

OPERATOR'S HANDBOOK

HARRISON

9" Swing Lathe
(4 $\frac{1}{2}$ " Centre)

MODEL LB

11" Swing Lathe
(5 $\frac{1}{8}$ " Centre)

MODEL LBA

PRICE 21/-

AND SPARE PARTS LIST

OPERATOR'S HANDBOOK

AND SPARE PARTS LIST

HARRISON

9" Swing Lathe

(MODEL L5)

11" Swing Lathe

(MODEL L5A)

CONTENTS

Instructions for Ordering Spares	5
Specification and Leading Dimensions	6
Introduction	7
Controls	9
Fitting and Use of Attachments	10
Maintenance	13
Recommended Lathe Practice	14
Hydraulic Profiling Equipment	20
SPARE PARTS LIST and DRAWINGS	
All-Geared Headstock	26
Gearboxes and Tailstock	30
Apron, Saddle and Slides	34
Profiling Equipment	38
Miscellaneous Accessories	42
HARRISON Products	55

INSTRUCTIONS FOR ORDERING SPARES

When ordering Spare parts **always quote Machine No.**
which is stamped on the bed at the tailstock end.

Spares can be obtained through your usual machinery dealer, or
direct from the manufacturers :—

T. S. HARRISON & SONS LIMITED

P.O. BOX 20,
HECKMONDWIKE,
YORKSHIRE, ENGLAND
Telephone: Heckmondwike 627-8-9 *Telegrams*: Harrison, Heckmondwike *Telex*: 55217

SPECIFICATION AND LEADING DIMENSIONS

	MODEL L5	MODEL L5A
Swing over bed	9 ³ / ₈ "	11 ³ / ₈ "
Admits between centres	24" or 40"	24" or 40"
Bed length	51" or 67"	51" or 67"
Swing over saddle	6 ¹ / ₈ "	8 ¹ / ₈ "
Swing in gap—Diameter	17"	18 ³ / ₄ "
Swing in gap—width in front of faceplate	4 ¹ / ₂ "	4 ¹ / ₂ "
Swing in gap—width in front of faceplate	3 ³ / ₈ "	3 ³ / ₈ "
Maximum cross slide feed	7"	7"
Maximum top slide feed	2 ⁷ / ₈ "	2 ⁷ / ₈ "
Maximum movement of tailstock spindle	4"	4"
Maximum set over of tailstock spindle	3 ³ / ₈ "	3 ³ / ₈ "
Centre to tool base	14.3 mm.	14.3 mm.
Maximum tool section	19 × 15.9 mm.	23.8 mm.
Spindle speeds—number	8 or 16	8 or 16
Range in r.p.m. with 1 h.p. motor	22 to 500	22 to 500
Range in r.p.m. with 1 ¹ / ₂ h.p. motor	34 to 750	34 to 750
Range in r.p.m. with 2 h.p. motor	45 to 1,000	45 to 1,000
Range in r.p.m. with 2 speed 3/1 ¹ / ₂ h.p. motor	34 to 1,500	34 to 1,500
Spindle bored to pass—diameter	3 ³ / ₈ " or 1 ³ / ₈ "	1 ³ / ₈ "
Size of morse taper centres	No. 3	No. 3
Leadscrew—diameter	1 ¹ / ₈ "	1 ¹ / ₈ "
Leadscrew—T.P.I.	4	4
Range of threads (T.P.I.)—3 speed gearbox	2 ¹ / ₂ to 80	
Range of feeds	-.002" to -.050"	-.05 to 1.27 mm.
Range of feeds	-.001" to -.030"	-.025 to -.76 mm.
Range of threads (T.P.I.)—36 speed gearbox	4 to 60	4 to 60
Range of feeds	-.0021" to -.032"	-.053 to .83 mm.
Range of feeds	-.0012" to .018"	-.03 to .47 mm.
Range of feeds		-.025 to .47 mm.

INTRODUCTION

The main purpose of this booklet is to provide users with a full list of parts, should replacements become necessary. When ordering spare parts please quote the part number, description and the LATHE NUMBER, which will be found stamped at rear end of bed. Attention has been drawn to a few points which may be of use to the

INSTALLATION

Slinging: Holes are provided in the base under the headstock and tailstock through which a bar may be passed for slinging purposes. Care should be taken to avoid the lifting ropes bearing on the lead-screw or feed rod.

Cleaning: All bright surfaces are covered with an anti-corrosive compound before despatch from the works. This should be removed with petrol or paraffin before putting the machine into operation.

Levelling: To ensure accurate production it is important that the machine be on a solid floor and correctly levelled. This should be checked with a sensitive spirit level as follows:—

Test longitudinally with spirit level on either of the bed flatways. Test transversely and for twist with spirit level across blocks of equal height, one on the front and one on the rear flat slideways at each end of the bed in turn. If correction is necessary, flat steel plate packing should be inserted under the low corner(s) of the base.

When jacking screws are used it is essential that the screw beds onto a steel plate and not onto concrete. After levelling, the locknuts on the jacking screws should be tightened, the machine is then ready for use.

Being of rigid design and construction it is unnecessary to bolt the base to the floor.

If it is essential that the lathe is bolted down, it is most important to ensure when tightening the nuts after levelling that no distortion is imparted to the lathe bed by clamping. When bolting down on concrete pack the base level

purchaser of a "HARRISON" lathe, the observance of which will ensure satisfactory service. New developments and modifications resulting in improved performance may be incorporated from time to time on them and the right is reserved to modify the specification as may be required.

with flat mild steel plate under the support points with foundations bolt in position. Run concrete under and around the base and allow it to solidify. The nuts should then be tightened on to spring washers sufficiently firmly only to prevent them working loose and a final level check made. It must be emphasised even with this method that great care must be taken to avoid distortion, and it is preferable to mount the lathe as stated with bolts but without nuts, using the bolts merely as location pegs to avoid lateral displacement.

Electrical connection: The supply wires should be connected to the isolator switch at the end of the cabinet in the usual manner.

Initial operation: It is important to make sure that the feed or screwcutting levers are in the disengaged position before operating the Lathe otherwise damage can be caused by the saddle or tools running into the headstock or tailstock.

As the headstock is the most important unit of the Lathe only the best materials and workmanship are incorporated in this assembly. All the gear teeth are induction hardened to 450/500 Brinell and honed to a smooth and accurate form. The hardening may result in a sound of higher pitch than is evident on a Lathe which does not have hardened gears.

To ensure satisfactory operation of the bearings it is essential to run in the machine at lower speeds only during the first 40/50 hours of operation. After this initial run in period we also recommend that a further gradual build-up to the top speed operation is followed.

LUBRICATION

Complete lubrication is essential before running a new lathe and light running for a short period is recommended. Daily lubrication will reduce wear and ensure trouble free running. All oil nipples are easily visible and an oil gun is provided.

RECOMMENDED LUBRICANTS

	MOBIL	SHELL	ESSO	POWER	S.A.E. No.
Headstock	Vactra oil extra heavy	Vitrea oil 72	Esstic 65	B.P. Energol HP. 60	40
Slideways, oil holes and nipples	Vactra oil heavy	Carnaolil 35	Esstic 65	B.P. Energol HP. 30	30
Motor, grease cups	Mobilux grease No. 3	Alvania grease 3	Beacon 3	B.P. Energol LS. 3	

The headstock level should be kept within the limits shown on the indicator at the rear of the headstock. Incorporated in the oil indicator are screwed filler and drain plugs. The external reverse gears on the headstock should be kept clean and occasionally smeared with grease based with Molybdenum Disulphide such as (Rocol) Molygear.

CONTROLS

All control levers are shown on the illustration on the opposite page.

(d) **Electrical Controls.** A single panel, on the front of the lathe, contains all the electrical controls within easy reach of the operator. A push-button operated starter with overload and no-volt protection is standard equipment on all machines; other controls available being two speed, reversing and coolant pump rotary type switches.

(b) **Headstock.** Speed changes should only be made after disengagement of the clutch. The clutch lever is at the top of the headstock, engagement is by moving to the right, disengagement by moving to left.

A two-position front gear lever selects the high speed range when in the right hand position and the low speed range in the left hand position and this, used in conjunction with the two position twin selectors at the top of the headstock, gives a total of eight spindle speeds. Freely sliding gears combined with a direct reading speed chart ensures effortless and instantaneous speed change.

Forward or reverse rotation of the feed gear train is obtained by rotating the knob at the front of the headstock.

(c) **Norton Feed Gearbox.** Thirty-six changes of threads and feeds are obtained by manipulation of the turnbuckle lever in conjunction with the two adjacent compound gear levers. The lever positions are determined by reference to the direct reading screwcutting and feed chart. For changewheel combinations see charts on page 10. When not being used it is recommended that the leadscrew be disengaged by operation of the dog clutch.

(d) **Three Speed Gearbox.** Three changes of both sliding and surfacing feeds are obtained by moving the selector lever into the appropriate positions A, B or C. The screwcutting and feed chart attached to the inside of the changewheel guard gives changewheel combinations for threads from 2 to 80 TPI. For 19 TPI an extra 95T changewheel is required and for fine threads of 36 TPI and upwards an extra 120T wheel is necessary.

(e) **Apron.** Instantaneous engagement and disengagement to both feeds is obtained by the trip lever of the drop out worm box situated at the base of the apron. The feed selector knob which is directly below the cross slide handwheel should be pushed in for sliding feeds and pulled out for surfacing feeds.

Engagement of the leadscrew for screwcutting is by means of the lever at the right of the apron which is pulled up for engagement and pushed down for disengagement. Simultaneous engagement of leadscrew and feedshaft is prevented by interlocking control.

The carriage may be locked to the bed by means of the hexagon screw on the right hand side of the saddle.

Exact repeat of leadscrew engagement is obtained with the screwcutting indicator.

- To cut even threads per inch engage at any graduation.

To cut odd threads per inch engage at graduated graduation.

To cut half threads per inch engage at graduations 1 or 3.

To cut quarter threads per inch engage at graduation 1.

The pivoting screwcutting indicator should be disengaged when not in use.

(f) **Slides.** Cross slide and tool slide are fitted with friction grip micrometer dials graduated to read .001". The tool slide assembly is arranged to rotate through 360 degrees on the graduated cross slide and locking is by means of the two nuts on the swivel slide.

(g) **Tailstock.** Clamping to the bed is effected by the lever at the rear and spindle quill locking is by means of the pad bolt on top of the tailstock.

FITTING AND USE OF ATTACHMENTS

*Many operations other than turning are possible on a lathe fitted with a few attachments and these enable further operations to be carried out without recourse to special machines.
The following attachments are available for "HARRISON" Lathes.*

Collet Attachments. This type of chuck provides a most accurate means of gripping work, the accuracy being 0.0005 in. at the collet nose, and 0.003 in. at a distance 3 in. out.

Use of attachments is not restricted to cylindrical work and collets for square or hexagonal bar can be provided.

(i) **For $\frac{3}{8}$ in. bore spindle.** To fit the attachment, unscrew the tail end sleeve from the driving end of the spindle, and remove chuck or face-plate, centre and sleeve from the spindle nose. Assemble the collet nose piece, closer bush and collet. Pass the draw tube through the spindle from the driving end and screw on to collet. Collets can be provided up to $\frac{3}{8}$ in. capacity, a standard set being $\frac{3}{8}$ in. to $\frac{1}{2}$ in. in increments of $\frac{1}{16}$ in., but sizes from $\frac{3}{4}$ in. together with millimetre sizes are available.

(ii) **Draw Tube Type Collet Attachment for $1\frac{1}{8}$ " Bore Spindle (Screwed or Taper Nose).** To fit the attachment, remove chuck or face-plate, centre and sleeve from spindle nose. Pass the draw tube through the spindle from nose, then assemble handwheel and clamping nut onto tube. Screw on spindle nose cover (screwed type) or mount onto taper and secure with draw-nut which is integral with spindle (Taper nose spindle). Assemble the closer bush into mouth of spindle, insert required size of collet and screw onto draw tube. The standard range of collets is from $\frac{1}{4}$ " to 1" maximum in increments of $\frac{1}{16}$ ", but any size within this range (including metric) can be provided.

(iii) **Multisize Collet Attachment (Screwed or Taper Nose Spindle).** The complete assembly is mounted on the spindle nose. Collets are inserted after removing the closer bush with the wrench provided. The capacity of the attachment is $\frac{1}{8}$ " to $1\frac{1}{2}$ " and is covered by 11 collets.

Taper Turning Attachment. Whilst it is preferred that this attachment be fitted at the works, little difficulty should be experienced by the engineer wishing to make this addition to the lathe. Bolt holes are drilled in the rear

of the saddle on all lathes to accept the support bracket of the attachment and an assembly instruction drawing is supplied with each unit. Taper turning of lengths up to 11 in. with included angles up to 20 degrees can be carried out, graduated scales being provided, reading degrees at the tailstock end and inches taper per foot at the headstock end. Instructions for setting up prior to taper turning are as follows :—

Release the two nuts clamping the swivel bar, set to the required angle by means of the adjusting screw at the rear and reclamp.

Release the two socket head cap screws at the left hand side of the attachment — these must remain released during taper turning.

Taper turning at any point along the bed can be achieved by setting the support bracket at the rear of bed to the desired position.

Change over to normal turning is as follows :—

Set swivel bar to zero graduation.

Withdraw support bracket to tailstock end of bed.

Lock the two socket head cap screws.

Milling Attachment. This attachment is mounted on to the top slide, replacing the toolpost. The tee slotted, vee grooved slide has vertical screw adjustment and is arranged to swivel against a scale graduated 45 degrees each side of the vertical centre line. An arbor for mounting between centres and driven by the lathe driver plate is available to take 1 in. bore cutters. Machining by this means is, however, restricted to thin work and so, wherever possible, face or end milling is recommended. Face and end mills together with Woodruff key cutters can be provided having No. 3 Morse taper shanks for direct fitting in the spindle nose.

Milling and Gearcutting Attachment. As in the previous case, this attachment is mounted on the top slide in place of the toolpost. On the vertical slide assembly, of similar construction to the milling attachment, is fitted a support for the work arbor together with indexing mechanism.

FITTING AND USE OF ATTACHMENTS—(contd.)

Cutter arbor and cutter are mounted between the lathe centres, the drive being by driver plate and pin. It is important that, when setting up for gear cutting, the work arbor be exactly at right angles to the cutter arbor and the cutter directly under the centre line of the work arbor. Gears up to 7 in. diameter can be cut and cutters covering a wide range of gear pitches are available.

Dividing Attachment. Accurate indexing of the lathe spindle is achieved by use of this attachment. Work mounted in the chuck, on faceplate or between centres can be indexed for operations such as graduating, slotting, key seating, etc. The attachment fits on the top changewheel shaft after removal of the gear, the hinged guard remaining open whilst in use. A very wide range of divisions is possible with the standard index plate, but special plates can be provided when necessary.

Boring Table. This attachment fits directly on to the saddle. A boring bar with six cutters for use between centres can be supplied. To fit the table, remove the complete cross slide by turning the handwheel until the slide becomes free and can be taken from the rear of the saddle. Replace by the boring table, feeding on to the screw which is operated in the reverse direction. Place the boring bar between the lathe centres and drive by means of the driver plate.

Fourway Toolpost. Indexes against a spring loaded plunger. This unit replaces the standard type toolpost.

American Toolpost. Of the recognised American pattern with swivelling base plate and single clamp screw. Suitable for 11 in. swing (Model L5A) lathes only.

Electric Pump Unit. This attachment comprises a flanged electric pump mounted on a storage tank, the whole being secured to the rear of the cabinet base. It is recommended for high speed lathes and for work requiring continuous, copious supplies of coolant.

Feed Stops.

- (i) **Micrometer Carriage Stop.** Clamps to the front vee bed way and is used for accurate machining of shouldered work. The screwed spindle is fitted with a micrometer dial having 0.001 in. graduations.
- (ii) **Four Position Carriage Stop.** Similar to the above, this unit clamps to the front vee bed way and is used for multi-shouldered work. The indexing body contains four adjustable screws each of which can be used in turn to control various shoulder lengths.

- (iii) **Cross Slide Stop.** Is located on the cross slide ways and is used on facing operations.

Bed Turret (Model L5A only). This attachment is clamped to the bed ways replacing the tailstock. It comprises a lever operated slide of 4 in. stroke length with a six station automatically indexing turret, each station having an adjustable stop screw. Supplied with lathe, the turret head is bored suitable for 1 in. diameter tool shanks but otherwise is left solid for boring in situ to ensure perfect alignment with the headstock centre.

Cut-off Slide. Used for parting off and facing operations. This quick acting lever operated slide, with front and rear toolposts, is clamped to the bed ways immediately in front of the chuck.

Changewheels for Screwcutting.

Metric Threads (Norton Feed Gearbox). A thread pitch range of 0.5 to 7 mm. is available on both models. Additional wheels required for 9 in. (Model L5) lathe are 40, 60, 63 and 127T, and for 11 in. swing (Model L5A) lathe, 40, 63 and 127T. Combinations are given on chart No. 63 (page 10).

American Pipe Threads (Norton Feed Gearbox). The complete range of pipe threads is directly available through the gearbox with the exception of 11½ and 27 TPI: the additional changewheels required for these together with their combinations are as given on page 10.

Metric Threads (Three Speed Gearbox). A thread pitch range of 1 to 11 mm. on the 9 in. (Model L5) lathe and 1 to 9 mm. on 11 in. swing (Model L5A) are obtained with an additional 127T changewheel. Combinations are given on chart No. 6.

Special Threads. Changewheels can be provided for comprehensive ranges of B.A., module, diametral, fractional and many other special thread pitches.

Note.—The indicator dial cannot be used for metric, B.A., and other special threads. It is necessary to maintain engagement of the lead-screw during screwcutting and an electrical reversing switch can be supplied for returning the carriage to enable repeat cuts to be taken.

Two Speed Equipment. Spindle speed ranges can be doubled by fitting a two speed motor and selector switch. The standard is 31 to 1440 r.p.m., but other ranges can be provided.

Additional Equipment. A wide selection of equipment available includes chucks of all sizes within the capacity of the lathe, tailstock drill chuck, rotating centre, half centre, pipe centre, turning tools and tool holders, etc.

FITTING AND USE OF ATTACHMENTS — (contd.)

9" (MODEL L5) LATHE (Norton Gear Box)

RANGE	T.P.I.	TOP SHAFT	INTER-MEDIATE SHAFT	BOTTOM SHAFT	G.B. LEVER POSITION
Standard	4 to 60	50	50	100	As G. Box Chart
Fine	8 to 120	50	100-50	100	4 to 60
Coarse	2 to 30	50	100	50	4 to 60
Special Threads	11½	50	100-50	115	5
	27	40	100	60	36

11" SWING (MODEL L5A) LATHE (Norton Gear Box)

RANGE	T.P.I.	TOP SHAFT	INTER-MEDIATE SHAFT	BOTTOM SHAFT	G.B. LEVER POSITION
Standard	4 to 60	50	60	100	As G. Box Chart
Fine	8 to 120	50	100-50	100	4 to 60
Coarse	2 to 30	50	100	50	4 to 60
Special Threads	11½	50	60	115	10
	27	40	100	60	36

* G. Box T.P.I. Position = $\frac{\text{T.P.I. Required}}{2}$

† G. Box T.P.I. Position = $\frac{\text{T.P.I. Required} \times 4}{\text{COMPLETE RANGE OF T.P.I.}}$ (Norton Gear Box)

Coarse	2	2½	2¾	3	3½	3¾	3½	3¾	3½
Standard	4	4½	4¾	5	5½	6	6½	7	7½
	8	9	9½	10	11	12	13	14	15
	16	18	19	20	22	24	26	28	30
Fine	32	36	38	40	44	48	52	56	60
	64	72	76	80	88	96	104	112	120
Special	11½	27							

Warning: When cutting threads coarser than ¼" pitch it is advisable to engage the half nuts with the spindle stationary, then engage the chuck. The use of the lowest spindle speed is essential. The maximum pitch that can be cut on a center lathe is determined by the diameter and depth of cut required. The recommended maximum helix for roughing is 3" and a light cut up to 10"-12". The cutting of a coarse thread should only be carried out by a skilled operator who will appreciate the limitations imposed by the conditions which will vary according to the type of material, thread and depth of cut, etc.

METRIC SCREWCUTTING CHART FOR THREE-SPEED GEARBOX

METRIC PITCH MM.	TOP SHAFT	INTER-MEDIATE SHAFT	BOTTOM SHAFT	GEARBOX LEVER
1	40	60	127	A
1.25	50	60	127	A
1.5	60	60	127	A
1.75	70	60	127	A
2	40	60	127	C
2.25	60	40-60	127	A
2.5	50	60	127	C
2.75	55	60	127	C
3	60	60	127	C
3.5	70	60	127	C
4	80	60	127	C
4.5	60	20-60	127	A
5	80	40-50	127	C
5.5	80	40-55	127	C
6	80	40-60	127	C
7	80	40-70	127	C
8	80	20-40	127	C
9	60	20-60	127	C
10	80	20-50	127	C
11	80	20-55	127	C

METRIC SCREWCUTTING CHART FOR "NORTON" TYPE GEARBOX

METRIC PITCH MM.	TOP SHAFT	INTER-MEDIATE SHAFT	BOTTOM SHAFT	T.P.I. POSITION
.5	50	40-60	127	60
.75	50	40-60	127	40
1	50	40-60	127	30
1.25	50	40-60	127	24
1.5	50	40-60	127	20
1.75	50	40-63	127	18
2	50	40-60	127	15
2.5	50	40-60	127	12
3	50	40-60	127	10
3.5	50	40-63	127	9
4	50	40-60	127	7½
4.5	50	40-63	127	7
5	50	40-60	127	6
6	50	40-60	127	5
7	50	40-63	127	4½

No. 6

No. 63

FOR 11 in. SWING LATHE SUBSTITUTE

* 4.5	60	40-60	127	C
† 8	80	127-100	50	C
‡ 9	60	127-120	40	C

Delete 10 and 11 mm. pitch

MAINTENANCE

Periodic inspection with adjustment where necessary, as given below, will ensure that this lathe retains its original high standard of accuracy and performance.

Drive Belts. The drive motor is mounted on slide rails and adjustment to the vee belt tension is by screws beneath the motor feet. Procedure for replacing vee belts is as follows:—

- Remove outer section on the drive guard (secured to inner section by three socket head screws).
- Release tension in belts by adjusting screws beneath motor feet.
- Replace belts and carefully retension.
- Check for correct alignment of motor pulley by laying a straight edge across face of pulley. This should line up with face of head pulley.

It is important to ensure that the belts do not slip as this would only increase both pulley and belt wear.

Clutch. If slip occurs then adjustment is as follows:—

- Remove small cover at top of the outer drive guard.
- Increase spring load by slightly rotating nut (anti-clockwise, i.e. left-hand thread) on end of clutch shaft.
- Constant operation of the clutch results eventually in wear on the driving faces (usually signified by clutch refusing to drive) and the following adjustment will be necessary:— (Fig. 1)

- Stop motor, leaving clutch in "ON" position.
- Remove outer section on drive guard.
- Remove adjusting nut "A" (by turning clockwise), and spring "B".
- Withdraw clutch plate "C" until it is clear of the splines leaving nut "D" in engagement with splines.
- Turn clutch plate clockwise 2 splines i.e. $2/7$ th of a turn and push back into position.
- Replace spring "B" and nut "A" and load spring sufficiently to drive machine.
- When the clutch lever is in the "START" position a radial clearance of approximately 1" should be evident at the end of the lever.

The clutch should be dismantled at six-monthly intervals and any lubricant on the driving faces removed by washing in paraffin.

Headstock Spindle Bearings. Adjustment for wear on the Timken taper roller bearings at the front of the main spindle is as follows:—

- Remove headstock cover.
- Release locknut (by turning anti-clockwise, i.e. right-hand thread) and rotate adjusting nut sufficiently to obviate play,

then re-tighten locknut. It must be emphasized that this operation requires the utmost care as over-tightening can seriously impair the life of the bearings. Sealing compound should be used when refitting the headstock cover.

Saddle Adjustment. To adjust the rear strip release the four nuts on the underside of the strip, adjust the headless set screws by turning clockwise and re-lock the nuts. To adjust the front strip release the cap head screw which secures the adjusting screw and rotate the latter anti-clockwise, re-clamp the cap head screw. Care should be taken to avoid over adjustment.

Cross Slide. Take-up of wear on the taper gib strip is by releasing the locknut, adjusting the screw and re-locking the nut.

The gib strip is of a length to allow adjustment over a range of wear but after a number of adjustments it may be necessary to shorten the screw.

Top Slide. Adjustment to the strip is by releasing the locknuts, tightening the screws and re-locking the nuts.

Electrical Controls. All electrical control equipment is mounted on the panel at the front of the cabinet and if removal is required it is important to ensure that the isolating switch, at the end of the machine, is in the OFF position.

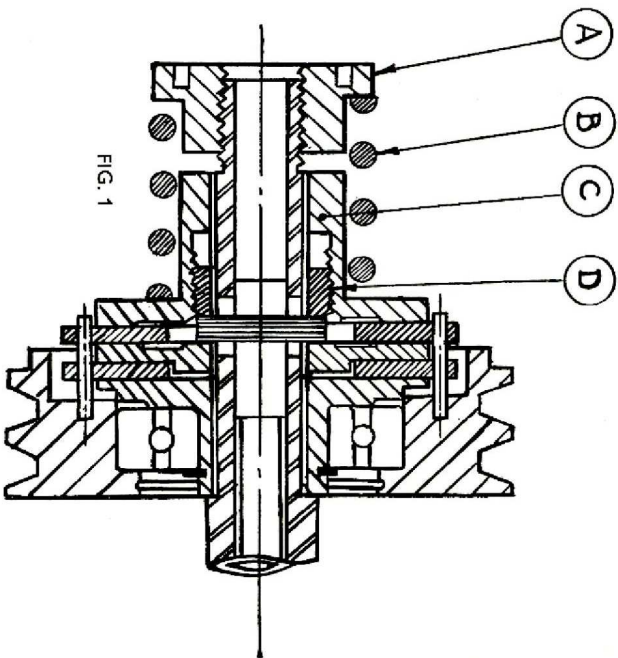


FIG. 1

RECOMMENDED LATHE PRACTICE

When a component is required to be machined on a lathe, the following principal points must be settled : (1) the manner in which the work should be mounted ; (2) the tool set-up to be employed ; and (3) the speeds and feeds to be employed.

Turning between Centres. This method of turning necessitates centre holes being drilled in both ends of the work. The operation should be performed by a special drill giving a countersink of 60 deg. angle to suit the lathe centres, the centre drill being held in a drill chuck mounted in the tailstock spindle with the work held in a chuck.

It is usual practice to carry out a facing operation on the end of the work piece before centre-drilling and it is essential that work overhang from chuck jaws, for both facing and drilling operations, should be a minimum, to ensure concentricity. Centre drills are delicate tools and easily broken, largely owing to lack of sensitivity in feeding the drill, and to work speed being too low. To prevent breakage use a high speed of work revolution and a very fine feed.

With the work mounted between centres, and fitted with a driving dog and with the tailstock centre well lubricated, it is important that the work should be free enough to turn by hand but without any end movement. Owing to heat generated by the cutting action, the work expands during machining, and if screwed up tightly before cutting commences, the result is that the centre end may become overheated causing damage to both centre and work.

When using carbide turning tools, the work speed may be so high that damage to a dead centre may take place however much care is used. It is better then, to use a revolving centre which rotates with the work, and is not therefore affected by high work speeds.

Tool Settings. Correct tool setting is important, for accurate grinding of tool angles is of no avail if the tool is improperly set in

relation to the work. While normally the tool point should be on the centre line of the work, a setting slightly above centre is permissible, but a setting below centre may cause slender work to deflect and spring on the top of the tool and out of the centres. For all taper turning and screw cutting operations, it is essential that the cutting edge of the tool be mounted exactly on the centre line of the work, otherwise discrepancies in taper and thread form will result. A simple way to obtain correct tool height is by setting to one of the lathe centres.

For parting-off operations, use a tool with a rigid shank and with the overhang from the toolpost kept to a minimum. The cutting edge must be set on the work centre and square to the lathe axis. Do not attempt parting-off unless the work is well supported and ensure that overhang from the chuck is not excessive.

Chuck Work. When a chuck is not in use it should not be left so that cast iron dust or other cuttings may enter the bore or parts of the mechanism. The threads in the bore may be protected by plugging with a cloth, nevertheless before mounting the chuck on the lathe spindle, clean the threads of both the spindle and chuck and lubricate with Molybdenum Disulphide, a tube of which is supplied with the machine.

When mounting or removing a chuck, protect the slides of the bed with a piece of wood upon which to rest the chuck before lifting it on to the spindle nose. Once the threads engage, do not spin the chuck rapidly back against the spindle shoulder or it may be difficult to remove later. To remove a chuck, place a block of wood between one of the jaws and the lathe bed, and pull the chuck so that the jaw strikes the wood and begins to unscrew. Do not attempt to use power for this operation : it is dangerous and may damage the chuck and spindle. When tightening chuck jaws, never try to obtain increased gripping power by lengthening the arm of the box key.

RECOMMENDED LATHE PRACTICE — (contd.)

When an electric reverse motion is fitted on the lathe, there is some danger of a chuck coming loose on the spindle through the rapid change of direction. As a safety device under such circumstances, the American-type long taper spindle nose is preferable and can be fitted to all "HARRISON" Lathes.

For second operation work, or for work which may be difficult to hold by standard jaws, the use of soft jaws shaped as required will often prove a time saving factor and ensure greater accuracy.

When setting work in an independent four-jaw chuck, make use of the setting rings on the face of the chuck to obtain an approximate location. It is then a simple matter to make the final adjustment for greater accuracy.

Faceplate Work. The remarks in regard to the mounting of chucks apply equally to faceplates and catch plates. Some castings or forgings are so shaped as to be difficult to hold in a chuck, but can be clamped on a faceplate by straps and bolts utilising the holes and slots provided, but do not rely entirely upon these. Whenever possible use stops against the work to take the pressure of the cut.

An angle plate bolted on to the faceplate, on to which the work is mounted, is often useful for boring and facing operations. Always ensure that revolving work is securely fastened and that a balance weight is fitted to counteract the out-of-balance effect of the mounting units and work.

Use of Steadies. Long slender work, if unsupported between centres, will tend to whip or bend under pressure of the cutting action. To prevent this happening, a travelling steady should be employed. When machining black bar, first turn a short length of the bar at the tailstock end to the diameter required, and adjust the steady

jaws to touch the work, then lock them in position. The jaws will then support the work at the point of the cut all along the length. Keep jaws well lubricated during the operation.

A stationary steady can be set up at any point along the bed to support a long shaft. If the shaft is of black bar, a ring somewhat wider than the jaws of the rest must be turned as a bearing for the jaws. If the shaft is slender, this can be a delicate operation, so that a sharp pointed tool with a very light cut should be employed.

Another use of a stationary steady is when an operation requires to be performed on the end of a bar. In such instances the distance from the chuck may be too great for machining to take place without additional support, and if drilling is required, the tailstock centre is not available. Thus to support the work by means of a steady, adjust the jaws to touch the work until it is running true, and then lock them. Again, use plenty of oil between the steady jaws and the revolving work.

Drilling and Reaming from the Tailstock. For these operations the work is gripped in a chuck or mounted on a faceplate. It is important that the drill be started true so that a hole concentric with the work diameter is produced, and a common method employed to attain this is by centre drilling before commencing normal drilling.

The limitation of a twist drill as a cutting tool is that it follows its own point which takes the line of least resistance. Incorrect grinding can cause additional inaccuracies by (1) cutting edges being ground to different angles, (2) cutting edges of equal angles but different lengths, (3) cutting edges of unequal angles and lengths causing the point to be off-centre. It is essential then to see that the radial components of the two cutting edges are equal so that they constrain the

RECOMMENDED LATHE PRACTICE — (contd.)

drill to follow a direct path, but if an accurate bore is required, a drilled hole should be enlarged by a single point tool and final size obtained by reaming.

Straight shank reamers are held in a chuck, while taper shanks may be inserted into the tailstock spindle. The reamer should be fed carefully through the hole by rotation of the tailstock handwheel, using an ample supply of lubricant when reaming steel.

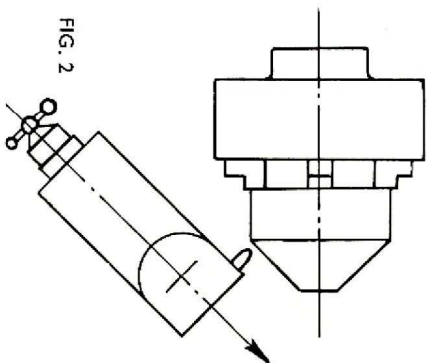


FIG. 2

The recommended cutting speeds for reaming are:

Cast iron	20 ft. per min
Mild steel	35 ” ” ”
Medium carbon steel	30 ” ” ”
Phosphor-bronze	35 ” ” ”
Aluminium and duralumin	35 ” ” ”

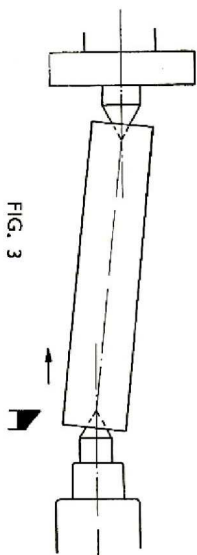


FIG. 3

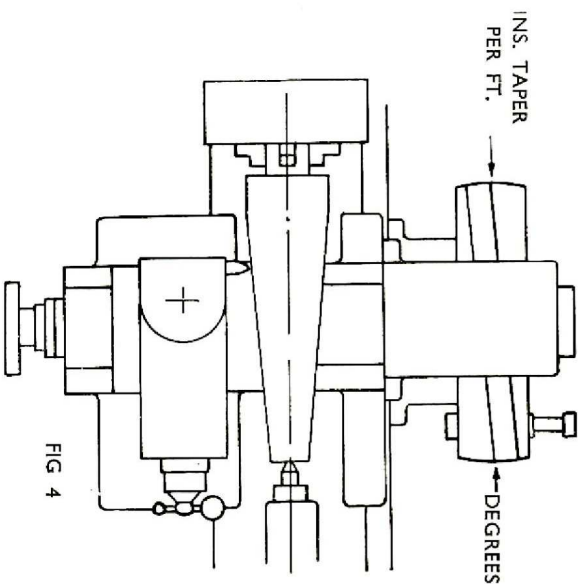


FIG. 4

Methods of Taper Turning and Boring. Three general methods are applicable. (1) As shown in fig. 2, by means of swivelling the compound rest to the angle required for either boring or turning. This method is by hand traverse of the tool, and is limited to the

RECOMMENDED LATHE PRACTICE—(contd.)

length of movement of the top slide, but it has the advantage that taper surfaces of any angle can be machined.

(2) The method shown in fig. 3 is by off-setting the tailstock centre. The drawback is that the centre points are not on the axis of the work, so that the centres are subjected to uneven wear and strain. Thus the method is limited to slow tapers on long work.

To find the amount of off-set X, if the taper is T inches per foot on diameter and the length of work is L inches, then $X = \frac{T \times L}{24}$ inches.

If the included angle of the taper is θ , $X = L \times \tan \frac{\theta}{2}$ inches.

(3) If the lathe is fitted with a taper turning attachment, fig. 4, then more accurate tapers, either external or internal, can be produced than by the two preceding methods. By the use of this attachment, the lathe centres are not of course taken out of alignment, so that the bearing surfaces are unaffected.

LATHE TOOLS

In mounting turning tools in the rest, the tool should only extend the minimum amount from the rest to obtain the maximum support

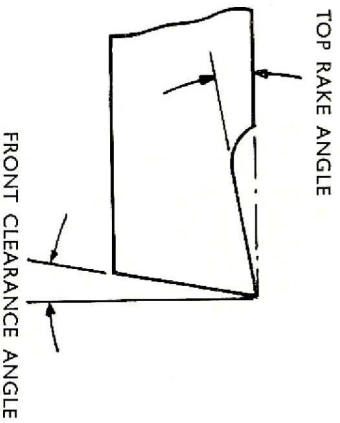


TABLE 1
Cutting Angles for H.S.S. and Cemented Carbide Tools

Materials	H.S.S.		Cemented Carbide	
	Top Rake	Clearance	Top Rake	Clearance
Mild steel ...	20°	6°	8°	4°-6°
High carbon steel ...	10°	4°	3°-4°	4°-6°
Soft cast iron ...	10°	8°	4°-8°	4°-6°
Chilled iron ...	0°	4°	0°	2°-4°
Copper ...	12°	10°	13°	4°-6°
Brass ...	0°-6°	10°	3°	4°-6°
Aluminium ...	30°	10°	16°	6°-8°

TABLE 2
Cutting Speeds in feet per minute

Material	H.S.S. Tools		Cemented Carbide	
	Roughing	Finishing	Roughing	Finishing
Mild steel ...	130	200	200	300
High carbon steel ...	45	60	200	400
Soft cast iron ...	60	75	200	350
Chilled iron ...	10	15	15	30
Copper ...	200	200	400	700
Brass ...	250	400	400	700
Aluminium ...	300	400	500	1000

TABLE 3
Feeds in inches per revolution

Material	H.S.S. and Cemented Carbide Tools	
	Roughing	Finishing
Mild steel ...	.010	.007
High carbon steel ...	.010	.007
Soft cast iron ...	.013	.008
Chilled iron ...	.008	.005
Copper ...	.020	.008
Brass ...	.020	.008
Aluminium ...	.013	.007

RECOMMENDED LATHE PRACTICE—(contd.)

against the downward pressure of the cut. For clamping the tool, ample pressure is provided with the spanner supplied, and on no account should extra pressure be applied by lengthening the leverage by dubious means such as a piece of piping. Such methods are unnecessary, and cause damage not only to the clamping screws, but the entire compound rest.

Boring tools may be of one piece solid forged, or may comprise cutter inserts fixed in a boring bar. A point of note in regard to the grinding of boring tools is that the conditions governing the top rake and clearance angles are different from those in turning, so that a secondary clearance is required for the front of the tool to clear the enveloping curve of the bore.

Speeds and Feeds. The cutting speed is expressed in surface feet per minute, and is the speed at which the surface of the work passes the tip of the tool. If D is the diameter of the work in inches, N the work speed in r.p.m., and S the cutting speed in feet per minute, then

$$N = \frac{3.82 \times S}{D}$$

The feed rate is expressed in inches per revolution of the headstock spindle.

The time to complete one cut, in minutes, can be calculated from

$$\frac{\text{Length of cut (in.)}}{\text{Spindle speed (r.p.m.)} \times \text{feed (in. per rev.)}}$$

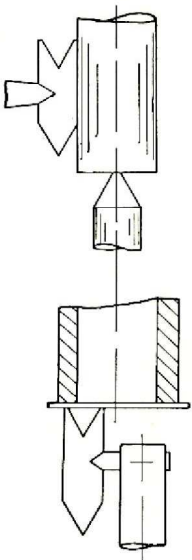


FIG. 5

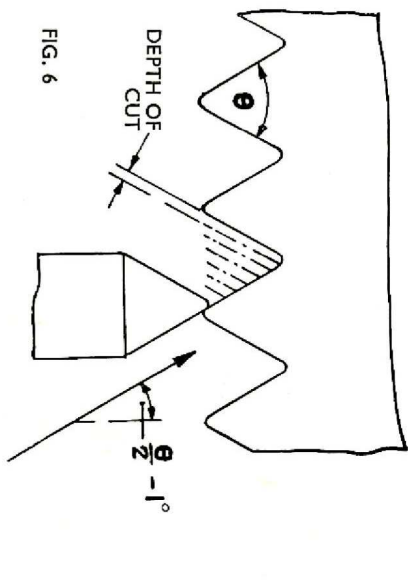


FIG. 6

Tables 1, 2 and 3 give suitable tool angles, cutting speeds, and feeds for a range of the common engineering materials.

Screwcutting.

For cutting vee threads the top of the tool is placed at centre height, having been previously ground to the required shape without any top rake. Note that if the tool is given top rake the plan angle of the tool is not the angle that will be reproduced in the work.

Fig. 5 shows the use of a setting gauge for both external and internal threading, but when cutting vee threads with the tool set in this manner, slow speeds and light feeds are necessary because the cuttings cannot be free flowing without top rake on the tool. Thus a better method for cutting external vee threads is shown in fig. 5 where the compound slide is swung around so that the tool is fed in at an angle of slightly less than half the included angle of the thread (i.e. approximately 26 deg. from normal, i.e. 64 deg. on cross slide graduations,

RECOMMENDED LATHING PRACTICE — (contd.)

when cutting standard 55 deg. threads) so that metal is mostly removed by the left-hand side of the tool. Side rake can be provided so that heavier cuts can be taken and the chips flow easily away.

In commencing a screwcutting operation, take a light trial cut and check the number of threads per inch by measuring with a rule or screw pitch gauge. Then proceed by taking successive cuts until the full depth is reached. Check for depth and accuracy by means of the nut to fit the screw, or by a thread gauge of the ring type.

Tapered threads may be cut by means of a taper attachment or by off-setting the tailstock. In either case the tool must be set square to the work axis, and not to the tapered portion.

Square Threads. This section of thread is often used for multiple threaded screws, and the terms "pitch" and "lead" should be understood. Pitch is the distance from a point on one screw thread to a corresponding point on the next thread, measured parallel to the axis.

Lead is the distance that a screw thread advances axially in one turn.

Thus on a single threaded screw the terms are identical, but a notation such as $\frac{1}{8}$ in. pitch, $\frac{1}{4}$ in. lead, would indicate a two start screw, and to produce this, the gearbox would require to give a saddle movement of $\frac{1}{4}$ in. for every revolution of the spindle, while the tool would be ground to produce $\frac{1}{8}$ in. pitch section of thread. The procedure when cutting a multiple start screw is to set the top slide parallel with lathe axis and cut the first thread in the usual manner at the correct LEAD. Cut subsequent threads by advancing the top slide each time a distance equal to the lead divided by the number of starts. This, of course, applies to all multiple threaded screws regardless of thread section.

Acme and Worm Threads. The procedure to be adopted for Acme and worm thread cutting is similar to that recommended for vee threads except for the setting angle of the compound slide. In this case the thread included angle is 29 deg. so that a slide setting of approx. 13 deg. from normal (i.e. 77 deg. on cross slide graduates) would be appropriate.

Full depth of an Acme thread is $0.5P + 0.01$ in. and width at bottom is $0.3707P - 0.0052$ in. where P is the thread pitch.

HYDRAULIC PROFILING EQUIPMENT

DESCRIPTION

The equipment comprises an independently operated rear tool slide fitted to a hydraulically operated angle slide, the whole being mounted on an extended cross slide. (A front compound slide is also fitted for normal turning.) Automatic copying control from the template to the hydraulic slide is by means of a stylus arm, mounted on taper roller bearings, actuating a spool type valve.

Template support heads and slide are mounted on the rear of the bed, one of the heads having a graduated eccentric sleeve to give 'set over' when required. Both heads can be locked in any position along the slide, the centres of each being adjustable by a handwheel.

Oil is supplied by the hydraulic pump unit usually placed on the floor

at the tailstock end of the machine. The unit comprises an oil container, flange mounted motor and geared pump with pressure relief valve. Three flexible hoses connect the pump unit to the hydraulic slide, these being pressure, return and drain lines.

Copy turning is carried out with the tool in the normal upright position; an electrical reversing switch facilitating quick change-over from normal turning. The American type, key drive, long taper nose headstock spindle ensures complete protection and positive drive in both directions of rotation.

A micrometer saddle stop controls the movement of the carriage.

OPERATION

TEMPLATES AND COMPONENT BLANKS

The circular templates are usually produced exactly similar to the finished work, and often the first of a batch of components is used as the template. It is important that the template has a good surface finish, otherwise irregularities will be transmitted to the work piece. For work of large diameter, a smaller overall diameter template may be used providing the profile and lengths are the same.

It is important that the lengths of the component blanks be similar and the ends centre drilled to a constant depth to ensure uniformity of shoulder lengths throughout the batch.

PREPARATION AND SETTING UP (Fig. 7)

The oil container should be filled with the recommended grade of hydraulic oil and the level always maintained between the end and the maximum level shown on the dipstick.

The end fittings of the pressure, return and drain hoses are numbered 1, 2 and 3 respectively, and care must be taken to ensure that these are connected to the fittings on the attachment and oil container bearing corresponding numbers.

Connection of the electrical leads to the hydraulic pump motor should be such that the direction of rotation is anti-clockwise when viewed from above.

Before commencing copy turning, the hydraulic pump unit should be run for a few minutes and the hydraulic slide fed in and out a few times by means of the hand control lever to allow the oil to circulate quite freely through the system. This should apply whenever the machine has been idle for any length of time. The oil pressure reading on the gauge should be 150 lb. per sq. inch approximately.

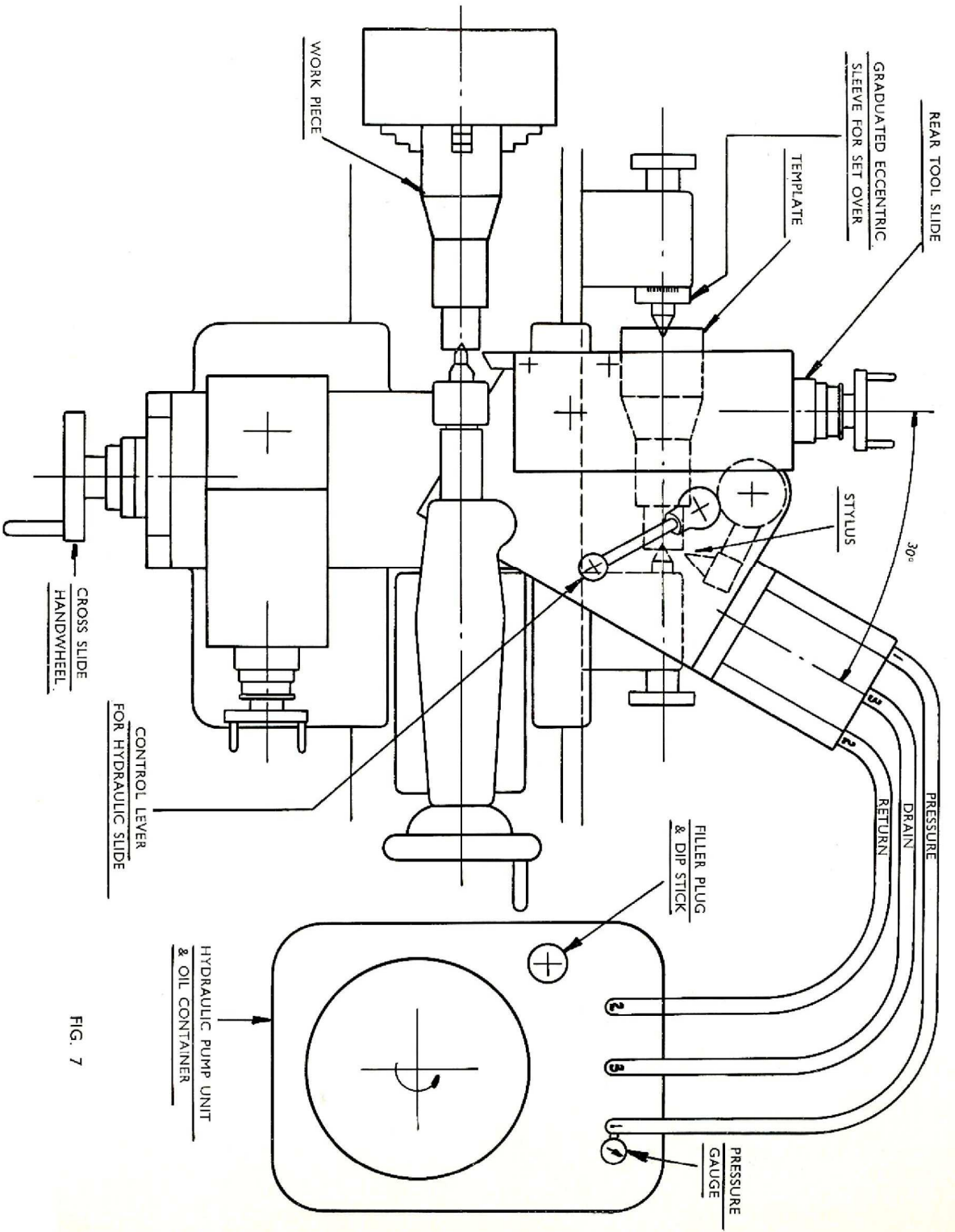


FIG. 7

OPERATION (Continued)

As the tool lies approximately $6\frac{1}{4}$ in. to the left of the stylus point, the template should be placed between the centres of the support heads a similar distance to the right of the intended position of the finished workpiece.

The hydraulic angle slide should be fed to its extreme inward position by means of the hand control lever.

Rotate the cross slide handwheel in an anti-clockwise direction until the stylus point contacts the smallest diameter of the template and commences actuating the valve controlling the hydraulic slide.

With a tool overhang of approximately 1 in. position the rear tool slide to ensure that the tool is clear of the largest diameter of the workpiece blank. Care should be taken to ensure that the tool is set exactly to centre height otherwise discrepancies will occur especially on small diameter work.

Copy turning can now commence, the depth of cuts for the 'first off' only being set by the rear tool slide handwheel.

On completion of the first workpiece, withdraw the hydraulic slide by means of the hand control lever and, only if more than one cut is necessary, traverse the whole slide assembly away from the work by means of the cross slide handwheel a distance equal to the depth of profile; on subsequent workpieces the cuts should be applied by this handwheel. The setting of the rear tool slide should not be altered after completion of the 'first off' unless a uniform fine finishing cut over the entire profile of the workpiece is required.

The micrometer saddle stop supplied with the lathe can be set towards the tailstock to position carriage after completion of each cut.

The cutting speed, depth of cut and feed rate are, as in normal turning, dependent upon the material, but accepted practice using carbide tipped tools is to combine high cutting speed with a fine feed to obtain the best surface finish.

E.g. material — mild steel, cutting speed 200 ft. per min., depth cut $\frac{1}{16}$ in., feed rate .002 in. per rev.

A minimum number of cuts per component should be taken to minimise tool point wear, thereby maintaining repeat accuracy throughout the batch. Wherever possible, the more robust (a) of the two cutting tools should be used, the lighter tool (b) being reserved for work requiring steep back angles and grinding reliefs (*fig. 10*).

SCREWCUTTING (*Fig. 9*)

A higher cutting speed for screwcutting can be achieved by use of the Copying equipment. Whilst the only purpose of the equipment during screwcutting is the automatic withdrawal of the tool, the manual withdrawal speed is usually the factor limiting a threading operation, so the advantage to be gained from using the equipment will be readily appreciated. The most satisfactory results are obtained on fine threaded work and with the more free cutting materials, *e.g.* brass, cast iron, etc.

For cutting right-hand threads the tool should be in an inverted position, the direction of rotation of the headstock spindle therefore being in an anti-clockwise direction when viewed from the tailstock end of the lathe.

For cutting left-hand threads the tool should be in the normal upright position, the direction of rotation of the headstock spindle being in a clockwise direction.

The template required should have a single shoulder of sufficient depth to allow the tool to be automatically withdrawn from the work. The stylus point must always be clear of the template diameter contacting only the shoulder at point of withdrawal. If more than one cut is necessary, then these should be applied by the cross slide handwheel.

Taper screwcutting can be carried out to advantage (the above remarks regarding fine threads or free cutting materials again applicable), but the 'setting-up' differs slightly from that of parallel screwcutting. A template is required having a taper similar to that of the taper thread being produced, the stylus point contacting this

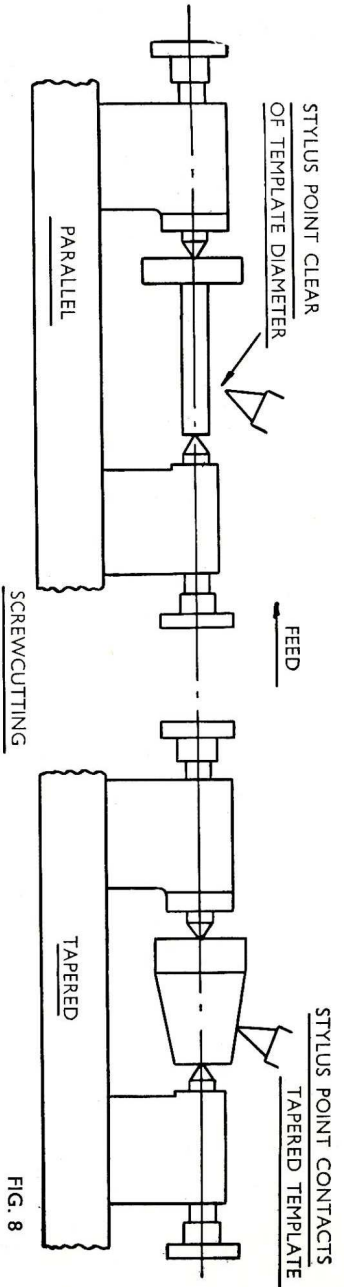


FIG. 8

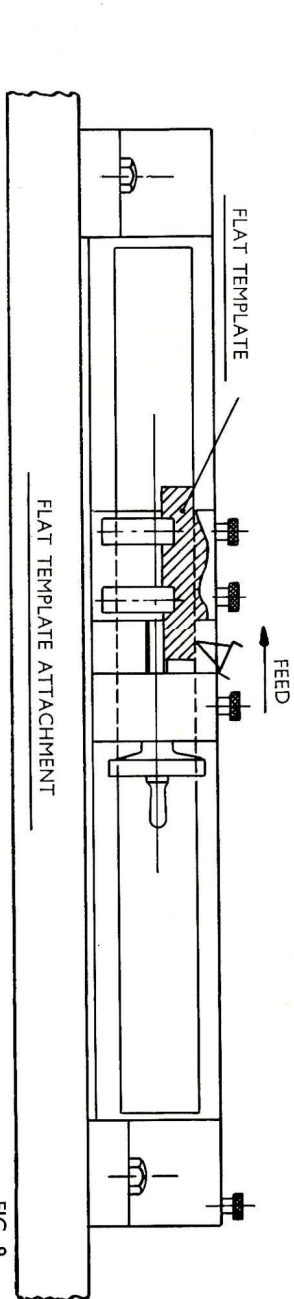
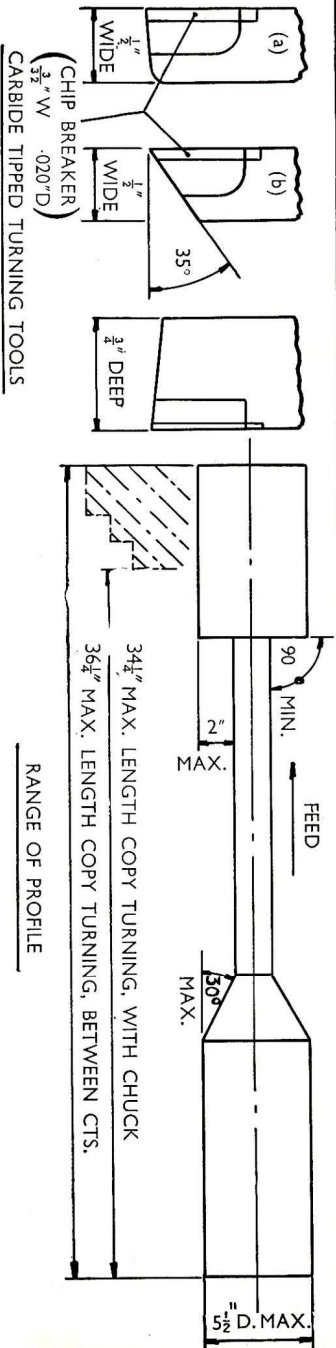


FIG. 9



OPERATION (Continued)

during thread cutting. If more than one cut is necessary then this should be applied with the rear tool slide handwheel. Because of the angular action of the hydraulic slide a modified changewheel combination is required for each different taper.

FLAT TEMPLATE ATTACHMENT (Fig. 9) (ADDITIONAL EQUIPMENT)

Whilst the major proportion of profile turned work is accomplished

by the use of cylindrical templates an attachment is available specifically designed to accommodate flat templates.

The unit replaces the cylindrical template support heads and is clamped to the tenoned block attached to the rear of the lathe bed.

Provision is made for accurate alignment of the template to the lathe axis and a graduated dial provides micro longitudinal adjustment.

COPYING DISCREPANCIES

Discrepancies occurring between workpieces and template may be attributed to the following —

(1) Tool requires regrinding.

(2) Tool is not on centre height — particularly important on small diameter work.

(3) Template and workpiece are not parallel — adjust by means of graduated eccentric sleeve in template support head.

(4) Gib strips on slides require adjusting.

MAINTENANCE

HYDRAULIC PUMP UNIT

Recommended grades of hydraulic oil —

D.T.E. Oil Light. Supplied by Mobil Oil Co. Ltd.

^{or}
Tellus Oil 33 Supplied by Shell-Mex & B.P. Ltd.

^{or}
Nuto - H44 Supplied by Esso Petroleum Co. Ltd.

or other equivalent grades. American equivalent S.A.E. 10.

The oil container should be drained, cleaned and renewed with oil at six-monthly intervals, whilst the filter fitted to the inlet port of the

pump should be cleaned at three-monthly intervals. A drain plug is fitted at the base of the container and after draining, the cover and pump unit complete should be removed—by releasing the four screws at the corners of the cover. The container is then available for easy cleansing.

The working pressure registered on pressure gauge should read approximately 150 lb. per sq. inch, but if readings differ greatly from this figure then adjustment should be made to the relief valve which is inside the container.

Capacity of oil container approximately 3 gallons.

MAINTENANCE (Continued)

LUBRICATION

Being a closed hydraulic system, the internal mechanism of the attachment requires no additional lubrication except for an oil nipple provided for lubrication of the stylus arm bearings and this together with periodic lubrication of the slides is all that is necessary.

(It is recommended that the slides be lubricated with molybdenum disulphide in petroleum jelly.)

PLAY IN SLIDEWAYS

All the slides are provided with gibs. Adjustment should be effected as required and the set screws and locknuts carefully tightened.

REPLACEMENT OF HYDRAULIC RAM LEATHER

(Fig. 11)

Instructions for replacing the hydraulic ram leather sealing the piston rod in the cylinder are as follows —

Remove cap screws 'A' and withdraw hydraulic slide in direction of arrow.

Release set screw 'B' and raise item 'C' clear of the cross slide — cylinder and valve unit should now be clear.

Remove end cover 'D' and withdraw piston and rod from the cylinder.

Remove piston.

Replace ram leather 'E' — care being taken to ensure that the sealing lip is not damaged.

On assembling end cover 'D' use sealing compound on face.

This hydraulic equipment has been made in the simplest and most foolproof form without unnecessary complications, and we believe that this is the most effective way of dealing with such apparatus. **IT IS IMPORTANT TO SWITCH OFF THE HYDRAULIC UNIT WHEN NOT IN USE,** so as to minimise temperature

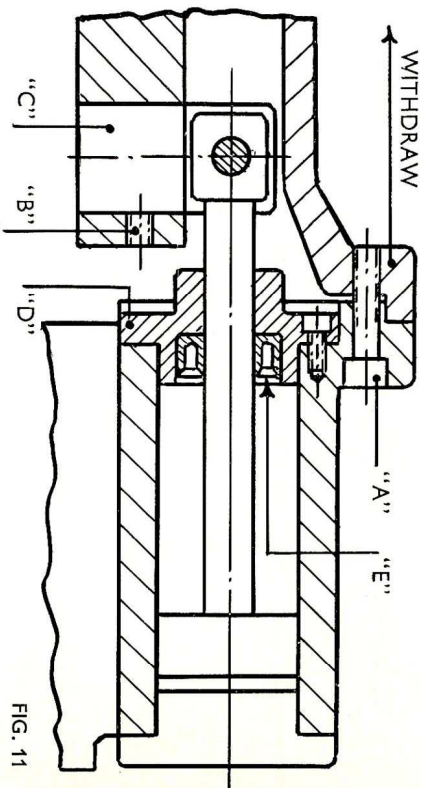


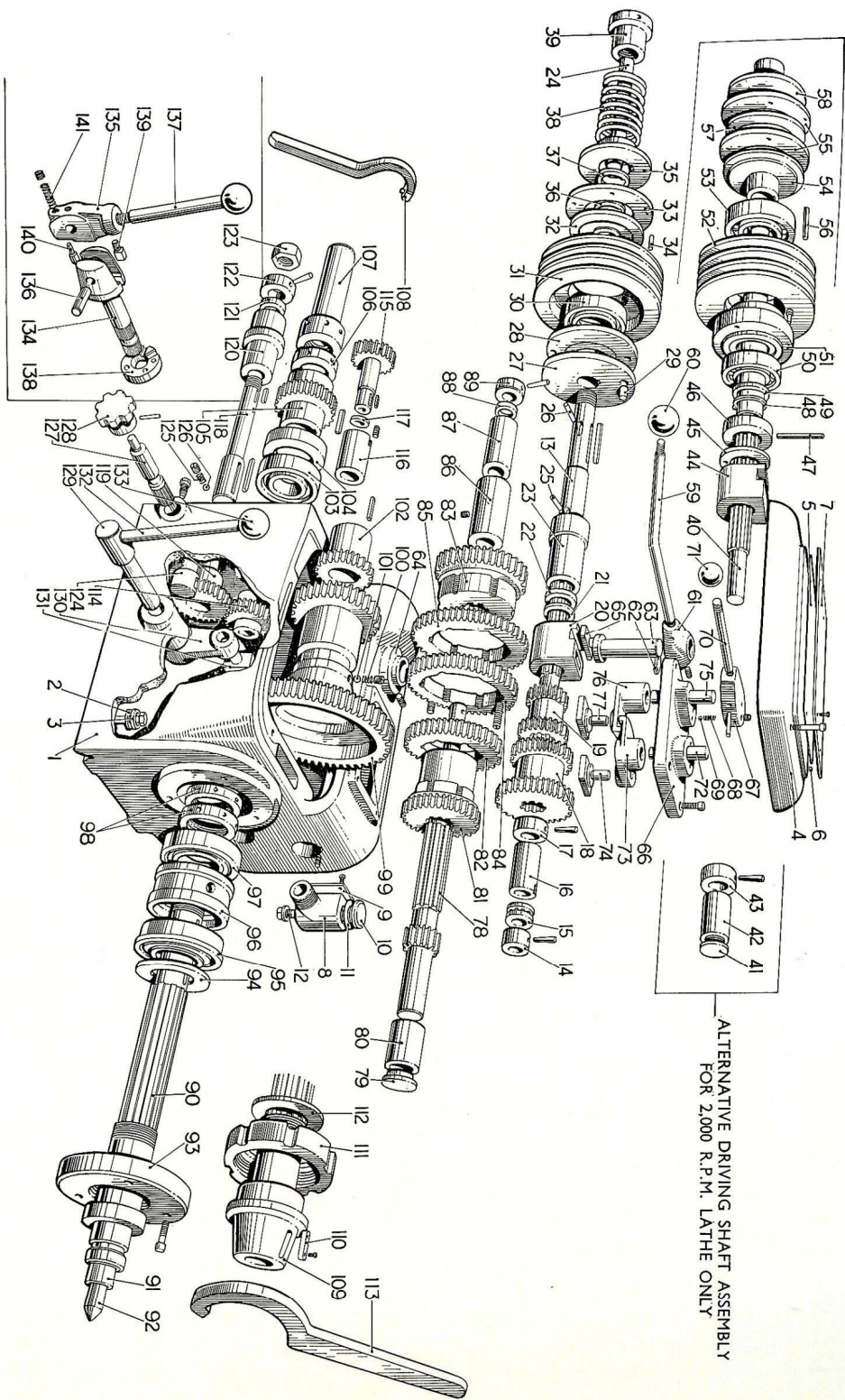
FIG. 11

rise in the hydraulic tank. Heat is generated when the hydraulic fluid is by-passed through the relief valve to the tank and if the pump is left running unnecessarily without utilising the copying slides, viscosity of the oil can be reduced and can affect smooth operation.

S P A R E P A R T S L I S T

ALL-GEARED HEAD

ALL-GEARED HEAD



ALL-GEARED HEAD

Item No.	Part No.	Description	No. Off
1	L5-2-1H L5-2-1D	Headstock, Model L5 (L5-2-1G)... "Model L5A (L5-2-1F)..."	1
2	L5-2-106	Washer ...	4
3	OS-10	"O" Ring ...	4
4	L5-2-159	Cover ...	1
5		Speed Plate ...	1
6	L5-2-104	(When ordering state Speed Range) ...	1
7	L5-2-103	Spacing Washer...	4
8	L5-2-20	"Perspex" Cover ...	1
9	L5-2-19	Oil Level Indicator ...	1
10	L21-2-141A	Window ...	1
11	SP-41	Filler Cap ...	1
12		Fibre Washer ...	1
13	L5-2-47	1/4" B.S.P. Taper Plug ...	1
14	L5-2-59	Driving Shaft ...	1
15	SKE.51102	Collar, R.H. ...	1
16	L5-2-12	Thrust Washer ...	1
17	L5-615B	Bearing ...	1
18	L5-2-49	Collar, L.H. ...	1
19	L5-2-48	Double Gear, 35T and 45T L5-2-174 for alternative driving shaft assembly	1
20	L5-2-69	Double Gear, 20T and 26T L5-2-173 for alternative driving shaft assembly	1
21	L5-884	Clutch Operating Block ...	1
22	L5-885	Washer, Clutch Block ...	1
23	L5-213	Washer, Clutch Pin ...	1
24	L5-624	Bearing ...	1
25	L5-609	Clutch Push Rod L6-2-23B for alternative driving shaft assembly ...	1
26	L5-608	Pin ...	1
27	L5-2-67	Clutch Plate, R.H. ...	1
28	DC.1	"Halo" Disc ...	1
29	PB.1	Brass Pin ...	1
30	RXLS 1 1/2"	Roller Bearing ...	2
31	L5-2-68	Vee Pulley ...	1
32	L5-2-63	Clutch Plate, Centre ...	1
33	DC.4	"Halo" Disc ...	1
34	L5-2-64	Pin ...	6
35	L5-2-66	Clutch Plate, L.H. ...	1
36	L5-814	Washer ...	3
37	SG.15A	Washer ...	1
38		Spring SG.236 for alternative driving shaft assembly ...	1
39	L5-613	Clutch Adjuster L6-2-24 for alternative driving shaft assembly ...	1

Item No.	Part No.	Description	No. Off
40	L5-2-172	Driving Shaft ...	1
41	L5-2-99	Sealing Plug ...	1
42	L5-212	Bearing ...	1
43	L5-2-149	Collar ...	1
44	L5-2-193	Clutch Operating Block ...	1
45	L5-2-128	Braking Ring ...	1
46	L5-2-194	Braking Collar ...	1
47	1/4" PG 2"	Pin ...	1
48		1 1/8" dia. External Circlip ...	1
49	L5-884	Washer ...	1
50	L1 1/8"	Ball Journal ...	1
51	L5-2-120	Locating Plate ...	1
52	L5-2-187	Vee Pulley ...	1
53	L1 1 3/8"	Ball Journal ...	1
54	L6-2-126	Clutch Plate, R.H. ...	1
55	DC.6	"Halo" Disc ...	2
56	L16-2-20	Pin for Clutch Disc ...	6
57	L16-2-110	Clutch Plate, Centre ...	1
58	L6-2-124	Clutch Plate, L.H. ...	1
	L5-2-125	Clutch Plate Adjusting Nut ...	1
	L5-2-150	Spacer, Inner Clutch Plate ...	1
		1 1/8" External Circlip } Not 1 1/8" External Circlip } illust.	1
59	L5-840	Clutch Lever ...	1
60	BB.2	Ball, 1 1/2" dia. ...	1
61	L5-2-5	Boss ...	1
62	L5-2-4	Stop Piece ...	1
63	L5-2-7	Eccentric Stud ...	1
64	L5-2-6	Bush ...	1
65	L5-610	Shoe ...	1
66	L5-2-3	Top Selector Bracket ...	1
67	L5-2-18	Selector Boss ...	2
68	SG.5	Spring ...	2
69	SB.3	Steel Ball, 1/2" dia. ...	2
70	L5-654	Selector Lever ...	2
71	BB.1	Ball, 1" dia. ...	2
72	L5-2-16	Interlocking Lever, R.H. ...	1
73	L5-205	Stud, R.H. ...	1
74	L5-221	Shoe ...	1
75	L5-2-17	Stud, L.H. ...	1
76	L5-206	Interlocking Lever, L.H. ...	1
77	L5-220A	Shoe ...	1
78	L5-2-175	Intermediate Shaft ...	1
79	L5-2-95	Sealing Plug ...	1

Part Nos. bracketed thus (—) refer to 1 1/8" bore Spindle Components.
 Part Nos. marked thus † fitted on previous models.

ALL-GEARED HEAD

Item No.	Part No.	Description	No. Off
80	L5-214	Bearing ...	1
81	L5-2177	Gear 46T ...	1
82	L5-2-12	Gear 56T ...	1
83	L5-2-176	Gear 56T ...	1
84	L5-2-10	Gear 65T ...	1
85	L5-2-9	Gear 71T ...	1
86	L5-2-178	Spacing Bush ...	1
87	L5-215A	Bearing ...	1
88	L5-2-117	Oil Seal M1. 062100 1/4" SE85 ...	1
89	L5-615A	Collar ...	1
90	L5-2-191	Main Spindle (L5-2-189) ...	1
91	L5-2-101	Sleeve (for 1 3/8" bore spindle only) ...	1
92	L5-585A	Centre No. 3 Morse Taper ...	1
93	L5-202	Bearing Cover (L5-2-41) ...	1
94	L5-604	Washer (L5-2-45) ...	1
95	355/354B	Timken Taper Roller Bearing (387/382B) ...	1
96	L5-233	Spacer (L5-2-42) ...	1
97	355/354A	Timken Taper Roller Bearing (387/382A) ...	1
98	L5-2-39	Lock Nut (L5-2-83) ...	1
99	L5-2-195	Main Spindle Gear (L5-2-192) ...	2
100	SG.5	Spring ...	1
101	SB.3	Steel Ball, 1/4" dia. } alternative front gear selector assy. with	1
102	L5-2-31	Spindle Gear, Inner 42T (L5-2-37) ...	1
103	L5-203	Ball Journal (XLU 1 1/4") ...	1
104	L5-2-32	Bearing Cover (L5-2-79) ...	1
105	L5-2-32	Spindle Gear, Outer 42T (L5-2-38) ...	1
106	L5-652	Lock Nut (L5-2-39) ...	1
107	L5-2-57	Tail End Sleeve (L5-2-165) ...	1
108	WR.19	Wrench (WR.20) ...	2
109	L5-2-190	Main Spindle ...	1
110	L5-2-77	(1 3/8" Bore L00 Taper Nose) ...	1
111	L5-2-151	Key (1 3/8" Bore L00 Taper Nose) ...	1
112	L5-2-45	Draw Nut ...	1
113	WR.17	(1 3/8" Bore L00 Taper Nose) ...	1
114	L5-2-23A	Washer (1 3/8" Bore L00 Taper Nose) ...	1
115	L5-2-22A	Wrench (1 3/8" Bore L00 Taper Nose) ...	1
116	L5-218A	Idle Gear, Inner 32T ...	1
117	L5-2-118	Idle Gear, Outer 32T ...	1
118	L5-2-179	Bush ...	1
119	L5-2-180	Oil Seal M1.075112 1/4" SE85 ...	1
120	L5-2-116	Reverse Shaft ...	1
121	L5-2-119	Gear, 42T ...	1
122	L5-626	Bearing ...	1
		Oil Seal M1.087125 3/8" SE85 ...	1
		Collar ...	1

Item No.	Part No.	Description	No. Off
123	7" F.B.	Hexagon Nut ...	1
124	L5-629	Feed Gear Selector Rack ...	1
125	SG.5	Spring ...	1
126	SB.3	Steel Ball 1/4" dia. ...	1
127	L5-2-13	Feed Gear Selector ...	1
128	SP.40	Hand Wheel ...	1
129	L5-2-84A	Hand Wheel ...	1
130	L5-210A	Front Gear Selector Shaft ...	1
131	L5-220	Selector Lever (L5-2-44A) ...	1
132	L5-7-9	Shoe (L5-2-43) ...	1
133	BB.2	Hand Lever ...	1
		Ball 1 1/2" dia. ...	1

Item No.	Part No.	Description	No. Off
134	L5-2-108A	Front Gear Selector Shaft ...	1
135	L5-2-114A	Selector Boss ...	1
136	L5-2-113	Swivel Pin ...	1
137	L5-2-109	Hand Lever ...	1
138	L5-2-110A	Locating Plate ...	1
139	L5-2-111B	Plunger ...	1
140	L5-2-112	Return Pin ...	1
141	SG.231	Return Pin ...	1
		Spring ...	1

Item No.	Part No.	Description	No. Off
	L5-2-171A	Clutch Lever ...	1
	BB.2	Bakelite Ball 1 1/4" dia. ...	1
	L5-2-170C	Boss ...	1
	L5-2-188	Pin ...	1
	SG.231	Spring ...	1
	L5-2-112	Return Pin ...	1
	L5-2-111B	Plunger ...	1
	L5-2-169A	Fork ...	1
	L5-2-168	Locating Plate ...	1
	L5-2-167A	Eccentric Stud ...	1
	L5-2-6	Bush ...	1
	L5-610	Shoe ...	1

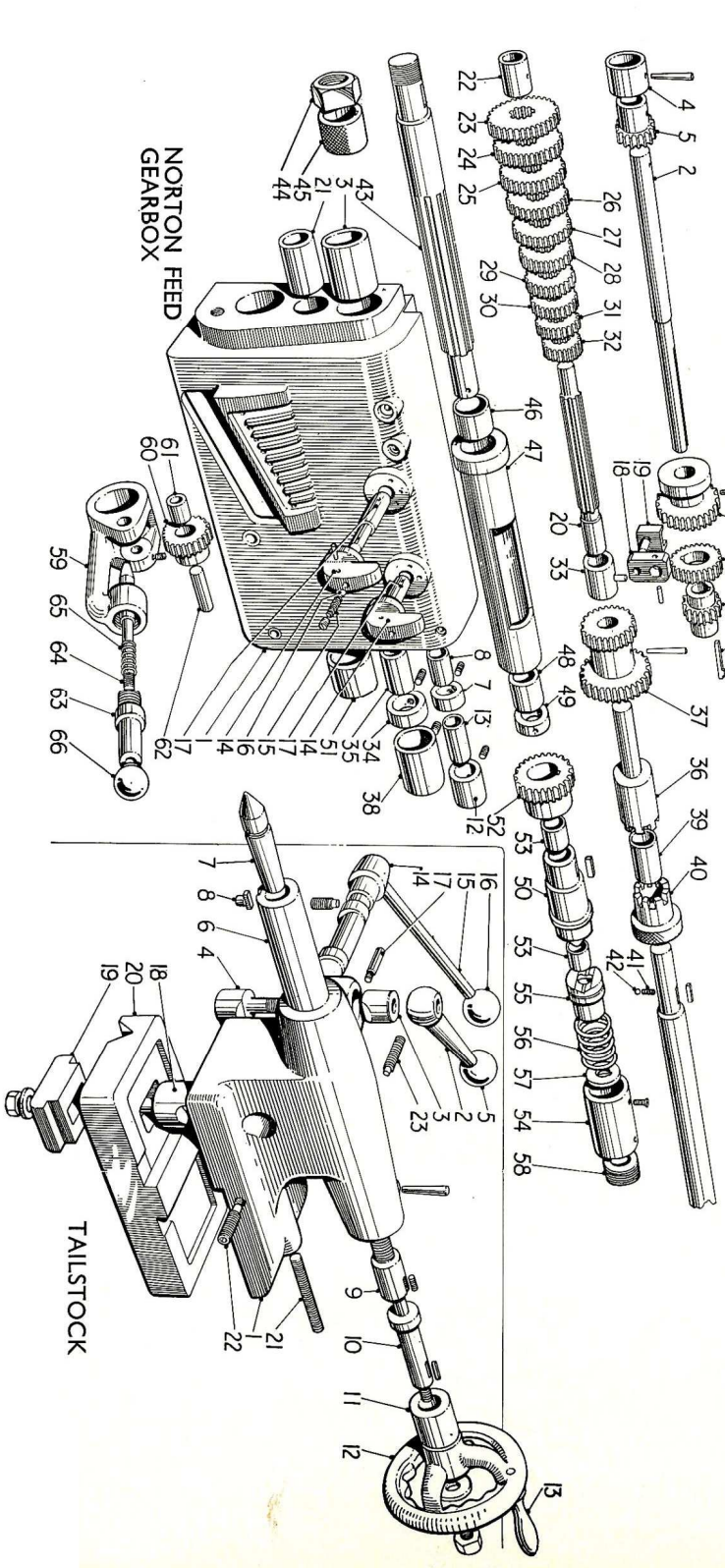
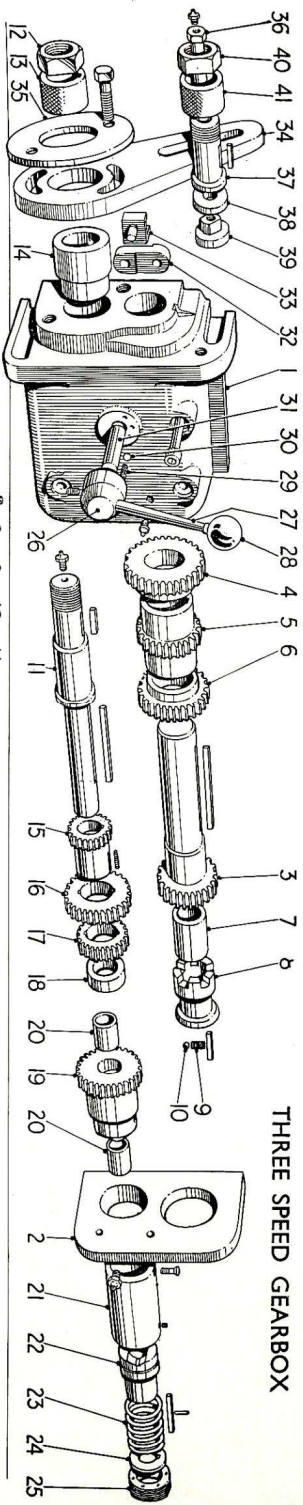
**ALTERNATIVE FRONT GEAR
SELECTOR ASSEMBLY**

**ALTERNATIVE SAFETY CLUTCH
LEVER ASSEMBLY
(Not illustrated)**

S P A R E P A R T S L I S T

**GEARBOXES
AND
TAILSTOCK**

GEARBOXES and TAILSTOCK



GEARBOXES and TAILSTOCK

Item No.	Part No.	Description	No. Off
NORTON FEED GEARBOX			
1	L5-3-1A	Gearbox ...	1
2	L5-3-5	Top Shaft ...	1
3	L5-3-40	Bush, L.H.	1
4	L5-3-7	Sleeve ...	1
5	L5-3-6	Gear 16T	1
6	L5-3-8	Gear 32T	1
7	L5-3-59	Sleeve ...	1
8	L5-3-41	Bush, Centre	1
9	L5-3-10	Sliding Gear 24T	1
10	L5-3-9	Sliding Gear 16T	1
11	SK.8	Key ...	1
12	L5-3-60	Sleeve ...	1
13	L5-3-42	Bush, R.H.	1
14	L5-3-3	Selector Handle	2
15	SG.142	Spring ...	2
16	SB.2	Steel Ball, $\frac{3}{8}$ " dia.	2
17	L5-3-56	Selector Shaft	1
18	L5-3-39 & 39A	Selector Lever (L.H. & R.H.)	1 off each
19	L5-3-38	Selector Shoe	2
20	L5-3-63	Mid. Shaft ...	1
21	L5-3-58	Sleeve ...	1
22	L5-3-43	Bush, L.H.	1
23	L5-3-73	Gear 32T	1
24	L5-3-72	Gear 30T	1
25	L5-3-71	Gear 28T	1
26	L5-3-70	Gear 26T	1
27	L5-3-69	Gear 24T	1
28	L5-3-68	Gear 22T	1
29	L5-3-67	Gear 20T	1
30	L5-3-66	Gear 19T	1
31	L5-3-65	Gear 18T	1
32	L5-3-64	Gear 16T	1
33	L5-3-76	Spacer ...	1
34	L5-3-61	Sleeve ...	1
35	L5-3-75	Bush, R.H.	1
36	L5-3-74	Clutch Shaft, Leadscrew	1
37	L5-3-13	Gear 24T and 32T	1
38	L5-3-45	Bush, Clutch Shaft	1
39	L5-3-49	Bush, Leadscrew	1
40	L5-3-15A	Clutch ...	1
41	SG.5	Spring ...	1
42	SB.3	Steel Ball, $\frac{1}{4}$ " dia.	1
43	L5-3-77	Bottom Shaft	1
44	$\frac{7}{8}$ " FB	Hexagon Nut ...	1
45	L5-502	Change Wheel Collar ...	1

Item No.	Part No.	Description	No. Off
Norton Feed Gearbox (contd.)			
†46	L5-3-46	Bush, L.H.	1
47	L5-3-78	Sleeve ...	1
48	L5-3-47	Bush, R.H.	1
49	L5-3-17	Collar ...	1
50	L5-3-31	Slipping Clutch Shaft	1
51	L5-3-48	Bush ...	1
52	L5-3-30	Gear 32T	1
53	L5-3-50&89	Bush, Feedshaft	1 off each
54	L5-3-35	Sleeve ...	1
55	L5-3-32	Slipping Clutch	1
56	SG.266	Spring ...	1
57	L5-3-34	Washer ...	1
58	L5-3-33	Adjusting Nut	1
59	L5-3-2	Swing Lever	1
60	L5-3-29	Gear 22T	1
61	L5-3-35	Bush ...	1
62	L5-3-28	Pin ...	1
63	L5-3-36	Plunger Sleeve	1
64	L5-3-37	Plunger ...	1
65	SG.141	Spring ...	1
66	BB.1	Ball, $1\frac{1}{2}$ " dia.	1

For Banjo Plate Assembly
see Three Speed Gearbox

Part Nos. marked thus † fitted on previous models.

GEARBOXES and TAILSTOCK

Item No.	Part No.	Description	No. Off
THREE SPEED GEARBOX			
1	L5-6-1A	Gearbox ...	1
2	L5-53	Endplate ...	1
3	L5-555	Top Shaft ...	1
4	L5-6-6	Gear 40T ...	1
5	L5-6-7	Gear 30T ...	1
6	L5-6-9	Gear 36T ...	1
7	L5-6-12	Bearing ...	1
8	L5-3-15A	Clutch ...	1
9	SG.5	Spring ...	1
10	SB.3	Steel Ball, $\frac{1}{4}$ " dia.	1
11	L5-6-4	Bottom Shaft	1
12	$\frac{7}{8}$ " F.B.	Hexagon Nut ...	1
13	L5-502	Change Wheel Collar	1
14	L5-6-5	Bearing, L.H.	1
15	L5-557	Gear 20T ...	1
16	L5-549	Gear 30T ...	1
17	L5-550	Gear 24T ...	1
18	L5-6-10	Bearing, R.H.	1
19	L5-6-8	Pinion, Feed Shaft...	1
20	L5-3-50&89	Bearing ...	1 off each
21	L5-3-35	Sleeve ...	1
22	L5-3-32	Slipping Clutch ...	1
23	SG.266	Spring ...	1
24	L5-3-34	Washer ...	1
25	L5-3-33	Adjusting Nut ...	1
26	L5-6-11	Selector Boss	1
27	L5-7-13	Lever ...	1
28	BB.1	Ball, $1\frac{1}{2}$ " dia.	1
29	SG.5	Spring ...	1
30	SB.3	Steel Ball, $\frac{1}{4}$ " dia.	1
31	L5-6-13	Selector Shaft ...	1
32	L5-6-2	Gear Mover Lever	1
33	L5-6-3	Gear Mover Shoe	1
34	L5-13-13	Banjo Plate ...	1
35	L5-13-14A	Lock Plate ...	1
36	L5-196	Changewheel Stud	1
37	L5-505	Changewheel Socket	1
38	L5-198	Collar, Stud ...	1
39	L5-197	Nut, Stud ...	1
40	$\frac{7}{8}$ " F.B.	Hexagon Nut ...	1
41	L5-502	Changewheel Collar ...	1
	L5-13-18	Lock Washer (not illustrated)	2

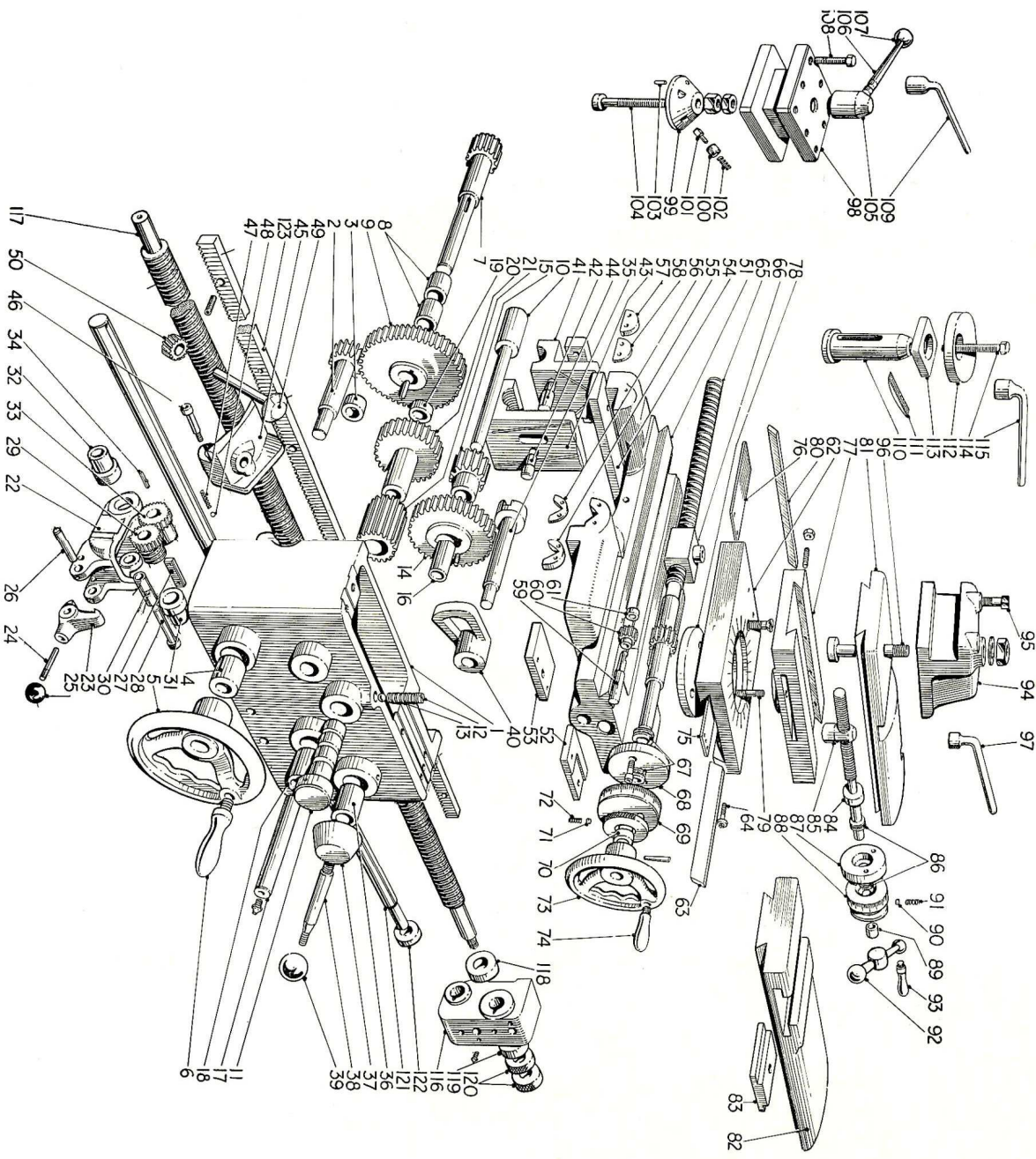
Item No.	Part No.	Description	No. Off
LOOSEHEAD			
1	L5-7-3	Tailstock (Model L5)	1
2	L5-7-4	Tailstock (Model L5A)	1
3	L5-589	Locking Lever (Quill)	1
4	L5-7-18	Locking Bush (Quill)	1
5	L5-7-17	Locking Bolt (Quill)	1
6	BB.1	Ball, $1\frac{1}{2}$ " dia.	1
7	L5-595C	Quill (L5-595A Metric) No. 3 M.T.	1
8	L5-585A	Centre No. 3 Morse Taper	1
9	L5-94	Key ...	1
10	L5-96	Nut ...	1
11	L5-7-15A	Screw ...	1
12	L5-49	Bush ...	1
13	L5-7-16	Handwheel	1
14	L5-598	Handle ...	1
15	L5-7-10	Eccentric Lock Stud	1
16	L5-7-9	Locking Lever ...	1
17	BB.2	Ball, $1\frac{1}{2}$ " dia.	1
18	L5-7-6	Stop Pin ...	1
19	L5-50	Eye Bolt ...	1
20	L5-7-5	Holding Down Plate ...	1
21	$\frac{1}{4}$ " BSP	Base ...	1
22	FX 3 $\frac{3}{4}$	Set Up Screw, End ...	1
23	$\frac{1}{4}$ " BSP/ FX 1 $\frac{1}{2}$ " FX 1 $\frac{3}{4}$ "	Set Up Screw, Front ... Set Up Screw, Rear ...	1

Part Nos. marked thus ‡ fitted on previous models.

S P A R E P A R T S L I S T

APRON, SADDLE & SLIDES

APRON, SADDLE and SLIDES



APRON, SADDLE and SLIDES

Item No.	Part No.	Description	No. Off
1	L5-4-1	Apron ...	1
2	L5-4-2A	Hand Motion Pinion	1
3	L5-4-3	Bearing, Rear ...	1
4	L5-4-5	Bearing, Front ...	1
5	L5-4-39	Handwheel ...	1
6	L5-597	Handle ...	1
7	{ L5-4-15B L5-4-15C	Rack Pinion ...	1
8	L5-4-4	Rack Pinion (for Profile Lathe) ...	1
9	L5-4-33	Bearing ...	1
10	L5-4-37	Gear ...	1
11	L5-4-35	Sliding Shaft	1
12	SG-5	Knob ...	1
13	SB-3	Spring ...	1
14	L5-583A	Steel Ball, $\frac{1}{4}$ " dia.	1
15	L5-576A	Gear ...	1
16	L5-4-41	Pinion ...	1
17	L5-4-38	Bush ...	1
18	L5-4-7	Worm Wheel Shaft	1
19	L5-4-6	Sleeve, Front ...	1
20	L5-88	Sleeve, Rear ...	1
21	L5-565	Worm Wheel ...	1
22	L5-4-9	Broad Pinion ...	1
23	L5-4-10	Worm Box ...	1
24	L5-4-18	Clip ...	1
25	B.B.1	Lever ...	1
26	L5-4-11	Ball, 1" dia.	1
27	L5-564	Hinge Pin ...	1
28	L5-4-40	Clip Bar ...	1
29	L5-567	Stud, Worm ...	1
30	L5-87	Worm and Pinion	1
31	L5-86A	Bush ...	1
32	L5-86	Bearing, R.H., Box	1
33	L5-566	Bearing, L.H., Box	1
34	L5-699	Gear ...	1
35	L5-4-36	Key ...	1
36	L5-4-8	Shaft, Nut Slides ...	1
37	L5-4-17A	Bearing ...	1
38	L5-4-16	Boss, Lever ...	1
		Lever ...	1

Item No.	Part No.	Description	No. Off
39	B.B.1	Ball, 1" dia.	1
40	L5-4-34	Interlocking Quadrant ...	1
41	L5-4-19	Nut Slide, Top ...	1
42	L5-538	Pin, Long ...	1
43	L5-4-20	Nut Slide, Bottom ...	1
44	L5-539	Pin, Short ...	1
45	L5-4-21	Indicator Bracket ...	1
46	S.S. $\frac{1}{8}$ " x 2"	Pivot Stud ...	1
47	SG-5	Spring ...	1
48	SB-3	Steel Ball, $\frac{1}{4}$ " dia.	1
49	L5-4-13	Dial ...	1
50	L5-90	Pinion ...	1
	L5-4-32	Nut Slide Plate ...	1
	L5-4-31	Bearing Pad, Nut Slide Plate (Not Illust.)	2
SADDLE AND SLIDES			
51	L5-5-96	Saddle ...	1
52	L5-34B	Front Strip, R.H.	1
53	L5-5-95	Front Strip, L.H.	1
54	L5-5-91	Rear Strip ...	1
55	L5-5-16	Wiper Cover, Front ...	1
56	L5-5-7 & 9	Wipers ...	1
57	L5-5-17	Wiper Cover, Rear ...	1
58	L5-5-8 & 10	Wipers ...	1
59	L5-697	Stud ...	1
60	L5-696	Pinion ...	1
61	L5-698	Collar ...	1
62	L5-25	Cross Slide ...	1
63	L5-33	Strip ...	1
64	L5-16-39	Adjusting Screw ...	1
65	L5-5-46A	Screw (L5-5-48A Metric)	1
66	L5-93	Nut (L5-808 Metric)	1
67	SKF.51102	Thrust Bearing ...	2
68	L6-5-8	Fixed Collar ...	1
69	L5-5-42	Micrometer Collar (L5-5-45A Metric)	1
70	L5-5-43A	Bush ...	1
71	L5-5-15	Die Piece ...	2
72	SG-289	Spring ...	2
73	L5-31B	Handwheel ...	1

Part Nos. marked thus † fitted on previous models.

APRON, SADDLE and SLIDES

Item No.	Part No.	Description	No. Off
74	L5-5-60	Saddle and Slides (contd.)	1
75	L5-345	Handle ...	1
+76	L5-346	Cover Plate, Front	1
77	L5-268	Cover Plate, Rear	1
78	L5-572A	Swivel Slide	1
79	L5-573A	Clamp Plate	1
80	L5-91	Studs ...	2
81	L5-27	Strip ...	1
82	L5-5-22A	Top Slide (Model L5)	1
84	L5-5-47A	Top Slide (Model L5A)	1
85	L5-92	Screw (L5-5-49A Metric)	1
86	SKF 51101	Nut (L5-811 Metric)	1
87	L5-5-40	Thrust Bearing ...	2
88	L5-5-39	Fixed Collar ...	1
89	L5-5-55A	Graduated Collar (L5-5-44A Metric)...	1
90	L5-5-15	Bush ...	2
91	SG-290	Die Piece ...	2
92	L5-5-57A	Spring ...	1
93	L5-570	Ball Handle	1
94	L5-5-28	Handle ...	1
95	$\frac{3}{8}$ " FZ.1 $\frac{3}{4}$ "	Tool Holder	2
96	L5-5-29	Square Head Set Screw	1
97	WR.7	Pivot Stud	1
83	L5-5-30	Wrench ...	1
	L5-5-30	Tee Piece (Model L5A) ...	1
	L5-5-61	Swarf Shield in Saddle (Not Illustrated)	1
	L5-5-50	Cover, Cross Slide Ways (Not Illust.) ...	1
	L5-5-93	Adjusting screw, LH front strip (Not ill.)	1
	L5-5-94	Locking Piece, LH front strip (Not ill.)	1
	L5-5-92	Rear Saddle Strip (Not illust.) ...	1
		FOUR WAY TOOLPOST	
98	L5-5-27	Square Turret	1
99	L5-712	Pivot ...	1
100	L5-715	Plunger Shell	1
101	L5-716	Plunger ...	1
102	SG-26	Spring ...	1
103	$\frac{3}{8}$ " P.R. $\frac{3}{4}$ "	Dowel ...	1
104	L5-5-29	Pivot Stud	1
105	L5-726	Nipping Boss	1
106	L5-713	Tightening Lever	1
107	BB.1	Ball, 1" dia.	1
108	$\frac{5}{8}$ " FZ.1 $\frac{3}{4}$ "	Square Head Set Screw	8
109	WR.7	Wrench ...	1
		AMERICAN TOOLPOST (L5A Model)	
110	L5-5-25	Tool Post ...	1
111	L5-5-24	Tool Plate	1
112	L5-5-23	Ring ...	1
113	L5-5-26	Clamp Plate	1
114	$\frac{1}{2}$ " FZ.2 $\frac{1}{2}$ "	Square Head Screw	1
115	WR.10	Wrench ...	1

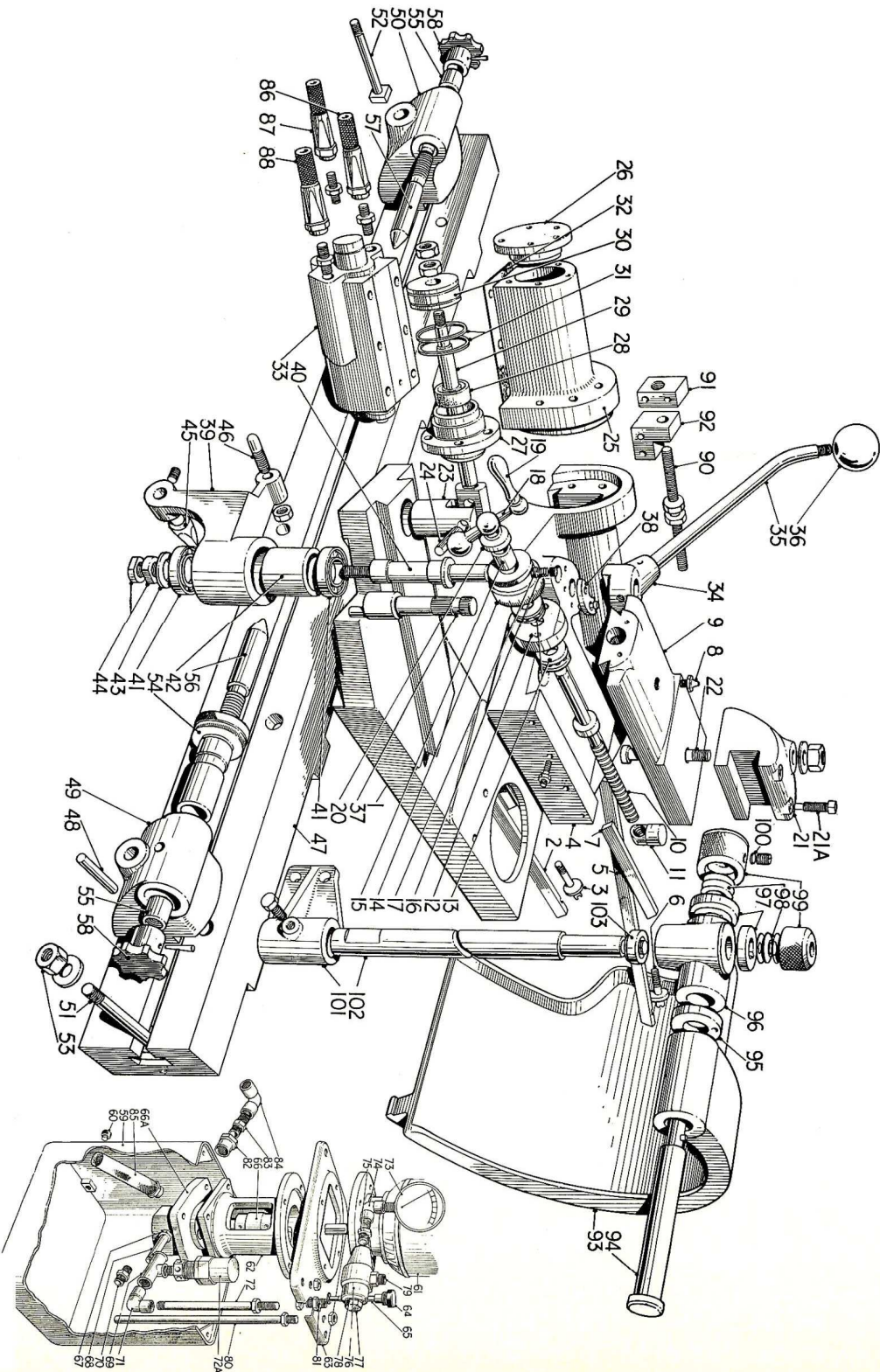
Item No.	Part No.	Description	No. Off
	L6-5-2/N	ALTERNATIVE COMPOUND SLIDE (Not Illustrated) (L5A Model)	
	L6-5-6	Top Slide ...	1
	L6-5-7	Screw ...	1
	L6-5-3A	Nut ...	1
	L6-5-5	Bearing Housing	1
	SKF 51101	16T Gear	2
	L6-5-4B	Thrust Race ...	2
	L5-5-39	Shaft, Top Slide Handle	1
	L5-5-15	Micrometer Collar	1
	SG-290	Die ...	2
	L5-5-55	Spring ...	2
	L5-5-57A	Spacer ...	1
	L5-570	Ball Handle	1
		Handle ...	1
		EXTENDED CROSS SLIDE (Not Illustrated) (L5A Model)	
	L5-5-76	Extended Cross Slide	1
	L5-16-37	Cross Slide Strip	1
	L5-5-77	Rear Tool Post	1
	L5-5-69	Locking Nut	1
	L5-5-78	Stud, Rear Tool Post	1
		LEADSCREW AND FEEDSHAFT	
116	L5-8-1	Bracket ...	1
	L5-561A	LeadscREW	1
		(3 Speed Gearbox, 24" Centres)	
	L5-800	LeadscREW	1
		(3 Speed Gearbox, 40" Centres)	
	L5-3-51	LeadscREW	1
		(Norton Feed Gearbox, 24" Centres)...	
	L5-3-54	LeadscREW	1
		(Norton Feed Gearbox, 40" Centres)...	
	L5-588	Collar ...	1
	L5-541	Washer ...	1
	L5-540	Nut ...	2
	L5-8-2	Feed Shaft	1
		(3 Speed Gearbox, 24" Centres)	
	L5-8-3	Feed Shaft	1
		(3 Speed Gearbox, 40" Centres)	
	L5-3-82	Feed Shaft	1
		(Norton Feed Gearbox, 24" Centres)...	
	L5-3-83	Feed Shaft	1
		(Norton Feed Gearbox, 40" Centres)...	
	L5-645	Collar ...	1
	L5-8-5	Rack (24" long) ...	1
	L5-8-5B	Rack (24" long) (for Profiling Lathes)	1
	L5-8-4A	Rack (16" long) (for Profiling Lathes)	1
	L5-8-4	Rack (16" long) (40" between Centres)	1
121			
122			
123			

†Additional Equipment.
 Part Nos. marked thus † fitted on previous models.

S P A R E P A R T S L I S T

PROFILING EQUIPMENT

PROFILING EQUIPMENT



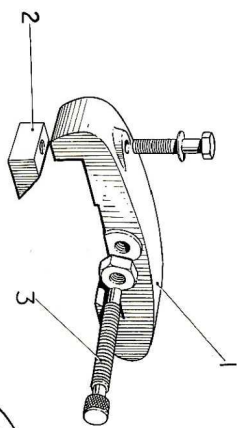
PROFILING EQUIPMENT

Item No.	Part No.	Description	No. Off
PROFILING EQUIPMENT			
1	L5-16-1	Cross Slide...	1
2	L5-16-37	Strip ...	1
3	L5-16-39	Adjusting Screw	1
4	L5-16-2	Hydraulic Slide ...	1
5	L5-16-38	Strip ...	1
6	L5 16-39	Adjusting Screw	1
7	L5-91	Strip, Top Slide...	1
8	NA5700/2	'Tecalmit' Nipple $\frac{1}{4}$ " White.	1
9	L5-5-52	Top Slide ...	1
10	L5-5-47A	Top Slide Screw (L5-5-49A Metric)	1
11	L5-92	Nut (L5-811 Metric)	1
12	L5-5-40	Fixed Collar ...	1
13	SK F51101	Thrust Race ...	2
14	L5-5-39	Graduated Collar (L5-5-44A Metric)...	1
15	L5-5-55A	Bush ...	1
16	SG-290	Spring ...	2
17	L5-5-15	Die ...	2
18	L5-5-57A	Ball Handle ...	1
19	L5-570	Handle ...	1
†20	L5-5-55	Spacer ...	1
21	L5-5-51	Tool Holder	1
21A	$\frac{3}{8}$ " FZ 1 $\frac{1}{4}$ "	Square Head Set Screws	2
22	L5-5-53	Pivot Stud	1
23	L5-16-20	Connecting End, Piston Rod	1
24	L5-16-23	Pin ...	1
25	L5-16-3	Cylinder ...	1
26	L5-16-5	End Cover, R.H.	1
27	L5-16-6	End Cover, L.H.	1
28		'U' Leather, 1 $\frac{3}{8}$ " x $\frac{3}{8}$ " B.	1
29	L5-16-22	Piston Rod	1
30	L5-16-21	Piston ...	1
31	P-2667B	Piston Rings	2
32	L5-16-123	Gasket ...	1

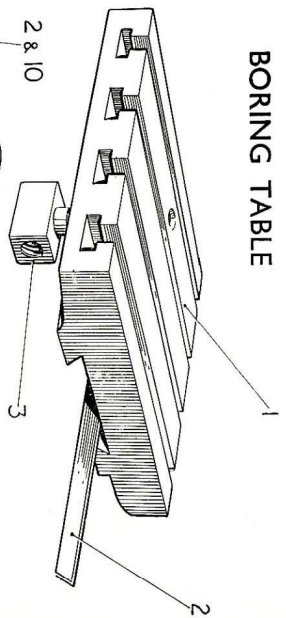
Item No.	Part No.	Description	No. Off
Profiling Equipment (contd.)			
33	L5-16/D	Valve Block (Complete) ...	1
34	L5-16-7	Boss, Control Lever	1
35	L5-16-10	Control Lever ...	1
36	BB2	Bakelite Ball, 1 $\frac{1}{2}$ " Dia. ...	1
37	L5-16-9	Eccentric Stud ...	1
38	L5-16-24	Stop Piece ...	1
39	L5-16-51	Pivot Arm, Stylus ...	1
40	L5-16-54	Swivel Stud ...	1
41	A6075 A6157	Tinken Taper Roller Bearing...	2
42	L5-16-55	Spacer ...	1
43	L5-16-56	Washer ...	1
44	L5-16-57	Lock Nut	2
45	L5-16-12	Stylus ...	1
46	L5-16-11	Contact Pin	1
47	L5-16-91	Support Block (22" Centres)	1
47	L5-16-92	Support Block (38" Centres)	1
48	L5-16-122	Dowels ...	2
49	L5-16-78	Head, R.H. Master Holder	1
50	L5-16-79	Head, L.H. Master Holder	1
51	L5-16-75	Locking Stud ...	1
52	L5-16-76	Locking Stud ...	1
53	L5-5-69	Locking Nut	2
54	L5-16-67	Eccentric Bush ...	1
55	L5-16-70	Nut ...	2
56	L5-16-68	Centre, R.H.	1
57	L5-16-17	Centre, L.H.	1
58	SP110	Handwheel	2
59	L5-16-40	Oil Containter	1
60		Plug, $\frac{1}{4}$ " B.S.P. ...	1
61	T.10	'Brook' Gryphon Totally Enclosed Motor	1
62	L5-16-50A	Flange Fitting. $\frac{1}{2}$ " H.P. 1000 R.P.M. Adaptor ...	1

Part Nos. marked thus † fitted on previous models.

MISCELLANEOUS ACCESSORIES

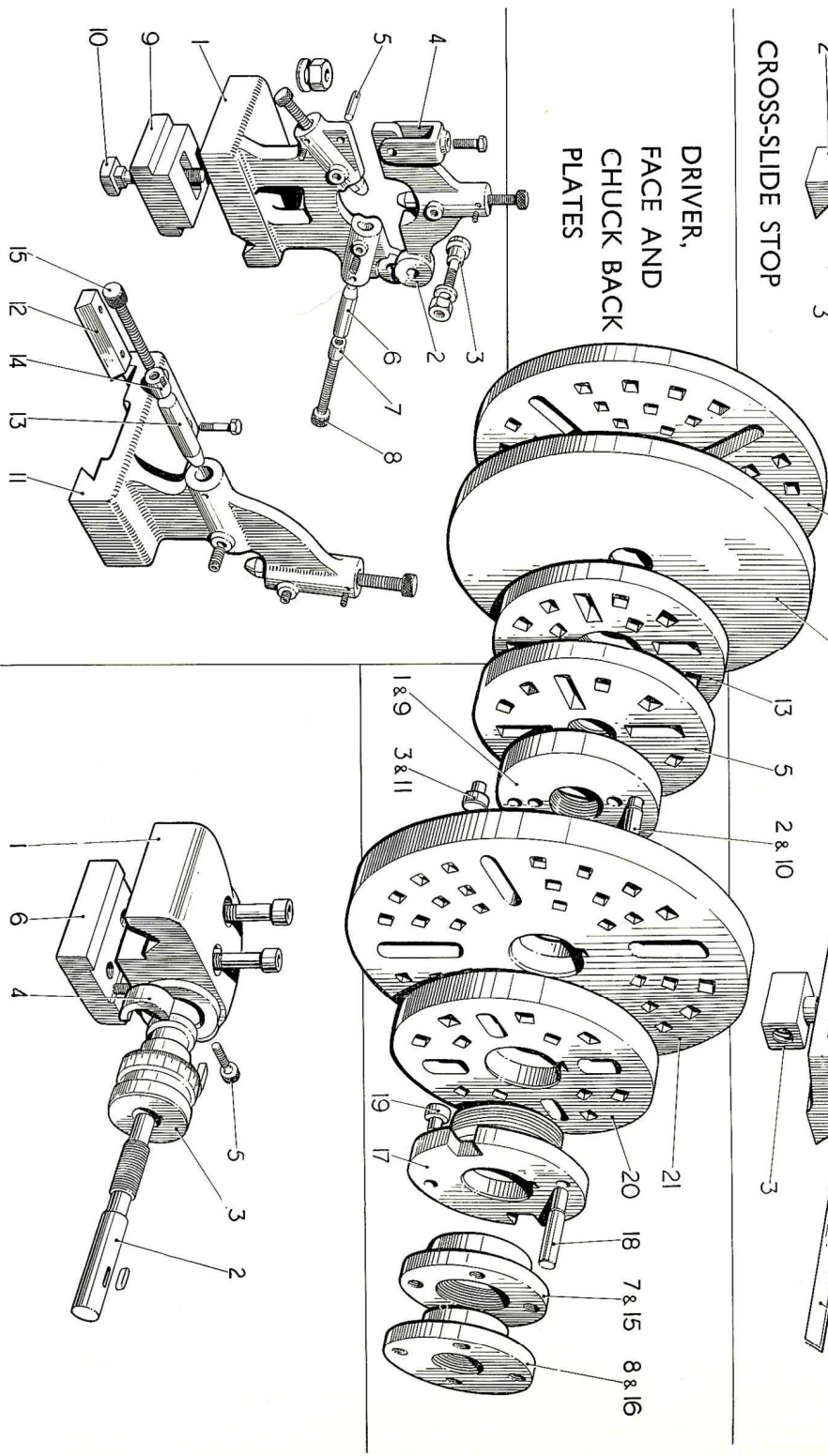


CROSS-SLIDE STOP

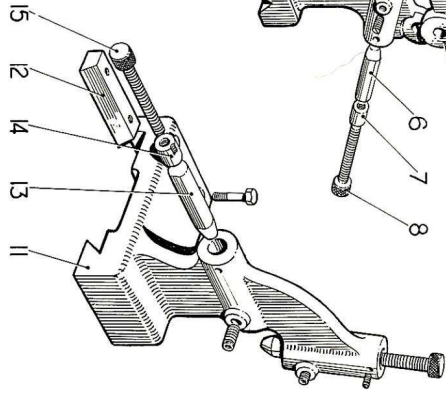


BORING TABLE

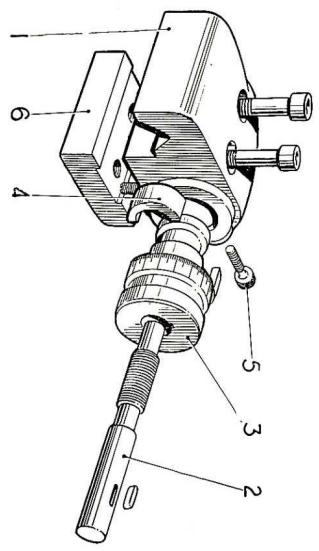
DRIVER,
 FACE AND
 CHUCK BACK
 PLATES



STEADIES



MICROMETER CARRIAGE STOP

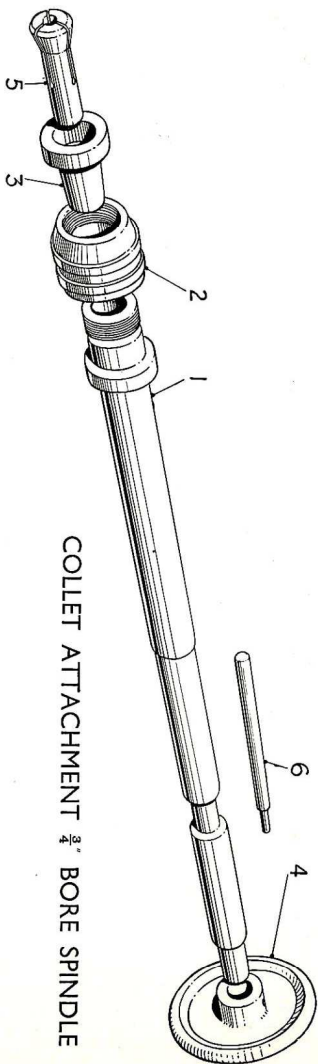


MISCELLANEOUS ACCESSORIES

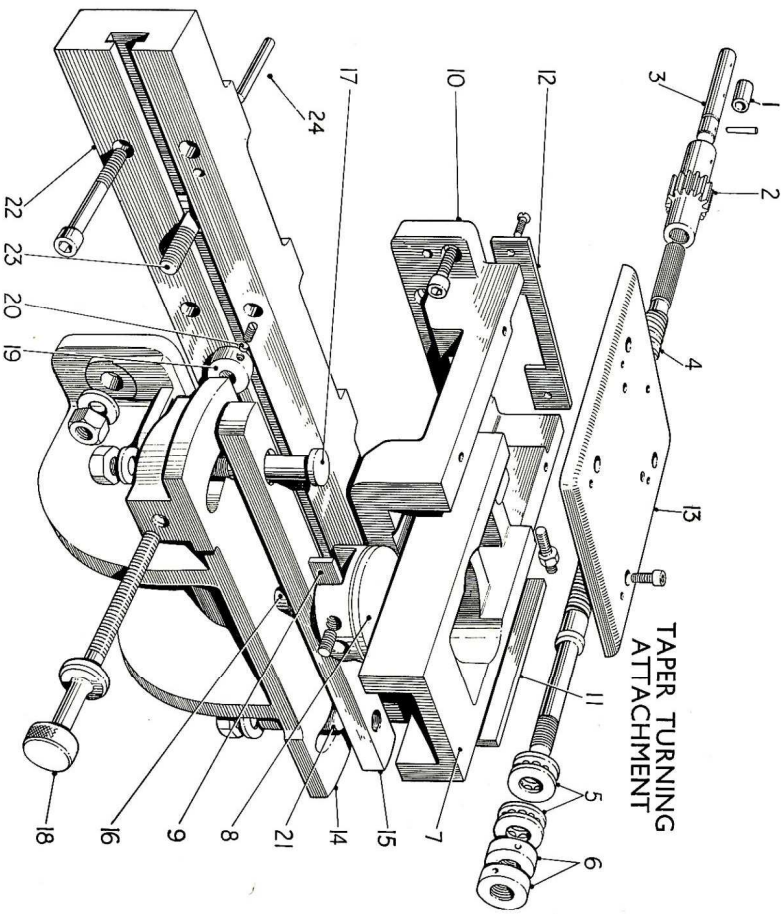
Item No.	Part No.	Description	No. Off
1	L5-10-48A	Base (Model L5)	1
2	L5-10-48	Base (Model L5A)	1
3	L5-10-49	Top	1
4	L5-521	Swivel Stud	1
5	L5-95	Clip	1
6	L5-640	Hinge Pin	1
7	L5-10-50	Pin	3
8	L5-522	Nut	3
9	$\frac{5}{16}$ " FY 2 $\frac{1}{2}$ "	Screw	3
10	L5-50	Clamp Plate	1
	$\frac{1}{2}$ " BC3 [*]	Clamp Bolt	1
		TRAVELLING STEADY*	
11	L5-9-10	Body (Model L5)	1
†12	L5-9-9	Body (Model L5A)	1
13	L5-73	Strip	1
14	L5-69	Pin	2
15	L5-522	Nut	2
	$\frac{5}{16}$ " FY 1 $\frac{3}{4}$ "	Screw	2
		DRIVER, FACE AND CHUCK BACK PLATES	
		$\frac{3}{4}$" BORE SPINDLE	
*1	L5-9-4	Driver Plate, 6" diam.	1
*2	L5-531	Pin	1
*3	L5-9-8	Balance Peg	1
4	L5-230	Driver Plate, 15" diam.	1
*5	L5-22	Face Plate, 9" diam.	1
6	L5-23	Face Plate, 15" diam.	1
7	L5-10-260	Back Plate	1
8	L5-241A	(5" 3 Jaw Self-Centring Chuck) Back Plate (8" 4 Jaw Independent Chuck)	1
		$1\frac{1}{8}$" BORE SPINDLE	
*9	L5-9-3	Driver Plate, 6" diam.	1
*10	L5-531	Pin	1
*11	L5-9-8	Balance Peg	1
12	L5-10-20	Driver Plate, 15" diam.	1
*13	L5-9-1	Driver, Face and Chuck Back Plates (cont'd.)	1
14	L5-10-18	Face Plate, 9" diam.	1
15	L5-10-263	Face Plate, 15" diam.	1
		Back Plate (6", 3 Jaw Self-Centring Chuck)	1
16	L5-10-17	Back Plate (9", 4-Jaw Independent Chuck)	1
		$1\frac{1}{8}$" BORE SPINDLE (L00 Taper Nose)	
*17	L5-9-5	Driver Plate	1
*18	L5-531	Pin	1
*19	L5-9-8	Balance Peg	1
*20	L5-9-7	Face Plate, 9 $\frac{1}{4}$ " diam.	1
21	L5-10-81	Face Plate, 15" diam.	1
		MICROMETER CARRIAGE STOP	
1	L5-10-31	Body (L5-10-61 Metric)	1
2	L5-10-33	Screw (L5-10-59 Metric)	1
3	L5-10-32	Micrometer Collar (L5-10-60 Metric)	1
4	L5-10-35	Die Piece	1
5	L5-10-36	Knurled Screw	1
6	L5-10-34	Clamp Plate	1
		CROSS SLIDE STOP	
1	L5-10-37	Body	1
2	L5-10-38	Clamping Strip	1
3	L5-10-39	Screw	1
	L5-10-146	Locknut	1
		BORING TABLE	
1	L5-247	Table	1
2	L5-260	Strip	1
3	L5-93	Nut	1

* Standard equipment.
 Part Nos. marked thus † fitted on previous models.

MISCELLANEOUS ACCESSORIES



COLLET ATTACHMENT $\frac{3}{4}$ " BORE SPINDLE



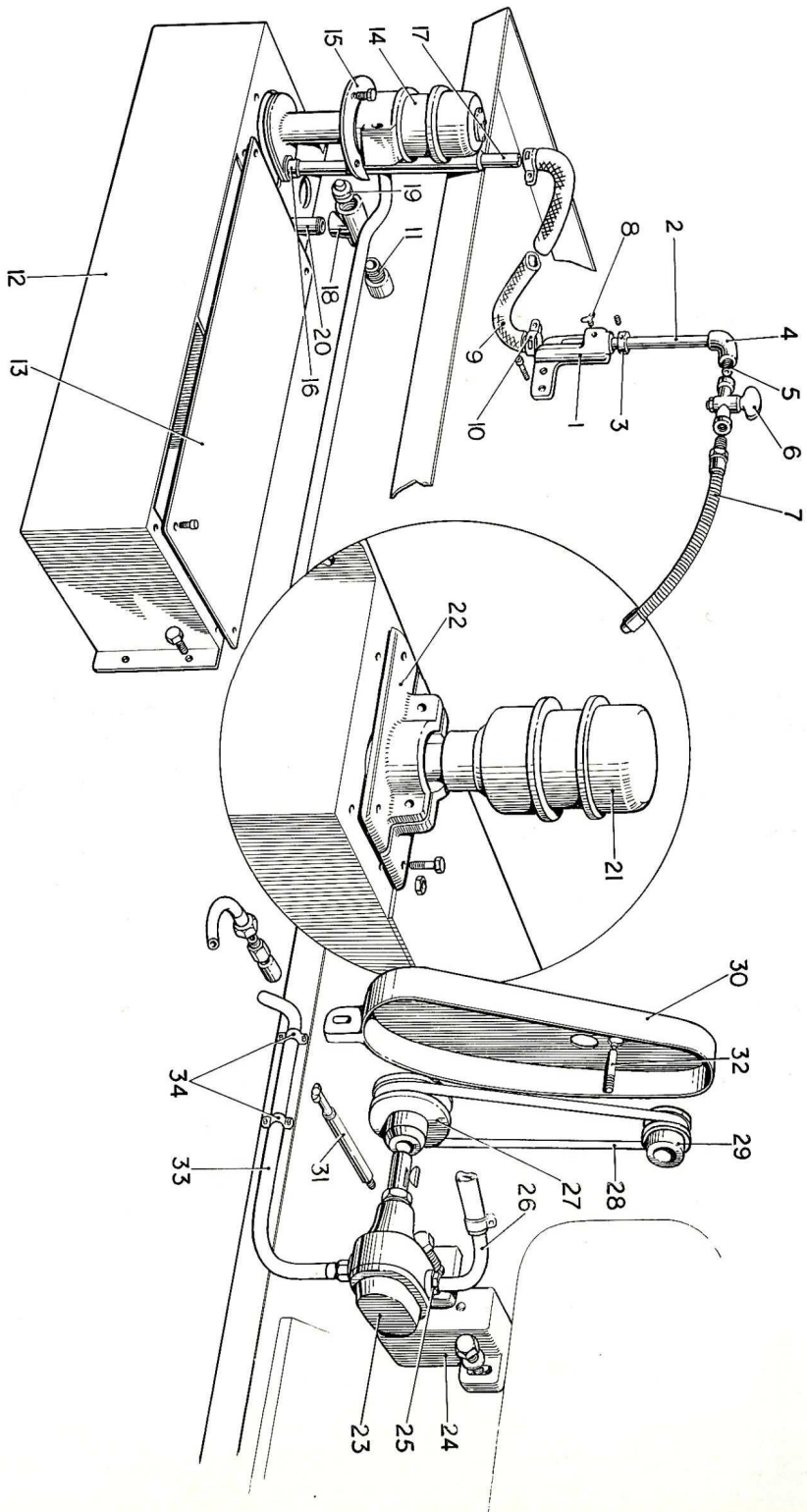
TAPER TURNING ATTACHMENT

MISCELLANEOUS ACCESSORIES

Item No.	Part No.	Description	No. Off
COLLET ATTACHMENT			
Draw Tube Type			
($\frac{3}{8}$" BORE SPINDLE)			
1	L5-10-245	Draw Tube...	1
2	L5-249	Nose Piece ...	1
3	L5-676	Closer Bush ...	1
4	L5-10-246	Handwheel ...	1
5	L5-677	Collets ...	As requ'd
6	L5-10-88	Tommy Bar ...	1
	L5-10-247	Nut } (Not Illustrated)	1
	L5-10-239	Key } (Not Illustrated)	1
COLLET ATTACHMENT			
Draw Tube Type			
($\frac{1}{8}$" BORE SPINDLE Screwed and			
Taper Nose)			
(Not Illustrated)			
	L5-10-244	Draw Tube (L00 Spindle)	1
	L5-10-243	" (Screwed Nose)	1
	L5-10-153	Spindle Nose Cover (L00 Spindle)	1
	L5-10-140	" (Screwed Nose)	1
	L5-10-154	Closer Bush ...	1
	L5-10-240A	Hand Wheel ...	1
	L5-10-158	Anchor Plate ...	1
	L5-10-249	Nut ...	1
	L5-10-172	Collets ...	As requ'd
	WR-24	Wrench ...	1
	WR-29	Wrench (Screwed Nose Only)	1
	L5-10-248	Thrust Washer ...	1
	L5-10-239	Key ...	1
TAPER TURNING ATTACHMENT			
1	L16-12-4	Bush ...	1
2	L5-14-28A	Pinion } supplied integral	1
3	L6-12-4	Shaft }	1
4	L5-14-16	Screw (L5-14-29 Metric)	1
5	SKF-51101	Thrust Bearing ...	2
6	L5-14-22	Lock Nut ...	2
7	L5-14-10A	Slide Block...	1
8	L5-14-40	Top Slide ...	1
9	L5-14-20	Strip ...	1
10	L5-14-12A	Support Bracket Slide Block	1
11	L5-14-21	Strip ...	1
12	L5-14-18	Cover Strip ...	1
13	L16-12-12A	Cover Plate ...	1
14	L5-14-14	Support Bracket (L5-14-14A Metric)	1
15	L5-14-41	Swivel Slide ...	1
16	L5-14-36	Swivel Pin ...	1
17	L5-14-25	Stud, Taper Setting ...	1
18	L5-14-24	Screw, Taper Setting ...	1
19	L5-14-26	Collar ...	1
20	L5-14-32	Die Piece ...	1
21	L5-14-37	Locking Stud ...	1
22	L5-16-84	Block, Bed (24" between Centres)	1
23	L5-16-85	Block, Bed (40" between Centres)	1
24	L5-822	Bolt ...	2
	L5-16-122	Dowels ...	2
	L5-346	Rear Cover Plate } Not	1
	L5-14-34	Saddle Cover } Illustrated	1
	L5-14-35	Stud ...	1
	L5-14-38	Spherical Washer, male (Not illust.)	1
	L5-14-39	Spherical Washer, female (Not illust.)	1

Part Nos. marked † fitted on previous models

SUDS PUMPS



AS THE ELECTRIC SUDS PUMP IS MORE EFFICIENT
 THE MECHANICAL SUDS PUMP WILL NOT BE
 AVAILABLE AFTER DECEMBER 31st 1959.

MISCELLANEOUS ACCESSORIES

SUDS PUMPS

Item No.	Part No.	Description	No. Off
ELECTRIC AND MECHANICAL SUDS PUMPS			
COMMON PARTS			
1	L5-12-13	Bracket	1
2	L5-12-6	Stand Pipe	1
3	L5-12-7	Collar	1
4	G14-98	Elbow, $\frac{1}{2}$ " B.S.P.	1
5	L5-12-21	Hex. Nipple	1
6	G14-105A	Tap	1
7	L5-682	Flexible Pipe	1
8	L5-12-8A	Thumb Screw	1
9		Hose, 3'-2" L. (24" between Centres)	1
10	G14-95	Hose, 4'-6" L. (40" between Centres)	1
11	L5-12-17 G14-98 L5-12-27 LP198	Pipe Clip Pipe Elbow, $\frac{1}{2}$ " B.S.P. } Extra for Taper Turning Attachment Hex. Nipple, $\frac{3}{8}$ " B.S.P. } Telescopic Nozzle, tap & Universal Fitting (Not illustrated)	1 1 1 1
ELECTRIC PUMP ONLY			
+12	L5-12-2B	Suds Tank	1
+13	L5-12-3A	Cover	1
14	L21-19-1	Electric Suds Pump (A.C. supply only)	1
+15	L5-12-26	Flange (A.C. supply only)	1
16	L21-19-7	Reducing Coupling	1
+17	L5-12-24	Supply Pipe	1
+18	L5-12-28	Tea, $\frac{3}{8}$ " B.S.P.	1
+19	L5-12-29	Plug, $\frac{3}{8}$ " B.S.P.	1
+20	L5-12-5	Inlet Pipe, $\frac{3}{8}$ " B.S.P.	1
21	L5-12-31	Electric Suds Pump (D.C. supply only)	1
22	G14-121 L16-11-3	Bracket (D.C. supply only) Connecting Pipe, Bottom	1 1
	L16-11-1	Rubber Hose, $\frac{5}{8}$ " Bore X 9" Long	1
	L5-16-58	Jubilee Pipe Clip	2
	L16-12-39	Connecting Pipe	1
		Return Pipe, 10" Long	1
		Elbow, $\frac{3}{8}$ " Gas	1
		for wide cabinet base only	1
MECHANICAL PUMP ONLY			
23	L5-894	Geared Suds Pump	1
24	L5-687	Block	1
25	L5-12-25	Reducing Bush	2
26	G14-96	Bend	1
27	L5-12-14	Pump Pulley (Lathe speeds up to 720 r.p.m.)	1
	L5-743A	Pump Pulley (Lathe speed over 720 r.p.m.)	1
28		Belt, 28" L. (up to 720 r.p.m.)	1
		Belt, 30" L. (over 720 r.p.m.)	1
29	L5-12-36	Driving Pulley	1
30	L5-12-15	Belt Guard	1
31	L5-12-11	Hinge Stud	1
32	L5-12-12	Stud	1
33	L5-12-32	Tube, 3'-8" L. (24" between Centres)	1
	L5-12-32A	Tube, 5'-0" L. (40" between Centres)	1
34		Saddle	2
Electrical and Mechanical Suds Pumps (contd.)			
MECHANICAL PUMP ONLY (MODEL L5 LATHES ONLY)			
Mechanical Pump not available after December 31st, 1959			

+ Not required with wide cabinet base.
 Part Nos. marked thus † fitted on previous models.

BED and DRIVE NOT ILLUSTRATED

Part No.	Description	No. Off
L5-235A	Bed (24" between Centres) ...	1
L5-799	Bed (40" between Centres) ...	1
L5-1-1	Bed (24" between Centres) without gap	1
L5-1-50	Bed (40" between Centres) without gap	1
L5-2	Gap Piece ...	1
L5-1-55A	Cabinet Base (24" between Centres) ...	1
L5-1-56A	Cabinet Base (40" between Centres) ...	1
L5-1-138	Door ...	1
L5-1-183	Hinge Pin Short ...	1
L5-1-184	Hinge Pin long ...	1
L5-1-181	Hinge Boss short ...	2
L5-1-182	Hinge Boss long ...	2
L5-1-115	Electrical Control Panel ...	1
L5-1-2	Drive Guard (Model L5) ...	1
L5-1-2B	Drive Guard (Model L5A) ...	1
L5-1-3	Drive Cover (Model L5) ...	1
L5-1-3B	Drive Cover (Model L5A) ...	1
L5-1-4	Change Wheel Guard (Model L5) ...	1
L5-1-4B	Change Wheel Guard (Model L5A) ...	1
L5-1-98	Cover, Clutch Spring ...	1
L5-1-8	Hinge Pin ...	2
L5-1-6	Button ...	2
L5-1-7	Latch ...	1
SG-170	Spring ...	1
L5-1-108C	Wide Cabinet Base (24" between Centres) ...	1
L5-1-99C	Wide Cabinet Base (40" between Centres) ...	1
L16-1-31	Inspection Cover ...	1
L16-1-32	Louvre ...	1
L5-1-100	Motor Platform ...	1
L16-1-12	Hinge Pin ...	2
L16-1-10	Swivel Stud, Base ...	1
L16-1-9	Adjusting Screw ...	1
L16-1-11	Swivel Stud, Platform ...	1
L5-1-101	Slide Rails ...	2
L6-1-45	Washer, Support ...	4
L6-1-50	Pad, Support ...	2
L6-1-47	Pad, Support ...	2
L6-1-42	Washer, Motor Mounting ...	4
L6-1-43	Pad, Motor Mounting ...	4
ALTERNATIVE DRIVE ASSEMBLIES		
3 Phase, 50 c/s Supply		
Motor, 1 h.p., 1000 r.p.m. (22 to 500 r.p.m.)	...	1
Motor Pulley ...	...	1

For profiling end wide cabinet base machines

Part No.	Description	No. Off
A.66	Alternative Drive Assemblies 3 Phase 50 c/s. Supply (contd.) Vee Belts (Model L5) ...	2
A.68	Vee Belts (Model L5A) ...	2
L5-1-164A	Motor, 1½ h.p., 1500 r.p.m. (34 to 750 r.p.m.) ...	1
A.66	Motor Pulley ...	1
A.68	Vee Belts (Model L5) ...	2
A.68	Vee Belts (Model L5A) ...	2
L5-1-165A	Motor, 2 h.p., 1500 r.p.m. (45 to 1,000 r.p.m.) ...	1
A.68	Motor Pulley ...	1
A.71	Vee Belts (Model L5) ...	2
A.71	Vee Belts (Model L5A) ...	2
L5-1-164E	2 Speed Motor, 3/1½ h.p., 3000/1500 r.p.m. (34 to 1,500 r.p.m.) ...	1
A.66	Motor Pulley ...	1
A.68	Vee Belts (Model L5) ...	1
A.68	Vee Belts (Model L5A) ...	2
L5-1-165E	2 Speed Motor, 3/1½ h.p., 3000/1500 r.p.m. (45 to 2000 r.p.m.) ...	1
A.68	Motor Pulley ...	1
A.71	Vee Belts (Model L5) ...	1
A.71	Vee Belts (Model L5A) ...	2
3 Phase, 60 c/s. Supply		
Motor, 1½ h.p., 1800 r.p.m. (34 to 750 r.p.m.) ...		
L5-1-168B	Motor Pulley ...	1
A.66	Vee Belts (Model L5) ...	1
A.68	Vee Belts (Model L5A) ...	2
L5-1-171B	Motor, 2 h.p., 1800 r.p.m. (45 to 1000 r.p.m.) ...	1
A.66	Motor Pulley ...	1
A.68	Vee Belts (Model L5) ...	2
A.68	Vee Belts (Model L5A) ...	2
A.82	Vee Belts (Fitted to all machines with motor mounted inside cabinet base) ...	2

MISCELLANEOUS ACCESSORIES

NOT ILLUSTRATED

Part No.	Description	No. Off
	Alternative Drive Assemblies	
	3 Phase 60 c/s. Supply (contd.)	
L5-1-168F	2 Speed Motor, 3/4 1/2 h.p., 3600/1800 r.p.m. (34 to 1500 r.p.m.)	1
A.66	Motor Pulley ...	1
A.68	Vee Belts (Model L5) ...	2
	Vee Belts (Model L5A) ...	2
L5-1-171F	2 Speed Motor, 3/4 1/2 h.p., 3600/1800 r.p.m. (45 to 2000 r.p.m.)	1
A.68	Motor Pulley ...	1
A.71	Vee Belts (Model L5) ...	2
	Vee Belts (Model L5A) ...	2
	Single Phase, 50 c/s Supply	
L5-1-164E	Motor, 1 1/2 h.p., 1500 r.p.m. (34 to 750 r.p.m.)	1
A.66	Motor Pulley ...	1
A.68	Vee Belts (Model L5) ...	2
	Vee Belts (Model L5A) ...	2
	ELECTRICAL EQUIPMENT	
	Starters for 50 cycles supply	
ISH.340	"Prentice" Direct on Line Starter, 3 phase 50 cycles, 400/440 volts for 1 H.P. Motors ...	1
ISH.440	"Prentice" Direct on Line Starter, 3 phase 50 cycles, 400/440 volts for 1 1/2 & 2 H.P. Motors ...	1
ISH.540	"Prentice" Direct on Line Starter, 3 phase 50 cycles, 400/440 volts for 3 H.P. Motors ...	1
ISH.623	"Prentice" Direct on Line Starter, single phase 50 cycles, 230/250 volts for 1 1/2 H.P. Motors ...	1
	Starters for 60 cycles supply	
ISH.5/6	"Prentice" Direct on Line Starter, 3 phase, 60 cycles 200/220 volts for 3 H.P. Motors. ...	1

Part No.	Description	No. Off.
ACS2/3	Heater Coil only (1-5-2-5 amps) ...	3
ACS2AS/3	Heater Coil Assembly (1-5-2-5 amps) with base mounting terminals ...	3
ACS2/4	Heater Coil only (2-0-3-75 amps) ...	3
ACS2AS/4	Heater Coil Assembly (2-0-3-75 amps) with base mounting terminals ...	3
ACS2/5	Heater Coil only (3-0-5-75 amps) ...	3
ACS2AS/5	Heater Coil Assembly (3-0-5-75 amps) with base mounting terminals ...	3
ACS4/1	Magnetic Coil for 400/440 volts A.C. 50 cycles ...	1
ACS4/3	Magnetic Coil for 200/250 volts A.C. 50 cycles ...	1
	Common Parts for "Prentice" Starters	
AC 11 AS	Main Moving Contact ...	4
AC 13	Main Fixed Contact ...	8
AC 14	Bow Spring ...	8
AC 15	Bimetal Strip ...	2
AC 50	Push Button Spring (for Interior) ...	3
AC 51	Trip Switch Spring ...	1
AC 53	Trip Scale (State amps and range) ...	1
AC 60 AS	Trip Switch Assembly, without scale ...	1
AC 62 AS	Trip Bar ...	1
AC 67	Serial Plate †(see note) ...	1
AC 105	Carrier Spring ...	2

† If it is desired to change the voltage and/or current rating of an existing starter, please give the serial and list number. A new serial plate (AC 67) will then be supplied to obviate the starter being used under wrong conditions. If the current rating is being altered, a new trip scale (AC 53) will also be required.

MISCELLANEOUS ACCESSORIES NOT ILLUSTRATED

Part No.	Description	No. Off	Part No.	Description	No. Off	
TS 520	Isolating Switches "Prentice" Isolating Switch (fitted on all 9" Swing Lathes and on 11" Swing Lathes with motor mounted on outside) "Prentice" Isolating Switch (single phase) "Prentice" Isolating Switch (fitted on all Profile Lathes and 11" Swing Lathes with motor mounted inside the cabinet) Instruction Plate " (American Machs. only)	1	68612/48/2	Low Voltage Lighting Unit Low Voltage Lighting Unit with two arm fitting suitable for 50 volts, 25 volts or 12 volts lighting (please state mains voltage and low voltage required) ... Bracket for Low Voltage Lighting Unit	1	
S 20 ADS 10		1	L5-10-225		1	
229 246	Reversing Switches Rotary Reversing Switch for 3 phase 50 cycles, 400/440 volts Rotary Reversing Switch for single phase 50 cycles, 230 volts Rotary Reversing Switch for 3 phase 60 cycles, 220/600 volts Instruction Plate Spacer	1	CHANGE WHEELS FOR THREE SPEED GEARBOX Wheels for Cutting Whit. and B.S.F. Threads Change Wheel, 20T *L5-51 Q Change Wheel, 40T *L5-51 O Change Wheel, 50T *L5-51 P Change Wheel, 55T *L5-51 M Change Wheel, 60T *L5-51 K Change Wheel, 65T *L5-51 J Change Wheel, 70T *L5-51 G Change Wheel, 80T *L5-51 E Change Wheel, 100T *L5-51 C Change Wheel, 120T (Standard Equipment on Model L5A only) *L5-51 B Change Wheel, 95T (for 19 T.P.I. only) *L5-51 S	1	Change Wheel, 127T Additional Wheel for Cutting Metric Threads Additional Wheels for Cutting B.A. Threads Change Wheel, 36T *L5-51 R Change Wheel, 53T *L5-51 N Change Wheel, 59T *L5-51 L Change Wheel, 66T *L5-51 H Change Wheel, 73T *L5-51 F Change Wheel, 81T *L5-51 D Change Wheel, 127T *L5-51 A	1
IPA 46/312P or SR 137K/MTM SR 137 KA/MTM SR 1313 AB 67/MTM 130 L5-1-53		1		L5-51 A		1
IPA 413/349P or SR 1314 AX 92/MTM SR 1320AY 56/MTM	Two Speed Control Switch Rotary 2 speed Control Switch for 3 phase 50 cycles, 220/440 volts Rotary 2 speed Control Switch for 3 phase 50 cycles, 220/440 volts Rotary 2 speed Control Switch for 3 phase 60 cycles, 220/600 volts Electric Suds Pump Switch Rotary Switch Instruction Plate (for Suds Pump) Spacer	1	SR 134 or IPA 44/31P 135 L5-1-53	1		
SR 134 or IPA 44/31P 135 L5-1-53		1		1		
IPA 47/319P or SR 137 GB 79 5-1-53	Electric Pump and Hydraulic Pump Switch (combined) Rotary Switch Instruction Plate Spacer	1	SR 134 or IPA 44/31P 135 L5-1-53	1		
IPA 47/319P or SR 137 GB 79 5-1-53		1		1		

* Standard equipment.

MISCELLANEOUS ACCESSORIES

NOT ILLUSTRATED

Part No.	Description	No. Off
	CHANGE WHEELS FOR NORTON FEED GEARBOX	
	Wheels for Cutting Whit. and B.S.F. Threads	
*L5-51 P	Change Wheel, 50T ...	1
*L5-13-1	Change Wheel, 50T (Fibre) ...	1
*L5-13-3	Change Wheel, 60T (Fibre) ...	1
*L5-51 C	Change Wheel, 100T ...	1
L5-51 X	Change Wheel, 25T ...	1
L5-51 E	Change Wheel, 80T ...	1
	Additional Wheels for Cutting Metric Threads	
L5-51 Q	Change Wheel, 40T ...	1
L5-51 K	Change Wheel, 60T (Model L5 only) ...	1
L5-51 V	Change Wheel, 63T ...	1
L5-51 A	Change Wheel, 127T ...	1
	Additional Wheels for Cutting B.A. Threads	
L5-51 R	Change Wheel, 36T ...	1
L5-51 Q	Change Wheel, 40T ...	1
L5-51 N	Change Wheel, 53T ...	1
L5-51 L	Change Wheel, 59T ...	1
L5-51 H	Change Wheel, 66T ...	1
L5-51 F	Change Wheel, 73T ...	1
L5-51 D	Change Wheel, 81T ...	1
L5-51 A	Change Wheel, 127T ...	1
	Additional Wheels for Fine Thread Range (Norton Gear Box)	
L5-51 C	Change Wheel, 100T ...	1
L5-51 P	Change Wheel, 50T (Model L5A only)	1
	Additional Wheels for Coarse Thread Range (Norton Gearbox)	
L5-51 P	Change Wheel, 50T (Model L5A only)	1

Part No.	Description	No. Off
L5-51 U	Change Wheel, 115T ...	1
L5-51 Q	Change Wheel, 40T ...	1
L5-51 K	Change Wheel, 60T (Model L5 only) ...	1
	Additional Wheels for Cutting 11½ T.P.I. (Norton Gearbox)	
	Additional Wheels for Cutting 27 T.P.I. (Norton Gearbox)	
	BED TURRET (Model L5A only)	
DEH 4256/75	Base (Model L5) ...	1
DEH 4256/60	Base (Model L5A) ...	1
DEH 4256/54	Clamp, Eccentric ...	2
DEH 4256/61	Clamp ...	2
DEH 4256/76	Clamp Pin (Model L5) ...	2
DEH 4256/62	Clamp Pin (Model L5A) ...	2
DEH 4256/28	Trip Plate ...	1
DEH 4256/29	Pin ...	1
DEH 4256/30	Spacing Washer ...	1
DEH 4256/31	Spacing Washer ...	1
DEH 4256/32	Roller ...	1
DEH 4256/23	Screwed Pin ...	2
DEH 4256/49	Spring ...	1
DEH 4256/63	Gib ...	1
DEH 4256/64	Gib ...	1
DEH 4256/65	Gib Clamp ...	1
DEH 4256/66	Clamp Screw ...	1
DEH 4256/67	Handle, Clamp Screw ...	1
DEH 4256/8	Gib Strip ...	1
DEH 4256/9	Gib Strip ...	1
DEH 4256/10	Pin, Gib Strip ...	2
DEH 4256/2	Slide ...	1
DEH 4256/33	Sleeve ...	1
DEH 4256/34	Plunger ...	1
DEH 4256/51	Spring ...	1
DEH 4256/35	Screw ...	1
DEH 4256/36	Trip Lever ...	1
DEH 4256/24	Screwed Pin ...	1
DEH 4256/37	Roller ...	1
DEH 4256/38	Stud ...	1

MISCELLANEOUS ACCESSORIES

NOT ILLUSTRATED

Part No.	Description	No. Off
Bed Turret (contd.)		
DEH 4256/52	Spring	1
DEH 4256/39	Indexing Finger	1
DEH 4256/40	Pin	1
DEH 4256/50	Spring	1
DEH 4256-68	Turret Head	1
DEH 4256-69	Tool Clamp	6
DEH 4256-16	Plunger Locating Bush	6
DEH 4256-15	Locating Pin	6
DEH 4256-11	Spigot	1
DEH 4256-17	Pin	1
DEH 4256-26	Bevel, 22T	1
DEH 4256-12	Washer	1
DEH 4256-13	Nut	1
DEH 4256-14	Turret Clamp	1
DEH 4256-5	Locking Handle	1
	Ball, 1 1/4" dia.	1
	Index Drum	1
DEH 4256-19	Collar	1
DEH 4256-20	Shaft	1
DEH 4256-22	Bevel, 22T	1
DEH 4256-27	Stop Screw	6
DEH 4256-18	Die	6
DEH 4256-21	Hand Lever	1
DEH 4256-45	Handle	1
DEH 4256-44	Handle Bush	1
DEH 4256-47	Stud	1
DEH 4256-48	Pivot	1
DEH 4256-41	Roller Stud	2
DEH 4256-42	Roller	2
DEH 4256-43	Pivot Bracket	1
H 4256-46		

Part No.	Description	No. Off
CUT OFF SLIDE		
DEH 4574-45	Saddle (Model L5)	1
DEH 4574-40	Saddle (Model L5A)	1
DEH 4574/8	Clamp Eccentric	1
DEH 4574/44	Clamp Pin (Model L5)	1
DEH 4574/42	Clamp Pin (Model L5A)	1
DEH 4574-41	Clamp	1
DEH 4574-20	Rack	1
DEH 4574-10	Cross Slide Stop	1
DEH 4574-1L	Cross Slide	1
DEH 4574-21	Gib Strip	1
DEH 4574/26	Die Piece	6
DEH 4574-28	Pin	1
DEH 4574-11	Stop	2
DEH 4574-19	Stop Clamp	2
DEH 4574-3	Wheel House	1
DEH 4574-4	Gear Wheel Shaft	1
DEH 4574-13	Handle	1
	Ball, 1 1/4" dia.	1
DEH 4754-7	Gear Wheel, 40T	1
DEH 4754-5	Sleeve	1
DEH 4754-6	Collar	1
DEH 4991-1	Toolpost, Rear	1
DEH 4991-3	Clamping Stud, Rear	1
DEH 4991-5	Wedge, Rear	1
DEH 4991-2	Toolpost, Front	1
DEH 4991-4	Clamping Stud, Front	1
DEH 4991-6	Wedge, Front	1
DEH 4991-7	Adjusting Nut	2
DEH 4991-8	Adjusting Screw	2

MISCELLANEOUS ACCESSORIES NOT ILLUSTRATED

Part No.	Description	No. Off
MILLING AND GEARCUTTING ATTACHMENT (Common Parts)		
L5-140	Angle Bracket	1
L5-165	Nipping Stud	1
L5-141	Swivel Slide	1
L5-155	Nut (L5-892 Metric)	1
L5-143	Vertical Slide	1
L5-150	Strip	1
L5-162A	Screw (L5-893A Metric)	1
L5-144	End Plate	1
L5-5-39	Micrometer Collar (L5-5-44A Metric)	1
L5-5-15	Die	2
SG-5	Spring	2
L5-351A	Locking Bush	1
L5-1432	Die	1
L5-5-57A	Ball Handle... ..	1
L5-570	Handle	1
GEAR CUTTING ATTACHMENT ONLY		
L5-146	Bracket for Arm	1
L5-164	Nipping Stud	3
L5-167	Support Bar	1
L5-147	Supporting Arm	1
L5-156	Bush	1
L5-159	Centre	1
L5-145	Spindle Bracket	1
L5-160	Spindle	1
L5-142	Worm Bracket	1
L5-151	Worm Wheel	1
L5-161	Nut	1
L5-10-220	Worm	1
L5-662A	Lock Nuts	2
L5-148 A & B	Index Plate	1 off each
L5-10-221	Index Arm	1
Gear Cutting Attachment Only (contd.)		
L5-10-222	Plunger	1
L5-10-215	Plunger Knob	1
SG-119	Spring	1
L5-170	Cutter Arbor	1
L5-179	Nut	1
L5-173	Short Spacer	2
L5-172	Long Spacer	1
L5-174	Driver Pin	1
L5-169	Work Arbor	1
L5-175	Washer	1
L5-171	Draw Screw	1
L5-10-211	Bush, Index Finger	1
L5-10-214A & B	Index Finger	1 each
L5-10-213	Lock Nut	1
SG-252	Spring Clip	1
L5-10-229	Clamp Plate	1
4 POSITION CARRIAGE STOP		
L5-10-119	Body	1
L5-10-120	Bush	1
L5-10-121	End Plate... ..	1
L5-10-122	Stop Screw	4
L5-10-143	Die Piece	4
SG-5	Spring	1
SB-3	Steel Ball, $\frac{3}{4}$ " dia.	1
L5-10-34	Clamp	1
HIGH SPEED STEEL TURNING TOOLS		
7	R.H. Knife Tool	1
8	L.H. Knife Tool	1
11	Square Nose Tool... ..	1

MISCELLANEOUS ACCESSORIES NOT ILLUSTRATED

Part No.	Description	No. Off
High Speed Steel Turning Tools (contd.)		
13	External Screwcutting Tool	1
16	Cut Off Tool	1
17	Straight Round Nose Tool	2
19	R.H. Round Nose Tool	1
20	L.H. Round Nose Tool	1
50	Internal Screwcutting Tool...	1
50	Internal Round Nose Tool	1
50	Internal Square Nose Tool	1
CENTRES, ETC.		
L5-10-185	Half Centre No. 3 M.T.	1
L5-10-186	Square Centre	1
L5-10-193	2 Prong Centre	1
L5-10-192	3 Prong Centre	1
L5-10-191	4 Prong Centre	1
L5-10-170	Light Centre	1
L5-10-194	Screwed Centre	1
L5-10-190	Cup Centre	1
L5-10-189	Hollow Centre	1
L5-10-187	Flange Chuck	1
L5-10-188	Drill Pad	1
HAND REST		
L2A-36	Base (Model L5)	1
JL334	Base (Model L5A)	1
L2A-65	Eccentric Shaft (Model L5)	1
JL146	Eccentric Shaft (Model L5A)	1
JL300	Handle	1
L5-664A	Eye Bolt	1
50	Holding Down Plate	1
217	7" Tee (Wood Turning)	1

Part No.	Description	No. Off
Hand Rest (contd.)		
L5-246	Tee (Metal Turning)	1
JL45A	Nipping Stud	1
JL46	Nipping Handle...	1
DIVIDING ATTACHMENT		
L5-10-82	Bracket	1
L5-657	Worm	1
L5-10-223	Worm Shaft	1
L5-662A	Lock Nuts	2
L5-10-83	Index Plate	1
L5-10-221	Index Arm	1
SG.119	Spring	1
L5-10-222	Plunger	1
L5-10-215	Plunger Knob	1
L5-138	Worm Wheel	1
L5-10-211	Bush, Index Finger	1
L5-10-224A & B	Index Finger	1 each
L5-10-213	Lock Nut	1
SG252	Spring Clip	1
L5-10-229	Clamp Plate	1
BORING BARS		
L5-646	1 3/8" dia. Boring Bar	1
L5-647	3/8" dia. Bits	6
A,B,C,D,E,F	1/2" dia. Boring Bar	1
L5-680		
WATER POT		
L5-681	Water Pot	1
L5-683	Support Rod	1
L5-682	Flexible Pipe	1
G14-105A	Tap	1
L5-750	Bracket	1

HARRISON PRODUCTS

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BOXFORD 'LITTLE GIANT' TOOLPOST GRINDER

T. S. HARRISON & SONS LIMITED

9" Swing	
10" Swing	
11" Swing	
12" Swing	
13" Swing	
15" Swing	
17" Swing	
11" Swing	
12" Swing	
13" Swing	
15" Swing	
17" Swing	
12" Swing	
10" to 24"	
6 1/8" Swing	
30" x 8" Table	
30" x 8" Table	
1" and 1 1/2"	
Angle Plates	
Adjustable Angle Plates	
Box Tables Parallel Packings	
Surface Plates	Testing Centres
Tilting Tables	Vee Blocks
Vices	
9" Swing	
9" Swing	
8" Stroke	