13	0.7 0.11	0.6 0.1	0.5 0.08	2.0 0.32	1.6 0.26	1.4 0.22	1.2 0.2	1.0 0.16
<b>B</b>	0.5 0.08	0.4 0.06	0.35 0.055	0.3 0.05	0.25 0.04	1.0 0.16	0.8 0.13	0.7 0.11	0.6 0.1	0.5 0.08

Fig. 19 Machine Chart 254 metric

### Thread Dial Indicator – 254 Metric Lathe

**NOTE:** This attachment can only be used for cutting metric threads on metric lathes. It is not suitable for cutting metric threads on imperial lathes with metric conversion sets or imperial threads at all.

#### Mounting the Thread Dial Indicator

When mounting the thread dial indicator, the end cap (provided) must first be placed on the support for the telescopic guard on the right hand side of the apron. To allow this, the leadscrew and feedshaft, which are both secured in the right hand leadscrew bracket assembly, must be removed.

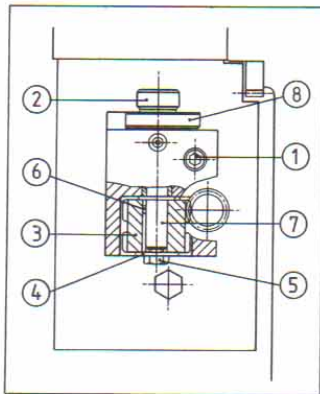
Firstly, for reasons of safety, the two telescopic leadscrew guards on either side of the apron must be compressed lengthways to a minimum length and secured with wire. They must be kept in this compressed state and not released until the machine is re-assembled and the indicator mounted. Next, the two cap head screws securing the leadscrew bracket at the right hand end of the bed are removed, thus allowing

the bracket, together with the leadscrew and feedshaft, to be withdrawn to the right, noting the woodruff key in the left hand end of the leadscrew.

After removal from the machine, if the right hand guard on the leadscrew was removed, make sure that it is correctly orientated, i.e. that when finally released the smaller diameter of the guard will be against the apron, and then pass the end cap along the leadscrew. The correct way for mounting this is such that the flat side will be towards the indicator body when mounted on the right hand side of the apron and the spigot will locate inside the guard. Now, with the right hand guard and end cap correctly positioned, pass the leadscrew and feedshaft through the apron, replace the left hand guard, again ensuring that the smaller diameter will butt against the apron when released, and then pick up the mountings in the leadscrew and feedshaft clutch housings, again noting the woodruff key in the leadscrew.

Before refitting the right hand bracket to the bed, care **MUST** be taken to achieve absolute cleanliness of the rear face and upper surface of the bracket, and the surfaces of the bed where contact occurs. The bracket must have intimate contact with both the vertical face on the front of the bed and the lower surface of the front bed slideway. This will ensure correct alignment of the leadscrew and feedshaft with the gearbox.

A tapped hole for the screw securing the indicator is provided on the right hand side of the apron, this normally has a screw inserted to prevent ingress of dirt. The indicator is face mounted on the side of the apron using the cap head screw ① provided, the gear on the underside of the unit engaging with the cut-out in the guard support. The right hand leadscrew guard may now be released, exercising extreme caution when the wire binding is removed. Ensure that the guard and end cap fit up to the indicator on the apron and the larger right hand end of the guard fits into the recess in the end bracket. Finally, again taking care, release the left hand guard, making sure that the guard locates on the spigot on the apron and in the leadscrew clutch housing.



### Using the Thread Dial Indicator

It will be seen that the thread dial indicator has a reversible dial ⑧ on the top with 4 sets of divisions, 2 on each face, and on the bottom a reversible cluster gear

③ with 28 and 30 teeth. Also to be noticed is that whilst the dial is driven only by friction after the knurled nut ② is tightened, the cluster gear, secured with a washer and setscrew ④ & ⑤, is located by means of a drive pin ⑥ in the shaft ⑦.

To use the indicator – if, for example, it is required to cut a screw thread of 1.75 mm pitch, an inspection of the chart will show that the 28T portion of the gear cluster must be uppermost. Slacken the cap head screw securing the indicator and pivot the unit to engage the gear with the leadscrew; tighten the cap head screw.

Also shown on the chart is the fact that the dial with the 'A' markings is required, mount this and then engage the leadscrew clasp nut. With the thumb nut slackened, rotate the dial by hand until one of the divisions marked 'A' is directly in line with the index mark on the datum pin, then tighten the nut.

When screwcutting, make sure that the leadscrew clasp nut is only engaged when the appropriate mark on the dial is directly in line with the index mark. Do not, **UNDER ANY CIRCUMSTANCES**, alter the angular setting of the dial whilst screwcutting.

If it is desired to cut a pitch which is not shown on the chart, whilst it may be possible to use the thread dial indicator on some of these, on others it will not be so. If in any doubt whatsoever, the leadscrew clasp nut must not be disengaged for the whole of the screwcutting operation. The lathe should be reversed electrically and the carriage returned to the thread starting point.

### Additional Metric Pitches – 254 Metric Lathe

The following input changewheel trains will provide metric pitches in addition to the range indicated on the machine chart. (Fig. 20)

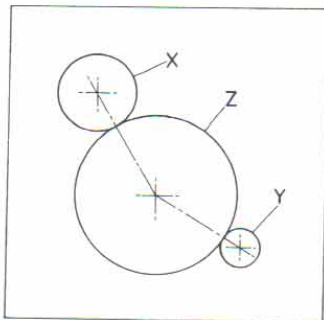
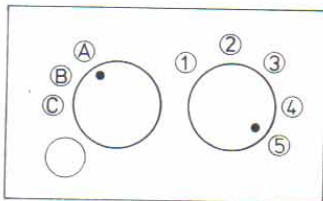


Fig. 20



Gearbox Selectors

20

mm/⌀	'X'	'Z'	'Y'	GEARBOX SELECTOR POSITIONS	
0.45 (I.S.O.)	40	60	80	C	4
0.75 (I.S.O.)	40	90	20	B	1
1.8	40	90	20	C	4
2.4	40	90	20	C	5
3.75	40	90	20	A	1
4.5 (I.S.O.)	40	90	20	A	4
5.25	40	90	20	A	2
6.0 (I.S.O.)	40	90	20	A	5

Note: 20T & 80T gears required extra to the standard set.



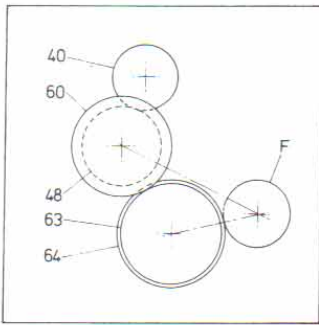
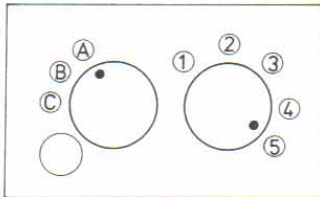


Fig. 21



Gearbox Selectors

### INCH Pitches – 254 Metric Lathes

The chart shows the inch pitches using extra gears 24, 27, 33, 36, 39, 42, 48, 57, 63 and 64T plus one extra complete changewheel stud assembly. (Fig. 21)

n/1"	ins /	'F'	GEARBOX SELECTOR POSITIONS	
4	0.2500	24	A	5
6	0.1666	36	A	5
7	0.1428	42	A	5
8	0.125	36	A	4
9	0.1111	27	C	3
10	0.1000	24	C	5
11	0.0909	33	C	3
12	0.0833	36	C	3
13	0.0769	39	C	3
14	0.0714	42	C	3
15	0.0666	36	C	5
16	0.0625	24	C	1
18	0.0555	27	B	3
19	0.0526	57	C	3
20	0.0500	36	C	4
22	0.4554	33	B	3
24	0.0417	36	C	1
26	0.0385	39	B	3
28	0.0357	42	B	3
30	0.0333	36	B	5
32	0.0312	24	B	1
36	0.0278	27	B	1
38	0.0268	57	B	3
40	0.0250	36	B	4
44	0.0227	33	B	1
48	0.0208	36	B	1
52	0.0192	39	B	1
56	0.0178	42	B	1

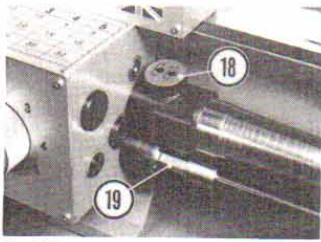


Fig. 22

### The Leadscrew Coupling

This should be engaged **only for thread cutting**. Engage and disengage by means of the knob No. ⑱, Fig. 22.

### The Feedshaft Clutch

On the Feedshaft No. ⑲, Fig. 22, protects the transmission against overload and permits turning to dead stops in either cross or longitudinal feed.

### Apron

Section of either longitudinal or cross feed functions is controlled by the selector knob No. ⑩, Fig. 23.

The apron is anchored to the saddle by means of four socket head screws, and a periodic check should be made to ensure that these screws are tight. The re-settable dial on the carriage traverse handwheel (apron) is graduated in carriage movement increments of .25mm (.010").

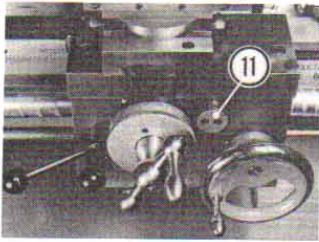


Fig. 23

### Engagement of Longitudinal or Cross Feed

Function is controlled by the feed lever No. ⑩, Fig. 24, which is lifted from the neutral position to engage longitudinal travel and depressed from the neutral position to engage cross feed.

This lever is interlocked with the leadscrew lever No. ⑨, Fig. 24, to prevent simultaneous engagement.

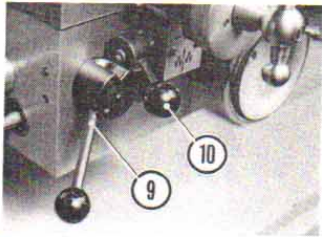


Fig. 24

### Leadscrew Nut

When using the leadscrew for screwcutting, use gentle pressure only to engage the leadscrew nut. **DO NOT USE FORCE**. Wait until the leadscrew rotates to a position which permits easy engagement.

### The Saddle and Compound Slides

The square-form bed shears present the optimum surface area to resist wear, and also the maximum resistance to thrust in **all** directions, to provide the necessary rigidity for boring and milling operations on

workpieces mounted on the cross slide.

The cross slide feedscrew dial represents diameter reduction in increments of 0.05mm, the topslide dial also is graduated in slide movement increments of .025mm.

On machines fitted with Imperial feedscrews, the cross slide dial represents slide movement increments of .001", and the topslide dial represents .001" slide movement.

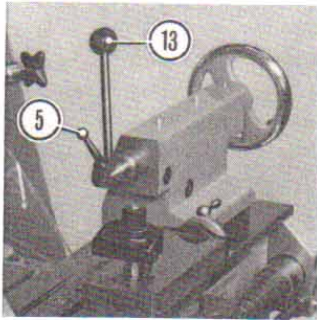


Fig. 25

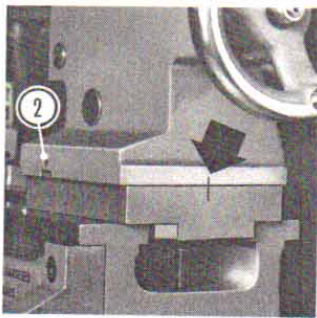


Fig. 26

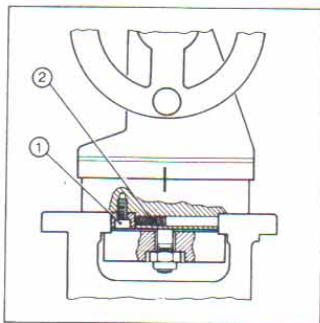


Fig. 27

Anti-friction thrust bearings are fitted to both cross slide and topslide feedscrew assemblies.

These bearings are pre-set with zero clearance and no provision is made for adjustment.

The saddle and compound slides on a centre lathe are designed to withstand the cutting force of the tool, and it is necessary, therefore, to maintain by periodic adjustment the close contact of gib strips and slide surfaces. Careful attention should be given to the adjustment of gib-screws to ensure even pressure of the gib strips.

### Tailstock

The Tailstock is securely locked to the bed by the quick-acting clamp lever which is located at the rear of the tailstock (13), Fig. 25.

The barrel is locked in place by the lever (5). The Tailstock can be set-over 11mm (.437") to the front, and 5mm (.187") to the rear, for taper turning, by first loosening the bed clamp and then adjusting the set-over screws (2), Fig. 26. A zero mark Fig. 26. is provided to serve as a rough guide to set-over amounts, and to assist in returning the tailstock to its normal position for parallel turning.

To move the tailstock towards the front of the machine, first slacken the rear set-over screw, then tighten the front one.

On completion of the adjustment, tighten the rear screw. It is essential that both screws are kept tight, to prevent the tailstock body from moving on its base when the clamp (13) is released. Reverse the procedure for set-over towards the rear.

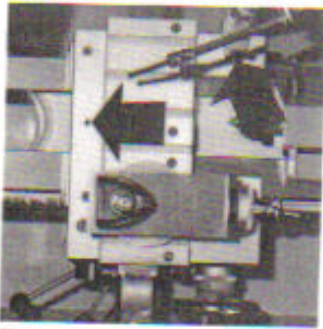


Fig. 28

By the very fact that the slides are built upon each other, deflection of the turning tool is transmitted through the slides, so it is important to see that your lathe tool is positioned with the minimum overhang, and is flat on its clamping surface.

Threaded holes (Fig. 28) are provided in the saddle to secure the travelling steady and the coolant pipe mounting bracket. Whenever these accessories are not in use, these holes must be plugged by means of the grub screws provided in order to prevent cuttings entering the holes and damaging the lathe bed.

#### Notes

## Mounting and Removal of Chucks

254 Lathes have a chuck mounting flange with a tapered register spigot.

When the chuck is pushed on to this taper by hand, a small gap, .050mm (.002"), will remain between the back face of the chuck and the register face.

Fig. A (gap is shown exaggerated for photographic purposes).

This gap should be eliminated when the chuck is finally pulled back by the securing nuts.

Care must be taken to support the weight of the chuck so that it does not 'sag' on the taper whilst the securing nuts are tightened, otherwise incorrect mounting could result with consequent inaccuracy.

**BEFORE MOUNTING CHUCKS**, ensure that the spindle flange and chuck register faces are clean, check that the nuts turn freely on the studs, and cover the lathe bed with a chuck board.

**TO MOUNT A CHUCK**, offer the chuck to the spindle flange until the securing studs project approx. 6mm (1/4") through the flange. Fig. B.

Start the first nut onto a stud (approx. 2 full threads), follow the same procedure for the second and third studs. Fig. C.

Seating the chuck squarely on the taper and pushed towards the flange, screw up all three nuts finger tight.

Using the spanner provided, lightly tighten all these nuts progressively.

Finally, tighten the nuts fully.

**BEFORE REMOVING CHUCKS**, always place the chuck board to protect the lathe bed against accidental damage.

**TO REMOVE A CHUCK**, release and unscrew all three nuts until they are flush with the ends of the securing studs. A light blow with the hand should then release the chuck from the flange.

Support the chuck by hand whilst removing the nuts.

New chucks may tend to 'stick' on the mounting

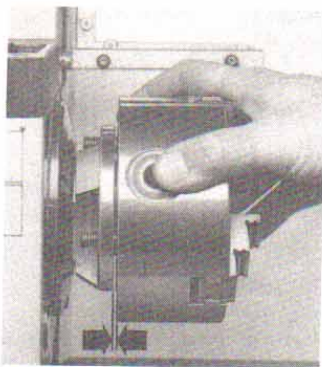


Fig. A

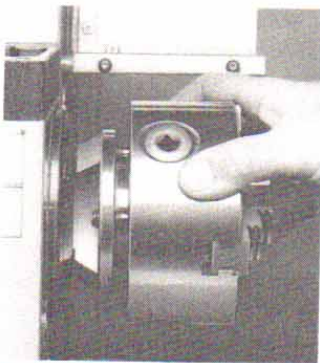


Fig. B

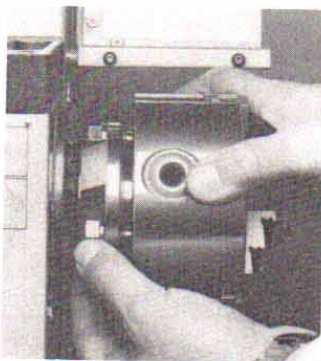


Fig. C

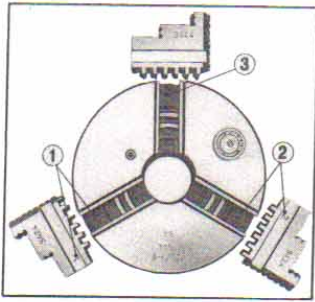


Fig. D

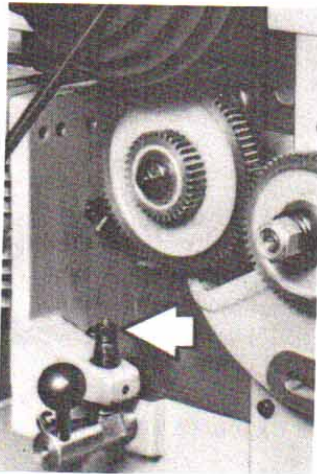


Fig. E

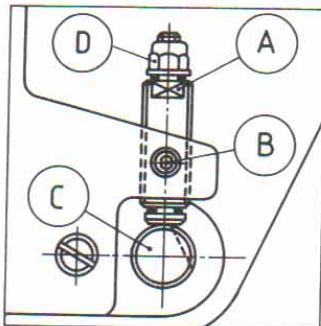


Fig. F Diagram of belt tension mechanism arrowed in Fig. E.

taper. They can be freed by a light tap with a mallet on a piece of 25mm (1") diameter x 250mm (10") long bar stock gripped securely in the chuck.

The 'sticking' tendency should diminish with further mounting and dismounting.

**FITTING CHUCK JAWS**, Fig. D. illustrates how the chuck jaws are numbered to ensure correct fitting to the body of the chuck. (This applies only to the chuck supplied as standard equipment with the lathe).

#### DRIVE BELT TENSION ADJUSTMENT.

To increase belt tension, release clamp screw (B) and screw down adjusting bush onto the lever cam (C) using spanner flats (A). Tighten belt until the slack of the belt allows approximately 12.5mm (1/2") total movement when lightly oscillated by the thumb and forefinger. This will provide an initial setting which can be increased if slip is experienced when the machine is operated.

As single phase motors have a characteristic electrical 'pulsing' vibration which is not found in three phase motors the belt tensioning mechanism is arranged with 'O' ring damping. This can be 'tuned' by careful adjustment of the nut (D) at the top of the assembly.

# MAINTENANCE

SECTION 4

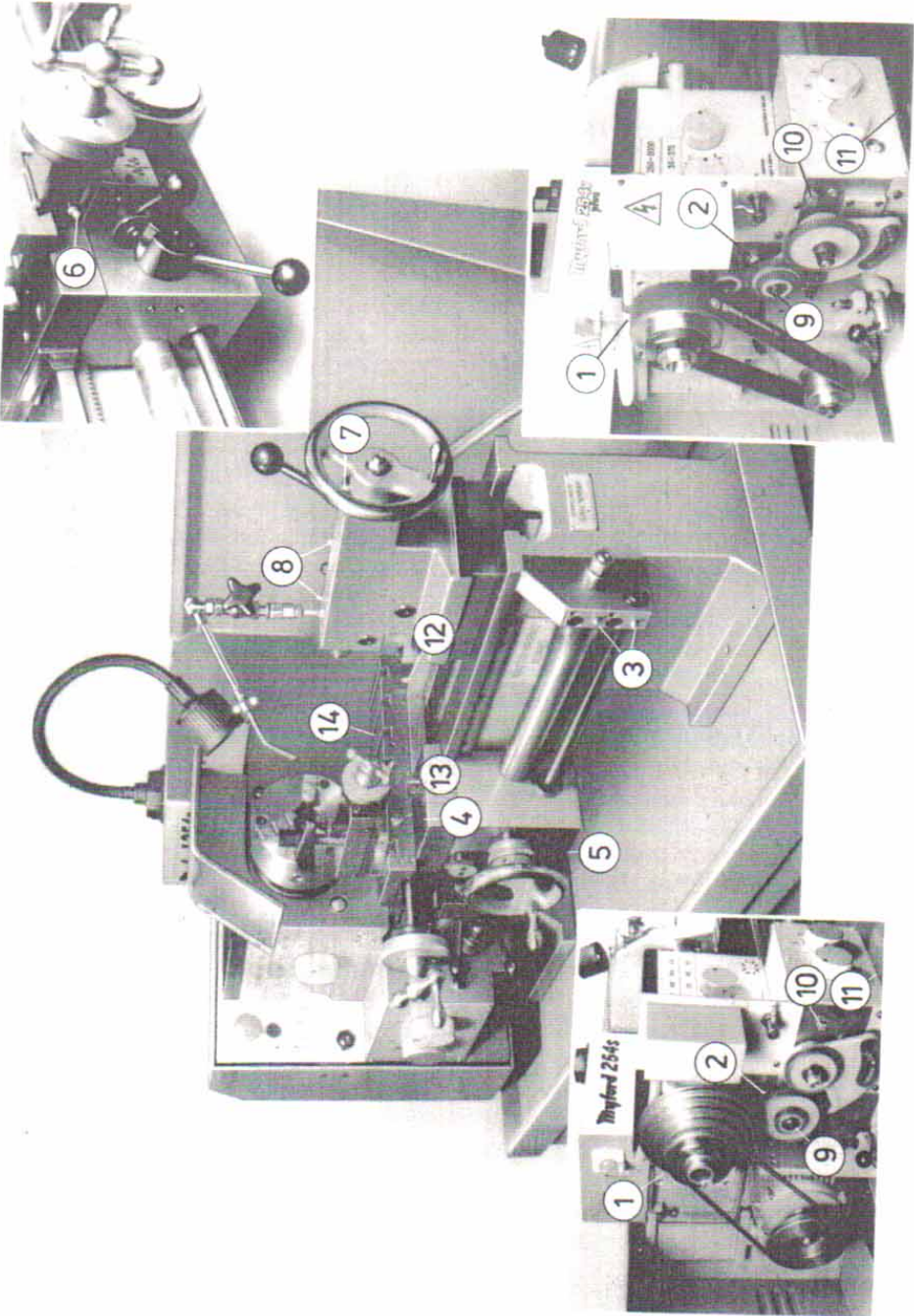
# Lubrication (non varispeed and varispeed models)

**Note:** When the headstock is operated in the two lowest back-gear speeds (53,80 r.p.m.) for prolonged periods, we recommend that the headstock is operated in a direct drive for a few minutes, at the commencement of each working day, to replenish the oil supply to the main spindle bearings.

*MOBIL VACTRA 2*

<ol style="list-style-type: none"> <li>1. Headstock oil filler plug</li> <li>2. Headstock drain plug</li> <li>3. Right hand leadscrew and feedshaft bearings (2 nipples)</li> <li>4. Apron reservoir oil filler/level plug</li> <li>5. Apron drain plug</li> <li>6. Cross feed screw bearing bracket</li> <li>7. Tailstock feedscrew bearing</li> <li>8. Tailstock barrel (2 nipples)</li> <li>9. Changewheel stud</li> <li>10. Gearbox filler/level plug (inside drive guard)</li> <li>11. Gearbox drain plug (under gearbox)</li> <li>12. Saddle rear shear</li> <li>13. Saddle front shear</li> <li>14. Cross feed nut (use oil can)</li> </ol>	<p><b>Recommended lubricant</b> (For all purposes)</p> <p>Esso Febis K68 or a similar oil having anti-oxidation, anti-wear and anti-foam properties and an approximate KINEMATIC viscosity of 68 centistrokes at 100°F. (I.S.O. V.G.K. 68)</p> <p><b>Headstock, Gearbox and Apron</b></p> <p>Top-up to centre of sight glass when necessary (Remove top cover to fill headstock)</p> <p><b>Twice weekly</b></p> <p>Lubricate all points with oil gun – (8 nipples – points 3, 6, 7, 8, 12, 13)</p> <p><b>Monthly</b></p> <p>Remove cross slide and topside, clean and lubricate slide surfaces and feed screws. Note: The cross slide may be moved to the rear and the topside to the right until they are free of their respective feed screws, after which they will slide off the saddle and topside base respectively.</p> <p><b>3 Monthly</b></p> <p>Sleeve bearing motor (if fitted). Fill bearing oil caps.</p> <p><b>Annually or every 2,000 hours of use</b></p> <p>Drain headstock and gearbox (drain plugs 2 &amp; 11) and refill to the centre of the sight glasses.</p> <p><b>Twice daily or before every separate period of use</b></p> <p>Lubricate the changewheel stud 9 (with the oil gun). Before screwcutting, slide the telescopic leadscrew guard aside adjacent to the left hand end of the apron and apply Esso FEBIS K68 or similar oil.</p>
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**SECTION 4**

### Compound Slide Adjustment

When stripping the slides for a thorough cleaning and lubrication, re-adjust the slides with the feedscrews disengaged, testing the slides by hand motion. Re-adjust the topline with the feedscrew and screw support bracket removed. In the case of the cross slide, wind the cross slide to the rear, until disengaged from the screw, and remove the feednut so that the slide can be moved by hand without re-engagement with the screw.

### Cross Slide Gib

The cross slide gib strip is held in position by four cheese head screws whose heads are visible in the top of the cross slide. There are four grubscrews in the right hand side of the cross slide for adjusting purposes. Before adjusting the strip, the four cheese head screws should be slackened-off and then just 'nipped'. They should be in this condition whilst the necessary adjustments are made to the grubscrews. Do not forget to lock the cheese head screws after adjustment.

Two additional grubscrews will be seen to project more than the others. These can be tightened to lock the slide if required, for boring and milling operations. Do not forget to reset these screws for normal sliding motion.

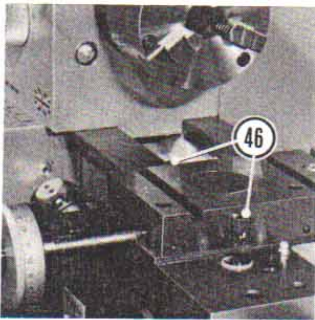


Fig. 29

### Removal of Topslide and Base Unit

The unit may be removed complete by releasing the two square head screws, one to the right and one to the left of the cross slide (46) (Fig. 29. ). Both screws should be withdrawn a full 7mm (1/4"). The unit may then be lifted clear of the cross slide.

**When the topline and topline base unit has been removed in order to enable the cross slide to be used as a boring or milling table, it is essential that the 48mm (1 7/8") diameter hole in the cross slide which locates the topline base be filled with the plug which is included in the standard equipment. Failure to fit this plus will result in swarf entering the feedscrews mechanism.**

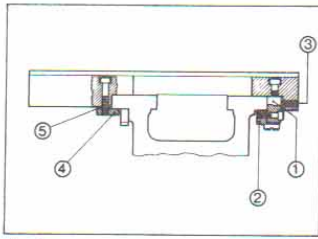


Fig. 30

### Saddle Gib and Lift Plates

A combined gib strip ① and lift plate ② is provided at the rear of the saddle for the elimination of play in both planes. See Fig. 30. When adjusting the saddle gib strip, first adjust the two outer screws ③, ensuring equal pressure. After adjusting, check for freedom of movement but without play. Next adjust the inner screw so that it contacts the strip without increasing the friction.

Lift plates ④ are fitted beneath the front of the saddle. These lift plates bear on the underside of the bed-way and adjustment to ensure close contact is by means of laminated shim washers ⑤.

These have a solid appearance, but are made up of .05mm (.002") laminations. By inserting a pen-knife blade it is an easy matter to peel-off the desired thickness to provide close contact with the bed-way.

A saddle clamp screw ⑥, page 13, is provided for facing, parting-off, milling etc. CARE SHOULD BE TAKEN TO ENSURE THAT THE CLAMP SCREW IS NOT TIGHTENED WHEN THE CARRIAGE IS TRAVERSED.

### Tailstock Gib Adjustment

Remove tailstock bed stop screw ②, page 13.

Release tailstock clamp, and slide tailstock off the end of the lathe bed, complete with its clamp plate and nut.

Remove the clamp nut and clamp plate, and separate the tailstock body from the base.

Refer to Fig. 27, page 23. Release gib securing screws ① and re-tighten until just nipped.

Adjust thrust screws ② just sufficiently to remove all trace of play of the tailstock relative to the bed shears when the base is placed in position on the bed, and without causing undue friction.

Re-tighten the gib securing screws ① and check for freedom of movement but lack of 'play'.

Reassemble the tailstock body, replace on the lathe bed complete with clamp plate and nut. Adjust the clamp nut so that clamping takes place just before the clamp lever eccentric shaft reaches its topmost position. (Top dead centre.) Replace the tailstock bed stop screw ② page 13.

Notes

A large rectangular box with a thin black border, intended for handwritten notes. The box is currently empty.

## **PARTS LISTING**

### **Ordering Replacement Parts**

The following information should be supplied with the order:-

1. Type and Serial Number of the lathe. For location of numbers see page 5.
2. Quantity required.
3. Quote Part Number.

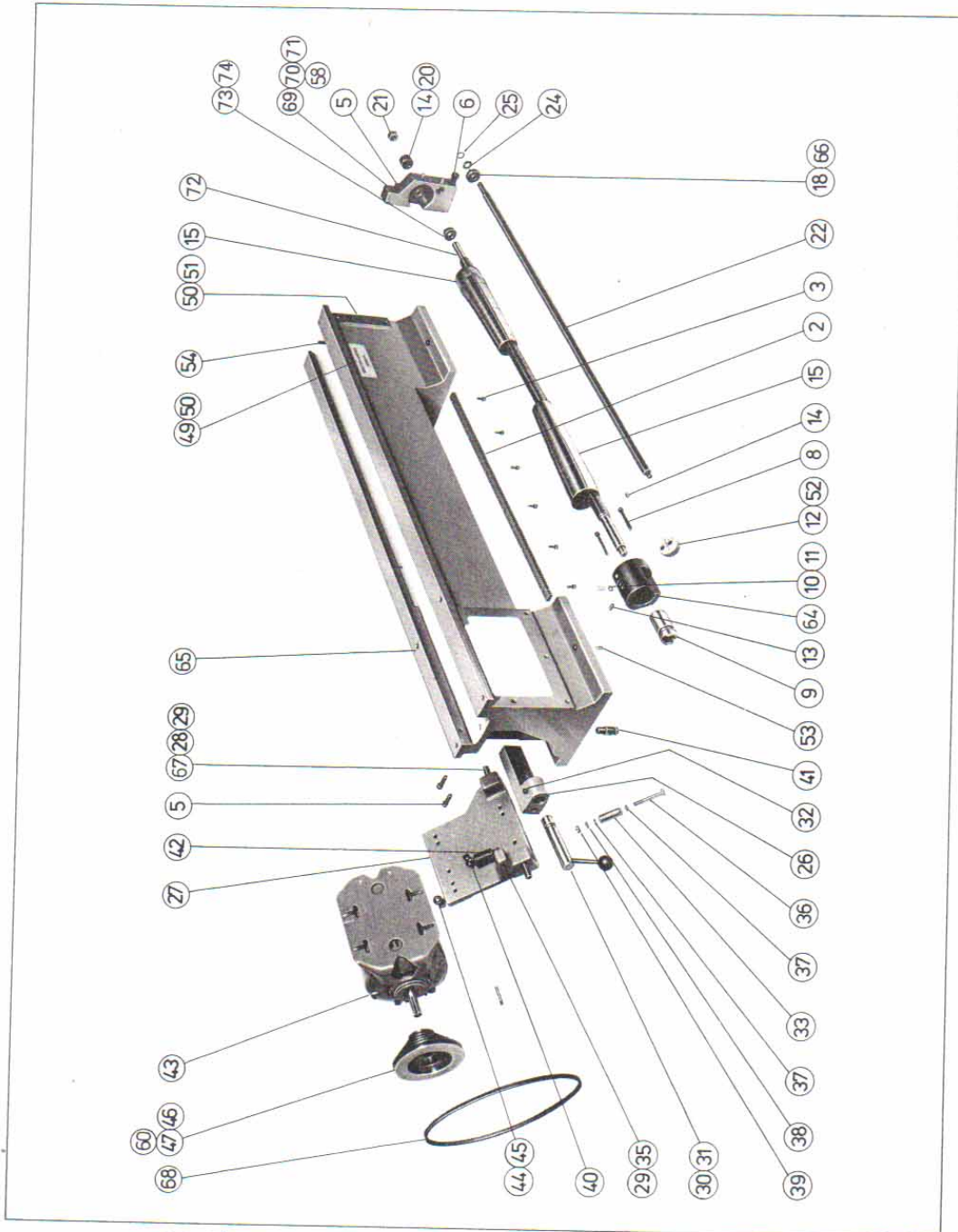
As it is the Company's policy to improve its products whenever opportunity occurs, designs are liable to modification at any time. In some cases, due to the nature of the part, it will be necessary for us to supply additional related parts, particularly if the item required has been altered.

**SECTION 5**

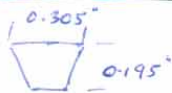
**254 plus Bed and Motorising Assemblies**

Drg. Ref.	Part No.	Description	No. off	Drg. Ref.	Part No.	Description	No. off
*2	11968	Rack (metric)	1	40	11984	Spring pin assembly - motor platform	1
*2	11969	Rack (imperial)	1	41	11985	Spring anchor pin - bed	1
+2	12383	Long rack (metric)	1	42	12174	Spring - belt tensioning	1
+2	12384	Long rack (imperial)	1	43		Motor (When ordering give exact details of voltage, phase and periodicity)	1
3	100094	Cap hd. screw - rack securing (M5 x 0.8 x 12mm)	6	A1102	Washer	4	
5	100234	Cap hd. screw - bracket securing (M8 x 1.25 x 30mm)	3	100085	Hex. hd. set screw - motor securing (M8 x 1.25 x 20mm)	4	
6	100090	Cap hd. screw - bracket securing (M8 x 1.25 x 60mm)	1		Cone pulley - motor (50 Hz)	1	
8	100235	Cap hd. screw - housing securing (M5 x 0.8 x 45mm)	2	100240	Cone pulley - motor (60 Hz)	1	
9	11972	Sleeve - leadscrew clutch	1	13361	Cap hd. set screw - pulley securing (M6 x 1 x 12mm)	1	
10	12173	Spring	1	100241	Information plate - bed	1	
11	73010	Ball (5mm $\varnothing$ )	1	100241	Rivet (NPK Type U No. 0 x $\frac{3}{16}$ )	6	
12	11973	Operating knob - leadscrew clutch	1	12181	Serial number plate - bed	1	
13	100214	Socket set screw - knob locating (M5 x 0.8 x 10mm)	1	100224	Disc - leadscrew clutch knob	1	
14	70002	Half Dog Point (TUFLOK)	2		Socket set screw (M/c levelling)	4	
15	80037	Woodruff key (No. 404)	2		(M10 x 1.5 x 25 Cone Point) (TUFLOK)		
18	100212	Leadscrew guard	2	54	Tailstock stop pin	1	
20	11977	Socket set screw - collar securing (M6 x 1 x 6mm)	2	58	Oil nipple (Adams 4120)	2	
21	100236	Cup Point TUFLOK)	1	11987	Washer	1	
*22	11978	Distance collar	1	11970/2	Housing - leadscrew clutch	1	
+22	12387	'Nyloc' nut (M12 x 1.75 Type P)	1	65	Bed	1	
24	100237	Feedshaft	1	66	Long bed	1	
25	100133	Long feedshaft	1	67	Thrust collar - feedshaft	1	
26	11958	Washer (M10 Std)	1	100220	Socket set screw (M5 x 0.5 x 10 Cup Point) (TUFLOK)	2	
27	12208/1	Circle (Anderdon Type DIN 1400-10)	1	70038	Vee belt (50 Hz)	1	
28	11980	Pivot bracket	1	11964/1	Vee belt (60 Hz)	1	
29	11252	Motor platform	2	14237	Leadscrew bracket assembly R.H. (includes 58, 70, 71)	1	
30	11981	Pivot screw - motor platform	3		Oilite bush	1	
31	80002	Pad	1	11963/1	Oilite bush	1	
32	100238	Cam and lever assembly - belt tensioning	1	11974/1	Leadscrew (metric)	1	
33	11982	Ball knob	1	11975/1	Leadscrew (imperial)	1	
35	100223	Socket set screw - cam locating (M8 x 1.25 x 8mm)	1	12385/1	Long leadscrew (metric)	1	
36	11983	Adjusting bush - motor platform	1	12386/1	Long leadscrew (imperial)	1	
37	65156	Socket set screw (M5 x 0.8 x 6mm Cup Point)	1	73	Thrust washer (Torrington TRB-815)	4	
38	13332	(TUFLOK)	1	74	Thrust washer (Torrington NTA-815)	2	
39	100239	Screw - adjusting bush	2				
		'O' ring (Dowty No. 108)	1				
		Washer	1				
		'Nyloc' nut (M6 x 1.0 'P' Type PP/Y066)	1				

\* For lathe 550mm (21 $\frac{1}{8}$ ") maximum distance between centres  
 † For lathe 800mm (31 $\frac{1}{2}$ ") maximum distance between centres



V Belt.



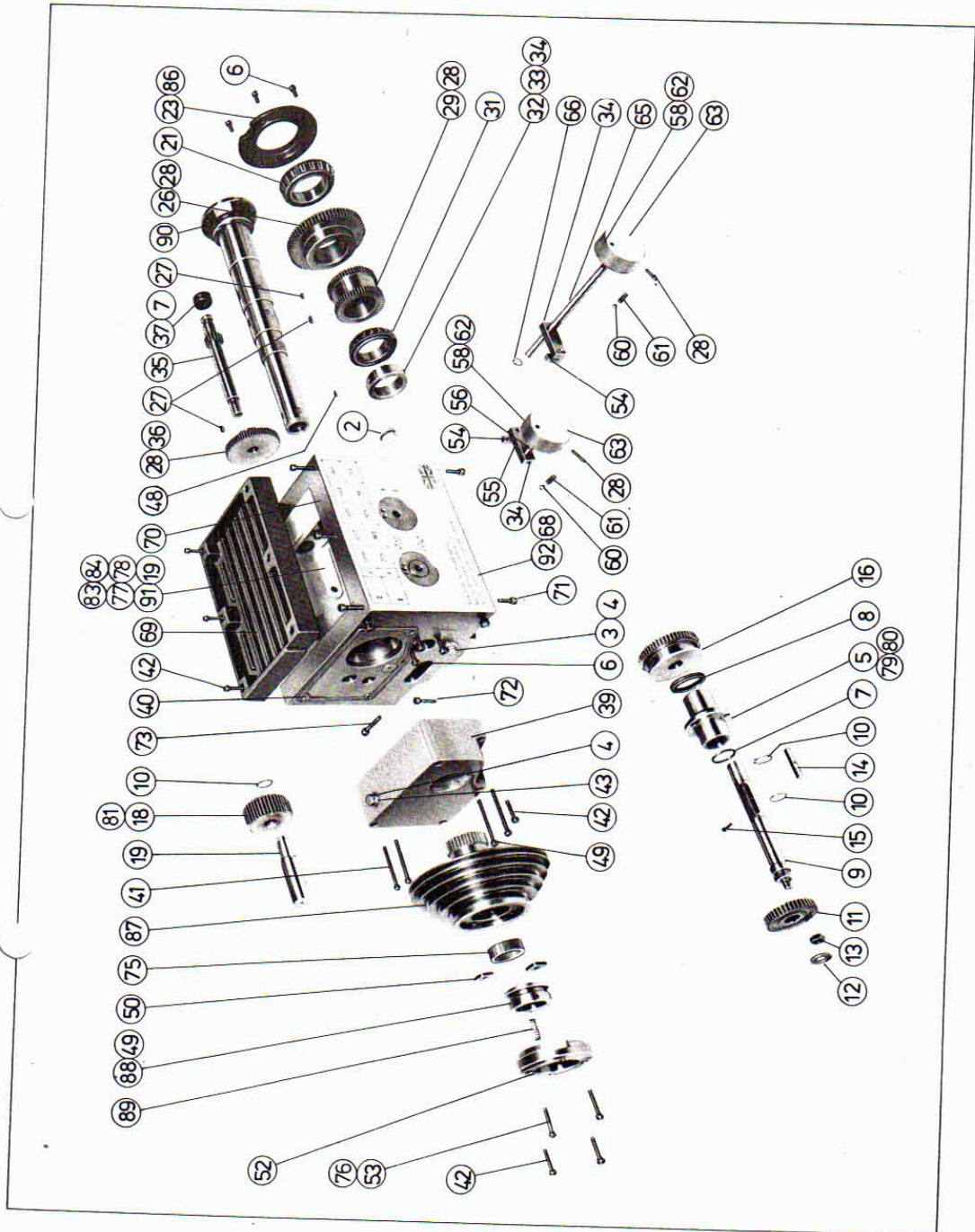
Optibelt VB  
 7.75mm x 4.45mm x 900

## SECTION 5

## 254 plus Headstock Assembly

Dwg. Ref.	Part No.	Description	No. off	Dwg. Ref.	Part No.	Description	No. off
2	65051	Oil sight glass	1	50	12146	Clamp washer	2
3	65202	Oil drain plug	1	52	12147	Clamp washer housing	1
4	65015	Sealing washer-plug (Dowty Selon MK.5)	2	53	100250	Socket button hd. screw (M6 x 1 x 25mm)	2
5	12122	Tumbler reverse housing assembly (includes: 79, 80)	1	54	12274	Shoe assembly - 52T sliding gear	1
6	100240	Cap hd. screw - housing sec'g. (M6 x 1 x 12mm)	6	55	12149	Lever	2
7	65189	'O' ring - housing sealing (Dowty 4470 BS4518-0245-30)	2	56	12150/1	Spindle-lever	1
8	65192	Oil seal (INA G20 x 28 x 4)	1	58	11924	Knob - gearbox drive/rev.	1
9	12126	Shaft - tumbler reverse	1	60	73021	Ball - knob indent (6mm Ø)	2
10	100136	Circlip - shaft retaining	1	61	11379	Spring - knob indent	2
11	11285/40	40T output gear	1	62	100251	Socket setscrew - knob indent (M8 x 1.25 x 8mm)	2
12	11298	Washer	3			(Cup Point)	2
13	100003	Hex. nut (M8 x 1.25)	1	63	12105	Selector plate - knob	2
14	12127	Key - tumbler reverse shaft	1	65	12151/1	Spindle-lever	1
15	100247	Cap hd. screw - key securing. (M3 x 0.5 x 12mm)	1	66	100133	Circlip (Anderdon 1400-10)	1
16	12128	52T sliding gear	1	68	100241	Rivet (N.P.K. Type 'U' No. 0 x 3/16")	1
18	12129	40T gear assembly - stub shaft (includes: 81)	1	69	12152/1	Tray	6
19	12116	Stub shaft	1	70	12153	Gasket - tray	1
21	73046	Taper roller bearing - front (Timken 368A-362A)	1	71	100253	Cap hd. screw - headstock securing (M8 x 1.25 x 25mm)	1
23	12132	Gasket - front bearing cover	1	72	100234	Cap hd. screw - headstock securing (M8 x 1.25 x 30mm)	3
26	12226	67T gear - spindle	1	73	100300	Cap hd. screw - headstock pull-back (M6 x 1 x 50mm)	1
27	70037	Woodruff key (No. 505)	1	75	73047	Sealed needle bearing	2
28	100219	Socket set screw (M6 x 1 x 8mm Cup Point) (TUFLOK)	3	76	12355	Spacer (thickness to suit)	1
29	12135	52T/52T Tumbler gear	1	77	13447	Oilite bush	2
31	73045	Taper roller bearing - rear (Timken 18590-18520)	1	78	12117/1	Spacer	2
32	12136	Locking collar	5	79	12124	Oilite bush	1
33	11253	Copper pad	1	80	12125	Oilite bush	1
34	100212	Socket set screw (M6 x 1 x 6mm Cup Point) (TUFLOK)	1	81	12131	Oilite bush	1
35	12227	16T Backgear shaft	3	83	12348	Oil catcher	1
36	12228	66T Backgear	1	84	100252	Self tapping screw (M3 x 0.5 x 6mm)	1
37	12139	End plug	1	86	12133/1	Front bearing cover	2
39	12140	Cover - backgear	1	87	12142/1	Vee cone pulley assembly (50 Hz)	1
40	12141	Gasket - cover	1	88	12374/1	Vee cone pulley assembly (60 Hz)	1
41	100248	Cap hd. screw - cover securing. (M6 x 1 x 60mm)	1	89	12145/1	Clamp - cone pulley	1
42	100249	Cap hd. screw - cover securing. (M6 x 1 x 30mm)	1	90	12902	Spring	1
43	65081	Oil filler plug	4	91	11966/1	Spindle (B.S. 4442 modified)	2
48	70002	Woodruff key (No. 404)	9	92	12217/1	Spindle (Camlock No. 3)	1
49	100223	Socket set screw (M5 x 0.8 x 5mm Cup Point) (TUFLOK)	1			(including: A8911 Cam-3, A8912 detent plunger-3, A8913 spring-3, Ch. hd. screw M8 x 1.25 x 8mm-3)	1
			1	91	13583	Headstock sub assembly (includes: 19, 77, 78)	1
			1	92	13585	Speed plate	1

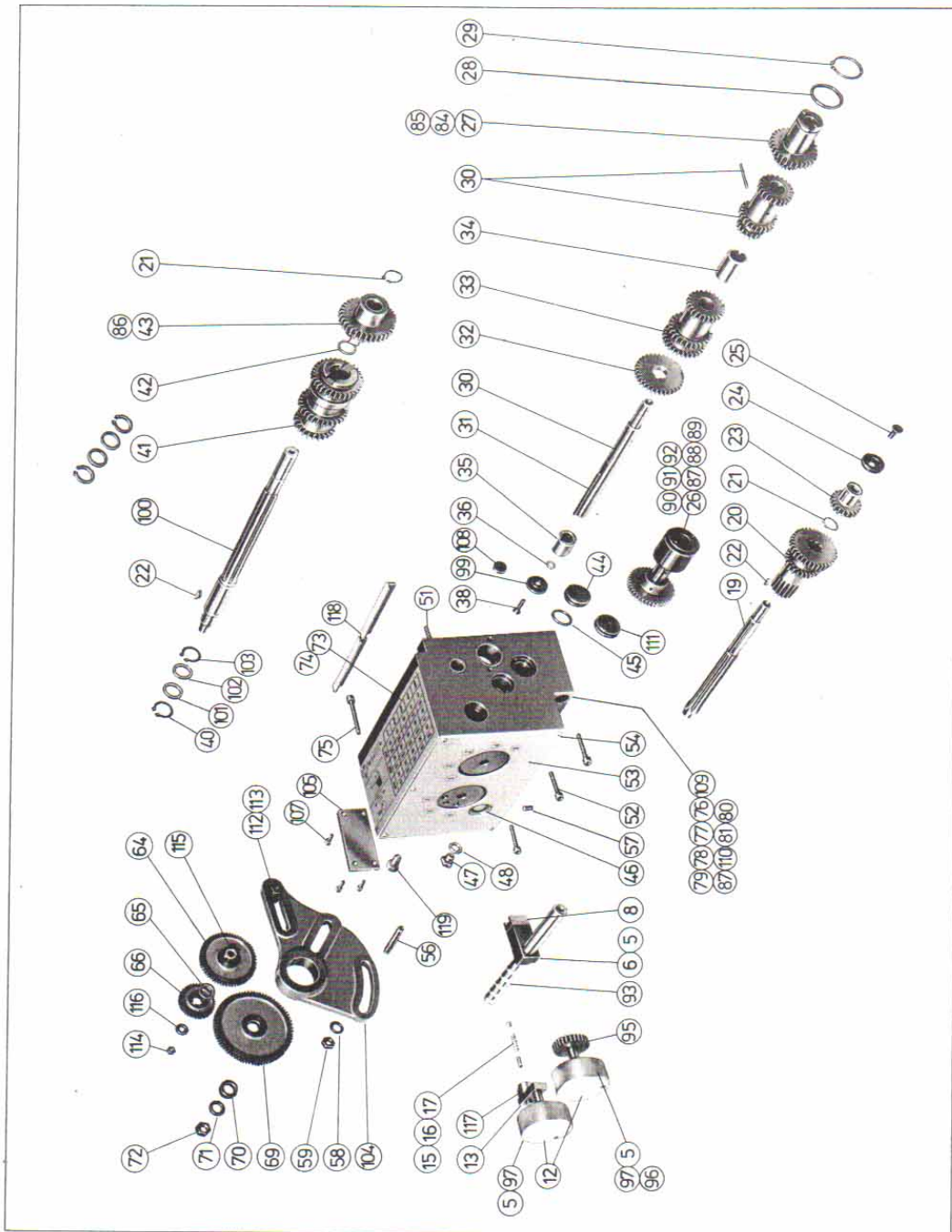




**SECTION 5**

## 254 Gearbox Assembly - Imperial

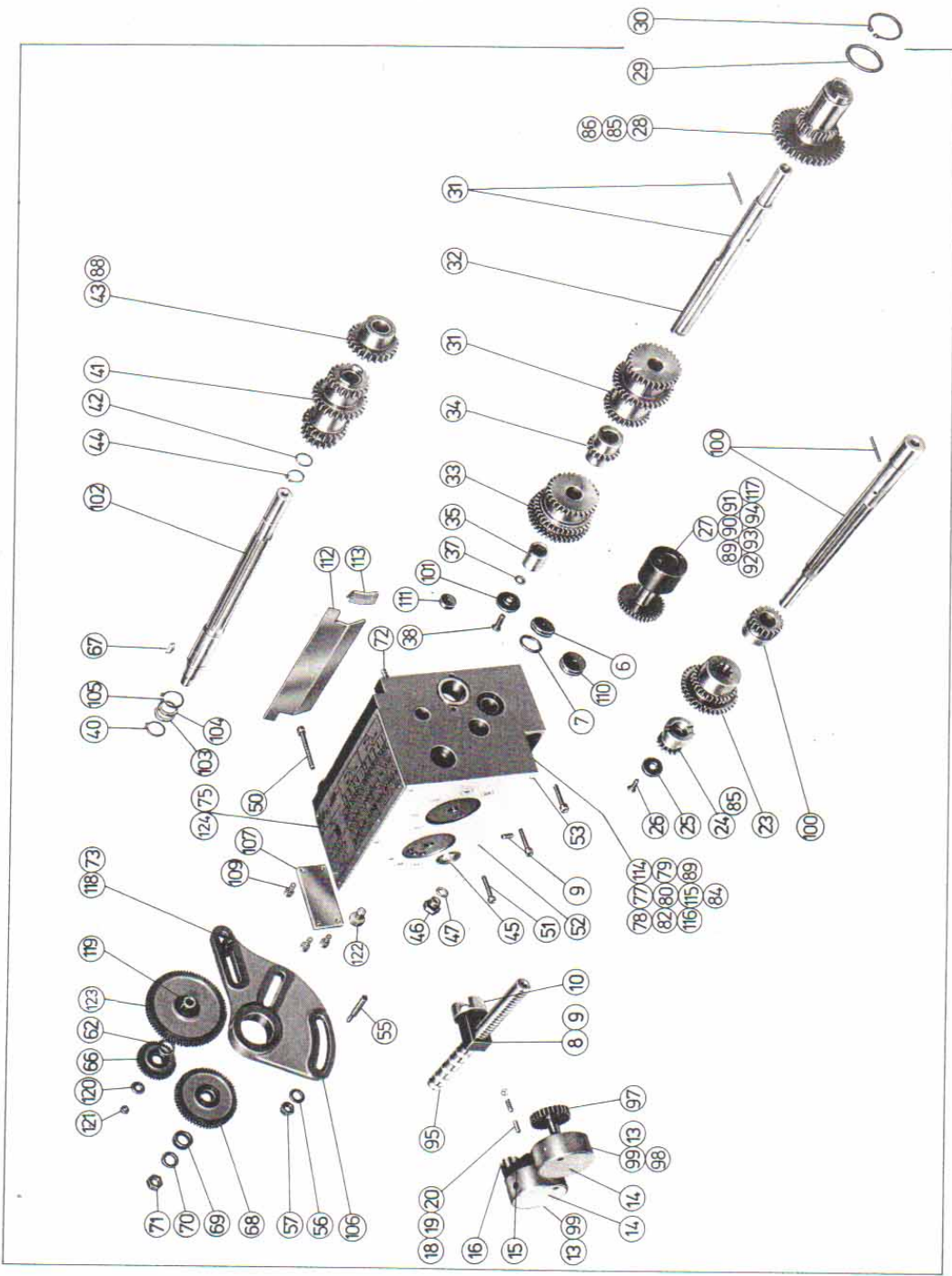
Dwg. Ref.	Part No.	Description	No. off	Dwg. Ref.	Part No.	Description	No. off
5	100219	Socket set screw - rack indent (M6 x 1 x 8mm, Cup point) (TUFLOK)	3	65	A1499	Spacer	1
6	11887	Actuator block - gear select input shaft	1	66	11285/40	40T Gear	1
8	11888	Shoe - gear select - input shaft	1	69	11285/80	80 Gear - Input	1
12	12105	End cap - dial	2	70	A2604	Spacer	1
13	11892/1	Swing arm assembly - gear select	1	71	100281	Washer (M12)	1
15	73021	Ball (6mm $\varnothing$ )	2	72	100282	Hex nut (M12 x 1.75)	1
16	11379	Spring	2	73	11929	Instruction plate	1
17	100251	Socket set screw (M8 x 1.25 x 8mm)	2	74	100241	Rivet (N.P.K. type U, No. 0 x $\frac{3}{16}$ ")	1
19	11895	Output shaft	2	75	100090	Cap hd. screw (M8 x 1.25 x 60mm)	6
20	11896	17/25/34 Sliding gear	1	76	11877	'O'Lite bush	1
21	100135	Circlip (Anderton 1400-14)	1	77	11878	'O'Lite bush	1
22	70002	Woodruff key (No. 404)	2	78	11879	Bush	1
23	11897	20T gear - output shaft	2	79	13447	'O'Lite bush	1
24	11898/1	Clamp washer	1	80	11885	'O'Lite bush	1
25	100268	C sunk head socket screw (M6 x 1 x 12mm)	1	81	11882	'O'Lite bush	3
26	12177	Feedshaft coupling assembly	1	84	11906	'O'Lite bush	1
27	11904	20/30T Gear assembly - leadscrew output (includes: 84, 85)	1	85	11907	'O'Lite bush	2
28	11908	Washer	1	86	11922	'O'Lite bush	1
29	100138	Circlip (Anderton 1400-25)	1	87	65192	Oil seal (INA G20 x 28 x 4)	1
30	11909	Layshaft sub assembly	1	88	12175	Disc spring	2
31	11913	Key	1	89	11901	Tab washer	4
32	11915	34T Gear	1	90	11902	Friction disc	3
33	11914	28/26/25T Gear	1	91	11903	Adjusting nut	2
34	11912	Spacer	1	92	11926	Clutch housing sleeve	1
35	11916	Sleeve	1	93	11866/1	Rack-gear selector	1
36	A2752	Laminated washer	1	95	11869/1	28T gear assembly	1
38	100279	C sunk socket head screw (M6 x 1 x 25mm)	1	96	100133	Circlip (Anderton 1400-10)	1
40	100137	Circlip - shaft locating (Anderton 1400-20)	1	97	11924/1	Dial - gear selector	1
41	11919	24/30/32T Sliding gear	1	99	11917/2	Clamp washer	2
42	12057	Spacer	1	100	11918/1	Input shaft	1
43	11920	33T Gear assembly (includes: 88)	1	101	13431	Washer	1
44	12058	Plug	1	102	13430	Washer	1
45	65188	'O' ring - plug sealing (BS4516.0221-16)	1	103	*00165	Circlip (Anderton 1400-19)	1
46	65051	Oil sight glass (M.J. Meddings Tepro Size 22)	1	104	11927/2	Change gear quadrant	1
47	65081	Oil drain plug	1	105	13448	Sealing plate	1
48	65015	Sealing washer (Dowty Selon MK.5)	1	107	100240	Cap hd. screw (M6 x 1 x 12mm)	1
51	100280	Cap hd. screw - gearbox securing (M8 x 1.25 x 65mm)	1	108	13433	Plug - input shaft	4
52	100253	Cap hd. screw - gearbox securing (M8 x 1.25 x 25mm)	3	109	11876/3	Gearbox assembly (includes: 76, 77, 78, 79, 80, 81, 87, 110)	1
53	11925/1	Instruction plate - gear select	1	110	11883/1	Sleeve assembly (includes: 80)	1
54	100252	Self tapping screw - pan head (GKN Supadrive, Taplite, M3 x 0.5 x 6mm)	5	111	13449	Cap - output shaft	1
56	A3015	Stud - quadrant securing (M6 x 1 x 6mm)	1	112	A1496/2	Change wheel stud	1
57	100212	Socket set screw stud securing (M6 x 1 x 6mm, Cup Point) (TUFLOK)	1	113	A1501/2	Sleeve	1
58	100015	Washer $\frac{3}{8}$ "	1	114	100057	Hex nut ( $\frac{1}{4}$ " B.S.F.)	1
59	100016	Hex nut $\frac{3}{8}$ " B.S.F.	1	115	A1500	Bush	1
64	11285/60	60T Gear - Idler	2	116	A1498	Washer	1
			1	117	11894/1	Shoe - gear select	1
			1	118	13357	Neoprene sealing set	1
			1	119	65198	Oil Filler Plug	1



**SECTION 5**

## 254 Gearbox Assembly - Metric

Dwg. Ref.	Part No.	Description	No. off	Dwg. Ref.	Part No.	Description	No. off
6	12058	Plug	1	69	A2604	Spacer	1
7	65188	O ring (Dowty 4470 B.S.4518-0221-16)	1	70	100281	Washer (M12)	1
8	11934	Actuator block - gear selector	1	71	100282	Hex nut (M12 x 1.75)	1
9	100212	Socket setscrew (M6 x 1 x 6mm Cup Point) (TUFLOK)	2	72	100280	Cap hd. screw (M8 x 1.25 x 65mm)	1
10	11935	Shoe	2	73	A1501/2	Sleeve	1
13	100219	Socket setscrew (M6 x 1 x 8mm Cup Point) (TUFLOK)	2	75	100241	Rivet (N.P.K. type 'U', No. 0 x 3/16")	1
14	12105	End cap - dial	2	77	11877	'Ollite' bush	6
15	11936	Swing arm assembly - gear select	2	78	11878	'Ollite' bush	1
16	11939	Shoe	1	79	11879	Bush	1
18	73021	Ball (6mm Ø)	1	80	11932	'Ollite' bush	1
19	11379	Spring	2	82	11882	'Ollite' bush	1
20	100251	Socket setscrew (M8 x 1.25 x 8mm)	2	84	11885	'Ollite' bush	1
23	11943	36/28T Sliding gear - output shaft	2	85	11907	'Ollite' bush	2
24	11944	16T Gear assembly (includes: 85)	1	86	11906	'Ollite' bush	2
25	11898/1	Clamp washer	1	88	11922	'Ollite' bush	2
26	100278	C/Sk socket head screw (M6 x 1 x 16mm)	1	89	65192	Oil seal (INA G20 x 28 x 4)	1
27	12178	Feedshaft coupling assembly	1	90	12175	Disc spring	2
28	11948	36/25T Gear assembly - leadscrew output (includes: 85, 86)	1	91	11901	Tab washer	4
29	11908	Washer	1	92	11902	Friction disc	3
30	10038	Circlip (Anderton 1400-25)	1	93	11903	Adjusting nut	2
31	11950	Layshaft sub assembly	1	94	11926	Clutch housing sleeve	1
32	11913	Key	1	95	11886/1	Rack - gear selector	1
33	11952	40/36/30T Gear	1	97	11889/1	28T gear assembly	1
34	11953	18T Gear	1	98	100133	Circlip (Anderton 1400-10)	1
35	11916	Sleeve	1	99	11924/1	Input shaft	1
37	A8949	Laminated washer	1	100	11940/1	Clamp washer	2
38	100274	C sunk socket head screw (M6 x 1 x 25mm)	1	101	11917/1	Clamp washer	1
40	100137	Circlip - input shaft locating (Anderton 1400-20)	1	102	11918/1	Input shaft	1
41	11954	18/21/28/21T Sliding gear	1	103	13431	Washer	1
42	12057	Spacer	1	104	13430	Washer	1
43	11955	24T Gear assembly (includes: 88)	1	105	100165	Circlip (Anderton 1400-19)	1
44	100135	Circlip - 24T gear retaining (Anderton 1400-14)	1	106	11927/2	Change gear quadrant	1
45	65051	Oil sight glass (Repro Size 22)	1	107	13448	Sealing plate	1
46	65081	Oil plug	1	109	100240	Cap hd. screw (M6 x 1 x 12mm)	1
47	65015	Sealing washer (Dowty Selon MK.5)	1	110	13432	Plug - output shaft	4
50	100090	Cap hd. screw - gear box securing (M8 x 1.25 x 60mm)	1	111	13433	Plug - input shaft	1
51	100253	Instruction plate - gear select.	1	112	13438	Oil deflector	1
52	11957/1	Self tapping screw - panhead (G.K.N. Supadrive, Taprite - M3 x 0.5 x 6mm)	3	113	80058	Edging strip	1
53	100252	Sud - quadrant securing washer-3/8"	5	114	11933/3	Gearbox assembly (includes: 77, 78, 80, 82, 89, 115, 116)	1
55	A3015	Washer-3/8"	1	116	11883/1	'Ollite' bush	1
56	100015	Hex nut 3/8" B.S.F.	2	117	65277	Sleeve assembly (includes: 84)	1
57	100016	Spacer	1	118	A1496/2	Change gear stud	1
66	11285/30	30T Change wheel	1	119	A1500	Bush	1
67	70002	Woodruff key - input shaft (No. 404)	1	120	A1498	Washer	1
68	11285/60	60T Input gear	1	121	100057	Hex nut (3/8" B.S.F.)	1
				122	65198	Oil filler plug	1
				123	11285/90	90T changewheel	1
				124	13880	Instruction plate	1

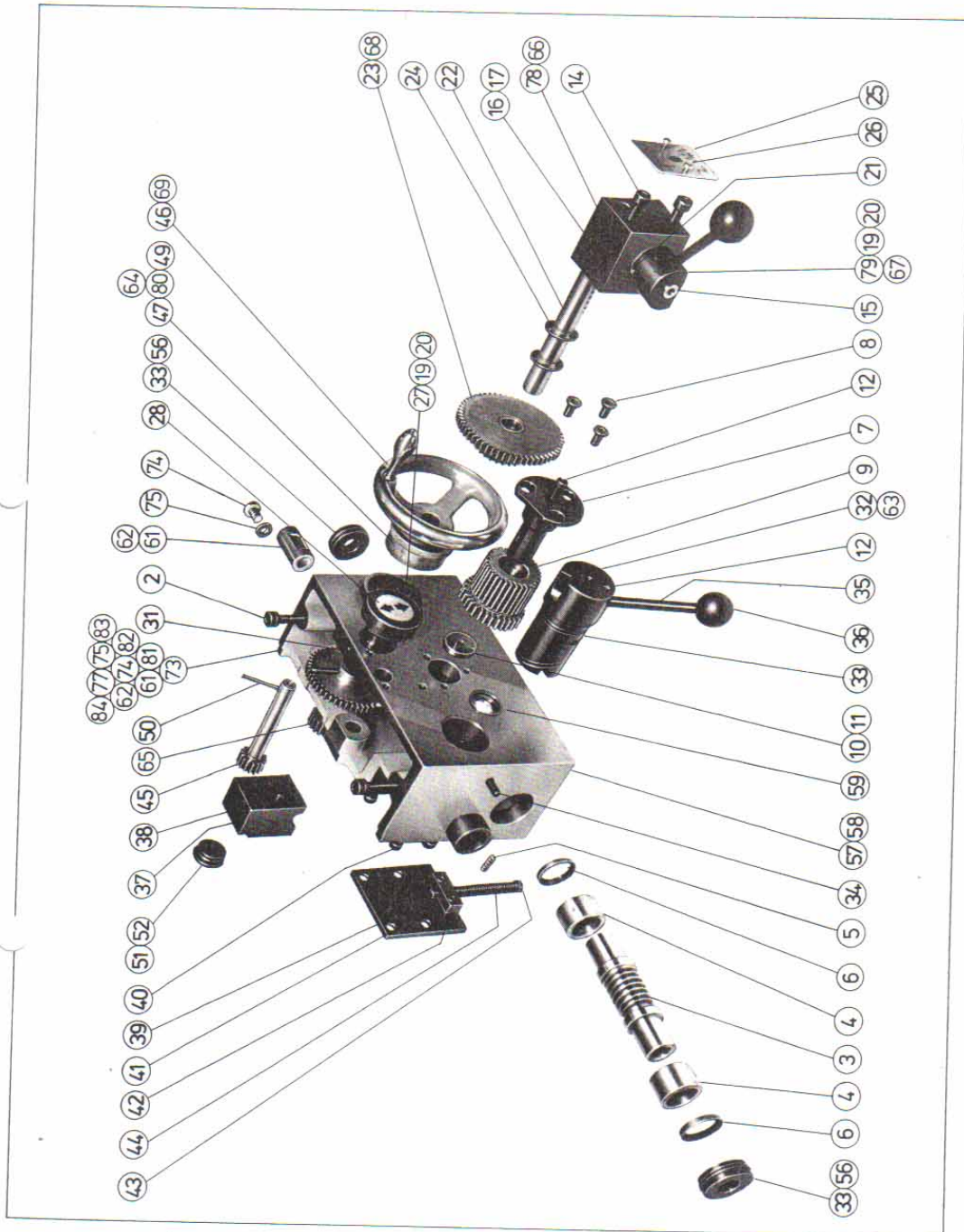


**SECTION 5**

## 254 Apron Assembly

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Dwg. Ref.	Part No.	Description	No. off	Dwg. Ref.	Part No.	Description	No. off
2	100266	Cap hd. screw - apron securing. (M8 x 1.25 x 40mm)	2	41	12034	Stop bracket - nut stop	1
3	12006	Worm	1	42	100271	Cap hd. screw (M5 x 0.8 x 10mm)	1
4	12007	Bush - worm	2	43	100272	Stop screw - L/screw nut (Hex hd. setscrew M6 x 1 x 7.5mm)	2
5	100209	Socket set screw - bush securing. (M6 x 1 x 16mm) (Dog Point) (TUFLOK)	2	44	A9256	Spring - stop screw	1
6	65193	Oil seal (INA G22 x 30 x 4)	2	45	12035	Handwheel pinion	1
7	12010	Stub shaft - wormwheel	1	46	12037	Handwheel assembly (includes: 69)	1
8	100268	Socket C/sunk screw (M6 x 1 x 12mm)	3	47	11325	Waved washer (EMO EPL 26)	1
9	12011	Wormwheel cluster gear	1	49	100138	Circlip (Anderton 1400-25)	1
10	12012	Retainer - wormwheel	1	50	100273	Taper pin - Handwheel securing. (No. 0 x 40)	1
11	75/1411	Pin - retainer	1	51	12039	Plug - pinion access hole	1
12	100269	Cap hd. screw - cluster securing. (M5 x 0.8 x 50mm)	2	52	65187	'O' ring - plug (Dowty Ref. 202-647-BS4518-0216-24)	1
14	100258	Cap hd. screw - housing sec'g. (M6 x 1 x 45mm)	2	56	12197	Plug - feedshaft entry	1
15	12016	16T Rack pinion	1	57	65081	Oil drain plug (Aqualux 1/4" B.S.P.)	2
16	12017	Plug - housing	1	58	65015	Sealing washer (Dowty Selon MK.5)	1
17	65188	'O' ring - plug (Dowty Ref. 202-524-BS4518-0221-16)	1	59	65051	Oil-sight glass (Tepro Size 22)	1
19	A8717	Spring - lever indent	2	61	12988	Support - R.H. Tensaguard (metric)	1
20	73010	Ball - lever indent (5mm Ø)	2	61	12009/2	Support - R.H. Tensaguard (imperial)	1
21	100270	Taper pin (No. 0 x 30)	1	62	100220	Socket setscrew (M5 x 0.8 x 10mm Cup Point) (TUFLOK)	1
22	12021	Rack - 25/56T cluster	1	63	100223	Socket setscrew (M5 x 0.8 x 6mm Cup Point) (TUFLOK)	1
23	12022	Assembly - 25/56T cluster - gear assembly (includes: 68)	1	64	12911	Spacer	1
24	100150	Circlip (Anderton DIN 1500-12)	2	65	12275	Rack pinion assembly (metric)	1
25	12025	Instruction plate	1	65	12276	Rack pinion assembly (imperial)	1
26	100252	Self tapping screw - pan head	2	66	12015	Bush	2
27	12026	(GKN Supadrive Taprite M3 x 0.5 x 6mm)	1	67	80034	Ball knob	1
28	12027	Knob-long/cross feed interlock	1	68	12024	'O' ring - bush	1
31	100265	Instruction plate	1	69	A9053/1	Handle	2
32	12028	Socket set screw (M6 x 1 x 8mm)	1	73	12005/3	Apron sub assembly (includes: 81, 82, 83, 84)	1
33	65190	(Half Dog Point) (TUFLOK)	1	74	100287	Socket/button hd. screw (M6 x 1 x 8mm)	1
34	A8527	Cam-leadscrew nut	1	75	100061	Washer (M6)	1
35	12029	'O' ring - cam (Dowty Ref. 202-778-BS4518-0295-30)	3	77	12465/1	Tube	1
36	80002	Adjusting screw - cam stop	1	78	13421	Rack and pinion housing assembly (includes: 66)	1
37	12030	Lever-cam	1	79	13422	Feed engagement lever assembly (includes: 67)	1
38	12032	Ball knob	1	80	11997/1	Micrometer dial (metric)	1
39	12033	Leadscrew nut (metric)	1	81	11998/1	Micrometer dial (imperial)	1
40	100246	Lead screw nut (imperial)	1	82	12043/1	Stop peg (Headland Eng. 4 dia. x 8mm)	1
		Cam peg - leadscrew nut	1	83	12008/2	Support bush	1
		Support plate	1	84	12036	Support - L.H. Tensaguard	1
		Cap hd. screw (M6 x 1 x 10mm)	4			Datum plate	1

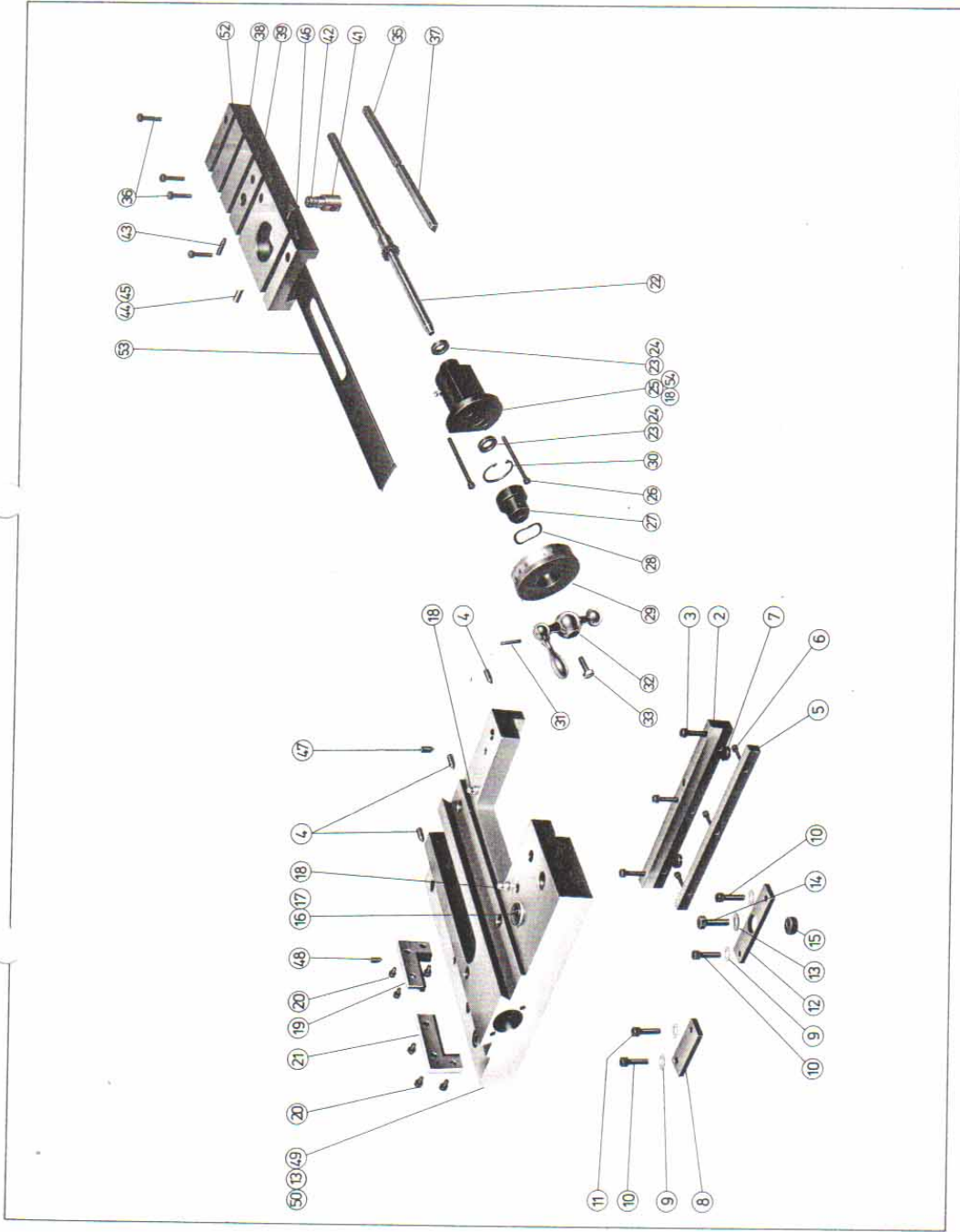


**SECTION 5**

# 254 Saddle and Cross Slide Assemblies

Dwg. Ref.	Part No.	Description	No. off	Dwg. Ref.	Part No.	Description	No. off
2	12061	Saddle strip - rear	1	28	11325	Waved washer (EMO EPL 26)	1
3	100257	Cap hd. screw - strip securing, (M6 x 1 x 25mm)	3	29	12001/1	Micrometer dial - cross slide (metric)	1
4	100209	Socket setscrew - saddle strip adj. (M6 x 1 x 16mm) (Dog point) (TUFLOK)	3	29	12002	Micrometer dial (imperial)	1
5	12062	Keep strip - rear	1	30	100104	Circlip (Anderton 1300-35)	1
6	100103	Cap hd. screw - strip securing, (M5 x 0.8 x 20mm)	1	31	100105	Taper pin (No. 0 x 1")	1
7	12063	Adjusting screw - Keep strip	3	32	12074	Ball handle assembly	1
8	12064	Keep strip - front L.H.	2	33	12076	Screw - handle securing.	1
9	A.8949	Laminated shim	1	35	A.2068	Gib strip - rear	1
10	100249	Cap hd. screw - strip securing, (M6 x 1 x 30mm)	4	36	12077	Cheese head screw	1
11	100258	Cap hd. screw - strip securing, (M6 x 1 x 45mm)	3	37	A.2069	Gib strip - front	4
12	12065	Keep strip - front R.H.	1	38	100262	Gib strip - front	4
13	100086	Washer (M8) - saddle clamp bolt (8mm Ø)	1	39	100263	Socket set screw - gib strip adj. (M5 x 0.8 x 16mm) (Half Dog Point) (TUFLOK)	4
14	12195	Saddle clamp bolt	2	41	12079	Socket set screw - cross slide locking (M5 x 0.8 x 20mm)	2
15	12067	Saddle clamp eccentric	1	41	12082	Feed nut - cross slide (metric)	1
16	A.2698	Oil filler plug	1	42	65203	Feed nut - cross slide (imperial)	1
17	65015	Sealing washer - filler plug (Dowty Selon MK.5)	1	43	100209	Ball valve oiler - feed nut (Adams No. 1403 Style 'A') (M6 x 1 x 25mm) (Dog Point) (TUFLOK)	1
18	65116	Oil nipple	1	44	A.2067	Socket set screw - feed nut sec'g.	1
19	12159	Wiper - rear shear	3	44	A.2067A	Thrust pad - R.H.	1
20	100259	Cap hd. screw - wiper (M4 x 0.7 x 8mm)	1	45	11314	Thrust pad - L.H.	1
21	12158	Wiper - front shear	6	46	100097	Sq. hd. screw - thrust pad	1
22	12068	Feedscrew assembly (metric)	1	47	100251	Socket set screw - plug/coolant (M6 x 1 x 6mm)	2
23	12080	Feedscrew assembly (imperial)	1	48	11870/1	Socket set screw - plug/steady (M8 x 1.25 x 8mm)	1
24	73085	Thrust washer (Torrington TRB-815)	4	49	100264	Saddle	1
25	73084	Thrust race (Torrington NTA-815)	4	50	11871/1	Cap hd. screw (M8 x 1.25 x 16mm)	1
25	12071	Bearing block assembly (includes: 18, 54)	2	52	12078/1	Cross slide	1
26	100261	Cap hd. screw - block securing, (M5 x 0.8 x 70mm)	1	53	12078/1	Sliding cover - feedscrew	1
27	12073	Sleeve	2	54	A9392	Oilite bush	1
			1				2



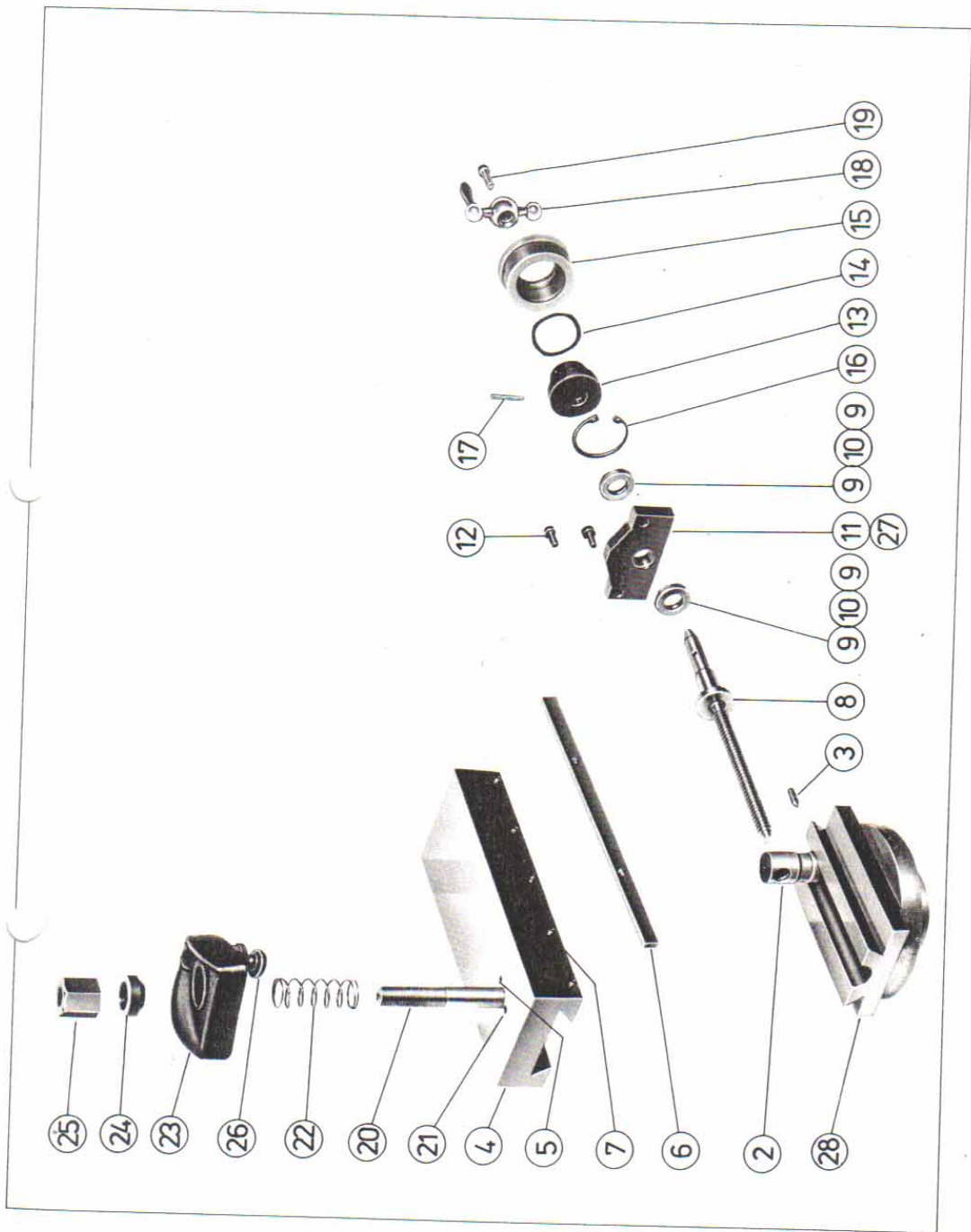


**SECTION 5**

# 254 plus Compound Slide Assembly

46

Dwg. Ref.	Part No.	Description	No. off	Dwg. Ref.	Part No.	Description	No. off
2	12084	Feed nut (metric)	1	14	11325	Waved washer	1
2	12094	Feed nut (imperial)	1	15	11999	Micrometer dial (metric)	1
3	100265	Socket setscrew (M6 x 1 x 8mm) (Half Dog Point) (TUJLOK)	1	15	12000	Micrometer dial (imperial)	1
4	11873	Top slide	1	17	100104	Circlep (Anderton 1300-35)	1
5	11264	Grubscrew - plug	3	18	12092	Taper pin No. 0 x 1"	1
6	12085	Gib strip	1	19	A1541/1	Ball handle assembly	1
7	A8623	Adjusting screw (WEDGLOK)	1	20	75/1406	Screw-ball handle securing.	1
8	12086	Feedscrew assembly (metric)	5	21	75/1411	Tool clamp stud	1
8	12095	Feedscrew assembly (imperial)	1	22	A2806	Pin - Tool clamp stud	1
9	73085	Thrust washer (Torrington TRB-815)	4	23	74/1409/1	Spring	1
10	73084	Thrust race (Torrington NTA-815)	2	24	75/1410	Tool clamp	1
11	12089	End plate assembly (includes: 27)	1	25	75/1412	Spherical washer	1
12	100100	Cap hd. screw - end plate securing. (M5 x 0.8 x 16mm)	2	26	75/1413	Nut - tool clamp	1
13	12097	Sleeve	1	27	12091	Adjusting screw assembly	1
				28	13856	'O'Lite' bush	1
						Top slide base	1



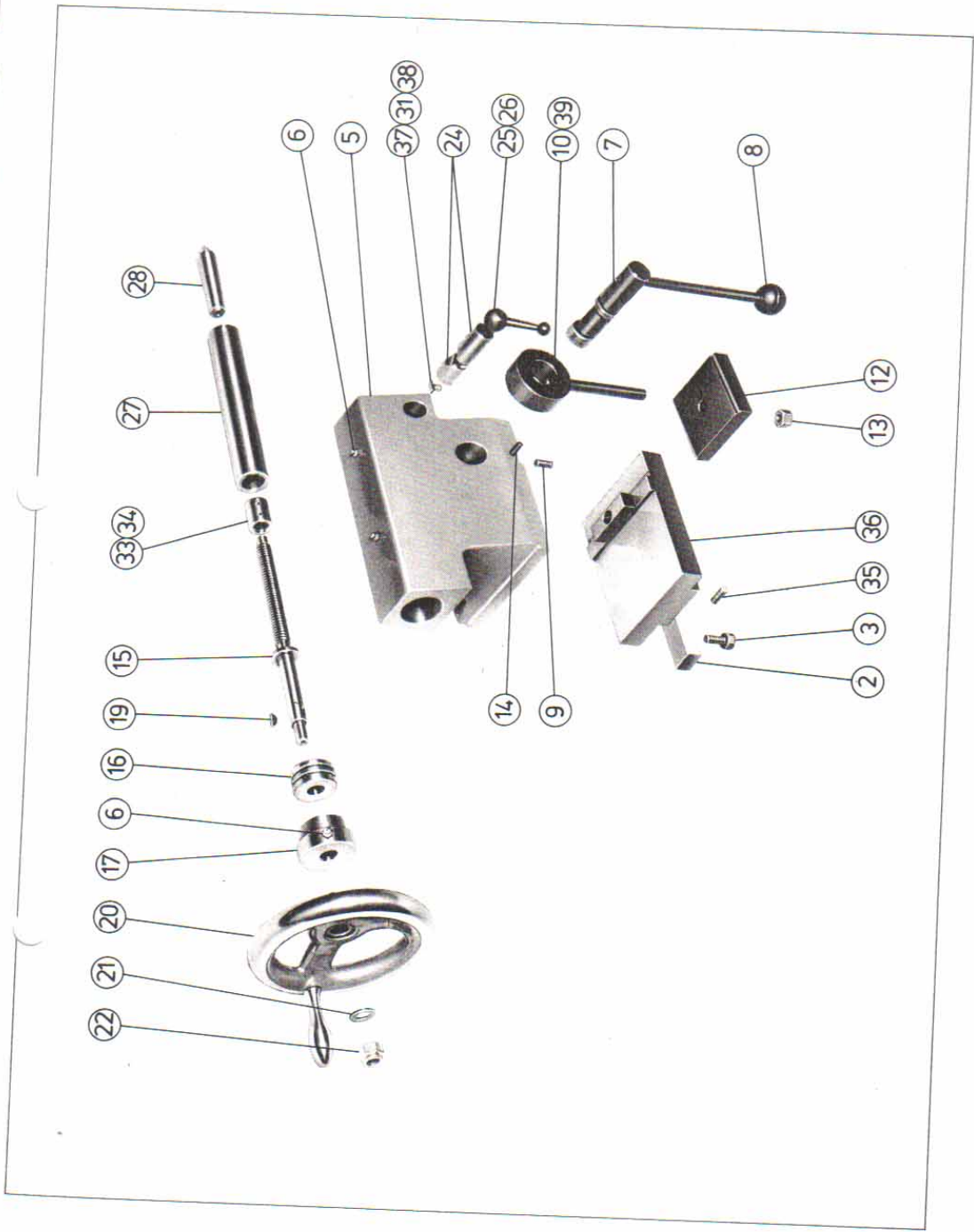
**SECTION 5**

## SECTION 5

## 254 plus Tailstock Assembly

48

Drg. Ref.	Part No.	Description	No. off	Drg. Ref.	Part No.	Description	No. off
2	11848	Gib strip	1	20	11856	Handwheel assembly	1
3	100094	Cap head screw - gib securing (M5 x 0.8 x 12mm)	2	21	100015	Washer (3/4")	1
5	11845	Body	1	22	100284	Simmonds nut (3/8" B.S.F. Type P)	1
6	65116	Oil nipple	3	24	11858	Pad bolt and bush	1
7	11849	Eccentric and lever assembly	1	25	11859	Stud	1
8	80035	Ball knob (MK10/125)	1	26	10297	Locking lever	1
9	100214	Socket set screw (M5 x 0.8 x 16mm) (TUFLOK) (Half Dog Point)	1	27	A2145	Barrel assembly (imperial) (includes: 33, 34)	1
10	11852	Boss - eyebolt	1	28	A8242	Barrel assembly (metric) (includes: 33, 34)	1
12	11854	Clamp plate	1	27	75/1248	No. 2 M.T. centre	1
13	100277	Nyloc nut (M10 x 1.5 Type P)	1	31	100063	Washer (M4)	1
14	100276	Socket set screw - set over (M6 x 1.0 x 30mm) (Half Dog Point)	2	33	A2117	Nut	1
15	A2116/1	Barrel feed screw	1	34	100036	Socket set screw (2B.A. x 3/16" Cup Point)	1
16	73005	Thrust race	1	35	100275	Socket set screw (M6 x 1 x 20mm Half Dog Point)	2
17	11855	Cap	1	36	13587	Base	2
19	70002	Woodruff key No. 404	1	37	13712	Barrel key	1
			1	38	100285	Domed nut (M4 x 0.7)	1
			1	39	13991	Stud - eye bolt	1



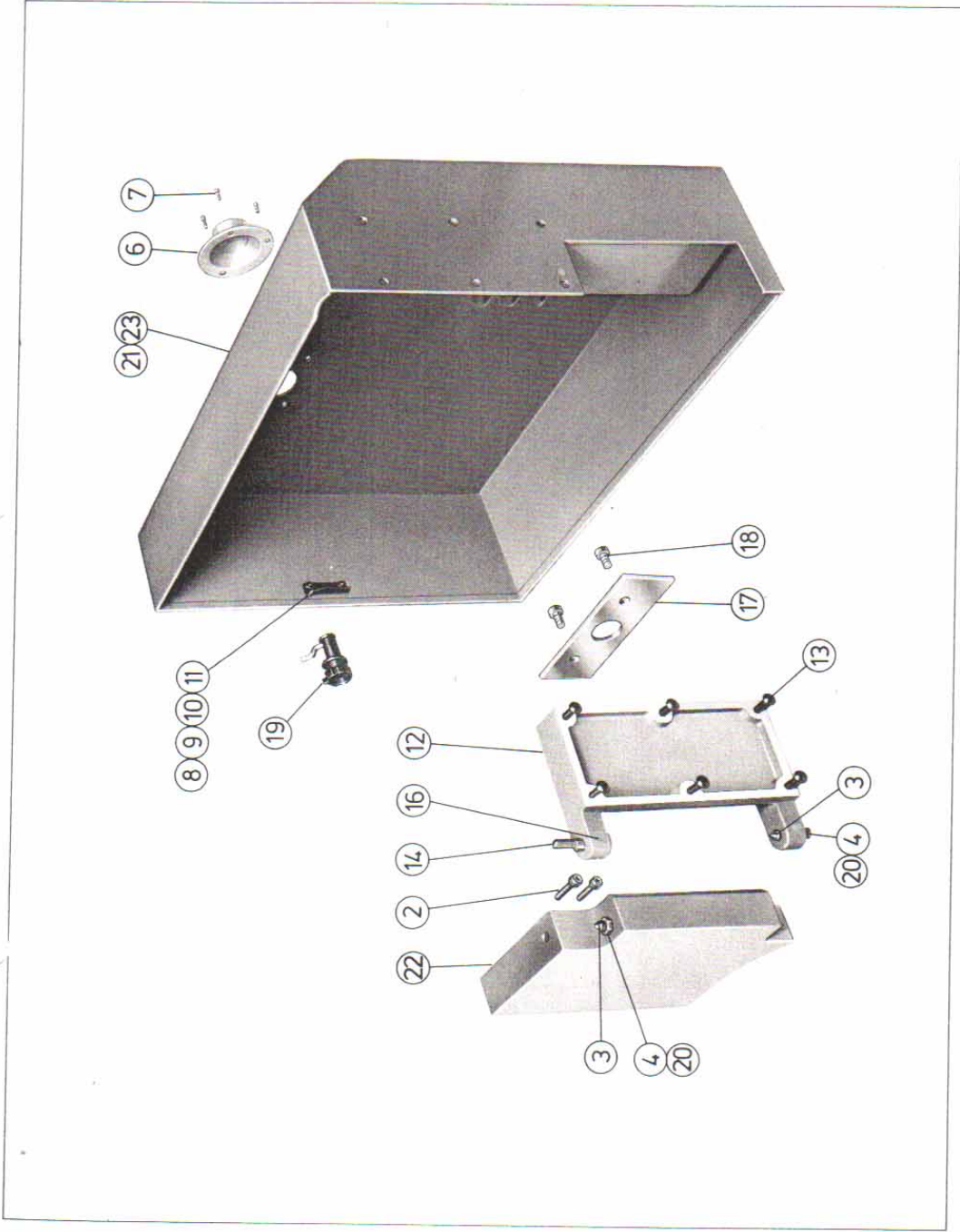
**SECTION 5**

## SECTION 5

## 254 plus Drive Guard Assembly

50

Dwg. Ref.	Part No.	Description	No. off	Dwg. Ref.	Part No.	Description	No. off
2	100242	Cap hd. screw - bracket securing, (M6 x 1 x 20mm)	2	13	100072	Socket button hd. screw (M6 x 1 x 16mm)	6
3	12055	Hinge pin - bracket	2	14	12054	Cam pin - hinge bracket	1
4	100092	Hex. lock nut (M8 x 1.25)	2	15	100245	Socket set screw (M4 x 0.7 x 6 Half Dog Point)	1
6	12052	Spindle end guard	1	16	100186	Tension pin (3mm $\varnothing$ x 22mm)	1
7	100243	Pan hd. self tapping screw (N.P.K. Type Z.No. 10 x 1/4")	3	17	12056/1	Blanking plate - gearbox	1
8	12053	Securing catch	1	18	100246	Cap hd. screw - plate sec.g. (M6 x 1 x 10mm)	2
9	100244	Socket button hd. screw (M5 x 0.8 x 10mm)	2	19	80036	Pawl latch - guard fastening	1
10	100075	Washer (M5 Std.)	2	20	100123	Shakeproof washer (M8)	2
11	100076	Hex nut (M5 x 0.8)	2	21	80058	Edging strip	1
12	12050	Hinge bracket - guard	1	22	13581	Hinge bracket - headstock	1
				23	13582	Drive guard	1



**SECTION 5**

The following parts differ from the standard parts list and apply to the 254V plus Vari-speed models only.

### Bed and Motorising Assemblies

Dwg. Ref.	Part No.	Description	No. off
46	13883	Motor pulley	1
68	70073	Poly-V belt	1
60	C1165	Washer	1
-	13749	Abutment washer	1
47	100253	Cap head screw-pulley securing - M8 x 1.25 x 25mm	1
44	11298	Washer	1

### Headstock

Dwg. Ref.	Part No.	Description	No. off
87	13881	Pulley assembly	1
92	13884	Speed plate	1
26	13757	67T gear-spindle	1
-	13759	Bracket-proximity sensor	1
-	100252	Self-tapping screw-pan hd	3
-	100291	Washers (for packing)	3
-	60905	Proximity sensor	1
-	60030	Cable gland - proximity sensor cable	1
-	65016	Sealing washer	1

### Drive Guard Assembly

Dwg. Ref.	Part No.	Description	No. off
23	13887	Drive guard	1

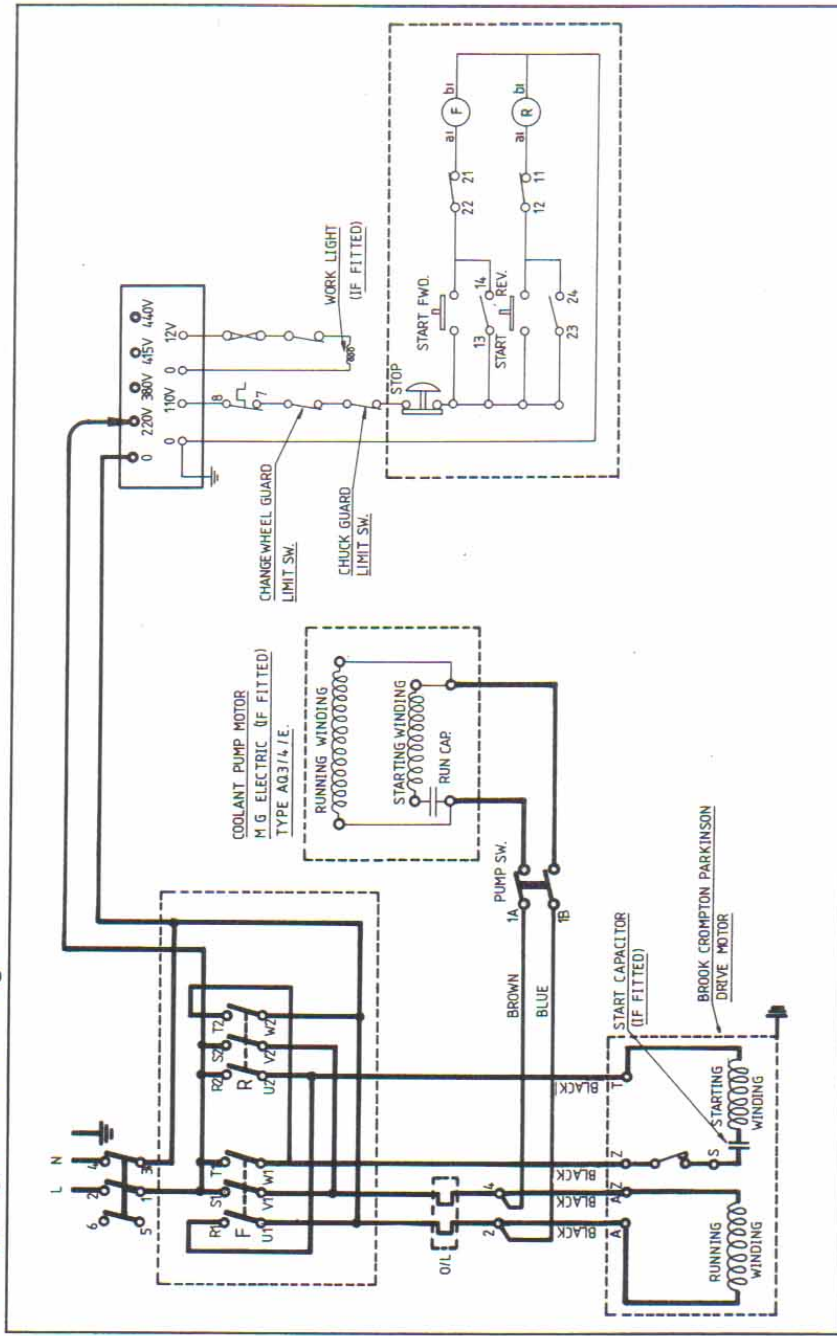
Note: Where no drawing reference number is shown these are additional items.



# Wiring Diagram 254 Single Phase

(Drawing No. 12313)

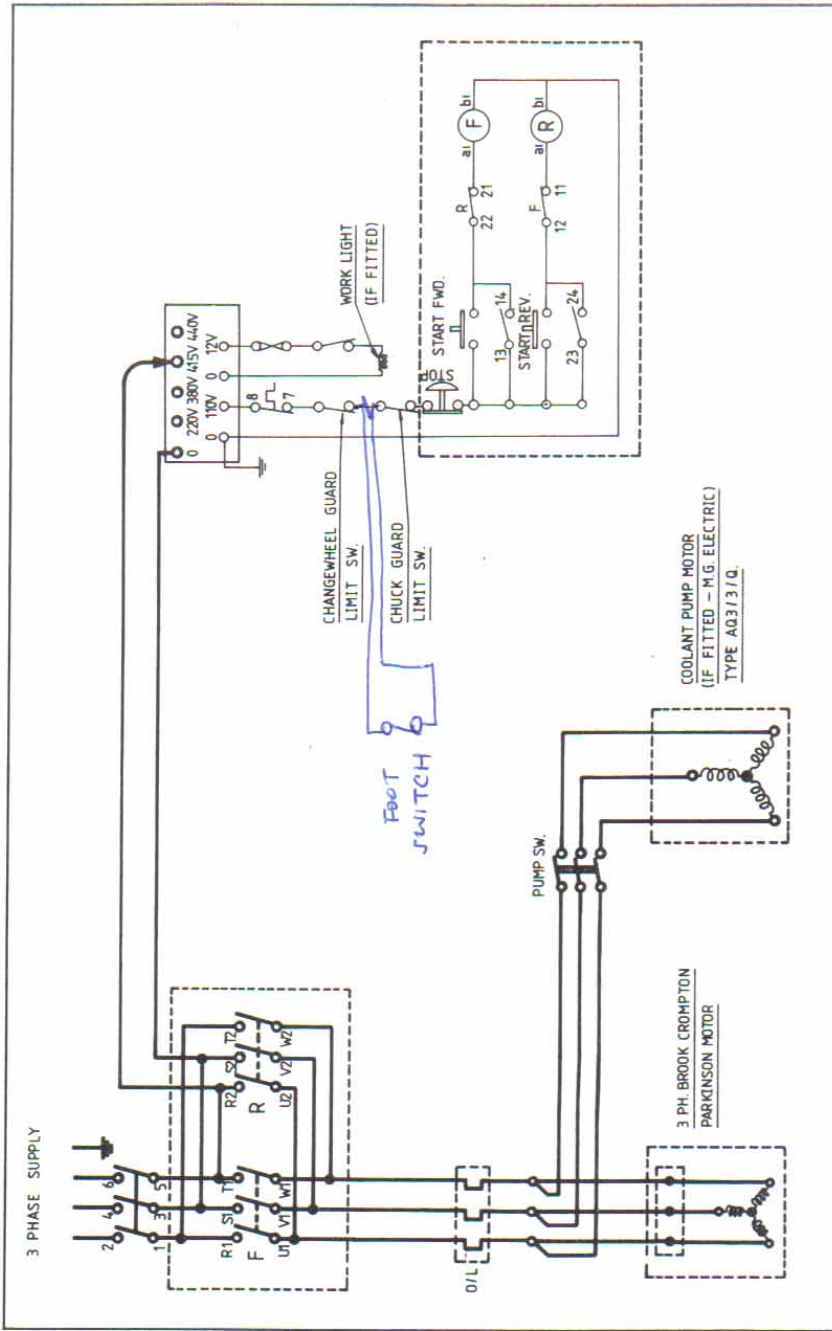
fitted with Reversing Push Button Starter with No-volt Release and overload protection, mushroom head stop button and lockable isolator switch, operating on 110 volt control circuit, safety cut-off switches included for chuck guard and drive guard, and 12 volt tapping for safe worklight.



# Wiring Diagram 254 Three Phase

(Drawing No. 12311)

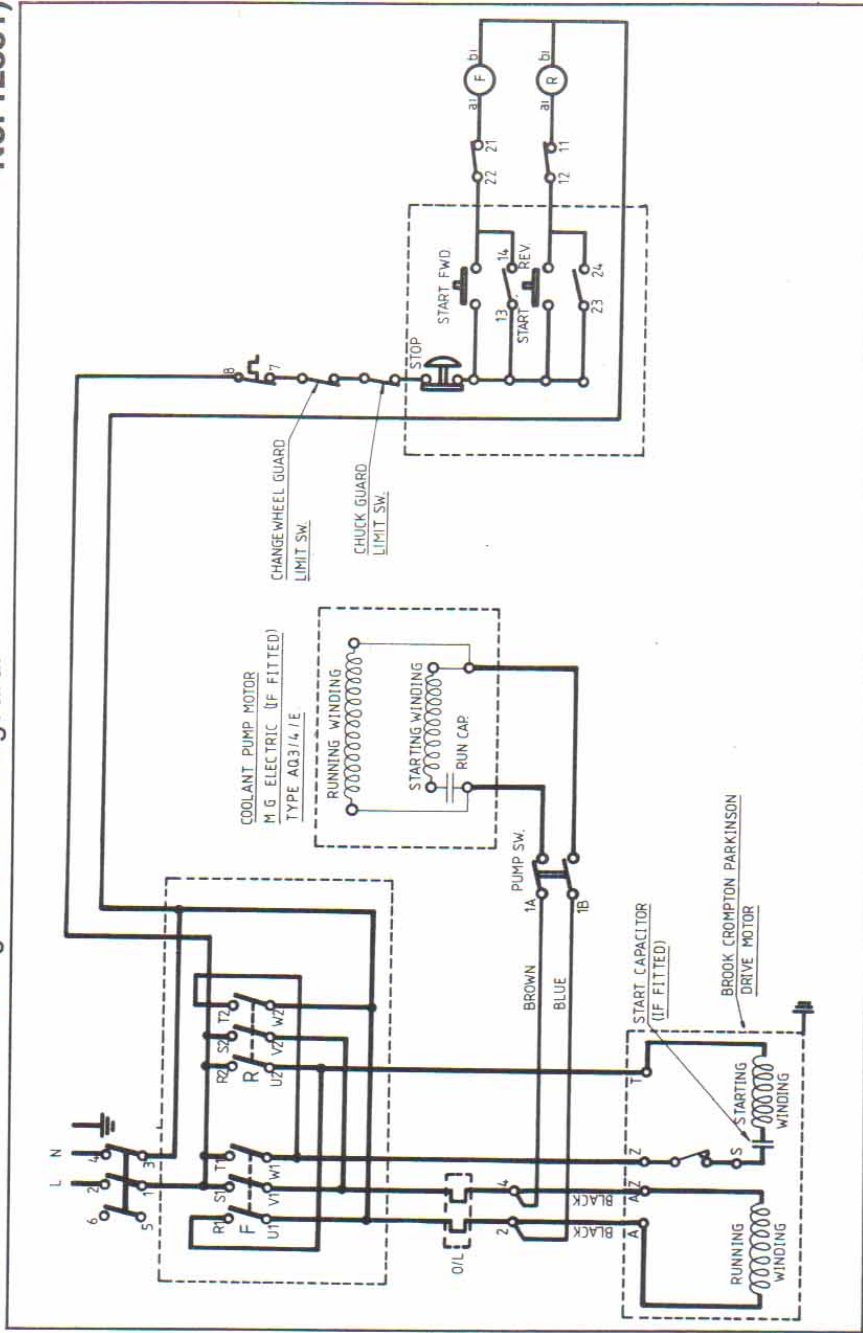
fitted with Reversing Push Button Starter with No-volt Release and overload protection; mushroom head stop button and lockable isolator switch, operating on 110 volt control circuit, safety cut-off switches included for chuck guard and drive guard, and 12 volt tapping for safe worklight.



# Wiring Diagram 254 (110 Volt 60Hz) Single Phase

fitted with Reversing Push Button Starter with No-Volt Release and overload release protection, mushroom head stop button and lockable isolator switch – safety cut-off switches included for chuck guard and drive guard.

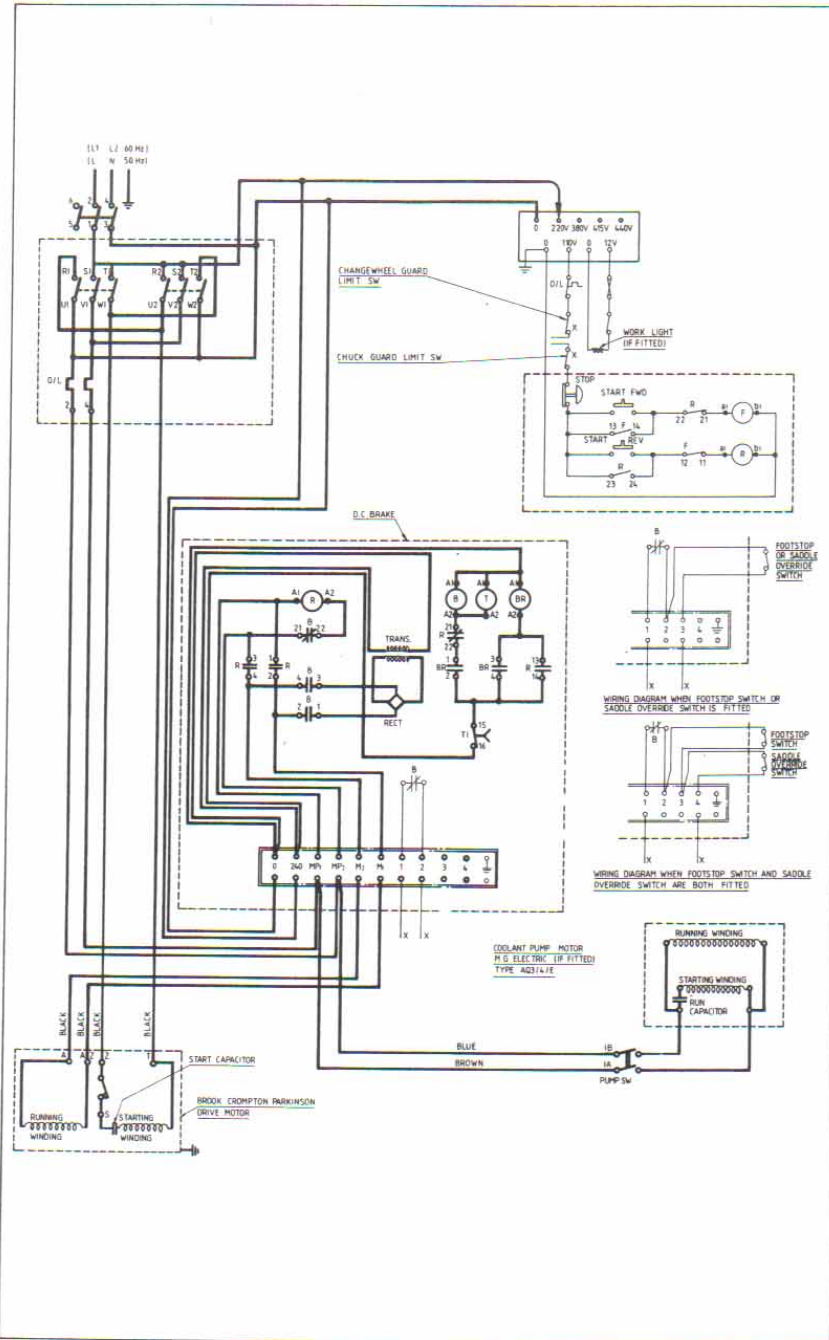
(Drawing No. 12381)



# Wiring Diagram 254 Single Phase

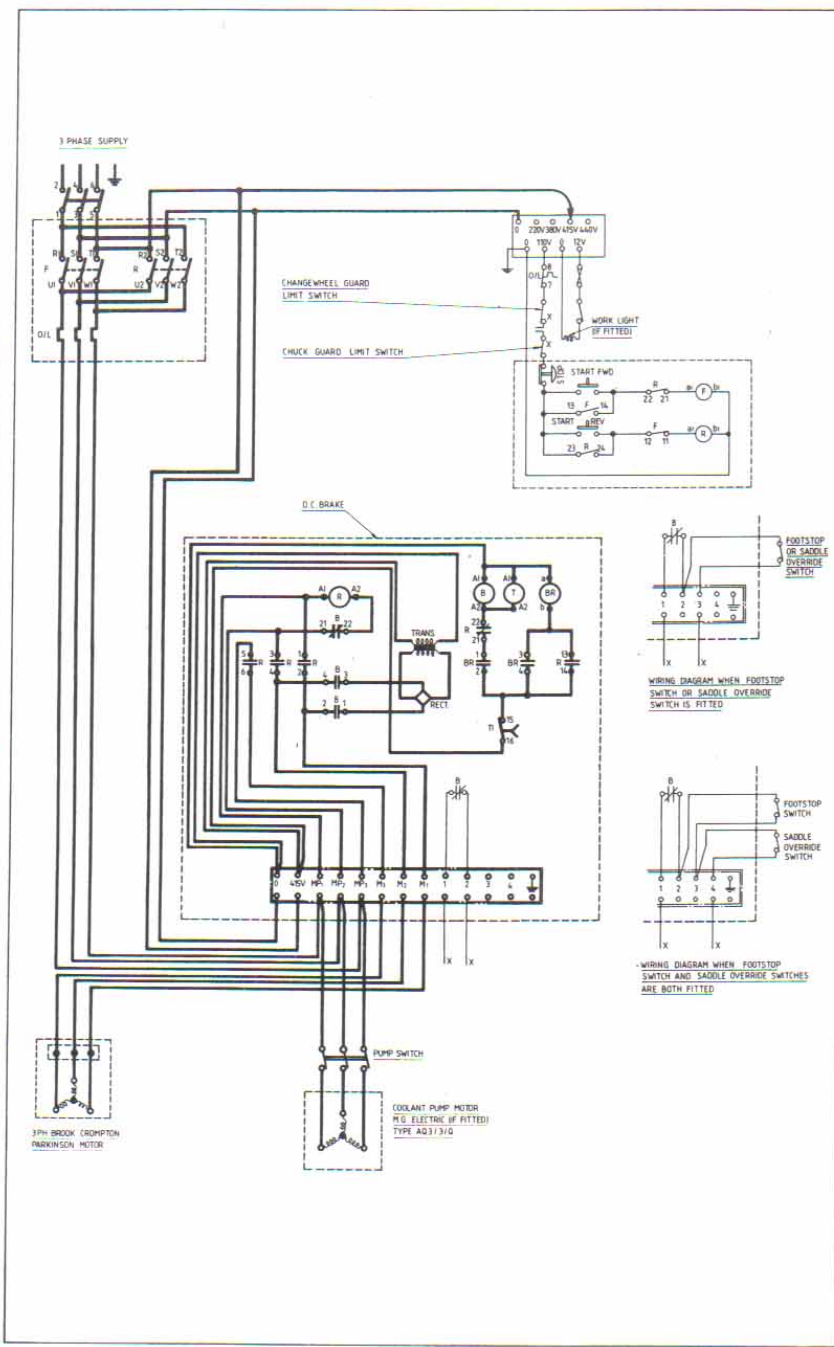
(Drawing No. 12898)

fitted with Reversing Push Button Starter with No-Volt Release and overload release protection, mushroom head stop button and lockable isolator switch, operating on 110 volt control circuit, safety cut-off switches included for chuck guard and drive guard, and 12 volt tapping for safe worklight, with D.C. injection brake, foot stop and saddle override switches.



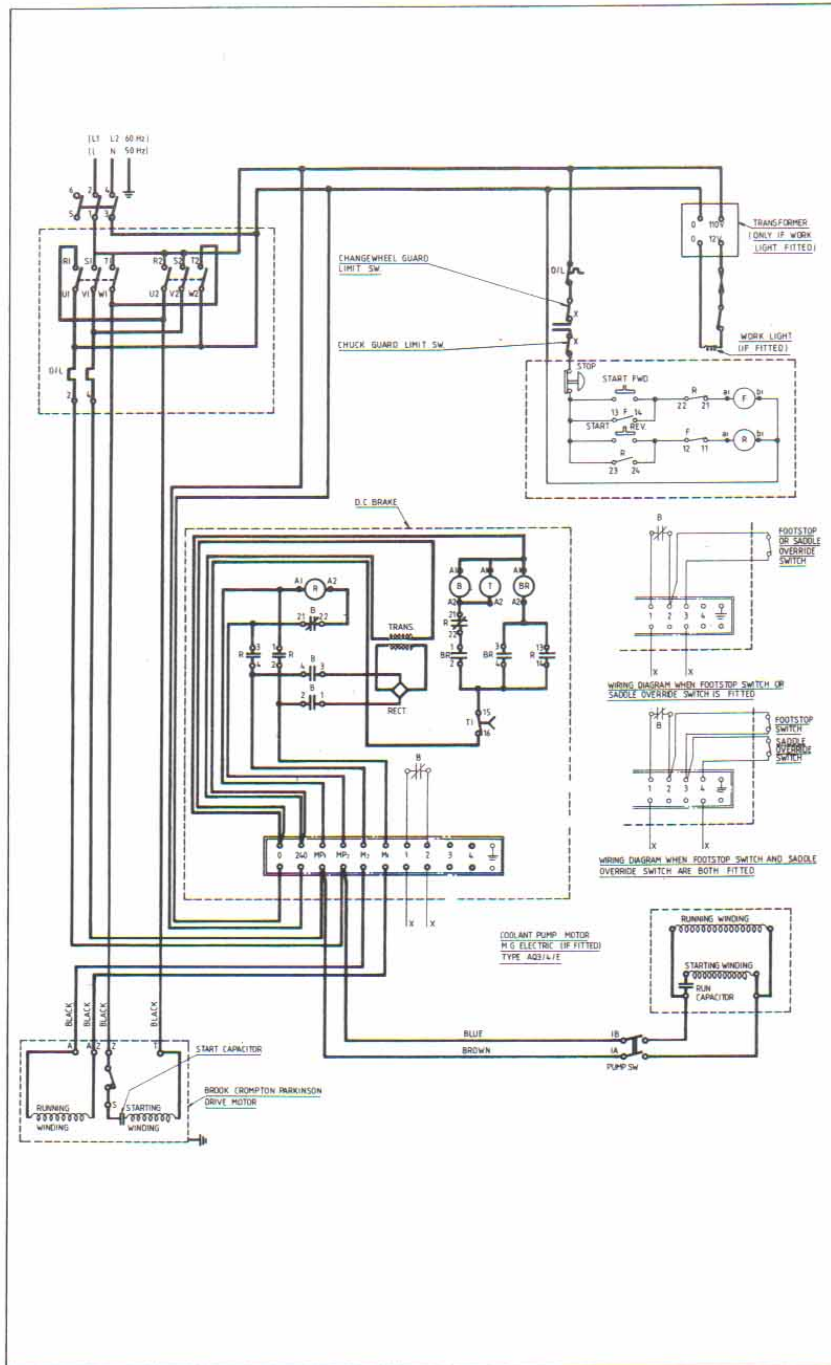
# Wiring Diagram 254 Three Phase (Drawing No. 12899)

fitted with Reversing Push Button Starter with No-Volt Release and overload protection, mushroom head stop button and lockable isolator switch, operating on 10 volt control circuit, safety cut-off switches included for chuck guard and drive guard, and 12 volt tapping for safe worklight, with D.C. injection brake, foot stop and saddle override switches.



# Wiring Diagram 254 (110 Volt 60Hz) Single Phase (Drawing No. 13089)

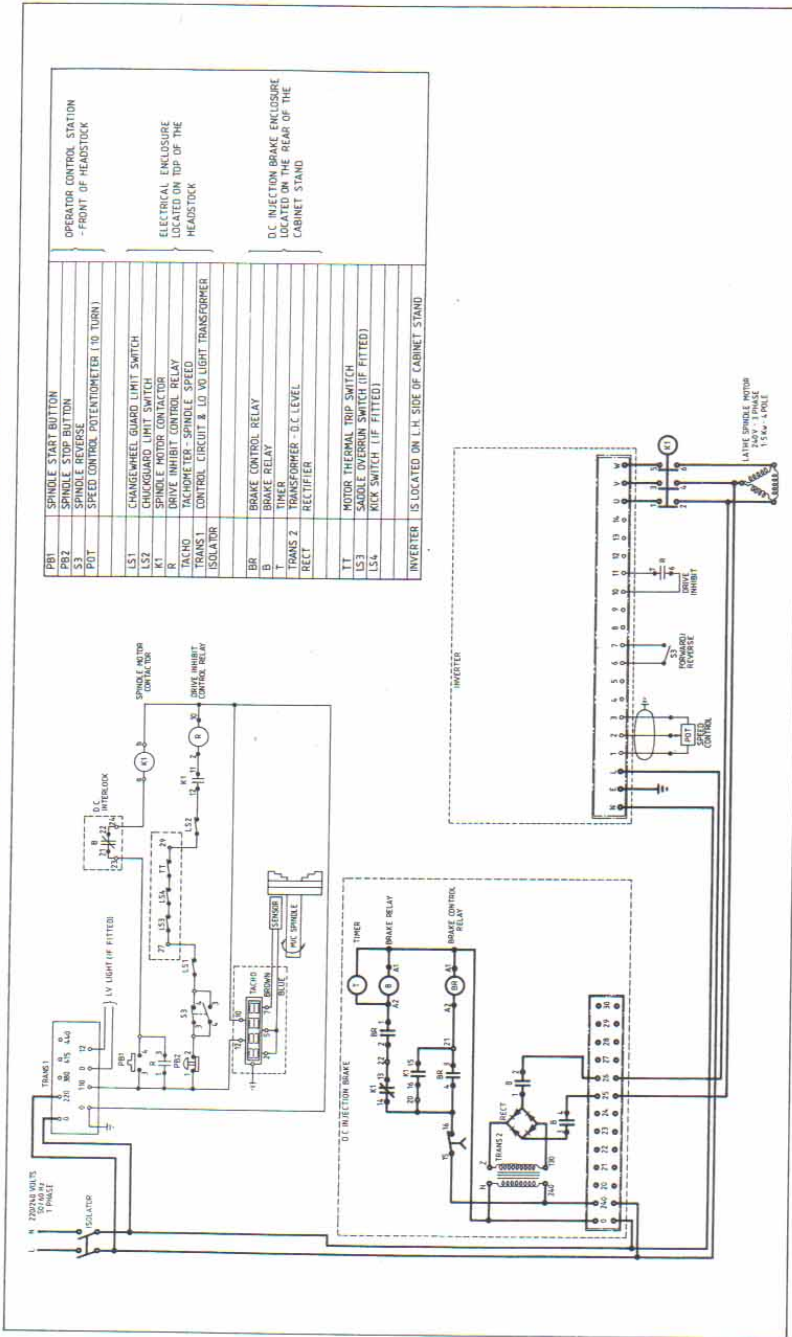
fitted with Reversing Push Button Starter with No-Volt Release and overload release protection, mushroom head stop button and lockable isolator switch – safety cut-off switches included for chuck guard and drive guard, with D.C. injection brake, foot stop and saddle override switches.



# Wiring Diagram 254V (Varispeed Model) (Drawing No. 13870)

Operating on 220/240 volts, single phase, 50/60 Hz power supply, with fuse protection of 10 amps from the supply.

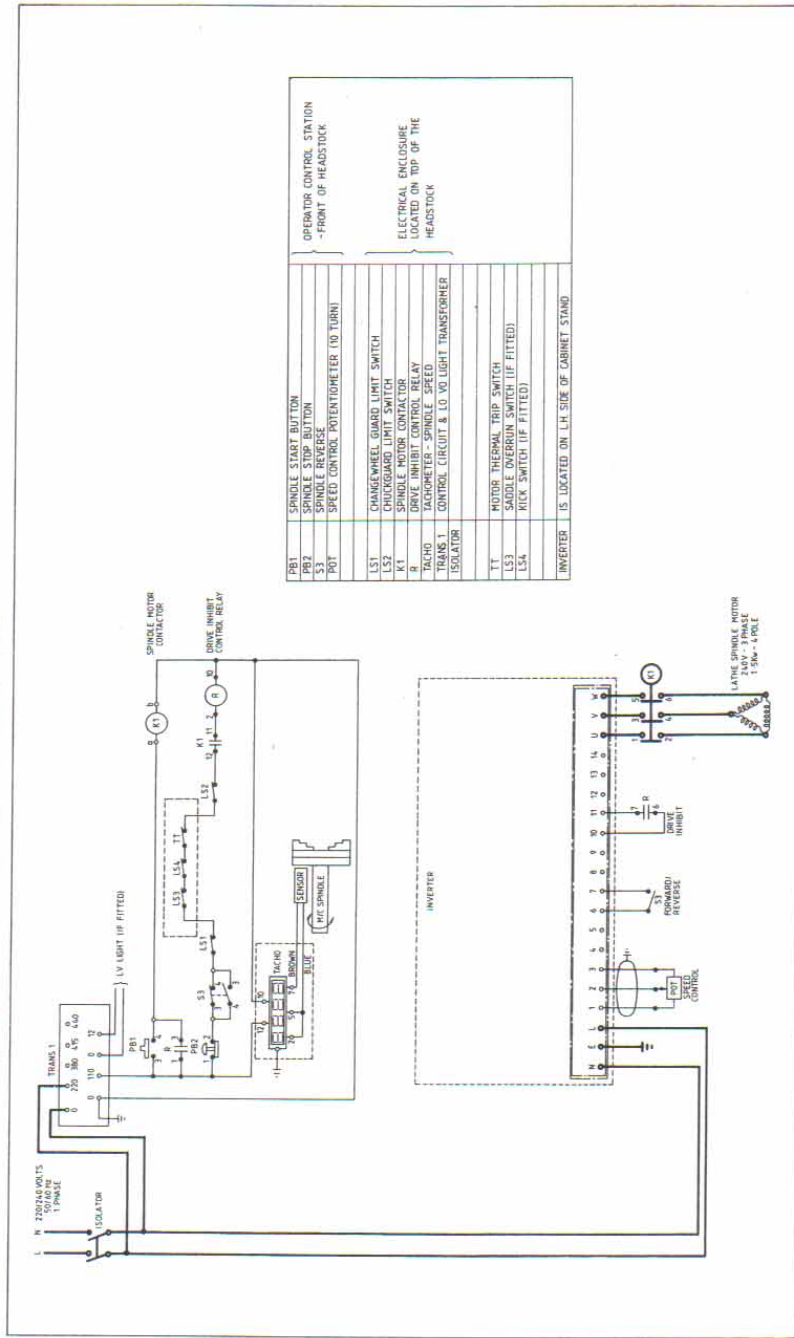
Fitted with reversing switch, push button starter with no-volt release, mushroom head stop button and lockable isolator switch, digital tachometer, safety cut-off switches included for chuck guard and drive guard, with D.C. injection brake, foot stop and saddle override switches.



# Wiring Diagram 254V (Varispeed Model) (Drawing No. 13888)

Operating on 220/240 volts, single phase, 50/60 Hz power supply, with fuse protection of 10 amps from the supply.

Fitted with reversing switch, push button starter with no-volt release, mushroom head stop button and lockable isolator switch, digital tachometer, safety cut-off switches included for chuck guard and drive guard, **with foot stop and saddle override switches.**



PB1	SPINDLE START BUTTON	OPERATOR CONTROL STATION - FRONT OF HEADSTOCK
PB2	SPINDLE STOP BUTTON	
S3	SPEED CONTROL POTENTIOMETER (10 TURN)	
LS1	CHUCK GUARD LIMIT SWITCH	ELECTRICAL ENCLOSURE LOCATED ON TOP OF THE HEADSTOCK
LS2	DRIVE GUARD LIMIT SWITCH	
K1	SPINDLE MOTOR CONTACTOR	
R	DRIVE INHIBIT CONTROL RELAY	
TACHO	TACHOMETER - SPINDLE SPEED CONTROL CIRCUIT & 10 VOLT LIGHT TRANSFORMER ISOLATOR	
TT	MOTOR THERMAL TRIP SWITCH	ELECTRICAL ENCLOSURE LOCATED ON TOP OF THE HEADSTOCK
LS3	SADDLE OVERRUN SWITCH (IF FITTED)	
LS4	KICK SWITCH (IF FITTED)	
INVERTER	IS LOCATED ON LH SIDE OF CABINET STAND	

## SECTION 5



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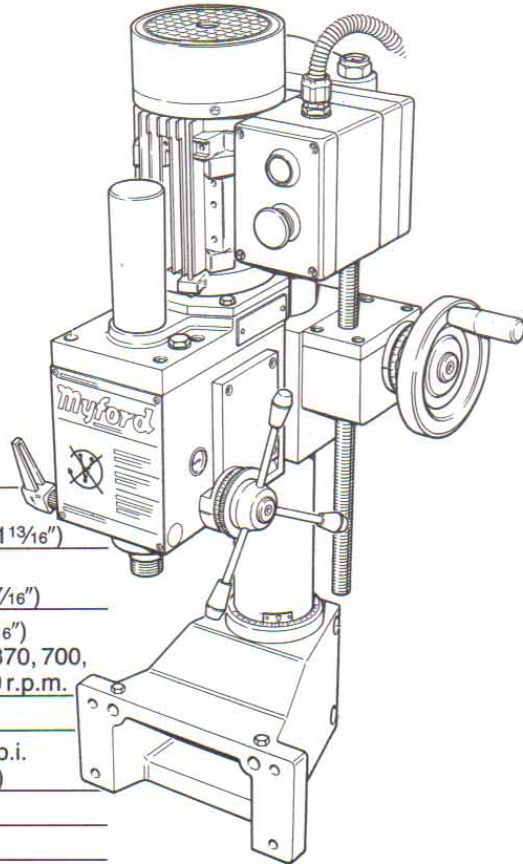
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**VM-A**  
Vertical Milling & Drilling Attachment

SECTION 6

### Specification

Maximum height, cross slide to spindle nose	300mm (11 <sup>13</sup> / <sub>16</sub> "
Throat depth, spindle nose to column	163mm (6 <sup>7</sup> / <sub>16</sub> "
Quill stroke	40mm (1 <sup>9</sup> / <sub>16</sub> "
Spindle speeds	130, 200, 370, 700, 1100, 2000 r.p.m.
Spindle taper	No. 2 M.T.
Spindle nose	1 <sup>1</sup> / <sub>8</sub> " x 12 t.p.i. (Whit form)
Register diameter	1 <sup>1</sup> / <sub>4</sub> "
Head swivels on vertical axis	360°
Head swivels on horizontal axis	90° each side
Weight	57 kg (125 lb)
<b>Dials (Metric machines 95/155 and 95/156)</b>	
Starwheel/quill down feed	0–40mm graduations in 0.5mm increments
Rise and fall handwheel	0–2.5mm graduations in 0.02mm increments
<b>Dials (Imperial machines 95/157 and 95/158)</b>	
Starwheel/quill down feed	0–1.6" graduations in 0.02" increments
Rise and fall handwheel	0–0.1" graduations in 0.001" increments
Draw bolt thread	M10 x 1.5

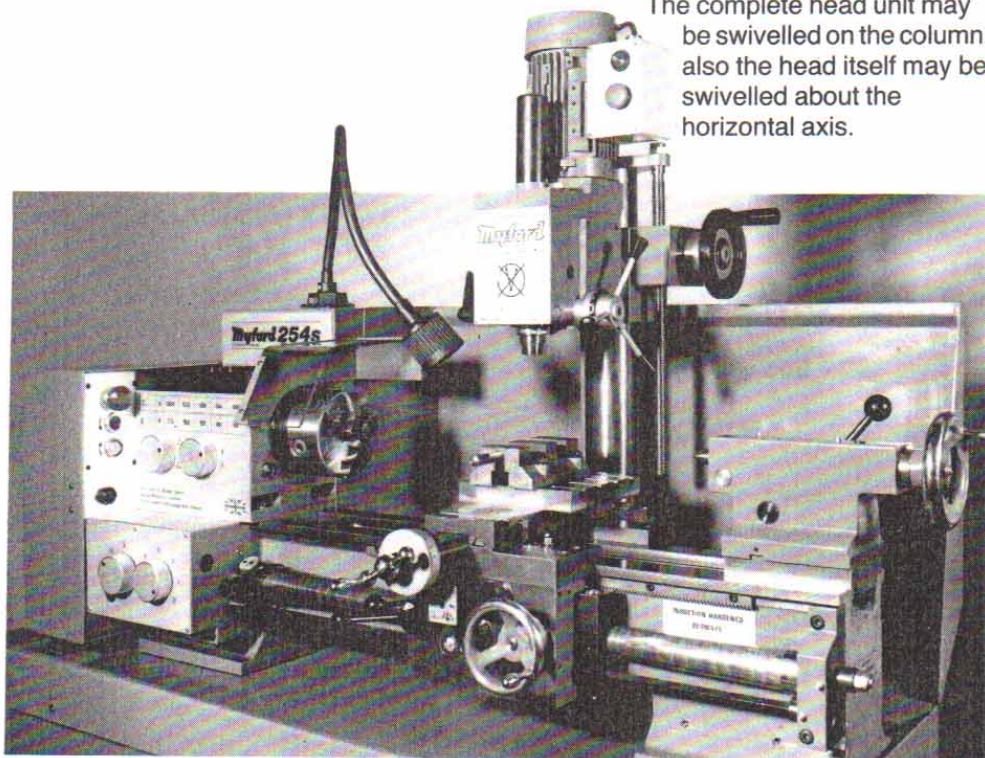


## VMA VERTICAL MILLING & DRILLING ATTACHMENT

This is arranged for mounting on the machined face at the rear of the lathe bed in either of two positions and greatly increases the facility and usefulness of the 254 lathe.

The complete head may be raised and lowered on the vertical column by means of a handwheel, via a worm and nut, whilst movement of the quill is by rack and pinion, controlled by a star wheel. Both these controls have re-settable micrometer dials fitted.

The complete head unit may be swivelled on the column, also the head itself may be swivelled about the horizontal axis.



### Electrical Equipment

Motor – 0.25 kw ( $\frac{1}{3}$  hp), protection to IP54, 2850 r.p.m.

Voltage, frequency, phase – to suit.

Starter – push button with no-volt release and overload protection.

## INSTALLATION

### Serial Number

This will be found stamped on the "MYFORD" nameplate on the front face of the head.

### Shipment

If the attachment has been fitted to the machine at the factory, the pedestal will be fitted to the bed and aligned and the head and column unit will only require inserting into the pedestal and clamping.

When the attachment has been ordered as an accessory for fitting later, the pedestal will be supplied on the column and will require mounting and aligning by the customer.

### Shortages

It is essential that the equipment supplied, including standard equipment, is checked against the packing/advice note and any discrepancies must be reported immediately, in writing, to the consignor, giving full details and quoting the packing/advice note number.

The standard equipment supplied is a draw bolt threaded 10mm, quill cover, quill spanner, 17mm open-ended spanner, 8mm hexagon key and a supply of gear oil. If the pedestal is not fitted to the machine, also supplied will be two jack plugs, four cap head screws, M8 x 25mm, two aligning screws, M6 x 16mm and four laminated washers.

### Damaged Goods

All goods should be examined upon arrival. In the case of damage, notification must be given immediately, in writing, to both the carriers and the consignor. The consignment, including the packaging, should be held exactly as received in case inspection is required by the carriers.

### Cleaning

All bright parts are protected with rust preventative; this must be removed with white spirit or similar and machined parts lightly oiled before any movement of parts is attempted.

## Electrics

The attachment is supplied with flexible conduit and cable for single phase or three phase supply as specified, the conduit terminating in a 16mm adaptor.

When the attachment has been fitted at the works to a machine with the complete electrical safety package, the wires will have been marked and suitably prepared for connection into the electrical box on the top of the machine headstock.

If the machine has the simple electrics option or where the attachment is supplied as an accessory, the customer must connect into a suitable power source.

It is important that the attachment and the complete machine are electrically connected to a satisfactory earthing point. If there is any doubt about connecting the supply, the advice of a competent electrician should be sought.

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(The numbers in brackets in the following sections refer to the pictorial parts list)

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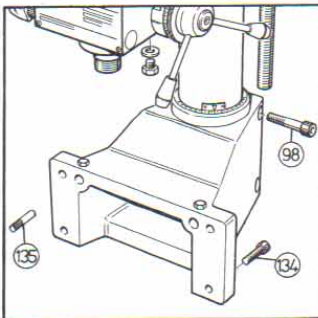


Fig. 1

## Mounting (Fig. 1)

When the pedestal has been mounted on the machine bed at the factory, the column and head need only to be inserted into the pedestal, clamped, the head filled and the motor connected to the electrical supply.

If the attachment has been supplied as an accessory or if the pedestal has been mounted and it is required to mount it in the alternative position along the bed, the following procedure must be carried out.

The pedestal is mounted on two raised machined rails on the rear vertical face of the bed in either of two positions, patterns of six tapped holes being provided.

Remove the paint and thoroughly clean the rails where the pedestal is to be mounted and screw in the two jackplugs (135). These are screwed into the inner two holes of the pattern on the top rail.

The pedestal is mounted on the machine and secured with four cap head screws, M8 x 25m (134), then the column and head are inserted and clamped with two cap head screws, M10 x 45 (98). Ensure that the head is set in the vertical position.

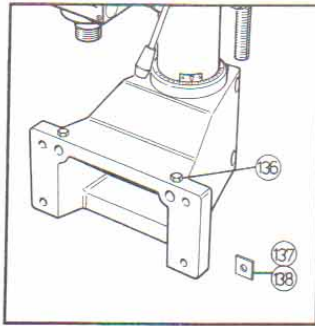


Fig. 2

### Alignment (Fig. 2)

To check the alignment of the unit, a dial test indicator reading 0.001" or 0.025mm in a suitable holder and mounted on the spindle nose is required. Alternatively, a fly cutter of suitable radius and feeler gauges may be used. To set the attachment perpendicular to the length of the bed, the same reading on the indicator must be obtained at two points along the bed when the spindle is rotated 180°. To achieve this there are two jacking screws, M6 x 16m (136) on the top edge of the pedestal which bear on the tops of the jack plugs. Care must be taken that after slackening the pedestal securing screws and adjusting with the jacking screws, the unit is firmly secured before testing again.

After satisfactorily completing this, the alignment across the bed must be checked.

Readings of the indicator are again taken at 180° to each other but, this time, across the top face of the bed. Adjustment in this instance, is by means of shim washers inserted between the bed and the pedestal, either at the top or bottom of the pedestal as indicated. Laminated shim washers are supplied (137, 138), the laminations being 0.002" (0.05mm) and 0.003" (0.076mm) respectively. These have a solid appearance, but by inserting a pen-knife blade it is an easy matter to peel off the desired thickness. Correct adjustment is when the reading at the front face of the bed is 0.001" (0.025mm) less than the reading at the rear.

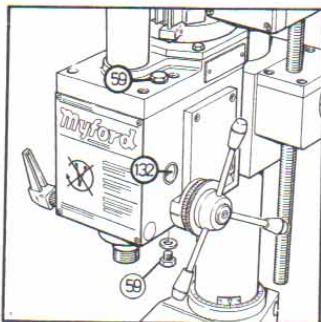


Fig. 3

### Lubrication (Fig. 3)

Attachments are sent from the factory with no oil in the head; this must be filled before operating the unit.

There is a filler plug (59) on the top of the head and an oil sight glass (132) on the side. Fill the head to the centre of the sight glass with the oil supplied.

There is a drain plug (59) on the underside; the oil should be changed at intervals of not more than 12 months or 500 hours. When refilling, use Esso Febis K68 (as is recommended on the 254 lathe itself) or equivalent.

**NOTE:** Ensure that the head is in a vertical position when checking and refilling.

For lubricating the elevating screw, column etc., again use Esso Febis K68.

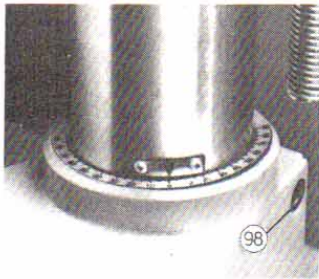


Fig. 4

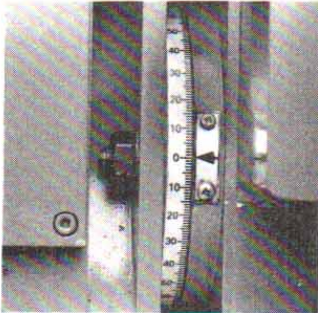


Fig. 5

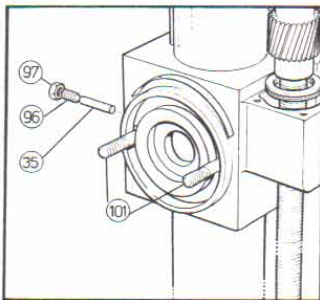


Fig. 6

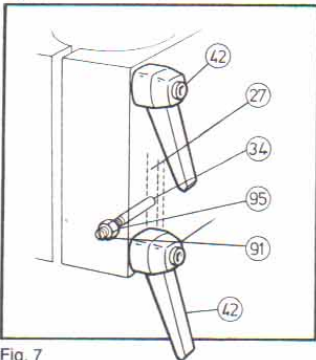


Fig. 7

## Operation and Adjustment

The head and column together may be swivelled 360° about the vertical axis, a datum mark on the column (Fig. 4) showing the angular position against a graduated plate on the pedestal. Two cap head screws M10 x 45m (98) are used to clamp the column after adjustment.

The whole head unit is moved up and down the column by means of the handwheel on the side of the elevating head, a micrometer dial being fitted. The relative position between the elevating head and the column is assured by a vertical key. Two adjustable clamping levers (42) are used to clamp the head unit to the column, (Fig. 7).

On releasing two hexagon nuts, M10 (101), the head may be rotated 90° either way about the horizontal axis, the amount being shown on a graduated scale on the elevating head.

Quill movement is controlled by a star wheel, with micrometer dial, and again, may be clamped using the adjustable clamping lever (42).

To reset the angular position of a lever after clamping, pull the boss and lever outwards against spring pressure away from the head, rotate to the desired position and allow boss and lever return inwards.

## Adjustment of Elevating Head on Column

This is by means of a push rod (35), socket set screw, M8 x 16m (96) and hexagon locknut, M8 (97). After slackening the nut, the set screw may be adjusted to alter the fit of the elevating head on the column.

## Adjustment of Elevating Head on Key

The sliding fit between the elevating head and the vertical key on the column is controlled by means of a gib strip (27). This is adjusted by two push rods (34), socket set screws M6 x 20m (91) and hexagon nut, M6 (95). Again, after slackening the nuts, the set screws may be adjusted to give the desired condition.



## Spindle Speeds

The following speeds may be selected:

130	200	370
700	1100	2000

Speeds **MUST NOT BE CHANGED** whilst the spindle is revolving. If the gears do not engage directly, assistance may be given by turning the spindle by hand. After changing speed, ensure that the spring-loaded detents in the selector levers have located satisfactorily.

Spindle speeds must be chosen with due regard to such factors as – material to be cut, form and size of cutter, feed rate, etc.

The finish obtained on the work can be affected by the speed and feed rate chosen and can also be influenced by the condition of the cutter, so remember –

**KEEP CUTTERS SHARP!**

## Mounting and Removal of Cutters, etc.

Before mounting any tool etc., ensure that both the shank of the tool and the bore of the spindle are absolutely clean and that no burrs are present.

When inserting cutters etc., into the bore of the spindle, normal force only is required, similar to that when mounting the centre in a lathe tailstock. If the shank of the tool has a tapped hole, the draw bolt (58) is screwed in and tightened by hand. Do not use a wrench or similar. (A morse taper is a self driving taper.)

To extract the tool, unscrew the draw bolt two or three turns and, using a light hammer, give a sharp tap on the end of the draw bolt. If the tool has a plain or tapered end, use a suitably sized plain rod down the hole in the spindle and apply the same method. **ON NO ACCOUNT** use a large hammer or heavy blows.

## Boring/Milling Table (95/159) (Figs 8, 9 & 10)

This provides an extended working surface, 168 x 168mm (6 $\frac{5}{8}$ " x 6 $\frac{5}{8}$ "") for clamping large items.

It is bolted onto the cross slide in either of two positions by means of four cap head screws and tee nuts, after removing the topslide. Squareness of mounting is assured by two locating studs fitted to the underside of the table.

Vee blocks, angle plates, vertical slides, machine vices etc., may be used to assist work holding, also, the

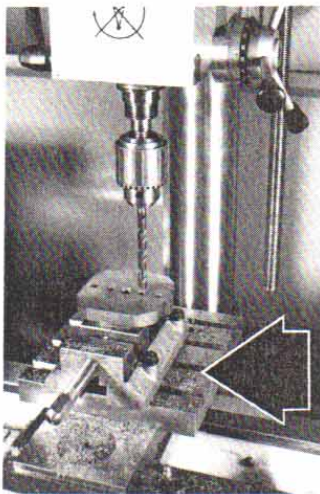


Fig. 8

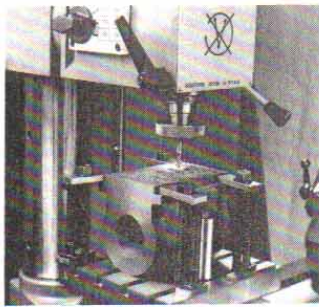


Fig. 9



Fig. 10

dividing attachment may be fitted directly onto the table for indexing, gear cutting etc.

### Using the Milling and Drilling Attachment

When using the attachment it may be found desirable to have the adjustment of the cross slide slightly tighter than when turning. To achieve this, do not re-set the four socket set screws which are normally used to control the adjustment of the slide but instead, use the two socket set screws which are used to lock the slide when required. These two screws are seen to project further than the others. Do not forget to slacken off these screws when reverting to normal lathe use.

When clamping work, fixtures, vice etc., care should be exercised not to distort either the cross slide or additional milling table if this has been fitted. Always ensure that both the table and the underside of the work etc. are absolutely clean and reasonably flat. If the surface of the part to be clamped is not flat, distortion of the table may result, causing the slides to bind. The use of long tee bars and bolts or studs, rather than standard tee nuts or tee bolts will help to spread the load. Removal of any local high spots or castings will again help to avoid distortion. Always clamp on a solid part of the work piece, not over any unsupported or overhanging parts. When tightening the clamping bolts, lightly tighten before final tightening, using even pressure to each in turn. Do not overtighten.

### General Safety Hints

Always switch off the attachment when changing cutters, setting work or leaving the machine for any length of time.

Before starting, ensure that the work surface is clear and that the cutter will not strike any clamps or bolts. Special care must be exercised if using a large diameter fly cutter.

Be careful when handling cutters; careless placing of these on the machine ways can damage both the cutter and the ways. Do not put sharp tools in your overall pockets.

Do not wear any loose clothing, e.g. ties that can become entangled in the cutter.

At all times, keep the attachment and machine clean and in good condition.

## **VM-A PARTS LISTING**

### **Ordering Replacement Parts**

The following information should be supplied with the order:—

1. Type and Serial Number of the lathe. For location of numbers see page 5.
2. Quantity required.
3. Quote Part Number.

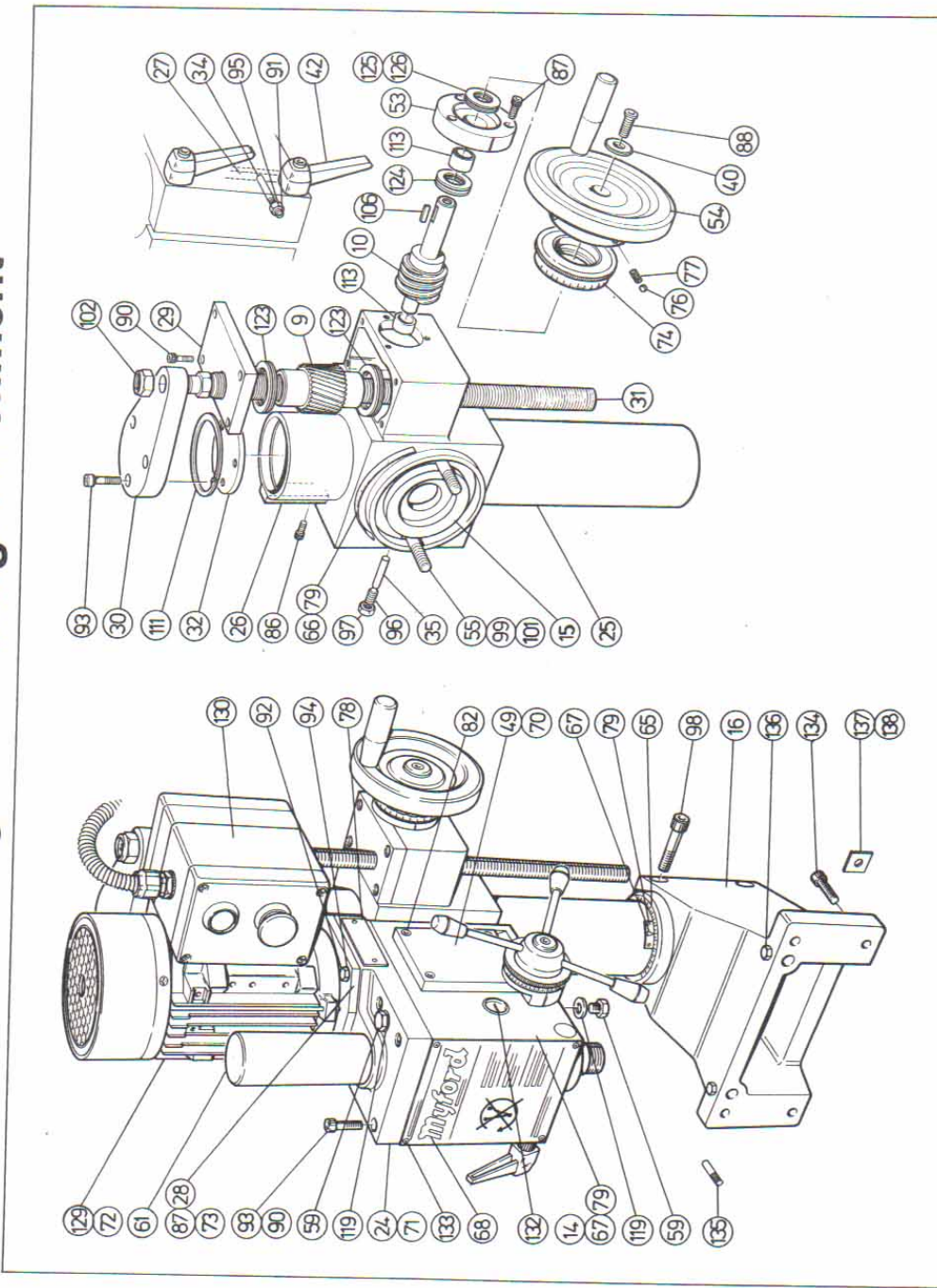
As it is the Company's policy to improve its products whenever opportunity occurs, designs are liable to modification at any time. In some cases, due to the nature of the part, it will be necessary for us to supply additional related parts, particularly if the item required has been altered.

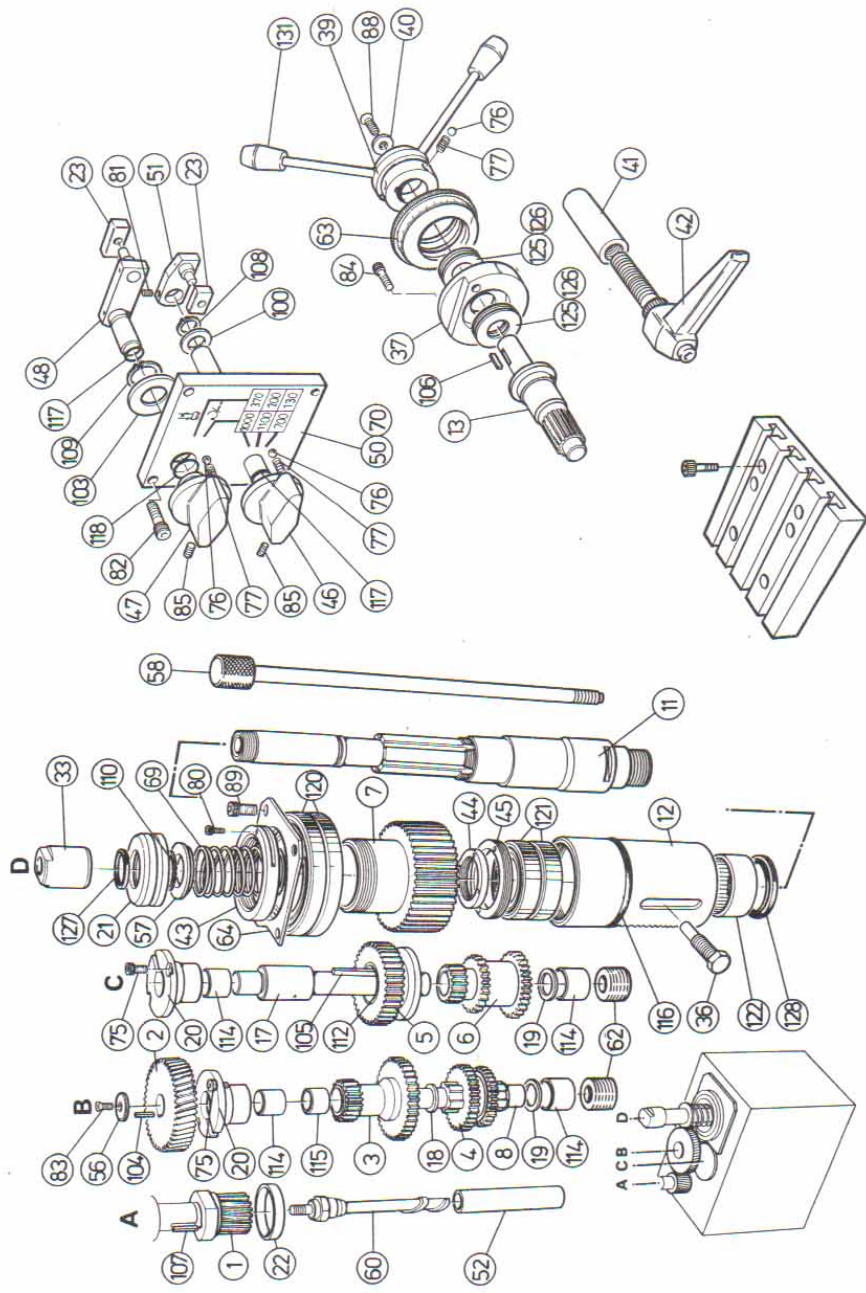
## 254 Vertical Milling and Drilling Attachment

Dwg. Ref.	Part No.	Description	No. off	Dwg. Ref.	Part No.	Description	No. off
1	RM0052	171. motor pinion (50Hz M/C)	1	96		Socket set screw - M8 x 16	1
2	RM0053	45T. tufool gear (50Hz M/C)	1	97		Hex. locknut - M8	1
3	RM0054	Combination gear	1	98		Cap hd. screw - M10 x 45	2
4	RM0055	22/27T. slider gear	1	99		Washer - M10	2
5	RM0056	Slider gear	1	100		Washer - M10 (form B)	2
6	RM0057	Combination gear	1	101		Hex. nut - M10	1
7	RM0058	42T. gear (quill)	1	102		Self locking nut - M14	2
8	RM0059	Spline shaft	1	103		Washer - M16 (form B)	1
9	RM0061	Elevating nut (metric)	1	104		Key - 4 x 4 x 20	1
10	RM0063	Worm shaft	1	105		Key - 4 x 4 x 40	1
11	RM0165	Quill (Myford No. 13261)	1	106		Key - 5 x 5 x 20	1
12	RM0066	Quill housing	1	107		Key - 4 x 4 x 12	2
13	RM0067	Shaft pinion	1	108		Self locking ring - Salfertix 7115-010	1
14	RM0049	Head	1	109		Self locking ring - Salfertix 7115-016	1
15	RM0050	Elevating head	1	110		'E' circlip - D1500-0150 (15mm)	1
16	RM0167	Pedestal (Myford No. 13260)	1	111		Int. circlip - Dln 472 - 67mm	1
17	RM0060	Control shaft	1	112		'O'Lite' bush - 18 I/D x 22 O/D x 18	1
18	RM0067	Washer	1	113		'O'Lite' bush - 15 I/D x 19 O/D x 10	1
19	RM0068	Washer	2	114		'O'Lite' bush - 12 I/D x 18 O/D x 16	4
20	RM0069	Shaft housing	2	115		'O'Lite' bush - 12 I/D x 16 O/D x 12	4
21	RM0070	Shaft housing	1	116		Dowly 'O' ring, 206-597-4470	2
22	RM0071	Seal housing	1	117		Dowly 'O' ring, 204-012-4470	2
23	RM0072	Location spigot	1	118		Dowly 'O' ring, 204-012-4470	2
24	RM0073	Brass slider	2	119		Dowly 'O' ring, 204-012-4470	2
25	RM0074	Gearing cover	1	120		Dowly 'O' ring, 204-012-4470	2
26	RM0074	Gearing cover	1	121		Dowly 'O' ring, 204-012-4470	2
27	RM0075	Vertical column	1	122		Dowly 'O' ring, 204-012-4470	2
28	RM0075	Vertical column	1	123		Dowly 'O' ring, 204-012-4470	2
29	RM0076	Key	1	124		Dowly 'O' ring, 204-012-4470	2
30	RM0076	Key	1	125		Dowly 'O' ring, 204-012-4470	2
31	RM0077	Gib	1	126		Dowly 'O' ring, 204-012-4470	2
32	RM0077	Gib	1	127		Dowly 'O' ring, 204-012-4470	2
33	RM0078	Motor mounting flange	1	128		Dowly 'O' ring, 204-012-4470	2
34	RM0078	Motor mounting flange	1	129		Dowly 'O' ring, 204-012-4470	2
35	RM0079	Worm cover plate	1	130		Dowly 'O' ring, 204-012-4470	2
36	RM0079	Worm cover plate	1	131		Dowly 'O' ring, 204-012-4470	2
37	RM0080	Screw mount	1	132		Dowly 'O' ring, 204-012-4470	2
38	RM0080	Screw mount	1	133		Dowly 'O' ring, 204-012-4470	2
39	RM0082	Elevating screw (metric)	1	134		Dowly 'O' ring, 204-012-4470	2
40	RM0082	Elevating screw (metric)	1	135		Dowly 'O' ring, 204-012-4470	2
41	RM0083	Caprive plate	1	136		Dowly 'O' ring, 204-012-4470	2
42	RM0083	Caprive plate	1	137		Dowly 'O' ring, 204-012-4470	2
43	RM0085	Quill nut	1	138		Dowly 'O' ring, 204-012-4470	2
44	RM0085	Quill nut	1				
45	RM0086	Setting pin (30mm long)	2				
46	RM0086	Setting pin (30mm long)	2				
47	RM0088	Setting pin (48mm long)	1				
48	RM0088	Setting pin (48mm long)	1				
49	RM0089	Dog point screw	1				
50	RM0089	Dog point screw	1				
51	RM0089	Rear bush - shaft pinion	1				
52	RM0089	Rear bush - shaft pinion	1				
53	RM0093	Star wheel assembly	1				
54	RM0095	Clasp washer	1				
55	RM0097	Brass lock pin - quill	2				
56	RM0098	Adjustable clamp lever assembly	1				
57	RM0099	Bearing lock nut	3				
58	RM0099	Bearing lock nut	3				
59	RM0100	Bearing lock nut	1				
60	RM0100	Bearing lock nut	1				
61	RM0101	Bearing lock nut	1				
62	RM0101	Bearing lock nut	1				
63	RM0102	Gear selector assembly (long)	1				
64	RM0102	Gear selector assembly (long)	1				



# 254 Vertical Milling and Drilling Attachment



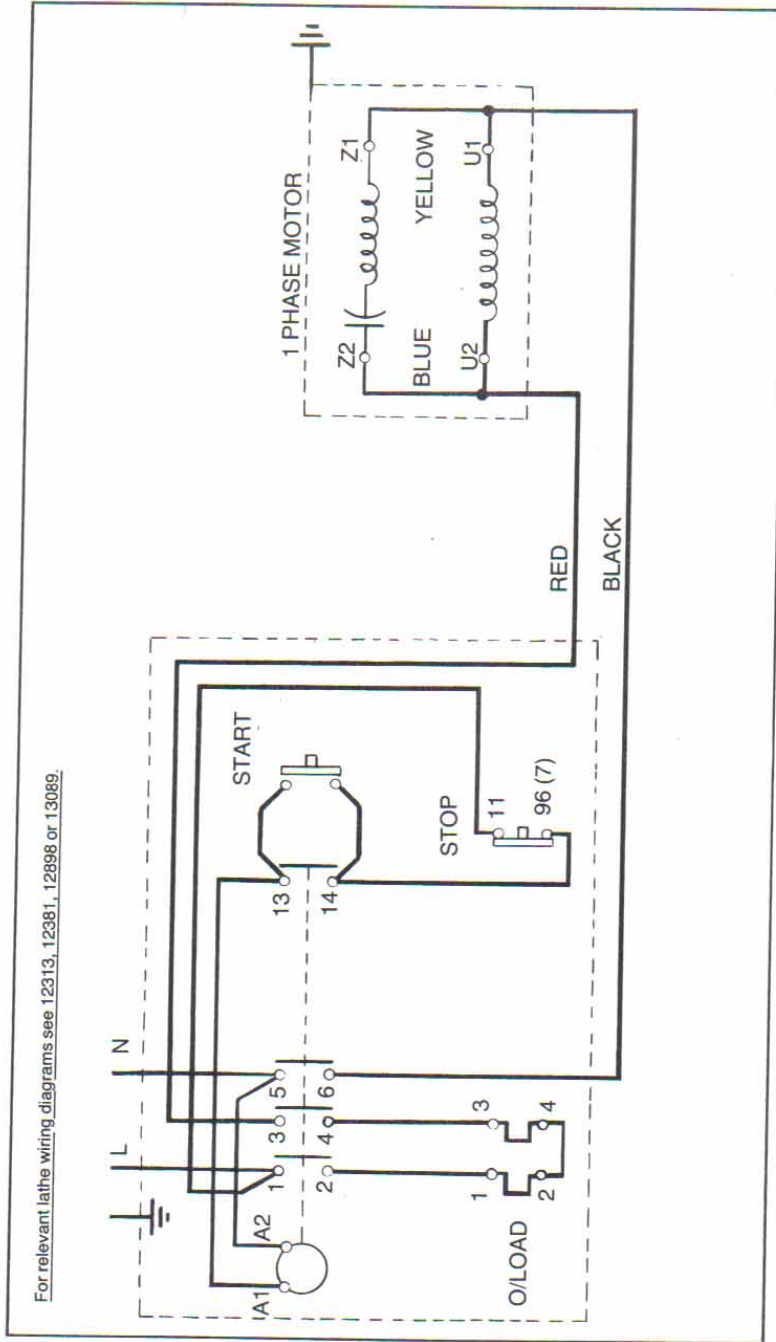


**SECTION 6**

# Wiring Diagram for 95/155 & 95/.57 Vertical Milling Attachment Single Phase

(Drawing No. 13696)

If the lathe is fitted with the complete electrical safety package, L (Line) may be connected to S1 and N (Neutral) to W2 on the reversing starter, otherwise they must be connected to an independent electric supply.  
 N.B. For 60Hz supply, L is L1 and N is L2





(Drawing  
No. 13697)

## Wiring Diagram for 95/156 & 95/158 Vertical Milling Attachment Three Phase

If the machine is equipped with the complete electrical safety package, L1 may be connected to R1, L2 to S1 and L3 to T1 on the reversing starter, otherwise they must be connected to an independent electric supply.

