COLCHESTER MASTER

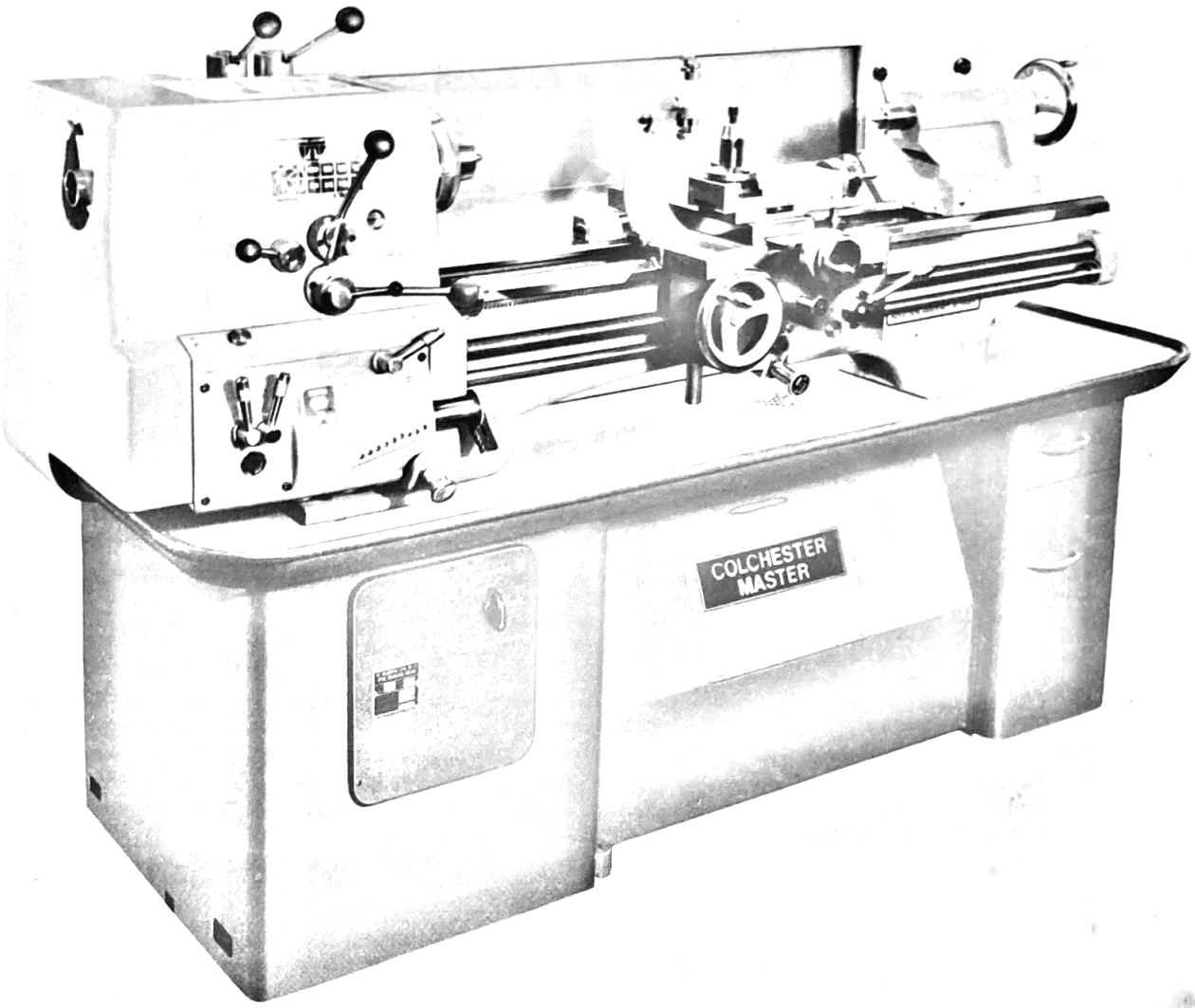
Reg'd. trade mark

INSTRUCTION AND SPARE PARTS MANUAL

THE COLCHESTER LATHE COMPANY LTD. COLCHESTER, ENGLAND

May 1970

Colchester Master



INSTRUCTION &
SPARE PARTS MANUAL

This manual applies only to the machine having the serial number shown; this is stamped at the tail-stock end of the bed, between bedways, and *must* be quoted in all communications.

Machine Serial No. .....

THE COLCHESTER LATHE COMPANY LTD.,
COLCHESTER **ENGLAND**

BRIEF SPECIFICATION OF THE MACHINE

This specification applies to all five standard models of Colchester "Master" lathe as follows:

BUCK —Gap bed cabinet base lathe with quick change gearbox.
BOXER —Gap bed cabinet base lathe without quick change gearbox.
VIXEN —Gap bed leg type lathe with quick change gearbox.
TERRIER —Gap bed leg type lathe without quick change gearbox.
QUARTER—Straight bed cabinet base lathe with quick change gearbox.

	English	Metric
Height of centres	6½"	165 mm.
Turning diameter		
Over bed	13"	330 mm.
Over carriage	9"	229 mm.
Over cross slide	8"	203 mm.
Distance between centres	36"	914 mm.
Diameter of face plate	12"	305 mm.
Gap bed models		
Turning diameter in gap	19"	483 mm.
Width in front of face plate	4⅜"	111 mm.
Width of bed	8⅜"	213 mm.
Spindle bore (Max. bar diameter)	1½"	38 mm.
Taper in spindle nose bush	No. 3 Morse	
Spindle nose	American Taper L.O.	
Capacity of travelling steady	2"	50 mm.
Number of spindle speeds (Standard motor)	8	
Range of spindle speeds (Standard motor)	54–1200 r.p.m.	
Number of spindle speeds (2-speed motor)	16	
Range of spindle speeds (2-speed motor)	34–1500 r.p.m.	
Feeds		
Number of sliding feeds	45	45
Range of sliding feeds per rev. of spindle	0.0025"–0.068"	0.06mm.–1.7 mm.
Number of surfacing feeds	45	45
Range of surfacing feeds per rev. of spindle	0.0006"–0.017"	0.015 mm.–0.43 mm.
Threads		
Number of Whitworth pitches	45	
Range of Whitworth pitches	4–120 t.p.i.	
Number of metric pitches	12	
Range of metric pitches	0.25–6 mm.	
Pitch of leadscrew	6 t.p.i.	
Total travel of bottom slide	6¾"	171 mm.
Total travel of topslide	3⅝"	92 mm.
Height from top of topslide to centre line of spindle	1⅞"	48 mm.
Maximum tool shank size (Pillar type toolpost)	9/16" x 1⅛"	11 mm. x 29 mm.
Travel of tailstock barrel (Std. No. 3 M.T. centre fitted)	5⅛"	130 mm.
Travel of tailstock barrel (Std. tank drill fitted)	3¾"	95 mm.
Taper in tailstock barrel	No. 3 Morse	
Overall length	77½"	1969 mm.
Overall width	33"	838 mm.
Weight	1512 lb.	686 kg.
Motor (Standard single speed)	3 h.p 50 cycles, 1425 r.p.m.	
Motor (2 speed)	3/1½ h.p 50 cycles, 1440/720 r.p.m.	

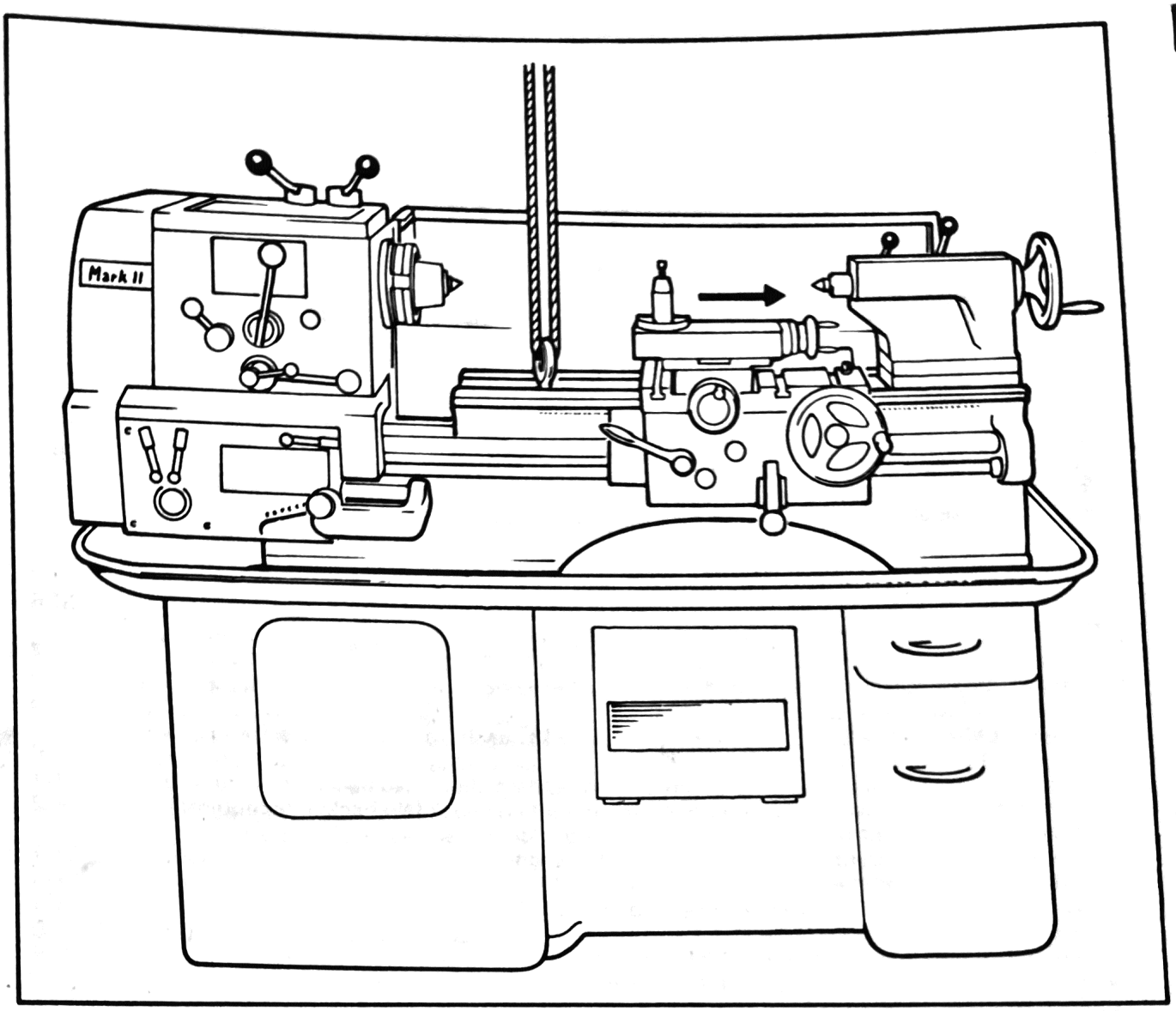
STANDARD EQUIPMENT SUPPLIED WITH THE MACHINE

(For details of additional equipment see pages 24-39)

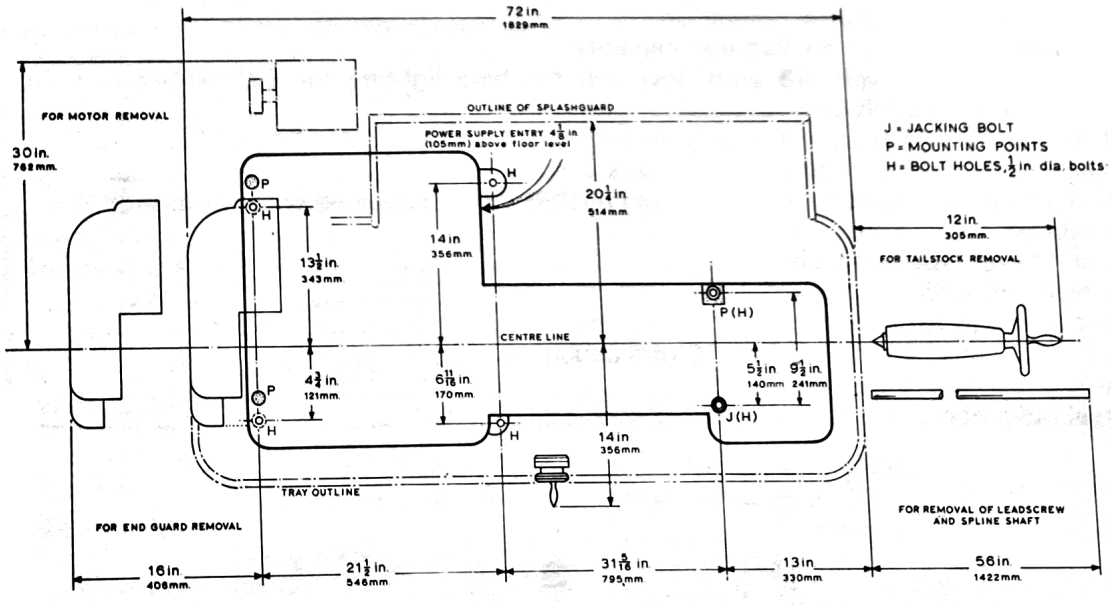
One 12" diameter faceplate.
One 6" diameter slotted driving plate.
Two No. 3 Morse taper centres.
Centre bush.
Travelling steady.
Spanners, Allen keys, etc.

ADDITIONAL EQUIPMENT

A comprehensive range of additional equipment is available for the Colchester "Master" lathe. All items are designed specifically for the "Master" and are engineered for simplicity, robustness, and reliability. A brief list of additional equipment is given below and more detailed information on certain items is given in subsequent pages. All these items can be fitted to the machine after it has left the works.



Method of lifting, with eyebolt fitted in the tapped hole provided



Foundation plan

INSTALLATION

LOCATION

To achieve the standards of accuracy to which your Colchester Lathe is capable of working it is essential that the machine should be placed on a solid concrete base, which should be as level as possible and free from vibration. A wooden floor is not recommended because changes in atmospheric conditions affecting the floor will affect the alignment of the machine. If a wooden floor site is unavoidable a section of the flooring should be removed and a concrete base built up to floor-level.

If the machine has to be placed above ground floor level it is necessary to have a reinforced concrete floor for best results, and to place the machine headstock as close as possible to a supporting wall or pillar.

Careful attention to siting and foundations will greatly add to the accuracy of the work produced and to the life of the machine.

When deciding on a position for the machine, it must be borne in mind that sufficient room must be allowed all round, not only for operation but to permit the end guard to be opened and to give access to the motor compartment at the rear of the cabinet base. In the foundation plan opposite, the main dimensions are given and also a recommended minimum space required for efficient operation and servicing of the machine.

LIFTING

The machine weighs approximately 1,512 lb. and proper equipment for handling this weight should be available. It is recommended that suitable plates are obtained before attempting to lift the machine. In case of difficulty please contact your local Colchester agent.

POSITIONING

Mounting points are built into the cabinet base, two at the head end and one at the tail end. In addition, a jacking bolt is provided at the front of the tail end pedestal for levelling adjustments. Although bolting-down of the machine is not normally necessary, machine bolts may be used at the positions provided. Do not overtighten holding-down bolts.

THE MACHINE SHOULD NOT BE GROUTED IN.

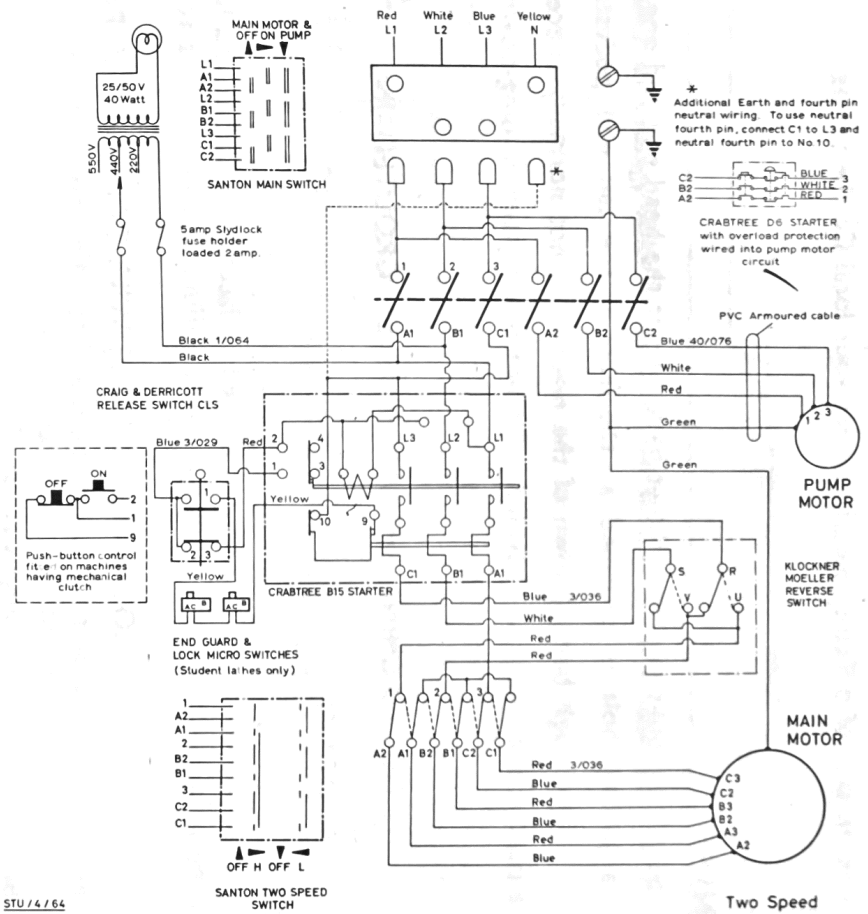
CLEANING

When the machine is delivered all bright machined surfaces are covered by a heavy protective coating. This must be removed with white spirit or paraffin (kerosene) before attempting to use the machine.

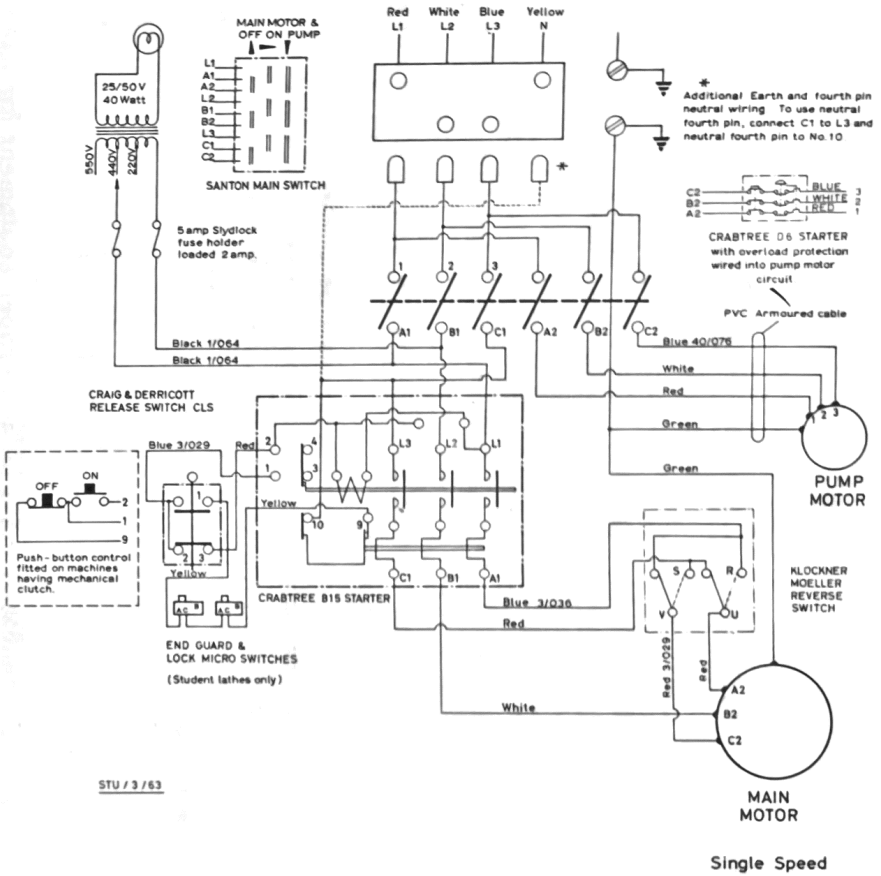
DO NOT USE CELLULOSE SOLVENTS AS THESE WILL DAMAGE THE PAINTWORK.

Particular attention should be paid to the slides and spindle nose, and it is essential that the end guard is removed and the end gear train carefully cleaned. All traces of the cleaning agent should then be removed and the bright surfaces given a light coating of Shell Tellus 33 oil.

WIRING two-speed



WIRING single-speed



LEVELLING

A precision engineers level should be used, and readings taken across the bed at the headstock and tailstock ends, and in two positions on the front and rear bed shears in a longitudinal direction. If the floor is not accurate, it may be necessary to place wedges under the edge of the cabinet base, preferably in positions adjacent to the bolt holes.

ELECTRICAL WIRING

The external wiring of the machine to the mains supply should be carried out by a competent electrician, and all wiring should be of a permanent character. All internal wiring is carried within the cabinet base, properly shielded to provide a high degree of safety. It is essential that a really efficient earth is provided in the installation as shown in the wiring diagram opposite.

The lathe may be fitted with either a single speed motor or a two speed motor and appropriate wiring diagrams are shown opposite.

It is important to note that certain electrical safety devices are built into these machines for the protection of the operators, and they should be properly understood before the motor is put into regular use.

1. In the right-hand side of the cabinet base is a lockable drawer which prevents unauthorised use of the machine. In order to start the machine, this drawer must be UNLOCKED.
2. A special safety switch is built into the end guard, so that if the end guard is removed for attention to the change gears or driving belts, the motor is automatically isolated for safety. Replacement of the end guard and tightening of the holding screws resets the electrics ready for use. The starting lever should always be in the " off " position before the end guard is removed (see page 13).
3. A no-volt release is incorporated in the electrical circuit which is correctly set before leaving the works. The adjustment may have been jarred during transit however, and this release should be tested at the first opportunity. The method of test is as follows.

   Switch off the main switch at the panel. Then put the starting lever in the starting position (see page 13) and switch the mains on again. If the machine starts up the no-volt release is NOT working correctly and should be adjusted. This is done as follows. First switch off the main switch on the panel and put the starting lever in the " on " position. Then release the lock-nut under the switch lever at the back of the headstock and screw in the actuating bolt until the switch plunger is fully extended. Then switch on again at the panel and unscrew the actuating bolt so that the plunger is gradually depressed until the electrical circuit is made and the motor starts. Return the lever to the " off " position to ensure that over adjustment has not been made thus preventing the circuit breaking. Re-tighten the locknut.

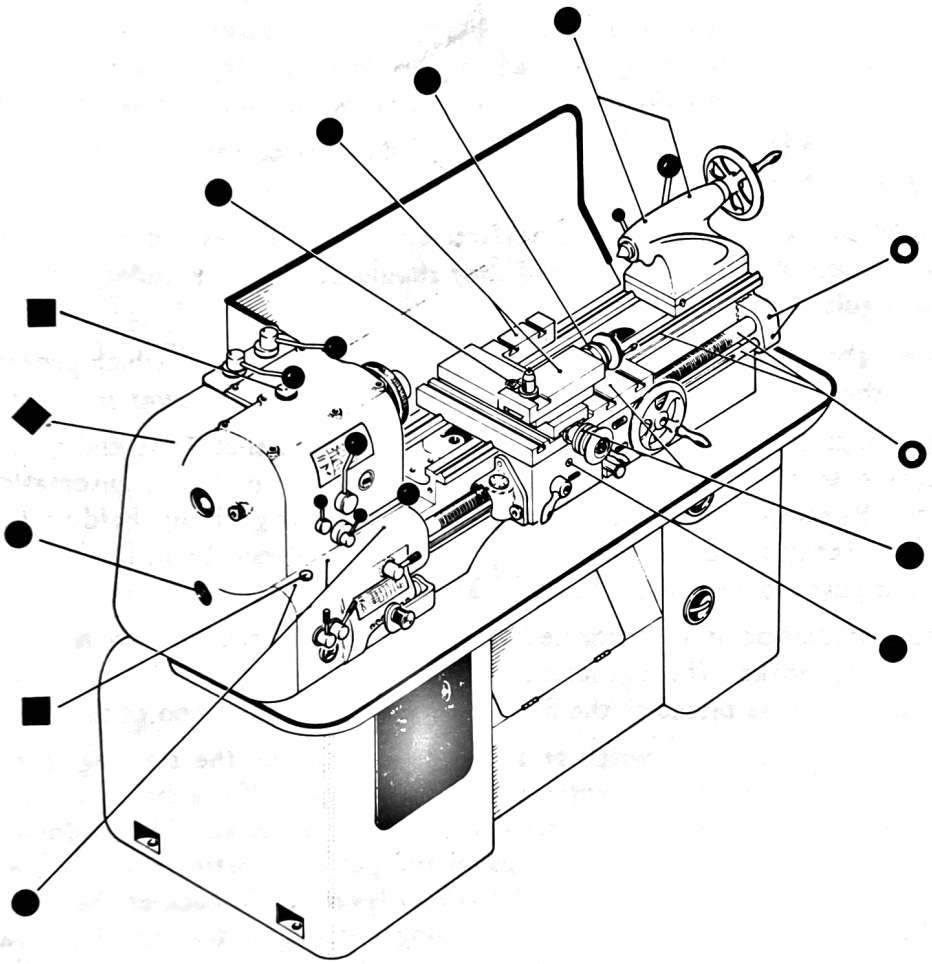
   This adjustment should be checked from time to time to ensure that the safety device is functioning correctly.

Clean and lightly oil daily.

Top up with correct oil each week.

Grease the Matrix clutch monthly.

Oil once every week.



LUBRICATION CHART

LUBRICATION

The accuracy and life of the machine depend on correct lubrication and before the machine is used, all oiling points should be properly lubricated. The lubrication chart opposite gives information on the points which need daily, weekly or monthly attention. It cannot be stressed too strongly that all the points marked with **a black circle** should receive daily attention to ensure the efficient operation of the machine.

When the machine is despatched from the works, the headstock and gearbox are filled to the correct levels with Shell Tellus Oil 27 and Shell Tellus Oil 33 respectively. Tellus oils may be obtained from Shell Oil Companies throughout the world, but in case difficulty is experienced in obtaining these particular grades the physical characteristics of these oils are given below.

	Shell Tellus Oil 27	Shell Tellus Oil 33
Specific gravity at 60°F.	0.870	0.876
Flash point closed	390°F.	410°F.
Pour point	—20°F.	—20°F.
Viscosity Redwood No. 1: 70°F.	310 secs.	750 secs.
140°F.	68 secs.	112 secs.
200°F.	41 secs.	52 secs.

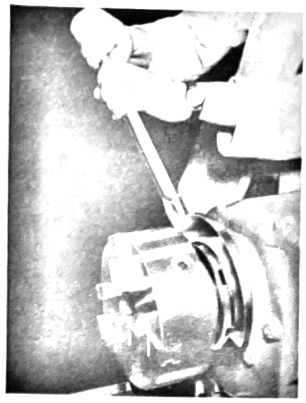
THE USE OF AN INCORRECT GRADE OF OIL IN THE HEADSTOCK IS LIABLE TO CAUSE OVERHEATING AND POSSIBLE DAMAGE.

Oil levels in the headstock and gearbox should be checked weekly. Always stop the machine when checking oil levels to allow the level to settle so that a true reading is obtained. If this precaution is not taken there is a risk of overfilling, which will result in the generation of excessive heat and loss of oil by leakage.

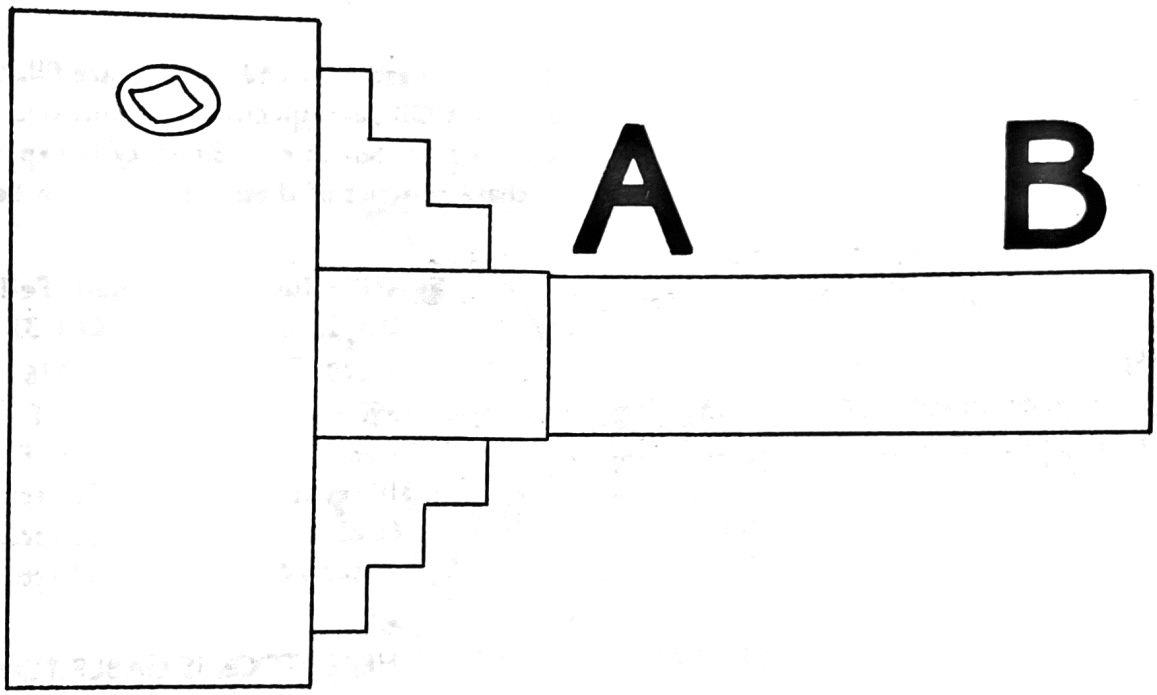
After the machine has been in operation for 150 to 200 hours both the headstock and gearbox should be drained, flushed with clean flushing oil and then refilled with the appropriate grade of oil to the correct level.

The motor bearings should be checked periodically to ensure that they have an adequate supply of the grade of grease recommended by the motor manufacturer.

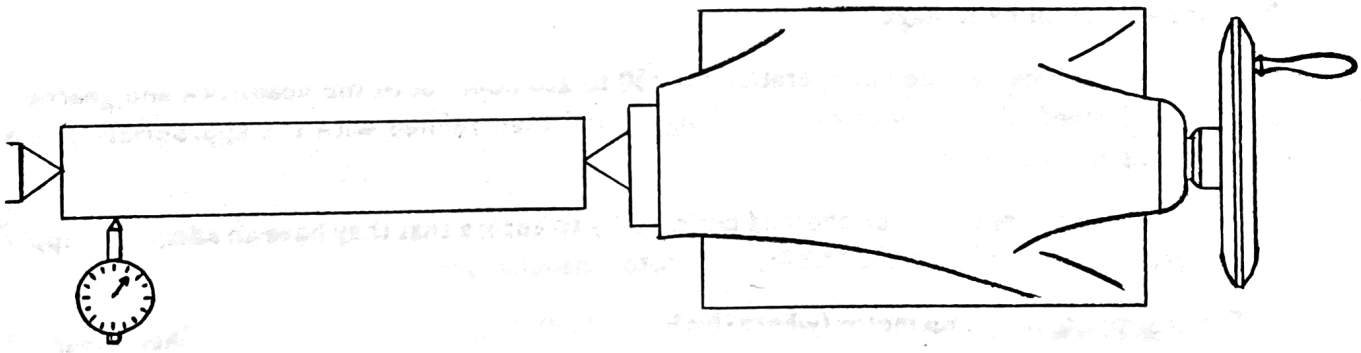
The bearings of the pump motor (where this is supplied) should be lubricated with Shell Alvania 3 grease or a water repellent grease.



Mounting the chuck



Headstock alignment check



Tailstock alignment check

CHUCK MOUNTING

The American long taper key drive spindle nose to LO standard has been selected to overcome the danger of chucks and faceplates becoming detached when the spindle is stopped rapidly or reversed.

When fitting chucks to the spindle nose, care should be taken to see that the centre and centre bush have been removed before attempting to fit the chuck. Care should also be taken to ensure that the taper and key on the spindle nose and the internal taper in the chuck are scrupulously clean, since any dirt or chips lodging on either of these surfaces will upset the accuracy of the machine, cause damage to the mating surfaces, and prevent the chuck locking on the spindle taper.

The spindle nose draw nut engages the thread on the back of the chuck, and when it has been screwed up hand-tight, the special "C" key supplied should be engaged in the slots and the nut tightened. It is advisable to give the "C" key one or two sharp blows with a mallet. Extension tubes should never be used on the key.

When releasing chucks or faceplates from this type of spindle nose, the draw nut will automatically free the chuck from the taper. Care must be taken to ensure that the chuck does not slide off the spindle nose and damage the lathe bed or saddle.

ALIGNMENT CHECKS

When the machine has been completely installed and connected, it is advisable to check the alignment of headstock and tailstock. All machines are accurately aligned before despatch, but transit shocks may render a check necessary.

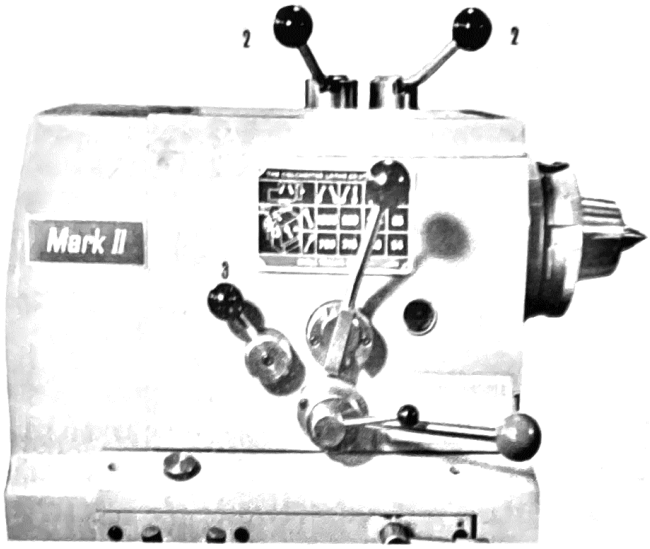
Headstock alignment

Place a length of mild steel bar in the chuck and take a light cut over the O.D. of the bar for about 6″ of its length. (Do not use the tailstock centre as a steady during this test). A micrometer reading at the two ends of the turned diameter (A and B in the sketch) should be the same. If the two readings are not the same, the headstock may be easily re-aligned by releasing the headstock holding down bolts and immediately re-tightening them.

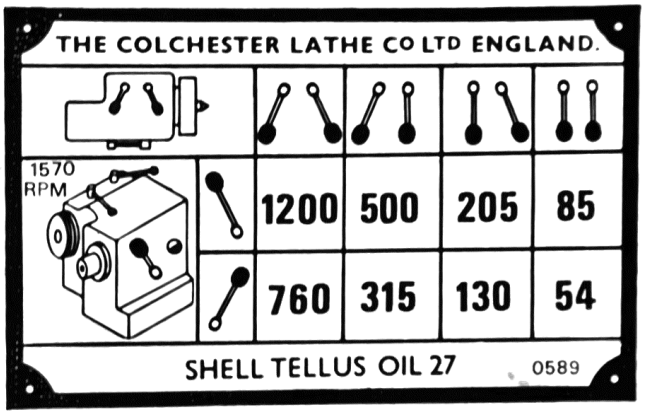
Tailstock alignment

Place a 12″ long ground steel bar between centres. Fix a dial gauge to the topslide with its anvil running along the horizontal centre line of the bar. By traversing the saddle along the bed an accurate check on alignment may be made. If any error is found it may be rectified by adjustment of the two set-over screws in the base of the tailstock. (See page 23).

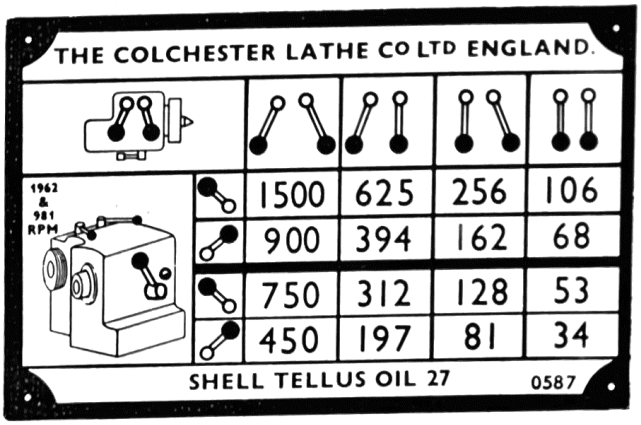
It is important to check that all holding-down bolts have been securely tightened after any adjustments have been made.



Headstock control levers



Spindle speeds using single speed motor



Spindle speeds using two speed motor

OPERATION

The illustration opposite shows the various controls and a fuller description of these and of the main components of the machine is given in the following pages.

HEADSTOCK

To start the machine CHECK THAT THE DRAWER IS UNLOCKED (see page 7) and switch on at the main panel.

The rotation of the main spindle is controlled from the front of the headstock by means of the "Safti-lok" starting lever, (1) which incorporates a safety device to guard against the machine being started accidently. Pull the starting lever forward against the spring pressure, then lift upwards. This action will start the motor through an air brake starter, and the lever will remain in this position until it is desired to stop the spindle.

The starting mechanism incorporates a no-volt release. In the event of an electrical supply failure, the machine can only be restarted by moving the control lever to the " off " position and then restarting in the normal manner. Correct operation of this safety feature should be checked periodically (see section " Electrical Wiring " page 7).

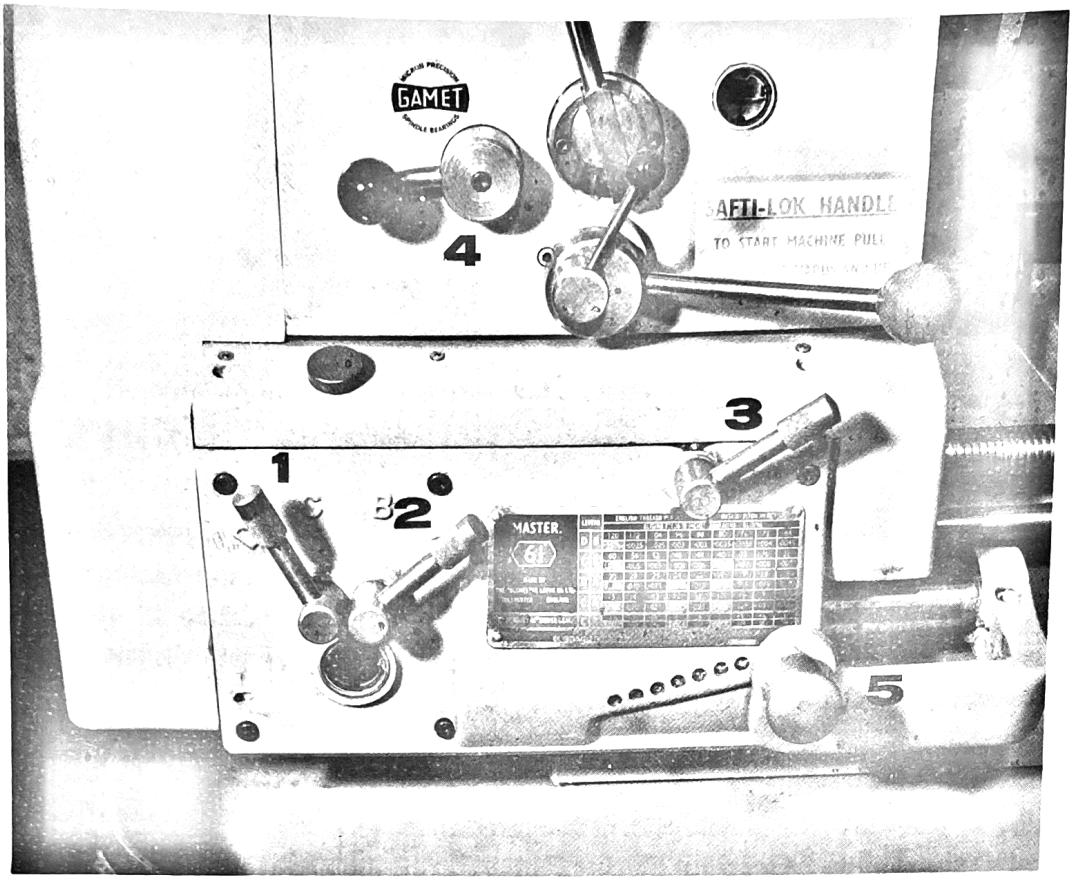
If specially ordered, a Matrix multi-plate machine tool clutch may be incorporated in the drive, in which case the starting lever controls the engagement of this clutch, the motor being left running all the time the main switch is on. (This clutch is supplied as standard on machines constructed for operation on single phase or D.C. supply). Machines fitted with a Matrix clutch do not have the " Safti-lok " device incorporated in the starting handle.

To stop the spindle, return the starting lever to its original position. On direct start machines, downward pressure on the starting lever operates a two-shoe Ferodo lined brake inside the driving pulley causing the spindle to stop instantaneously. This brake cannot be fitted on machines with Matrix clutch.

In the case of 3-phase A.C. machines only, the rotation of the main spindle may be readily reversed by means of the finger-tip reversing switch (4), inset into the starting lever. Because of the use of the American long taper key drive spindle nose there is no possibility of chucks or face-plates " running off " when the spindle is reversed or stopped. (See page 11).

Speed selection is by two levers on the top (2) and one lever in the front of the headstock(3). Each lever has two positions, thus providing eight spindle speeds, but this range may be increased to sixteen by the use of an optional two-speed motor. In the latter case, the two-speed control switch will be found on the right of the main electric panel. Charts of both ranges, giving the lever positions are shown opposite.

THE SPINDLE AND HEADSTOCK GEARING MUST ALWAYS BE STOPPED BEFORE MOVING ANY OF THE CHANGE SPEED LEVERS.



Gearbox control levers

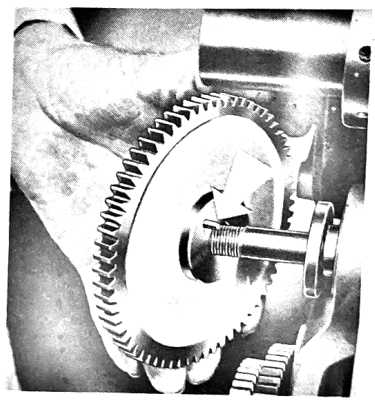
MASTER 6½"

MADE BY
THE COLCHESTER LATHE CO. LTD.
COLCHESTER
ENGLAND

LEVERS	ENGLISH - THREADS PER INCH					METRIC-PITCH IN M/M			
	SLIDING FEEDS IN THOUSANDTHS					SURFACING ¼ SLIDING			
D B	60	56	52	48	44	40	38	36	32
	·5 M/M	·005	·005	·006	·006	·75 M/M	·007	·008	·009
C B	30	28	26	24	22	20	19	18	16
	1 M/M	·010	·011	1·25 M/M	·013	1·5 M/M	·015	·016	·017
D A	15	14	13	12	11	10	9½	9	8
	2 M/M	·020	·021	2·5 M/M	·025	3 M/M	·029	·031	·034
C A	7½	7	6½	6	5½	5	4¾	4½	4
	4 M/M	·039	·042	5 M/M	·050	6 M/M	·058	·061	·068

FILL WITH SHELL TELLUS OIL 33 TO MARK ON SIGHT GLASS
OIL OBTAINABLE FROM SHELL OIL COMPANIES THROUGHOUT THE WORLD

Feeds & threads available from Master gearbox



DOMINION 13"

MADE BY
THE COLCHESTER LATHE CO. LTD.
COLCHESTER
ENGLAND

LEVERS	THREADS PER INCH								
	SLIDING FEEDS IN INCHES-SURFACING ¼ SLIDING.								
D B	112	104	96	92	88	80	76	72	64
	·0025	·0025	·003	·003	·003	·0035	·0035	·004	·0045
C B	56	52	48	46	44	40	38	36	32
	·005	·005	·006	·006	·006	·007	·007	·008	·009
D A	28	26	24	23	22	20	19	18	16
	·010	·011	·012	·013	·013	·014	·015	016	·017
C A	14	13	12	11½	11	10	9½	9	8
	·020	·021	·023	·024	·025	·027	·029	·031	·034
WHEN USING 42T DRIVER GEAR C A	7	6½	6	5¾	5½	5	4¾	4½	4
	·039	·042	·045	·048	·050	·055	·058	·061	·068

FILL WITH SHELL TELLUS OIL 33 TO MARK ON SIGHT GLASS. OIL
OBTAINABLE FROM SHELL OIL COMPANIES THROUGHOUT THE WORLD.

Feeds & threads available from Dominion gearbox

M

GEARBOX (ENGLISH & DOMINION)

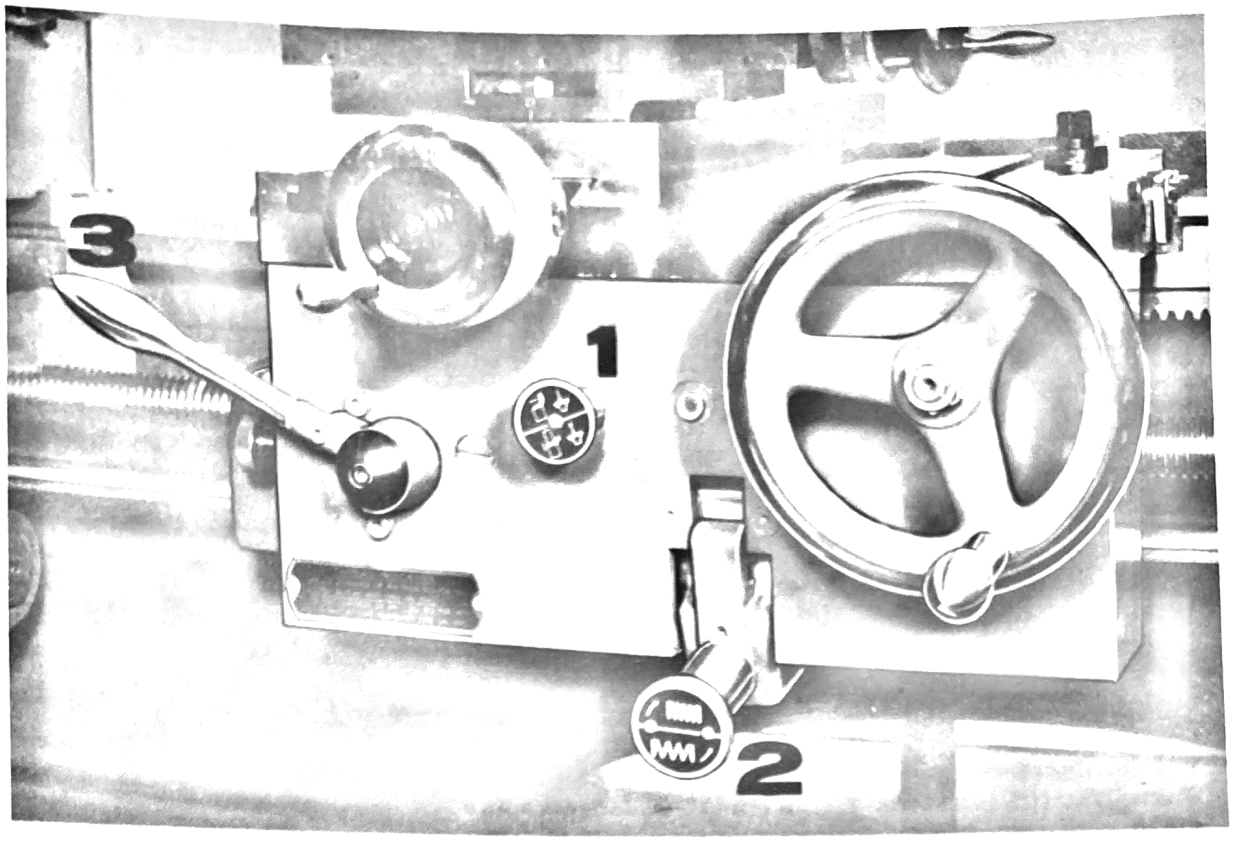
Two alternative types of quick change gearbox may be fitted to the lathe. The standard gearbox (*i.e.*, that normally fitted to gap bed machines) provides a range of 45 longitudinal and cross feeds, 45 threads covering the Whitworth range, and 12 metric thread pitches. The alternative gearbox, (*i.e.*, that normally fitted to straight bed machines) does not provide metric pitches and covers a slightly different range of feeds and Whitworth threads (including 11½ and 23 t.p.i.). The full range of feeds and threads for both gearboxes is shown opposite.

Control of the gearbox is by four levers (1–4) and a tumbler shaft (5) as illustrated. The tumbler shaft is provided with a spring-loaded plunger which engages in holes in the front of the gearbox cover, to provide positive positioning and locking. There are two selection levers (1) and (2) at the left-hand end of the gearbox, each having two positions. By manipulating these two levers in conjunction with the tumbler arm a range of 36 feeds and threads are obtained. The remaining 9 feeds and threads are obtained by substituting the 42T change gear for the 21T change gear on the top driver position, and remeshing the gear train. The 42T change gear will be found alongside the 35T change gear on the gearbox driving shaft. A third lever (3) disengages the leadscrew when this is not actually required for screwcutting, and is also provided with two other positions, one for Whitworth threads, the other for metric threads.

A further lever (4) situated high up on the front of the headstock controls the directions of the feeds, reversing them as necessary. THE SPINDLE AND HEADSTOCK GEARING MUST BE STOPPED BEFORE ANY OF THE LEVERS CONTROLLING THE GEARBOX ARE MOVED.

A shear-pin device is fitted as a precautionary measure to protect the leadscrew against overload. A broken shear-pin may be easily replaced by removing the top gear in the train, then the splined sleeve which carries the gear. The broken portion may then be tapped out of the sleeve from the side opposite to the splines. To remove the other broken portion, the shaft should be rotated until the pin hole is opposite the slot in the housing and swing frame, then the broken pin may be knocked straight through and it will drop out through the slot. The new pin may then be inserted and the top gear and sleeve re-assembled.

The leadscrew should never be allowed to revolve except when screwcutting, and before use should always be cleaned between the threads and lightly oiled.



APRON (knock-off type)

Longitudinal and cross-feeds are selected by means of a plunger (1) shown in the illustration. Longitudinal feeds are obtained with the plunger fully extended; cross-feeds with the plunger fully depressed. A central or neutral position is also provided which is selected when neither longitudinal nor cross-feed is required.

The feeds are engaged by lever (2) which incorporates a safety device to prevent overloading. This mechanism is pre-set at the Works to trip out at 350 lb end pressure. It should give long, trouble-free service. Screwing the handgrip anti-clockwise decreases the tension and lightens the tripping pressure. When screwcutting, the leadnut is controlled by depressing the lever (3).

THREAD CUTTING

1. Threads available from the gearbox

The screwcutting dial has four numbered divisions and four subdivisions marked on its surface, and is clearly visible from the operating position. The housing carrying this dial may be pivoted and is retained in position by a knurled thumbscrew; when not required for use it may be swung out of contact with the leadscrew, only being used when screwcutting is actually carried out.

To cut an even number of threads per inch, e.g., 12 t.p.i., the leadnut may be engaged at any division on the dial. For cutting an odd number of threads per inch, e.g., 13 t.p.i., the leadnut must only be engaged on the numbered divisions, whilst to cut fractional threads, e.g., $4\frac{3}{4}$ t.p.i., the leadnut must only be engaged at the division marked 1 on the dial.

When engaging the leadnut, care should be taken to ensure that the appropriate dial division coincides exactly with the fixed point on each pass.

THREAD CUTTING (*contd.*)

For metric threads the screwcutting dial cannot be used. The nut must be closed over the leadscrew and the machine reversed by means of the reversing switch after each pass and tool withdrawal. The nut must not be released until the thread is completed.

The setting of the gearbox levers for threads available from the gearbox is shown on page 14.

2. Threads not available from the gearbox

To cut threads which are not available from the gearbox, it is necessary to use special change gears which are available as extra equipment. To obtain the number of teeth in these gears the following formula should be used.

$$\text{Thread to be cut} = \frac{3 \times X \times Y}{10 \times T} = \frac{\text{Driver gear}}{\text{Driven gear}}$$

Where X = hole in feed box (see sketch below).

Y = 1 with selection levers on AC
2 with selection levers on AD
4 with selection levers on BC
8 with selection levers on BD

and T = No. of threads per inch to be cut.

Values for X are as follows.

METRIC GEARBOX

o	o	o	o	o	o	o	o	o
30	28	26	24	22	20	19	18	16

DOMINION GEARBOX

o	o	o	o	o	o	o	o	o
28	26	24	23	22	20	19	18	16

Example

It is required to cut 21 t.p.i.

The values of X and Y may be chosen from any of the relevant numbers given above, and there is no rule about the choice. If the values selected give impossible numbers of teeth try other values of X and Y and continue doing so until a suitable result is obtained.

In the case of 21 t.p.i. ... ... $\frac{3 \times 28 \times 2}{10 \times 21} = \frac{28}{35}$ Driver / Driven

To use this formula for metric pitches it is necessary to convert the pitch in millimeters to threads per inch. To do this the following formula is used:—

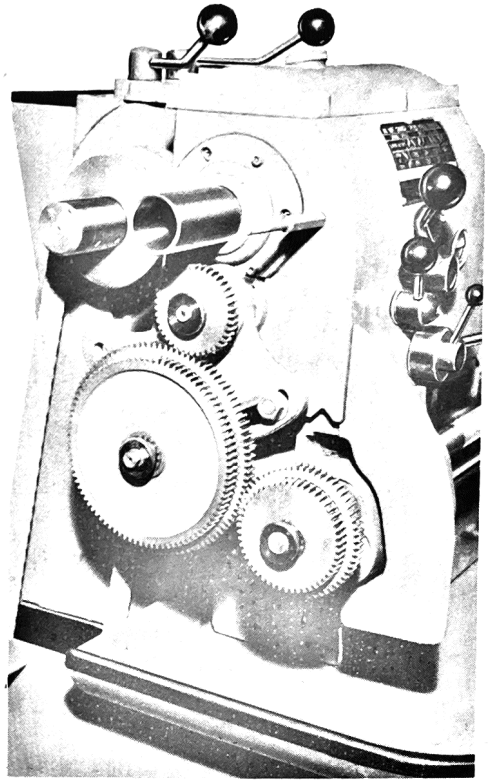
$$\text{t.p.i.} = \frac{25.4}{\text{pitch in m.m.}}$$

Note.—The largest gear that can be accommodated on the driver position with the standard 120T/16d.p. idler gear is 60T, and on the driven position, 64T.

3. Multi-start threads

Multi-start threads may be cut in any one of three ways:—

1. By repositioning the compound slide one pitch forward for each start. It will be realised, however, that the accuracy of this method depends upon the operator.
2. By using an accurately-divided driver plate and turning the workpiece one division forward for each start.



The end gear train of the non-gearbox machine

THE MASTER 6½ INCH LATHE

THREADS PER INCH

THREADS	4	4½	5	6	7	8	9	10	11	12	13	14	15	16	18	19	20	22	24	26	28	30	32	40	44	48	56	60
DRIVER	45	40	30	40	45	30	30	30	45	30	30	30	40	30	30	40	30	45	25	30	30	20	45	40	45	40	30	40
DRIVEN	100	100	100	80	70	80	80	80	100	80	80	80	50	70	60	100	60	66	60	65	70	60	60	80	66	80	70	80
DRIVER				90	80				80							60		40		50	50		25	30	20	25	25	20
DRIVEN	30	30	25	45	60	40	45	50	66	60	65	70	100	80	90	76	100	100	100	100	100	100	100	100	100	100	100	100

PITCH IN MILLIMETRES

PITCH	4	3·5	3	2·5	2	1·75	1·5	1·25	1	·9	·8	·75	·7	·6	·5
DRIVER	45	45	45	45	45	45	45	45	45	30	45	45	45	45	45
DRIVEN	76	76	76	60	100	100	76	76	76	70	60	76	76	70	76
DRIVER	80	70	60		80	70	60	50	40	50	25	30	25	20	20
DRIVEN	50	50	50	76	76	76	100	100	100	100	100	100	90	90	100

OIL CHANGE GEARS AND SLEEVE WITH SHELL TELLUS 33 OIL

OIL OBTAINABLE FROM SHELL COMPANIES THROUGHOUT THE WORLD

Threads available on non-gearbox machine

THREAD CUTTING (*contd.*)

3. By advancing the driver gear a calculated number of teeth to advance the spindle by one pitch of the thread to be cut. The accuracy of this method is that of the machine. In order to use this method a driver wheel should be used in which the number of teeth is a factor of the number of starts, to be cut, *e.g.*, to cut a 6 start thread use the 42T driver gear; dividing 6 into 42 gives 7 which is the number of teeth to move the driver gear to obtain each start.

To use method 3 cut one start. Mark the meshing tooth on all gears, then remove the idler gear. Turn the idler gear through the calculated number of teeth and replace the idler gear, making sure that the meshing marks correspond exactly. Cut the next start and repeat for each remaining start.

FEEDS AND THREADS FOR NON-GEARBOX MACHINES

In machines where a gearbox is not fitted a special two-speed feed arrangement is incorporated. The two feeds are selected by sliding the double gear on the feed shaft into one of the two positions provided by means of the knurled collar, engaging either the fast or slow feed rate as required. A full set of change gears is supplied as standard, covering all the more useful threads.

Illustrated opposite is the screwcutting chart for these machines, from which the combination of gears for all normal threads may be read at a glance. The method is simple and is as follows:—

The number of threads per inch is read off along the top line and immediately beneath may be read off the gear train required to obtain this value. Information is also given as to whether the gears need compounding or not. The same remarks apply to the metric pitches which are available. In order to obtain Whitworth pitches between those listed the necessary information may be calculated as follows:—

Formula to obtain change gears for special threads.

$$\frac{\text{No. of threads per inch in leadscrew}}{\text{No. of threads to be cut}} = \frac{\text{Driver}}{\text{Driven}}$$

EXAMPLE

To cut 26 t.p.i.

Since these machines are fitted with 6 t.p.i. leadscrews, the following is obtained:—

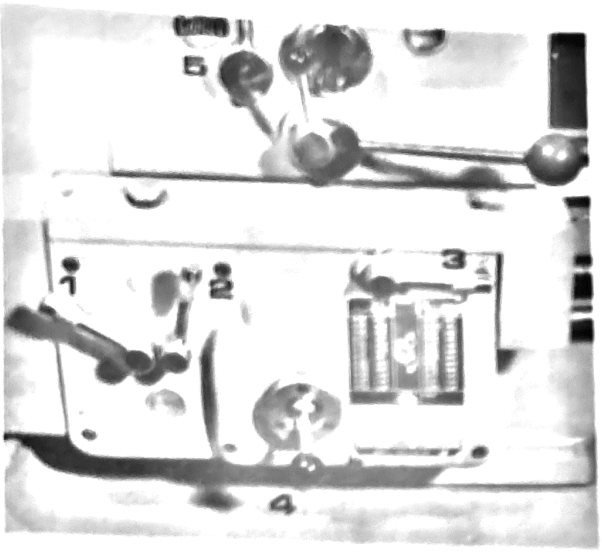
$$\frac{6}{26} = \frac{\text{Driver}}{\text{Driven}}$$

As there is no 6T gear each figure should be multiplied by a common factor so that the value of at least one of the figures corresponds with one of the available change wheels. For example:—

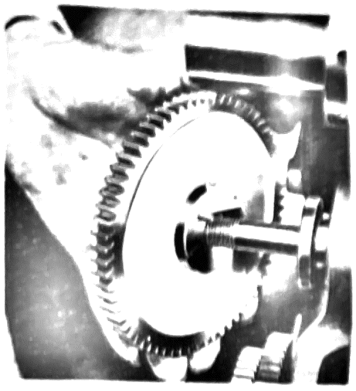
$$\frac{6\times5}{26\times5} = \frac{30}{130} = \frac{\text{Driver}}{\text{Driven}}$$

As there is no 130T gear in the set, the gears must be compounded to give the same ratio.

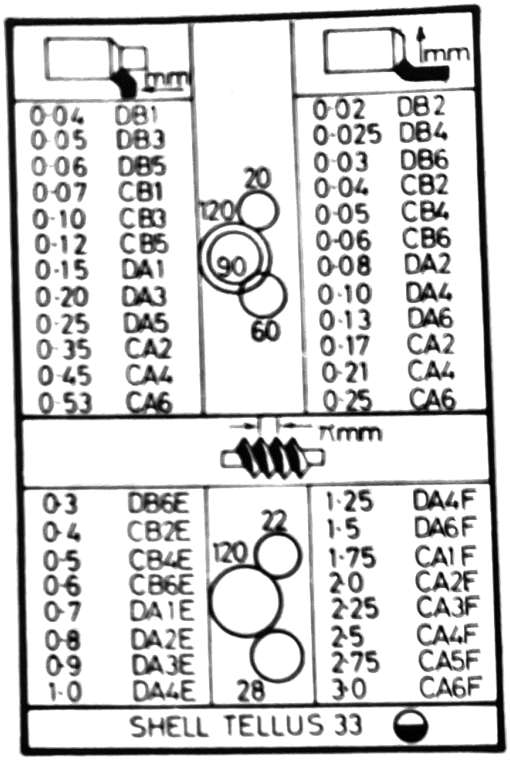
$$\frac{30}{130} = \frac{30\times50}{65\times100} = \frac{\text{Drivers}}{\text{Driven}}$$



Gearbox control levers



Shear pin

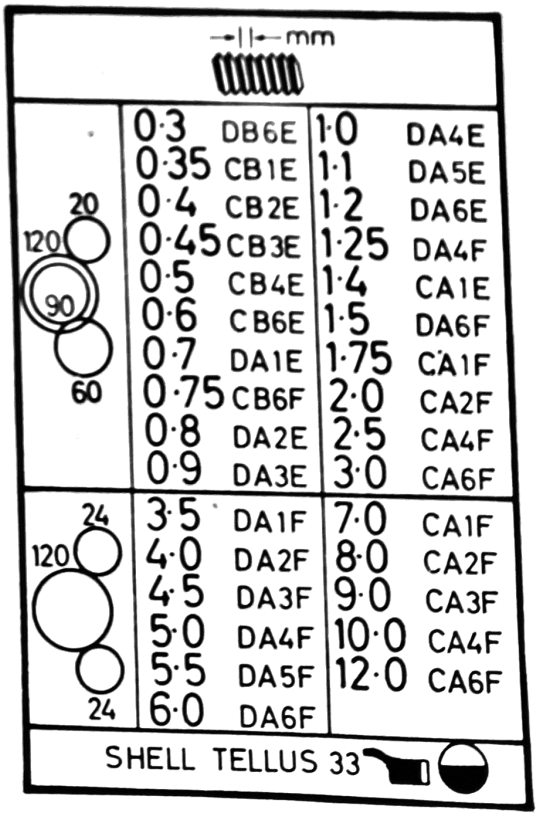


METRIC FEEDS & THREADS

ENGLISH

1in	127 X 120 Y			1in	127 X 120 Y		
	X	Y			X	Y	
2·5	24	24	CA6E	16	24	24	DB6F
3	24	24	CA2F	18	24	36	CB2F
3·5	48	49	CA1F	19	24	19	DB2F
4	24	24	DA6F	20	24	24	DB6E
4·5	24	36	CA2F	22	24	22	DB2F
5	24	24	DA6E	23	24	23	DB2F
6	24	24	DA2F	24	24	24	DB2F
7	24	49	CA1F	26	24	26	DB2F
8	24	24	CB6F	27	24	27	DB2F
9	24	36	DA2F	28	24	49	CB1F
10	24	24	CB6E	32	24	48	DB6F
11	24	22	CB2F	36	24	36	DB2F
11·5	24	23	CB2F	40	24	48	DB6E
12	24	24	CB2F	48	24	48	DB2F
13	24	26	CB2F	56	24	49	DB1F
14	24	49	DA1F	60	24	48	DB2E

SHELL TELLUS 33



GEARBOX (CONTINENTAL)

The Continental gearbox has been designed to give a full coverage of standard metric and module pitches. The brief specification below shows the range of feeds and thread pitches available.

FEEDS

Number of Feeds	12
Range per rev. of spindle:	
Longitudinal	0.04 mm — 0.53 mm
Cross	0.02 mm — 0.25 mm

THREADS

Number of threads—Metric	31
Range	0.3 mm — 12 mm
Number of threads — Module	16
Range	0.3 — 3.00
Number of threads—English (using addition change gears)	32
Range	2.5 — 60 threads per inch
Pitch of leadscrew	6 mm pitch

GEARBOX

Control of the gearbox is by four levers, two of them (No. 1 and 2) situated at the left hand end of the gearbox having two positions each, one situated at the top of the gearbox (No. 3) having three positions, and a fourth located in the centre of the front cover (No. 4) having six positions. By fitting the correct change gears for the required feed or thread, and manipulating these four levers, a range of 12 longitudinal and cross feeds, 31 metric thread pitches and 16 pitches covering the module range may be obtained.

When placed in the central position, the lever No. 3 disengages the leadscrew when this is not actually required for screwcutting.

A further lever No. 5 situated high up on the front of the headstock controls the directions of the feeds, reversing them as necessary. THE SPINDLE AND HEADSTOCK GEARING MUST BE STOPPED BEFORE ANY OF THE LEVERS CONTROLLING THE GEARBOX ARE MOVED.

THREAD CUTTING

1. Threads available from the gearbox

When cutting metric, module and English thread pitches, the nut must be closed over the leadscrew and not released until the thread is completed. After each pass and tool withdrawal, the machine should be reversed by means of the reversing switch until the tool has returned to the correct position for commencing the next pass.

Setting the machine for thread cutting is accomplished by fitting the appropriate change wheels and selecting the correct positions for the gearbox levers. The correct settings may be readily ascertained by referring to the nameplates shown opposite.

Multi-Start Threads

Multi-start threads may be cut in any one of three ways.

1. By re-positioning the compound slide one pitch forward for each start. It will be realised however, that the accuracy of this method depends upon the operator.
2. By using an accurately divided driver plate and turning the workpiece one division forward for each start.
3. By advancing the driver gear a calculated number of teeth to advance the spindle by one pitch of the thread to be cut. The accuracy of this method is that of the machine. To use this method the number of teeth on the driver wheel should be a factor of the number of starts to be cut: e.g. when cutting a 12 mm pitch 4 start thread the 24T. driver gear is used; dividing 4 into 24 gives 6 which is the number of teeth to move the driver gear to obtain each start. To use this method, cut one start. Mark the meshing tooth on all gears then remove the idler gear. Turn the driver gear through the calculated number of teeth and replace the idler gear making sure that the meshing marks correspond exactly. Cut the next start and repeat for each remaining start.

Whichever method is used, the leadnut should be engaged to cut the first start and not released until all the starts have been completed.

English Threads

By fitting a number of additional change wheels in place of those supplied as standard with the machine a full range of English threads from 2.5 to 60 threads per inch may be cut. These threads are cut in the normal manner by fitting the appropriate change gears and manipulating the four gearbox levers to the correct positions for the thread required. The required change gears and lever positions are given on the nameplate shown on page 20. These extra gears may be obtained as additional equipment.

THREAD CUTTING

2. Threads not available from the gearbox

To cut threads which are not available from the gearbox it may be necessary to use special change gears which are available as extra equipment. To obtain the number of teeth in these gears, the following formulae should be used:

Metric Pitches

$$\frac{\text{DRIVER}}{\text{DRIVEN}} = \frac{40P}{VZ}$$

Where P = Pitch required to be cut.

V = 7 for centre lever position 1
8 for centre lever position 2
9 for centre lever position 3
10 for centre lever position 4
11 for centre lever position 5
12 for centre lever position 6

Z = 4 for lever settings DBE
5 for lever settings DBF
8 for lever settings CBE
10 for lever settings CBF
16 for lever settings DAE
20 for lever settings DAF
32 for lever settings CAE
40 for lever settings CAF

Example:

It is required to cut 0.65 mm pitch.

The values of V and Z may be chosen from any of the relevant numbers given above, and there is no rule about the choice. If the values selected give impossible numbers of teeth try other values of V and Z and continue doing so until a suitable result is obtained.

In the case of 0·65 mm pitch:

$$0.65 \text{ mm pitch} = \frac{65}{100} \text{ mm pitch}$$

$$\frac{\text{DRIVER}}{\text{DRIVEN}} = \frac{40P}{VZ} = \frac{40 \times 65}{10 \times 8 \times 100} = \frac{13}{40}$$

This must be compounded on the swing frame, thus: $\frac{13}{40} = \frac{26}{60} \times \frac{90}{120}$

This is fitted to the swing frame: $\frac{26}{120} \times \frac{90}{60}$

Module Pitches:

$$\frac{\text{DRIVER}}{\text{DRIVEN}} = \frac{880M}{7VZ}$$

Where M = Module required to be cut and V and Z have the same values as for metric pitches.

Example:

It is required to cut 1.4 Module: 1.4 Module $= \frac{14}{10}$ thus:

$$\frac{\text{DRIVER}}{\text{DRIVEN}} = \frac{880M}{7VZ} = \frac{880 \times 14}{7 \times 7 \times 32 \times 10} = \frac{11}{14} = \frac{22}{28}$$

English threads per inch

$$\frac{\text{DRIVER}}{\text{DRIVEN}} \times \frac{960}{VZT}$$

Where T = threads per inch required to be cut and V and Z have the same values as for the metric pitches.

The result will be compounded with the $\frac{127}{120}$ change gears thus:

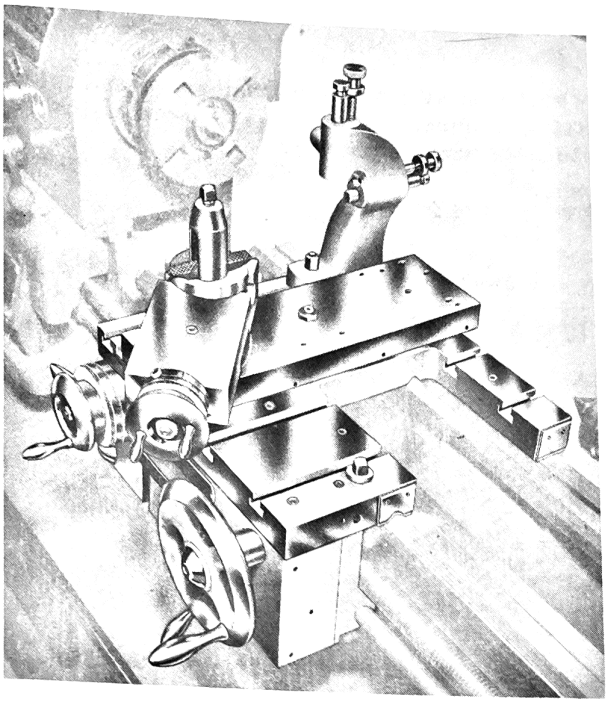
$$\frac{\text{DRIVER}}{\text{DRIVEN}} \times \frac{127}{120}$$

Example:

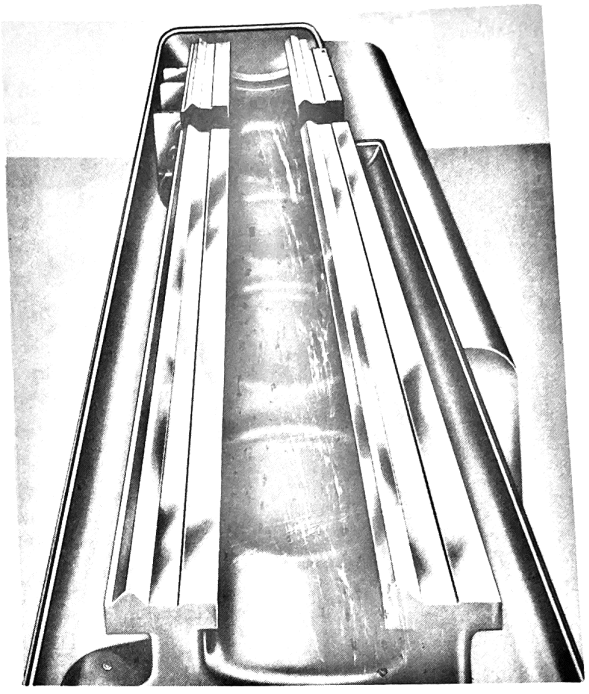
It is required to cut 15 threads per inch

$$\frac{\text{DRIVER}}{\text{DRIVEN}} \times \frac{127}{120} = \frac{960}{VZT} \times \frac{172}{120} = \frac{960}{8 \times 10 \times 15} \times \frac{127}{120} = \frac{24}{30} \times \frac{127}{120}$$

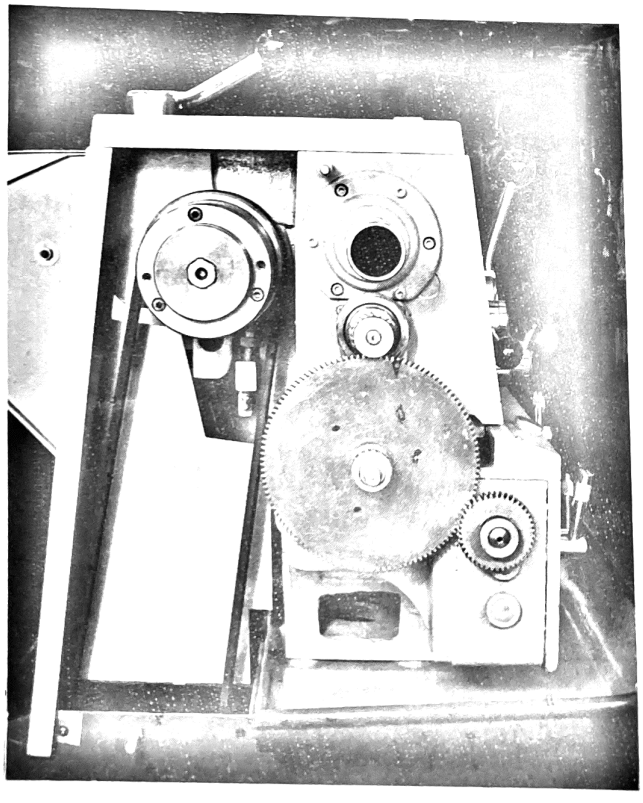
This is fitted to the swing frame thus: $\frac{24}{120} \times \frac{127}{30}$



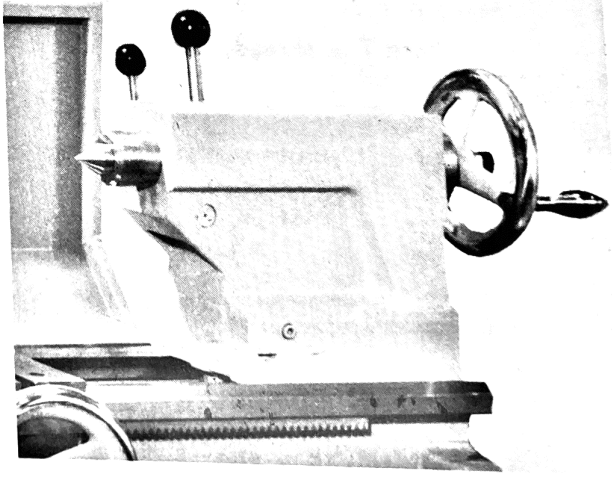
The saddle and slides



The machine bed



The drive and end gear train



The tailstock

THE SADDLE AND SLIDES

The saddle is of the boring type on gap bed machines, and of American winged type on straight bed machines. It is secured to the bed by adjustable gibs at front and rear, and can be locked at any position on the bed by means of a locking clamp. The swivel slide is radially graduated for accurate setting on the cross slide. Large diameter micrometer dials are fitted to top and cross slides; each graduation represents 0.001 in. of tool movement or, in the case of the metric slides, each graduation on the top slide represents 0.05 mm and on the cross slide 0.025 mm.

An American pillar type tool post is fitted as standard, intended for $\frac{9}{16}'' \times 1\frac{1}{8}''$ tools. Alternative tool posts are available as additional equipment—either a four-way automatic indexing turret or the Colchester multi-type tool post.

THE BED

The lathe bed should be cleaned down as often as possible by brushing to keep it free from cuttings. Do not use an air line, which will drive chips under the sliding surfaces and blow away the protecting oil film. After each cleaning, the bed should be coated with Shell Tellus 33 Oil to prevent rust formation.

To remove the gap piece on gap bed machines, unscrew the four Allen screws. No dowels are fitted.

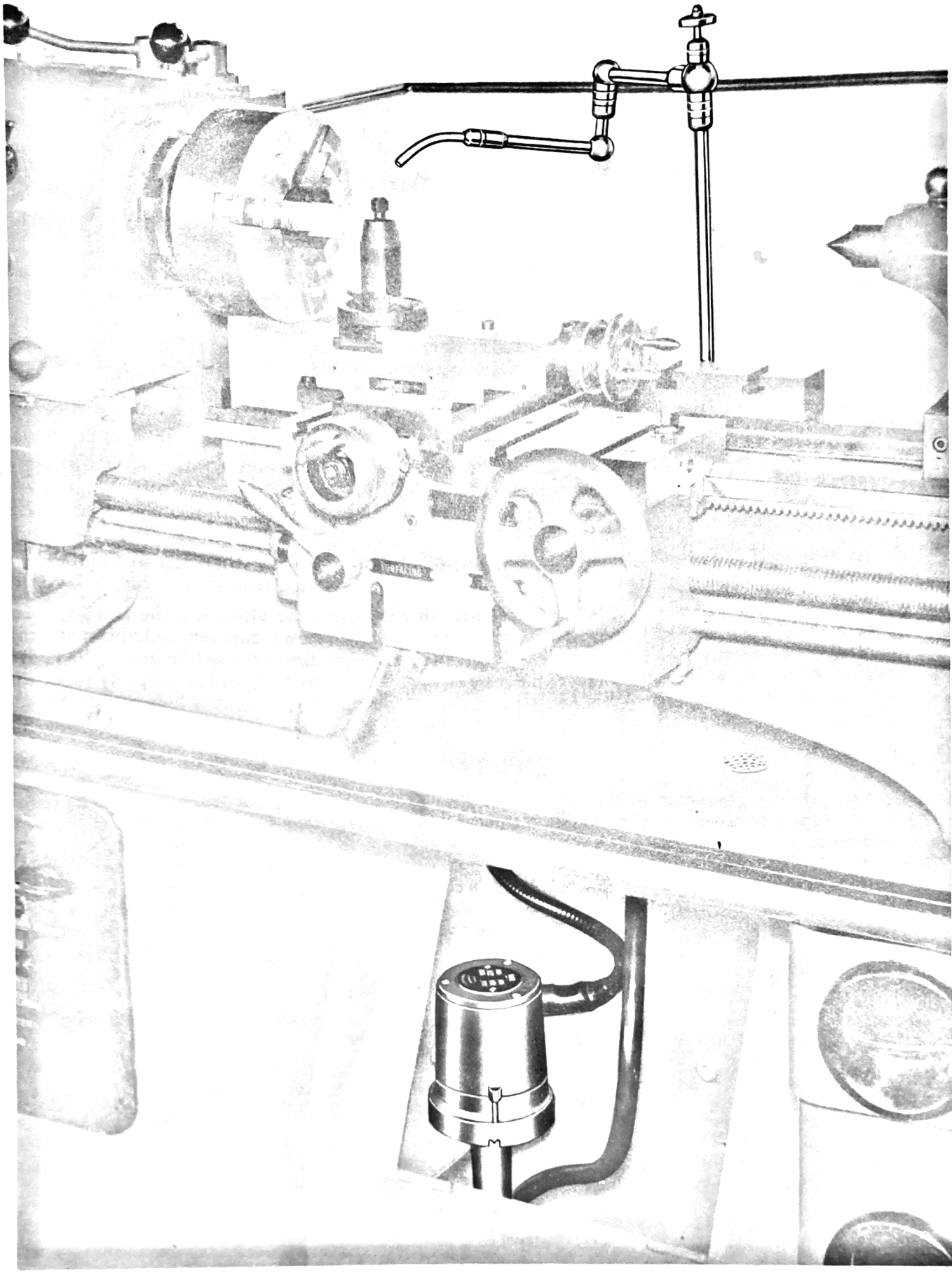
To replace the gap piece, it is important first to clean both the block and the locating faces thoroughly. Then replace the gap piece, and locate the four screws, two vertically from the top and two horizontally, one in each outer edge of the gap piece. Bring the saddle up to give rough alignment and tighten the screws down lightly. Then, if the locating faces are properly clean the gap piece may be aligned with a few taps in the required direction with a hide mallet. Finally tighten the four Allen screws.

THE TAILSTOCK

The barrel is graduated in inch and metric divisions and induction hardened both in the No. 3 morse taper bore and on the outside diameter. All standard tang drills are driven by the tang and eject at zero graduation. A tool height indicator line is stamped onto the front face of the nose chamfer to assist in setting tools to the correct centre height when a workpiece is being held between centres. There are two parts to the tailstock casting, the base proper which slides along the bedways and the tailstock body, which may be moved laterally on the base. This movement or " setting over " allows shallow tapers to be turned without the need of a special taper-turning attachment. The tailstock is set over by first releasing the bedway clamp lever and adjusting the two set-over screws fitted for this purpose. THE TWO SPRING-LOADED SHOULDER BOLTS HOLDING THE BASE TO THE MAIN CASTING DO NOT REQUIRE SLACKING OFF AT ANY TIME. Quick lever clamping is employed to lock the assembly in position on the bedways. The tailstock barrel is locked by a lever operated clamp.

DRIVE

Drive to the headstock from the motor is by belt. The motor platform is adjustable to allow for the correct tensioning of the belts. When correctly tensioned, a flat belt should have approximately $\frac{1}{2}''$ (12 mm.) free side movement in either direction under finger pressure. In the case of vee-belts the corresponding free movement should be approximately $\frac{3}{4}''$ (19 mm.).



The suds unit

ADDITIONAL EQUIPMENT

THE SUDS UNIT

The cabinet base has a built-in storage tank in the centre with a pump fitting position already provided. A return pipe from the centre of the tray takes coolant back to the tank, and a gauze strainer is fitted to the pipe at tray level to ensure that no chips are returned to the sump. The flexible piping supplied with this unit is fully universal and will feed the coolant to any required position. The supply of coolant is easily controlled by the ball-type shut-off valve which is leak-proof. The whole unit has been designed to eliminate the leaks which are usually inherent in coolant systems. The capacity of the unit is 5½ gallons.

Soluble oil emulsions

For most work a soluble oil emulsion will be chosen, since this will almost always be adequate for the work in hand, and will be preferred by the machine operator.

When screwing with a die-head, tapping, or reaming, some extra coolant applied locally may be required. If much work of this type is contemplated, it may be better to use an emulsion of an extreme pressure soluble oil in the machine sump. A good quality oil of this type will give results equal to neat cutting oil whilst retaining the cleanliness of soluble oil.

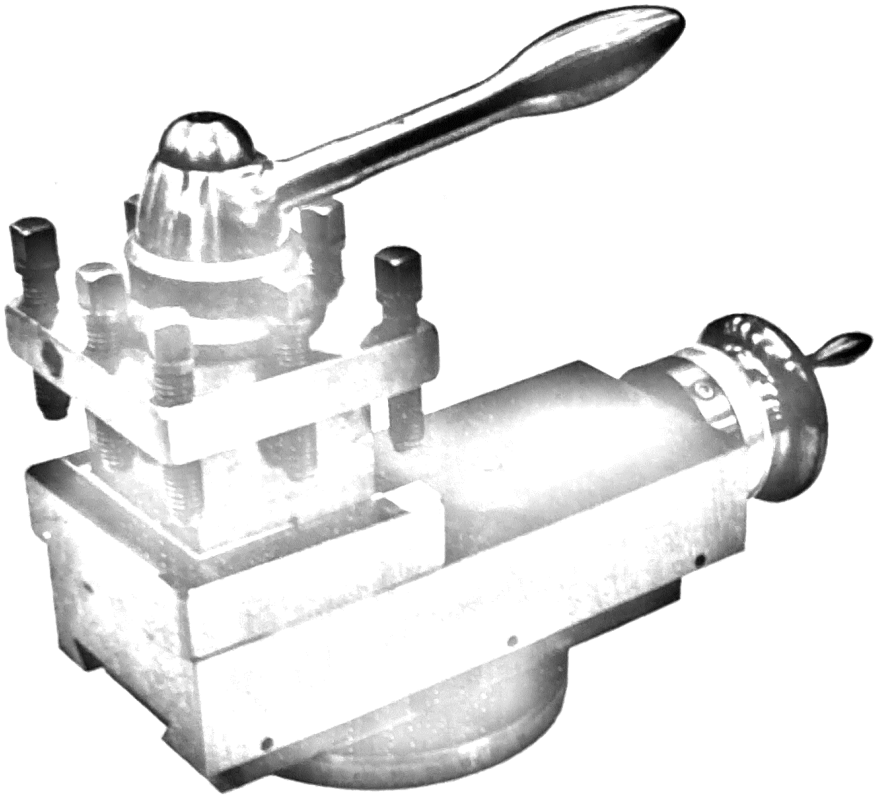
Good quality soluble oils should always be chosen and mixed in accordance with the suppliers' recommendations. The following grades have been tested and used in our own works with complete satisfaction:—

Shell Dromus Oil B—conventional milky soluble oil mixed with water in the ratio 25/30 : 1.
Shell Dromus Oil D—translucent soluble oil mixed with water in the ratio 40 : 1.
Shell Dromus Oil 908—extreme pressure oil mixed with water in the ratio 10/15 : 1.

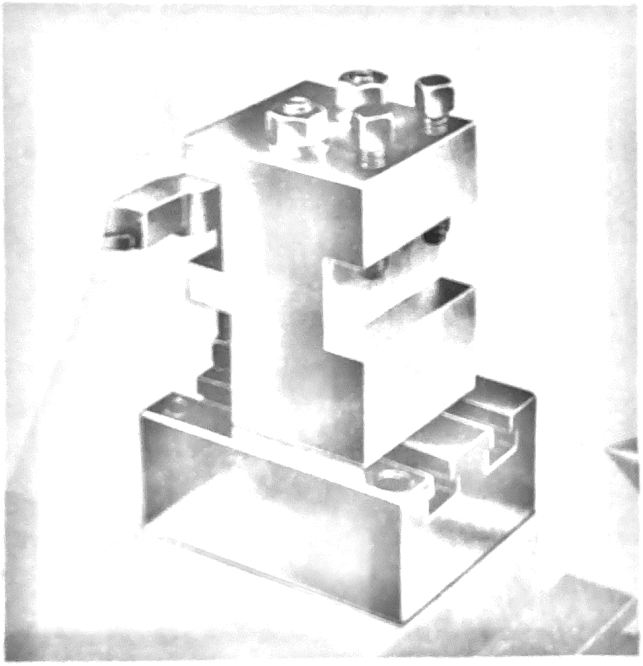
Soluble oils and machine maintenance

No soluble oil emulsion, however good, can completely prevent rust without help from the operator. The machine should therefore be cleaned down regularly and the bright parts wiped over with machine oil. It should never be left, especially over weekends or holidays with wet swarf on the bed or slides. When the work in hand requires the saddle or tailstock to be clamped in one position for long periods it is advisable to spread a little machine oil on the bed beforehand to ensure a film of oil between the surfaces.

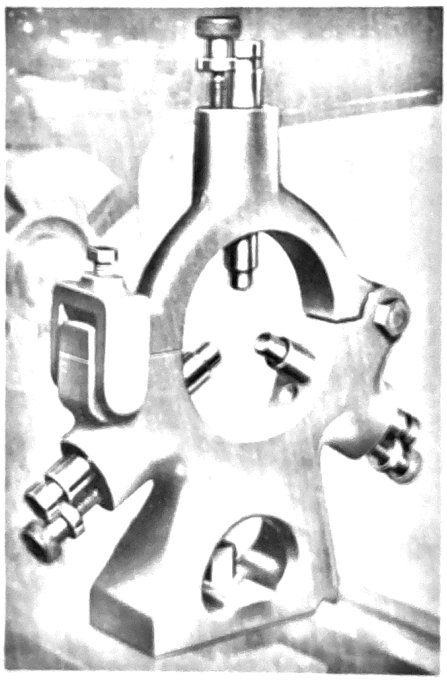
The sump should be emptied, cleaned out and re-filled with newly mixed soluble oil at regular intervals.



Square turret toolpost



Rear toolpost



Stationary steady

SQUARE TURRET TOOLPOST

To index the toolpost into any of the four operating positions, the central hand lever is moved in an anti-clockwise direction until two distinct detents have been felt. This indicates that the plunger mechanism has released the locating plunger and that the indexing mechanism is engaged. When the central hand lever is returned in a clockwise direction the turret will index into the next position. A further short movement of the lever in the same direction will lock the turret block to the topslide.

By using the retracting plunger method of indexing, the turret block is able to remain on its bottom face whilst being indexed, which effectively prevents the entry of swarf between the locating faces. The turret block can also be swung into any position without the use of the indexing mechanism.

The turret block will accommodate up to four tools or toolholders having a height up to $\frac{13}{16}$".

STATIONARY STEADY

Of extremely rigid design, this attachment is very easily opened and set. Three adjustable fingers are provided, and the maximum capacity is 4" bar diameter.

The inserts are of sintered bronze and are quickly replaced, being a press fit into the ends of the fingers.

The whole attachment is readily attached to the bed by a clamp bolt, and can be removed very rapidly when not required for use.

REAR TOOLPOST

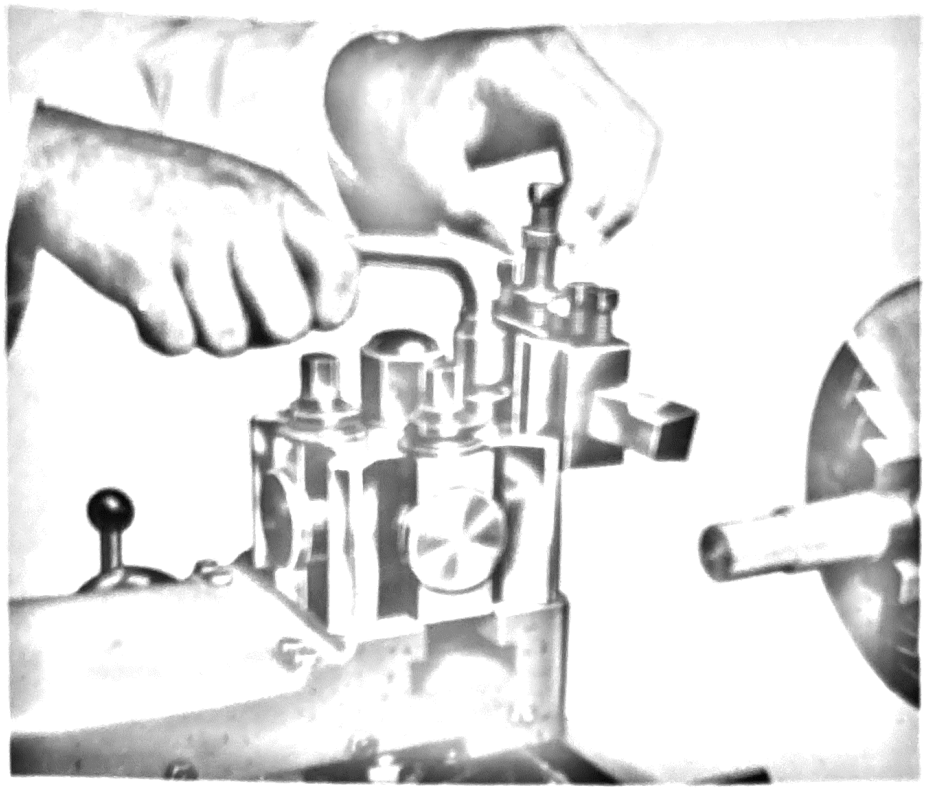
As an aid to production, a rear toolpost is available for fitting direct to the cross slide, which is drilled and tapped ready to receive it.

Two tool positions are provided so that the tool may be fitted either in the conventional manner, or in the inverted position.

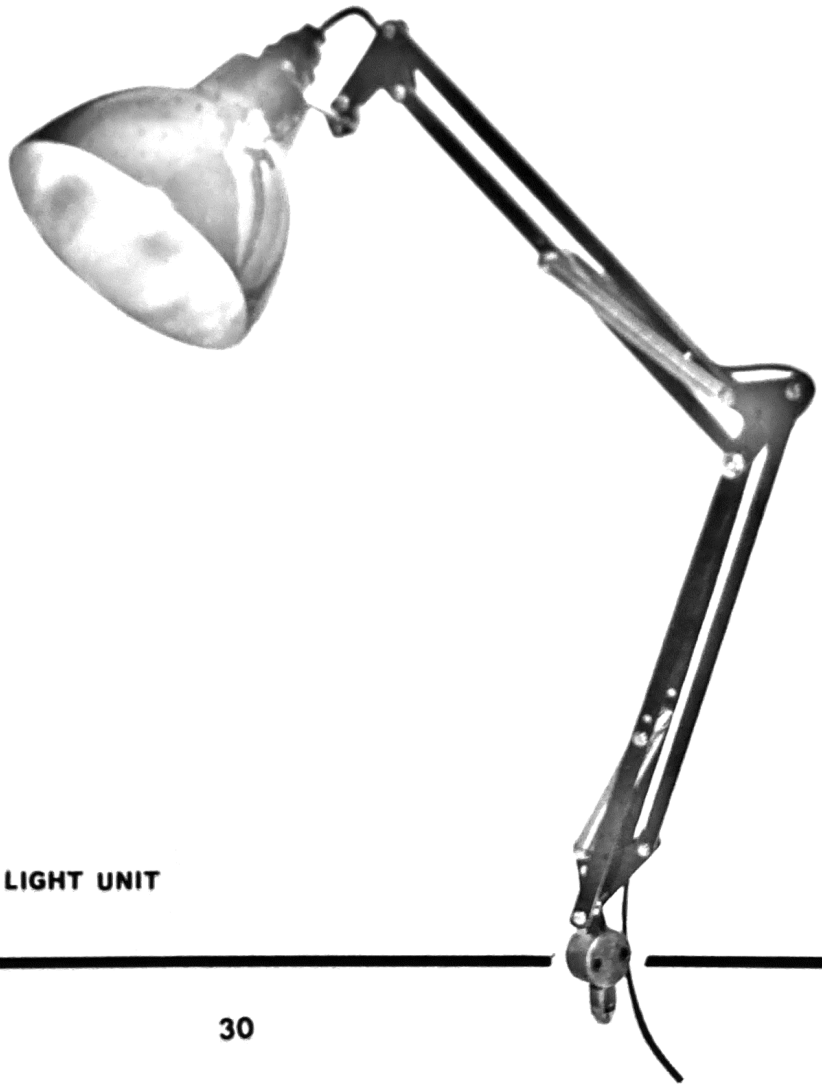
Using this tool post (with the tool fitted in the conventional manner) left hand threads can be very easily cut.

Supplied complete with all the necessary fixing screws, the only fitting required is the physical bolting of the base pad to the cross slide. Tee slots are provided in the base pad so that the toolpost may be adjusted in position on the base. Maximum tool depths that can be accommodated in either position are $\frac{5}{8}$".

The standard spanners and Allen keys supplied with the machine will fit all the nuts and screws in this assembly.



QUICK CHANGE TOOLPOST



LOW VOLT LIGHT UNIT

COLCHESTER QUICK-CHANGE TOOLPOST

This type of toolpost may be fitted to existing standard topslides without modification. Designed to cut down time on repetition work, it enables any number of toolholders to be used.

The toolpost unit comprises a basic clamping block to which a variety of toolholders may be fitted. Each toolholder has a vertical adjusting screw and when a tool in its holder has once been set to centre-height it may be removed and replaced any number of times in sure knowledge that the tool will be at exact centre height each time it is clamped back into the block.

Four types of toolholder are available:

The standard toolholder will accommodate all normal types of tool up to a maximum size of $\frac{3}{4}'' \times 1''$ (19 × 25·4 mm).

The vee toolholder accommodates boring tools with parallel shanks up to $\frac{5}{8}''$ (16 mm) diameter.

The morse taper holder is suitable for all tools having a No. 1 M.T. shank.

A parting-off toolholder, complete with spare tools, is now available.

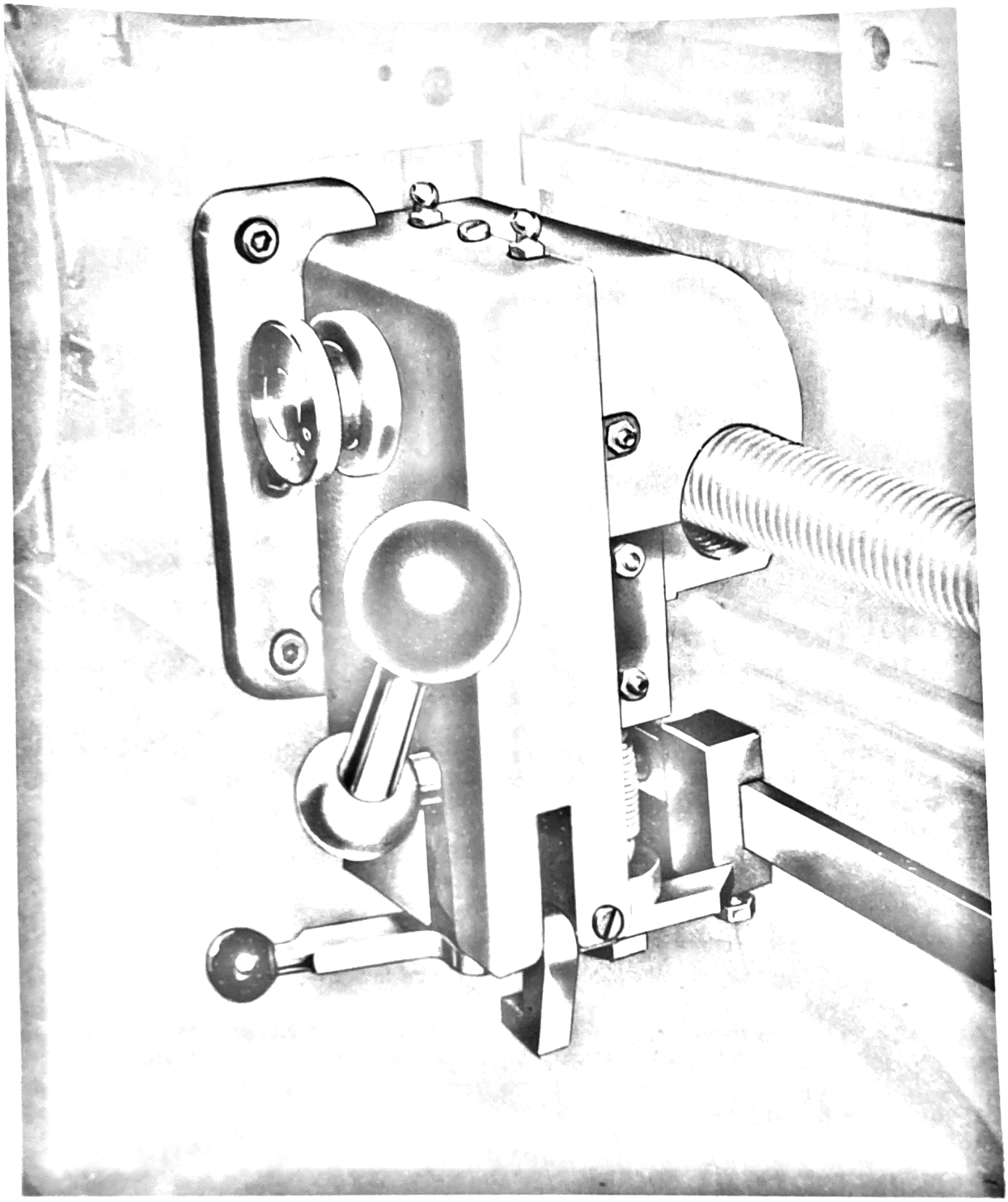
LOW VOLT LIGHTING

The " Anglepose " lighting unit offers the positive virtue that it will really " stay put " in any position through all normal speed and cutting ranges.

The unit is supplied complete with transformer, bulb, switch, and fuses. Fitting instructions are given below. If the unit is supplied as initial equipment with the machine, the transformer and fuses are already fitted in the electrical panel and items 4 to 7 inclusive of the fitting instructions can be omitted.

Instructions for fitting low-volt lighting

1. Switch off the main switch.
2. Mount the carrying block on the rear of the headstock casting after first removing the grub screws from the two drilled and tapped holes provided for this purpose.
3. Insert the screwed end of the supporting screw in the block and secure with spring washer and nuts.
4. Remove the three cap head screws securing the main electric panel and pull the panel forward, which will automatically isolate the mains supply from the panel.
5. Fit the toggle switch provided to the front of the panel and connect up. (See wiring diagram page 6).
6. Wire up the transformer for the correct voltage as indicated by the coding on the wires.
7. Screw transformer to panel using pads provided.
8. Run cable from lamp through the hole provided in the top of the motor casing.
9. Pass the end of the cable through one of the conduit holes in the panel casing, and connect to the secondary (output) winding of the transformer via the switch.
10. Replace the panel and secure with the three screws.



RAPID THREADING UNIT (ENGLISH)

RAPID THREADING UNIT (ENGLISH)

This revolutionary feature enables standard Colchester Lathes to cut threads at up to five times faster than by normal methods. Threads may be cut right up to a shoulder at maximum speeds, blind bores may be threaded without an undercut and full advantage may thus be taken of modern cutting tools.

The unit contains its own half nut and engagement mechanism and so eliminates the possibility of threads being picked up incorrectly. An adjustable stop disengages the half nut automatically at the end of a thread. The unit may only be used on Whitworth threads and it is not suitable for metric, module, D.P. threads, or threads per inch ending in any fractions other than $\frac{1}{2}$ or $\frac{1}{4}$, e.g., $5\frac{1}{8}$ t.p.i.

A graduated dial may be set in any one of four positions for cutting the following threads.

0—Safe. It is impossible to engage the lead nut.

1—Quarter threads per inch—e.g., $4\frac{3}{4}$.

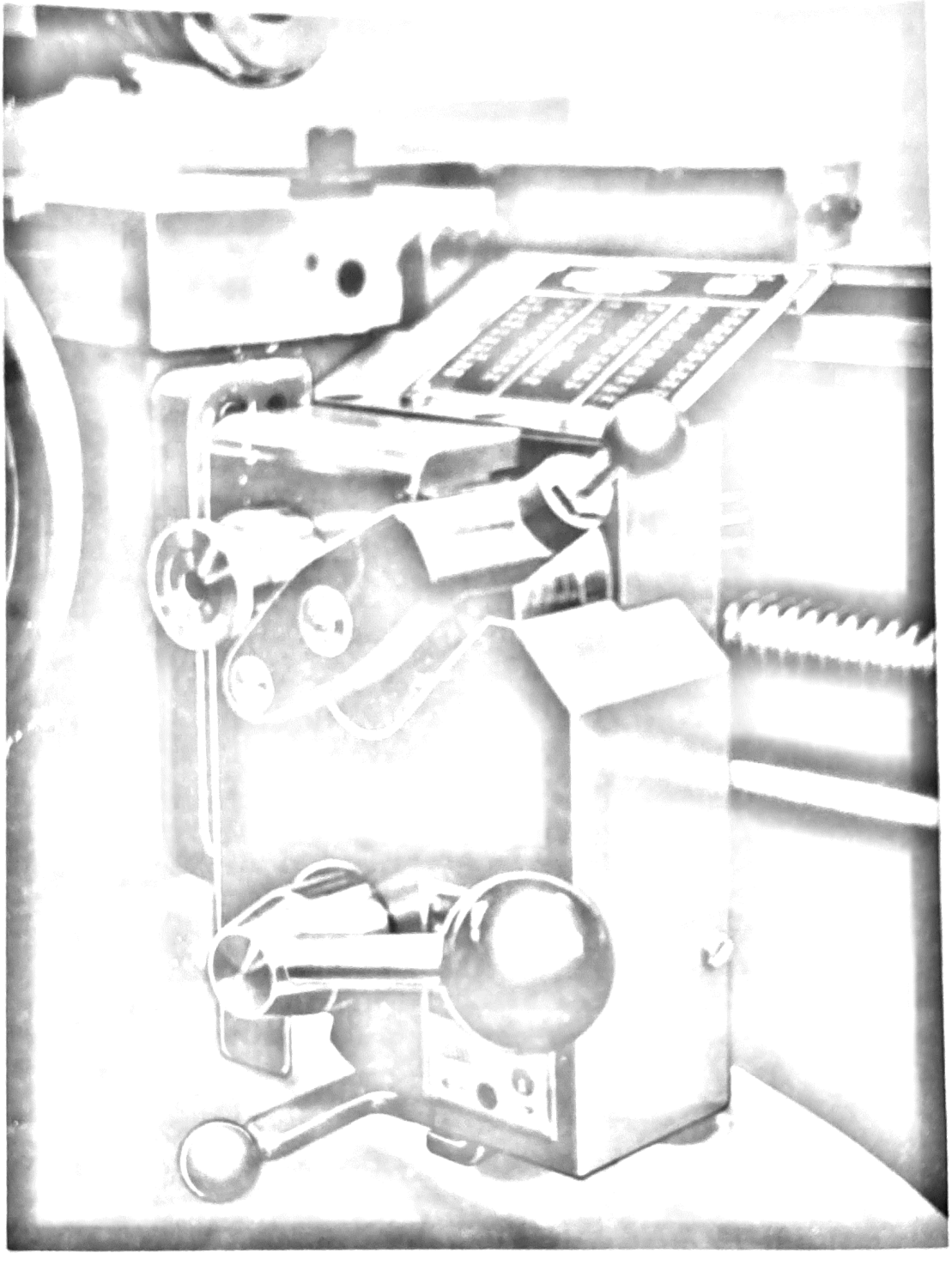
2—Half threads per inch—e.g., $4\frac{1}{2}$.

4—Whole threads per inch, either even or odd Nos.—e.g., 8 t.p.i.

Mounted below the saddle is a stop bar attached to the lathe bed, which carries an adjustable stop. By setting this stop, the cut may be disengaged automatically in any desired position.

The lead nut lever operates a half nut below the leadscrew with a steady pad situated above the leadscrew giving adequate support when cutting threads at high speeds. The knock-off lever may be swivelled out of position so that the lathe may be used normally, without disturbing the setting off the knock-off stop.

The necessary holes for mounting this unit to the apron at a later date are pre-drilled and tapped during manufacture, and all necessary holding screws and locating dowels are supplied with the unit. The only operations which must be carried out on site are the drilling and tapping of the bed to accept the stop bar, and the fitting of a small lock plate to the normal lead nut handle to prevent the apron half nut being accidently engaged.



RAPID THREADING UNIT (METRIC)

RAPID THREADING UNIT (METRIC)

Introduction of the Metric Rapid Threader Attachment reduces machining time for what is normally regarded as the slowest operation and in so doing eliminates bottle-necks. It enables you to take full advantage of the speed and capacity of your Colchester Lathe. Screw-threads 3mm pitch 50mm diameter can be cut at 1200 rpm. and is typical of the production rates you can achieve.

Designed as a self-contained unit, it contains its own leadscrew nut and engagement mechanism.

There are no revolving dials to watch or need for manual co-ordination when cutting screw-threads on a machine fitted with this unit. After setting the tumbler gear in the correct position in the quick change gearbox for the required pitch all you have to do is set a control knob on the unit to one of two positions and the selector lever on the front of the unit to one of five positions according to the pitch to be cut. The leadscrew nut housed in the unit can then be engaged in the predetermined positions with complete accuracy and infallibility.

An adjustable stop disengages the leadscrew nut automatically at the end of each cut; thus preventing the tool over-running either into the work or chuck.

The tool is then withdrawn from the workpiece manually and the saddle returned to the starting point. The tool is then fed in for the next cut and the handle depressed to re-commence the cycle. This sequence is repeated until full depth of pitch is attained.

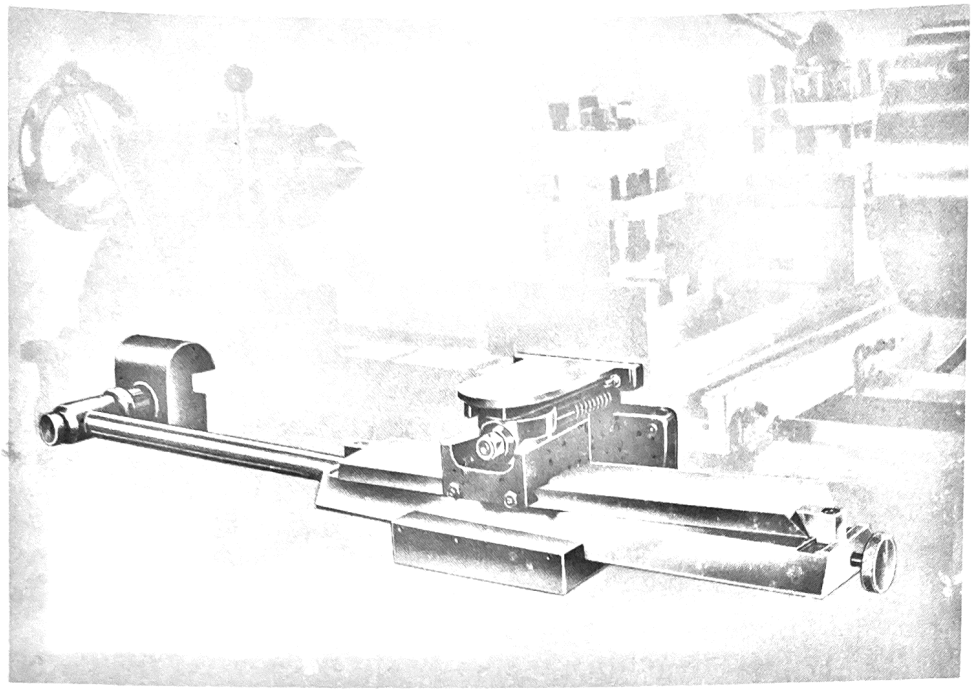
METRIC THREADS - settings

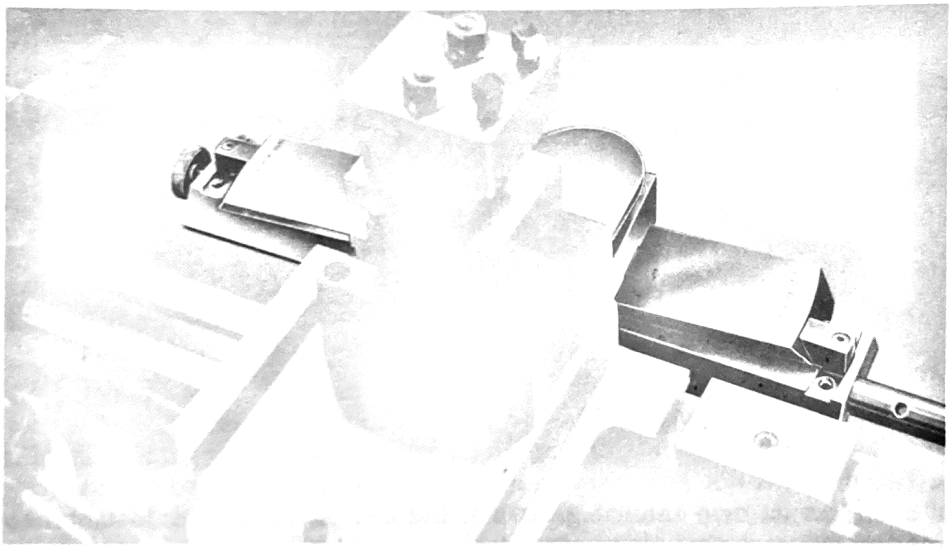
0·3	A4	1·0	A4	3·5	E4
0·35	A4	1·1	C2	4·0	A4
0·4	A4	1·2	A4	4·5	D4
0·45	D4	1·25	B4	5·0	B4
0·5	A4	1·4	E4	5·5	C2
0·6	A4	1·5	A4	6·0	A4
0·7	E4	1·75	E4	7·0	E4
0·75	A4	2·0	A4	8·0	A4
0·8	A4	2·5	B4	9·0	D4
0·9	D4	3·0	A4	10·0	B4
				12·0	A4

On repetition work, cycle times for screwcutting can be considerably reduced as it now becomes possible to perform this operation at the high turning speed applicable to Tungsten Carbide Tooling. It is not necessary to machine undercuts prior to commencing screwcutting as the tool produces its own annular groove at the end of the thread. Instantaneous cut-out of the saddle motion makes it possible to repeatedly cut tight up to a shoulder without risk of over-run.

The special adjustable bed stop does not prevent the machine being used as a normal lathe because the knock-off lever can be swivelled out of position to permit normal sliding feeds to be used.

The High Speed Metric Screwcutting Attachment is intended for the production of metric pitches—either right or left hand—only. It cannot be used for Module, inch pitch or D.P. Threads.





Telescopic taper attachment

TELESCOPIC TAPER TURNER

This attachment can be used for producing tapers up to 10° in either direction.

It can be mounted directly onto the rear of the saddle without any modification other than the fitting of a new saddle screw and nut which is supplied with the unit.

The swivel slide is graduated in $\frac{1}{4}$° of arc and in $\frac{1}{8}$" taper per foot, and great sensitivity of control is obtained when setting a taper by the use of the micro adjustment screw.

The cross slide handwheel is always used to control the tool and the base slide can be adjusted along the bed so that the taper may be cut in any position.

The attachment will deal with a length of 12" of taper at any one setting.

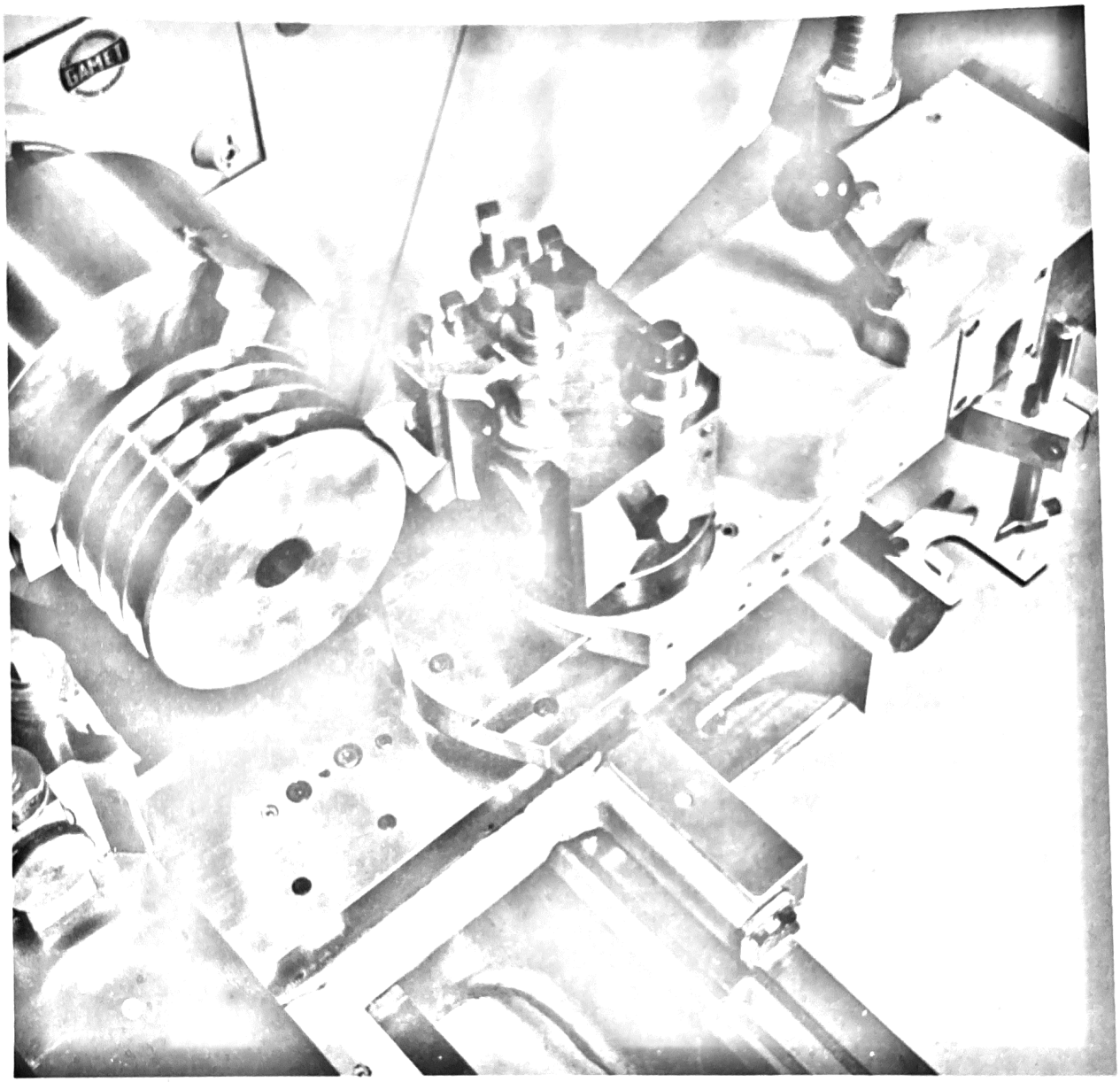
After attaching to the machine, all that is required to prepare the taper turner for use is the clamping of the connecting rod in the anchor bracket by means of the knurled thumb screw.

The fitting of this attachment in no way detracts from the use of the machine as a normal centre lathe. Change-over can be simply accomplished by loosening the connecting rod clamping screw and traversing the saddle towards the headstock to disengage the connecting rod from the clamp. Then remove the anchor bracket from the bed so that there is no obstruction to foul the connecting rod. By replacing the bracket and engaging the connecting rod the taper turner is rapidly reset for use.

Great care should be taken when readjusting or altering the fit of the base slide in the taper turner bracket, as any slackness will result in incorrect tapers.

To fit the taper turner

1. The saddle and cross slide are ready drilled to receive the attachment, the necessary holes being drilled and tapped during manufacture.
2. Clean down the rear end of the saddle to receive the taper turner bracket.
3. Release the locknut in the centre of the cross slide handwheel.
4. Remove the two securing screws from the saddle screw keep and by turning the handwheel in a clockwise direction withdraw the saddle screw.
5. Slide the cross slide to the rear of the saddle, remove the saddle screw nut and replace it with that provided with the taper turner.
6. Insert the taper turner saddle screw from the rear of the machine into the saddle screw nut, turning in an anti-clockwise direction until the splined end of the screw protrudes about $1\frac{1}{2}$" from the front of the saddle, making the engagement of the splines in the pinion and the taper turner saddle screw an easy operation.
7. Replace the saddle screw keep and secure. (*Note:* The lock nut from the original saddle screw is not replaced, but should be retained in case it is needed when refitting the original screw.)
8. The slide block assembly can now be fitted to the thrust block on the rear of the saddle screw assembly. Engage the slides in the bracket and the slide block assembly on the slides, which will enable the bracket to be bolted to the rear of the saddle using the pre-tapped holes provided.
9. Finally, bolt the bottom slide extension piece to the rear of the bottom slide and affix the connecting rod and slideway clamp to the bed.



Hydraulic Profiling Attachment

THE COLCHESTER SERIES 300 HYDRAULIC PROFILING UNIT

Designed for faster and more accurate profiling the standard equipment comprises a profile slide assembly, a rear beam assembly for round or flat masters, a free standing hydraulic power unit and a set of connecting hoses housed in a single flexible armoured conduit.

The Profile Slide Assembly

Mounted on the cross slide of the lathe, this is an integral unit consisting of the operating cylinder, cartridge type servo valve, stylus lever mechanism and a swivelling Colchester Multi-type Toolpost complete with one turning toolholder.

The cylinder has a 3 in. (76 mm) stroke and a maximum approach retraction speed of 110 ins. (279 cm.) per minute. The low stylus pressure of 6 oz. (170 g.) allows soft masters to be used if necessary, and the in-feed rate is lever controlled.

A swivelling Colchester Quick Change Toolpost allows tooling to be pre-set and enables tool changes to be made without re-setting the slide assembly. Sufficient height adjustment is provided to allow the tool to be set for forward or reverse cutting.

The assembly can be set at five alternative angles to the axis of the machine—either 90°, 60°, 30°, 0°, depending on the work to be produced and a copying accuracy of ± ·0005 ins. can be achieved. The change in copy diameter at 90° is 5½ in. and at 60° 5 in.

The Rear Beam Assembly

The beam fixes directly to the rear face of the lathe bed and provides a rigid datum surface for carrying the master parallel to the axis of the machine.

Two beam brackets slide on the rear beam and provide a locating surface for the tailstocks which accommodate round masters or flat templates. The tailstocks are adjustable for the micrometer setting of the master or template.

The Hydraulic Power Unit

A free standing unit, designed to fit neatly at the rear of the lathe, has a ½ H.P. pump producing a working pressure of 300 lbs/sq. in. A pressure gauge is fitted and independent switch gear is also incorporated.

The pump and oil filter can be removed as an assembly for inspection.

Turret Stop

An indexing turret stop is available as an optional extra to enable progressive in-feed to be applied between roughing cuts. Six stops provide for five roughing cuts and one finishing cut to be pre-set. Progressive settings of the turret stop enable roughing cuts to be taken at uniform depth. The final cut follows the full form of the copy master.

Facing Beam

A facing beam is also available as an optional extra. Designed for flat templates, it is secured to the saddle of the machine and incorporates micrometer laterial adjustment.

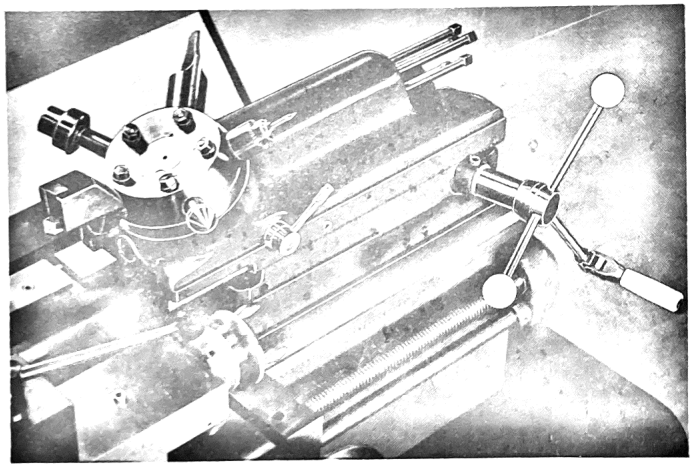
BRIEF SPECIFICATION OF COLCHESTER SERIES 300 PROFILER

Cylinder stroke	3 in	Stylus load	6 oz.
Max. approach/retraction speed	110 in/min	Change in copy diameter at 90°	5½ in
Velocity characteristic	12 in/min/0·001 in stylus deflection	Change in copy diameter at 60°	5 in
		Working pressure	300 lb/in²
Hydraulic reproduction accuracy	± 0·0005 in	Pump motor ½ h.p. at	1500 r.p.m.

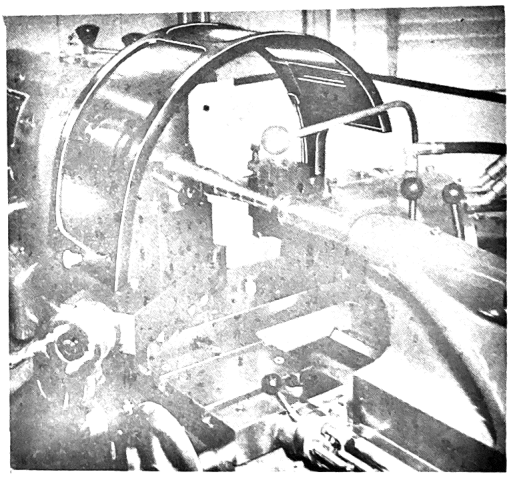
THE COLCHESTER CHUCK/CHIP GUARD

This perspex and alloy guard can be used either as a chuck guard or a travelling chip guard, and is supplied complete with mounting block. The necessary holes for fitting are pre-drilled and tapped before machines are despatched from the works. When used as a travelling chip guard, it is mounted on the rear face of the saddle, and when used as a chuck guard it is clamped either to the bedways in the case of straight bed machines, or to the rear face of the headstock in the case of gap bed machines.

The use of this guard eliminates the risk of injury to operators when using high speeds, and also prevents the splashing of coolant over adjacent machines.



Close up view of capstan unit



Perspex chuck/chip guard

THIRD SHAFT CONTROL UNIT

Introduction

Of proven design and application, this integral electro-mechanical unit affords a significantly effective arrangement for localising the control of a lathe. Its outstanding advantages centre around the single lever operating control and the means for pre-selection of speeds and feeds. Efficient and effortless operation of the lathe is from the hand lever at the apron which controls starting or stopping and forward or reverse rotation of the spindle with the leadscrew nut engaged.

This equipment and the facilities thus available can be built into the machine as an optional extra. By incorporating and controlling a two-speed motor, 16 spindle speeds are available for each machine.

Panel controls

On each lathe, the control panel is built into the front of the cabinet before despatch. On the top, sloping face of the panel is carried a switch panel having the five operating switches used during working. On the front face of the panel is located the main supply ON/OFF switch. (2).

The two operating switches (3) at left of the panel are marked clearly FORWARD and REVERSE respectively and are used to pre-set the motor speed range at either HIGH or LOW for both the forward and reverse directions of spindle rotation. The use of these two switches makes the third shaft control system specially suitable for cutting metric pitches, where the half-nut must be left in engagement with the leadscrew until thread cutting is completed.

Motor

A two-speed motor is employed, giving the same range of sixteen spindle speeds as for standard centre lathes.

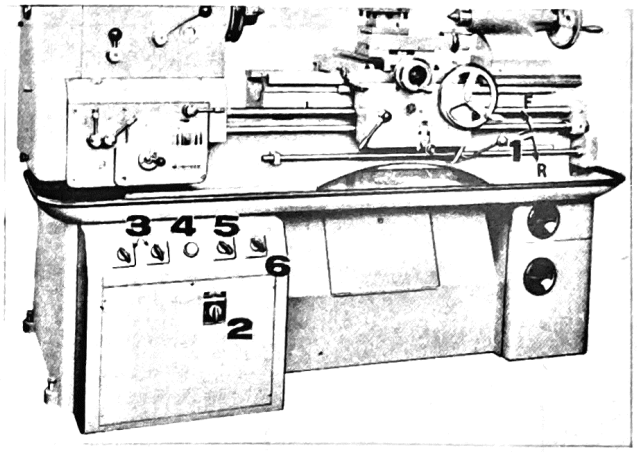
Each motor so fitted includes an electro-magnetic brake device, providing an instantaneous braking of the main motor and drive when the apron control lever is moved to the OFF position. This facility is also extended with the inclusion of an EMERGENCY STOP button.

Apron controls

The control lever (1) is situated at the right of the apron assembly, as shown, and has two functions;

(a) To start and stop the machine for normal requirements.

(b) To select forward or reverse rotation of the spindle.



A safety feature is incorporated to prevent accidental starting of the machine. Before the control lever is raised or lowered into the operating positions, it must first be moved to the right in order to disengage the locking mechanism which retains the lever in the OFF position. Raising the lever then sets the spindle in forward rotation, depressing the lever stops the motor instantly then reverses the direction of rotation.

Application

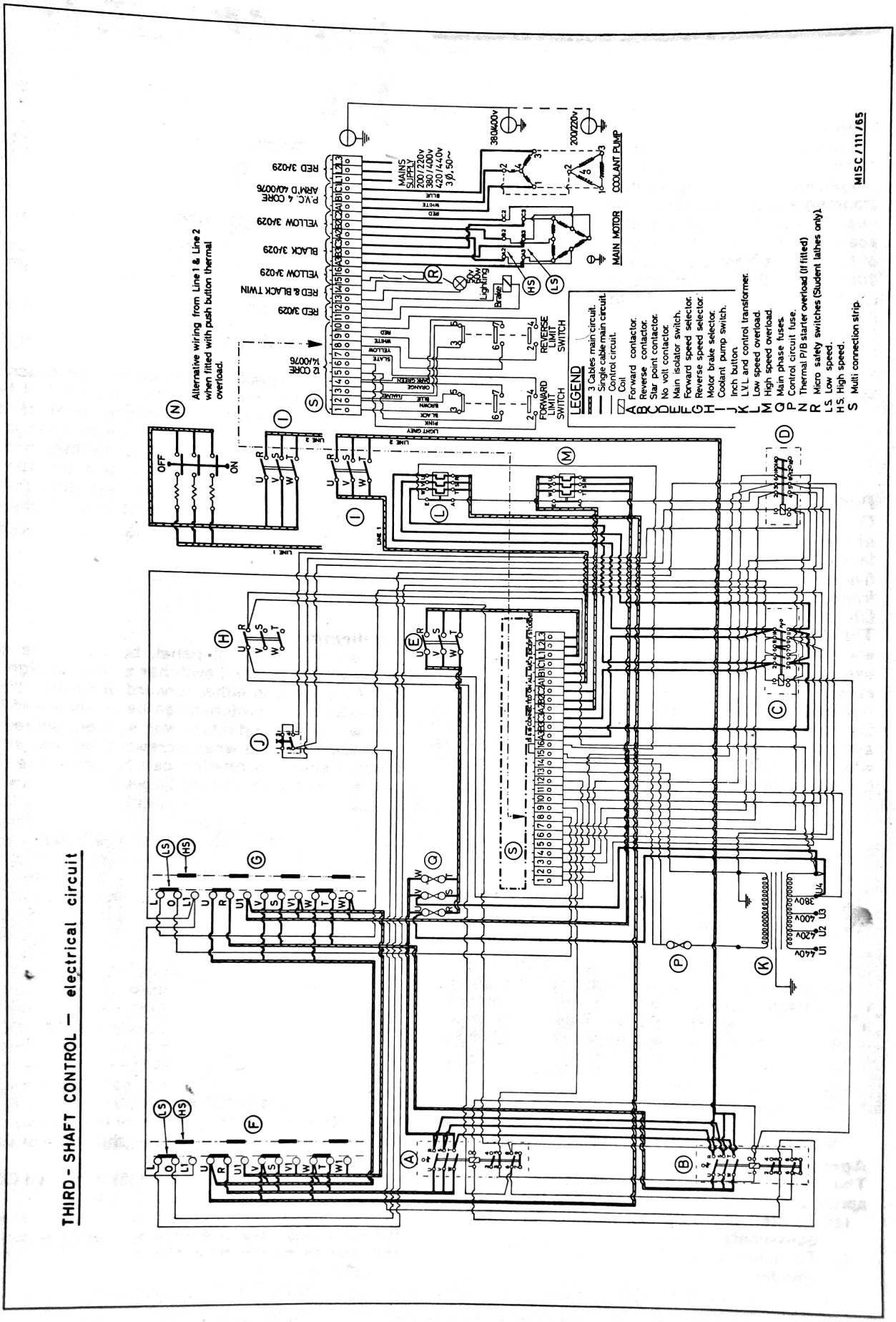
The electrical control panel, built into the cabinet houses the pre-select switches providing high or low spindle speeds in either forward or reverse direction of rotation. The switches can be pre-selected to give a slow feed and fast return with subsequent reduction in production time when screwcutting. For example, forward speed of rotation can be set at the correct rate for metric thread cutting using the low range whilst the reverse spindle rotation carrying the tool back for the next pass can be set at the high range.

The centre switch button (4) serves a dual purpose; light pressure on the button whilst the machine is running operates the emergency stop brake, heavy pressure on the switch button when the machine is stopped actuates the circuit for 'inching' the spindle in forward rotation. When the lathe is stopped by pressing the STOP button, it is necessary first to move the apron control lever back to the OFF position before restarting in the prescribed manner. The switch (5) controls the magnetic brake. It may be set to operate automatically in conjunction with the apron control lever in normal start, stop and reverse sequence, or it may be set to allow the release mechanism to become energised whilst the spindle is stopped. In this condition, the spindle is free to be rotated by hand. Note, however, that the brake release should not be left energised for any length of time or damage may result.

The switch at the extreme right (6) is marked ON/OFF and is for control of the coolant pump motor.

The complete control circuit operates at low voltage (50 volts only). No ill effects will result should it be required to switch from fast to slow feed in either forward or reverse travel.

THIRD SHAFT CONTROL



THIRD - SHAFT CONTROL — electrical circuit

COLCHESTER

PARTS SECTION

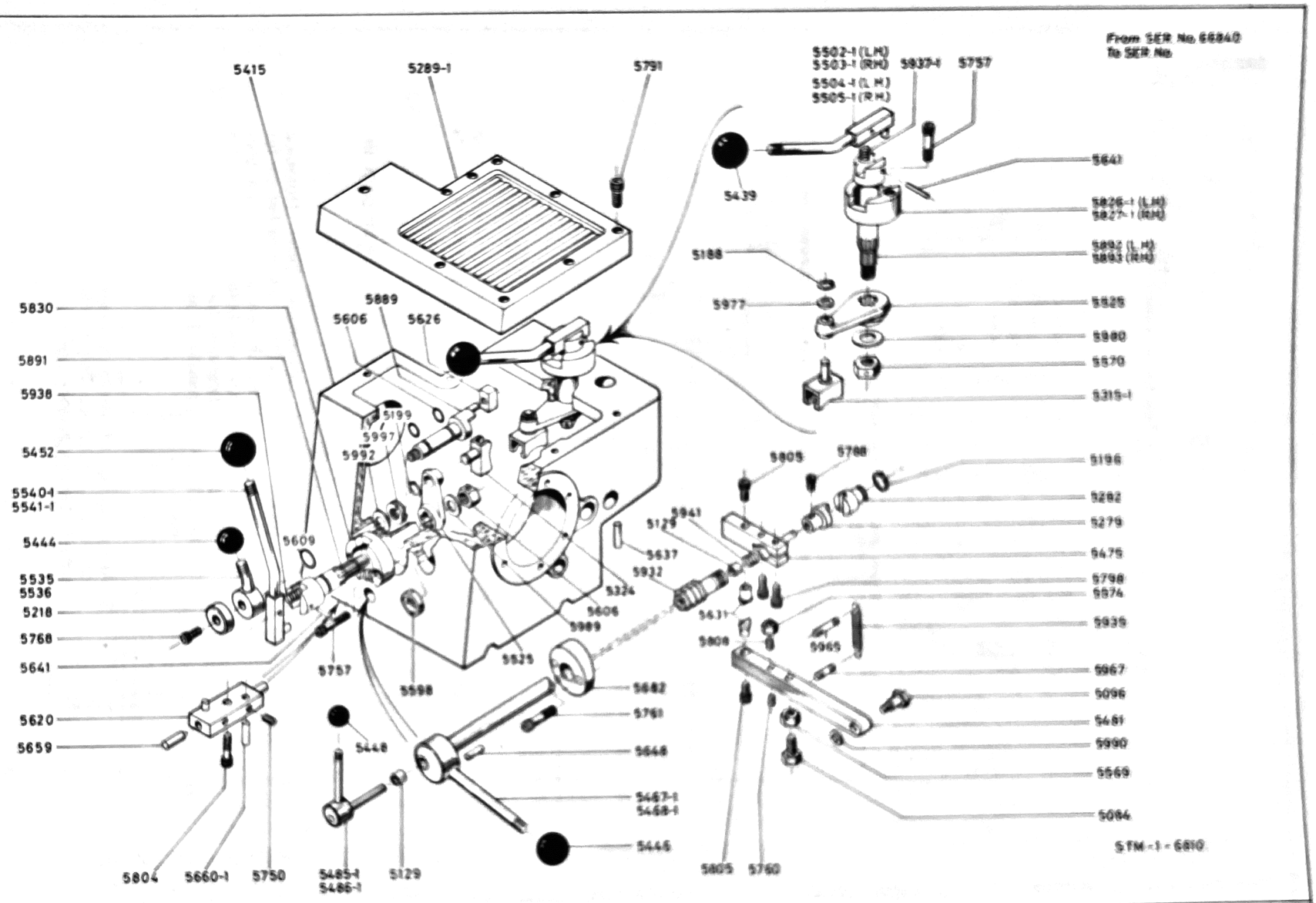
IMPORTANT when ordering—

1. Quote component Order Number, which is given on the parts illustration for all component parts required.

2. Give component description in full, from parts list below each drawing.

   Note :—Those component Order Numbers followed by asterisk(*) in the parts list are for standard items which can generally be purchased locally ; e.g. nuts, bolts screws, washers etc. Full specifications for these items are included in Appendix 1 at the back of this manual.

3. Always quote lathe Serial Number in all parts orders or technical enquiries. This number is stamped into lathe bed at the tailstock end.



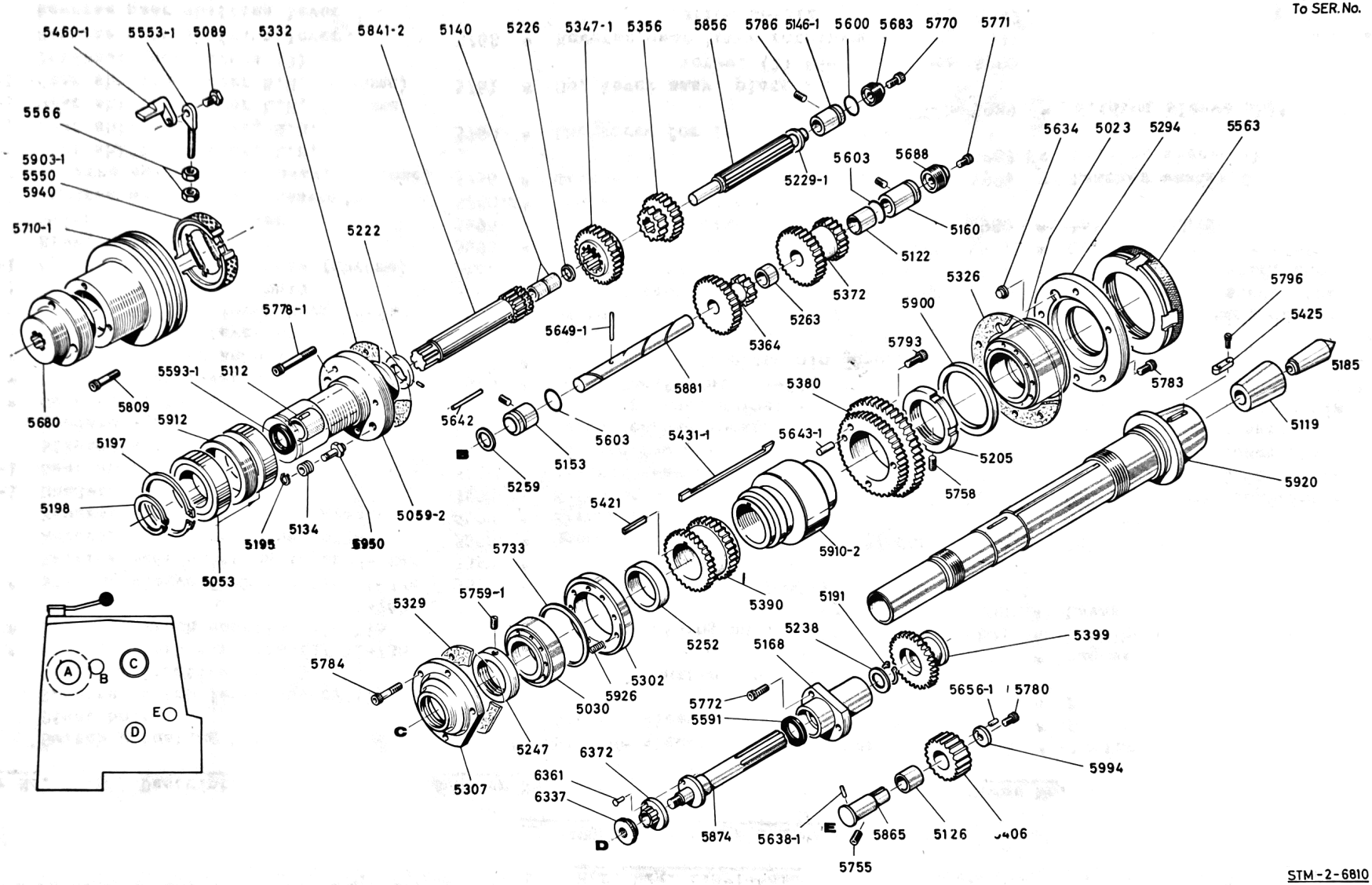
HEADSTOCK : castings & levers

Ref. Drg. STM-1-6810

HEADSTOCK: Castings & Levers

Order No.		Description
5084		Switch actuating bolt
5096		Pivot bolt
5129		Reverse switch lever bushes (2)
5131		Selector locating bush
5188	*	Shifting fork circlips (2) 11-736
5196	*	Reverse switch coupling circlip 11-743
5199	*	Sliding sleeve fork circlip 11-736
5218		Reverse gear shifting lever collar
5279		Reverse switch coupling, male
5282		Reverse switch coupling, female
5289-1		Headstock cover
5315-1		Gear shifting forks (2)
5324		Sliding sleeve fork
5415		Headstock casting
5439	*	Gear shift lever knobs (2) 18-830
5444	*	Reverse gear lever knob 18-835
5446	*	Operating lever knob 18-833
5448	*	Reverse switch lever knob 18-840
5452	*	Sleeve shifting lever knob 18-830
5467-1		Operating lever assembly
5468-1		Operating lever assembly (chrome)
5475		Brake operating lever
5481		Switch operating lever
5485-1		Reverse switch lever assembly
5486-1		Reverse switch lever assy. (Chrome)
5502-1		Gear shifting lever, L.H.
5503-1		Gear shifting lever, R.H.
5504-1		Gear shifting lever L.H. (Chrome)
5505-1		Gear shifting lever R.H. (Chrome)
5525		Internal gear levers (3)
5535		Reverse gear shifting lever
5536		Reverse gear shifting lever (Chrome)
5540-1		Sliding sleeve shifting lever
5541-1		Sliding sleeve shifting lever (Chrome)
5569	*	Switch actuating bolt locknut 20-637
5570	*	Lever retaining nuts (3) 22-663
5574	*	Lever stop locknut 20-635
5598	*	Oil-level sight 80-873
5606	*	Operating shaft O-rings (2) 27-846
5609	*	Sleeve lever O-ring 26-846
5620		Set-over pad
5626		Reverse gear shifting pad
5631		Locking pawls (2)
5637		Headstock/bed locating pin
5641		Selector lever swivel pin
5645	*	Lever locking pin 24-539
5648	*	Op. lever assy. plate pin 25-629
5655-1	*	Lever stop pin 24-525
5659		Set-over pins (2)
5660	*	Pad locating pin 14-131
5682		Op. lever assy. plate
5693	*	Drain plug 88-070
5695		Oil filler plug
5750	*	Pin adjusting screws (2) 73-522
5756	*	Gear selector Sec. screw (6) 45-208
5760	*	Lockscrew for lever stop screw 59-352
5761	*	Op. lever assy. plate sec. screw. (2) 46-214
5768	*	Reverse gear lever retaining screw 46-212
5788	*	Switch coupling screw 72-495
5791	*	Headstock cover screws (9) 46-217
5798	*	Brake operating lever screws (2) 46-214
5804	*	Pad securing screw 47-227
5805	*	Locking pawl screws (2) 45-203
5808	*	Lever stop screw 59-355
5826-1		Driving shaft gear selector, L.H.
5827-1		Driving shaft gear selector, R.H.
5830		Gear selector
5889		Reverse gear shifting shaft
5891		Sliding sleeve shifting lever shaft
5892		Gear shifting lever shaft L.H.
5893		Gear shifting lever shaft R.H.
5932		Operating lever spring
5935	*	Switch lever return spring 82-817
5937-1	*	Gear selector springs (2) 82-830
5938	*	Sliding sleeve shifting lever shaft spring 82-830
5941	*	Switch rod spring 82-813
5965		Return spring stud, long
5967		Return spring stud, short
5977	*	Gear lever washer 85-695 (2)
5980	*	Internal shift lever washers (2) 85-696
5986	*	Leather washer 86-118
5987	*	Sliding sleeve shifting lever fork washer 85-695
5989	*	Sliding sleeve shifting lever shaft washer 85-696
5990		Switch lever washer
5992	*	Reverse gear shift shaft washer 85-698
5997	*	Reverse gear shift shaft spring washer 84-718

From SER. No. 66840
To SER. No.



STM-2-6810

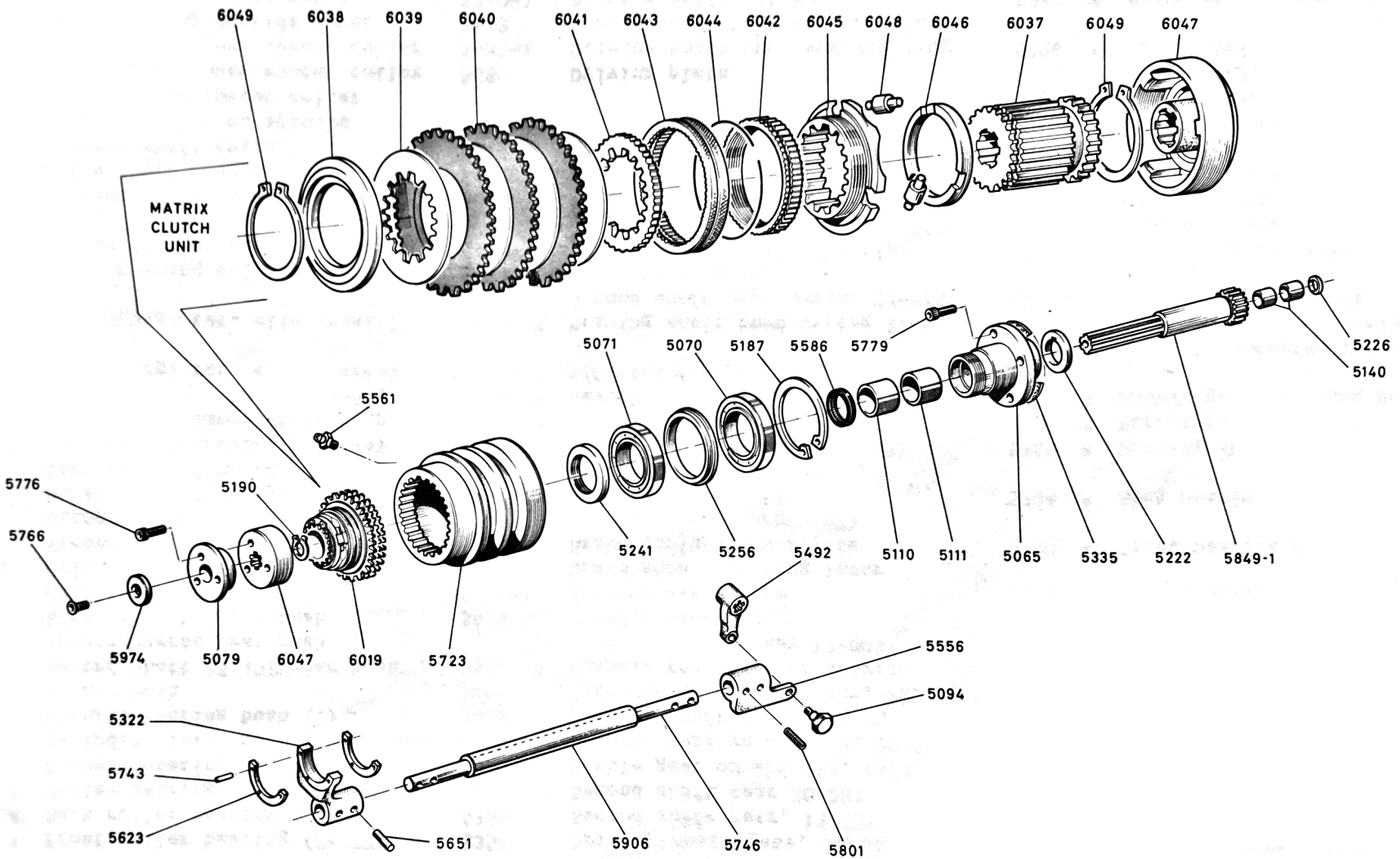
HEADSTOCK: gears & shafts

Ref. Drg. STM-2-6810

HEADSTOCK: Gears & Shafts

Order No.		Description
5023	*	Front roller bearing (GAMET)
5030	*	Back roller bearing (GAMET)
5053	*	Pulley bearings 02-896 (2)
5059-2		Flanged bearing
5089		Expanding-lever bolt
5112		Flanged bearing bush (2)
5119		Centre bush
5122		Second shaft 28/40T gear bush
5126		Inter-reverse gear bush
5134		Brake shoe flanged bush
5140		Clutch driving shaft bush
5146-1		Driving shaft bush
5153		Second shaft bush (L.H.)
5160		Second shaft bush (R.H.)
5168		Reverse shaft flanged bush
5185		Centre, No. 3 morse
5191	*	Reverse shaft circlip 11-749
5195	*	Brake shoe flanged bush clip 11-845
5197	*	Pulley brg. ret. clip (large) 12-770
5198	*	Pulley brg. ret. clip (small) 11-859
5205		Front bearing adjusting collar
5222		Clutch driving shaft thrust collar
5226		Driving shaft thrust collar
5229-1		Drive shaft bush collar
5238		Reverse shaft collar
5247		Screwed collar on spindle
5252		Back bearing spacer collar
5259		Second shaft bush spacer collar
5263		Second shaft gear spacer collar
5294		Front bearing outside cover
5302		Back bearing inside cover
5307		Back bearing outside cover
5326		Front bearing cover gasket
5329		Back brg. outside cover gasket
5332		Flanged bearing gasket
5347-1		Driving shaft gear, 30T
5356		Driving shaft gear, 14/24T
5364		Second shaft gear, 13/30T
5372		Second shaft gear 20/28T
5380		Double gear on spindle, 44/51T
5390		Reverse gear on spindle, 30/30T
5399		Reverse shaft gear, 30T
5406		Inter-reverse shaft gear, 20T
5421	*	Spindle reverse gear driving key 17-009
5425		Spindle nose key
5431-1		Sliding sleeve key
5460-1		Brake shoe expanding lever
5550	*	Brake linings c/w rivets (Ferodo 4")
5553-1		Expanding lever link
5563		Spindle nose draw nut
5566	*	Brake adjusting locknuts (2) 20-637
5591	*	Reverse shaft oil seal 79-865
5593-1	*	E/Clutch flanged brg. oilseal 79-062
5600	*	Driving shaft bush O-ring 27-858
5603	*	Second shaft bush O-ring 27-858
5634		Front bearing peg
5638-1	*	Inter-reverse shaft locating pin 24-539
5642		Flanged bearing pin (2) 14-613
5643-1	*	Double gear locating pin 14-686
5649-1	*	Second shaft gear pin 14-652
5656-1	*	Inter-reverse gear stop washer pin 24-520
5680		Driving plate
5683-1		Driving shaft bush screwed plug
5688		Second shaft bush screwed plug
5710-1		Driving pulley (twin vee)
5733		Back bearing thrust ring
5755	*	Inter-reverse shaft locating screw 59-355
5758	*	Front bearing adjusting collar lock-screw 60-361
5759-1	*	Spindle screwed collar lock-screw 53-303
5771	*	Screwed plug retaining screw 47-226
5772	*	Stop washer retaining screws (2) 46-212
5778-1	*	Flanged bearing securing screws (3) 47-229
5780	*	Reverse shaft flanged bearing screws (2) 46-212
5782	*	Back bearing inside cover screws (3) 46-219
5783	*	Front bearing cover screws (3) 46-213
5784	*	Back bearing outside cover screws (3) 46-213
5786	*	Driving shaft bush screw 67-419
5786-1	*	Bush securing screws (2) 67-419
5793	*	Double gear securing screws (3) 47-229
5796	*	Nose key securing screws (2) 45-201
5809	*	Driving plate sec. screw (3) 47-229
5841-2		Clutch driving shaft
5856		Driving shaft
5865		Inter-reverse shaft
5874		Reverse shaft
5881		Second shaft
5900		Front bearing shield
5903-1	*	Brake shoes c/w linings 09-997
5910-2		Sliding sleeve
5912		Bearing spacer
5920		Main spindle
5926	*	Back bearing pressure springs (15) 82-812
5940	*	Brake shoe springs (2) 82-815
5950		Brake shoe fixing stud
5994		Inter-reverse gear stop washer
6337		Reverse shaft knurled nut
6361		Shear-pin
6372		Shear-pin sleeve

From SER. No. 66840
To SER. No.



HEADSTOCK : matrix clutch

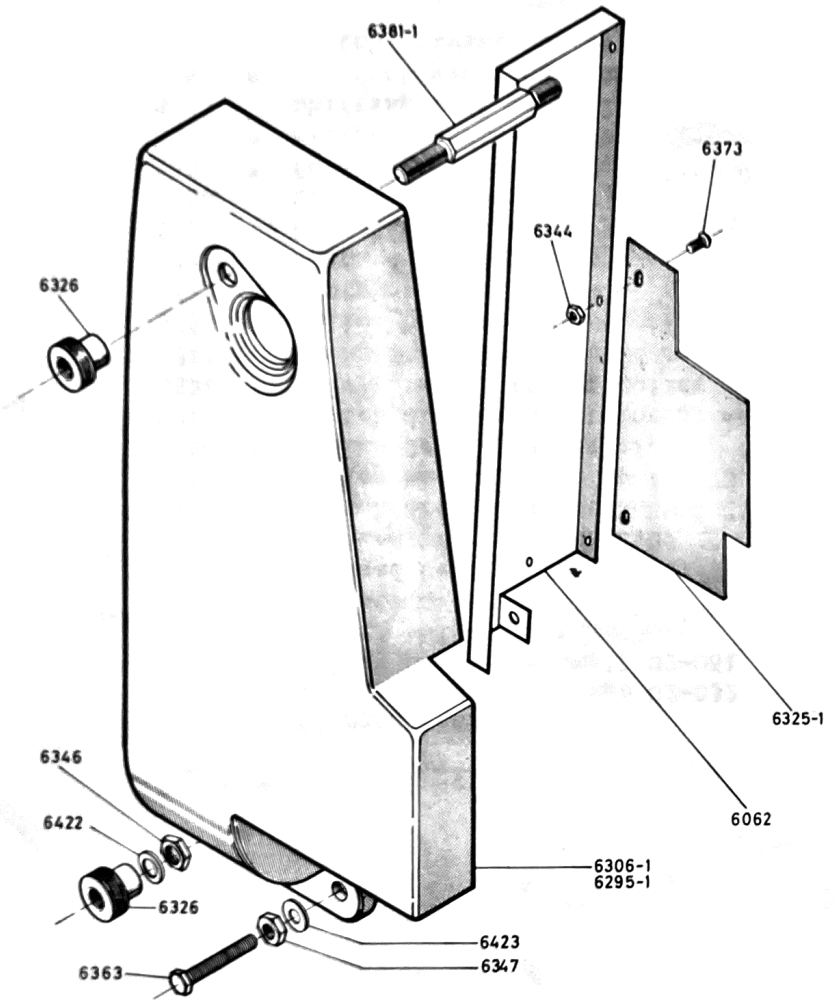
SM

Ref. Drg. STM-3-6810

HEADSTOCK: Matrix Clutch

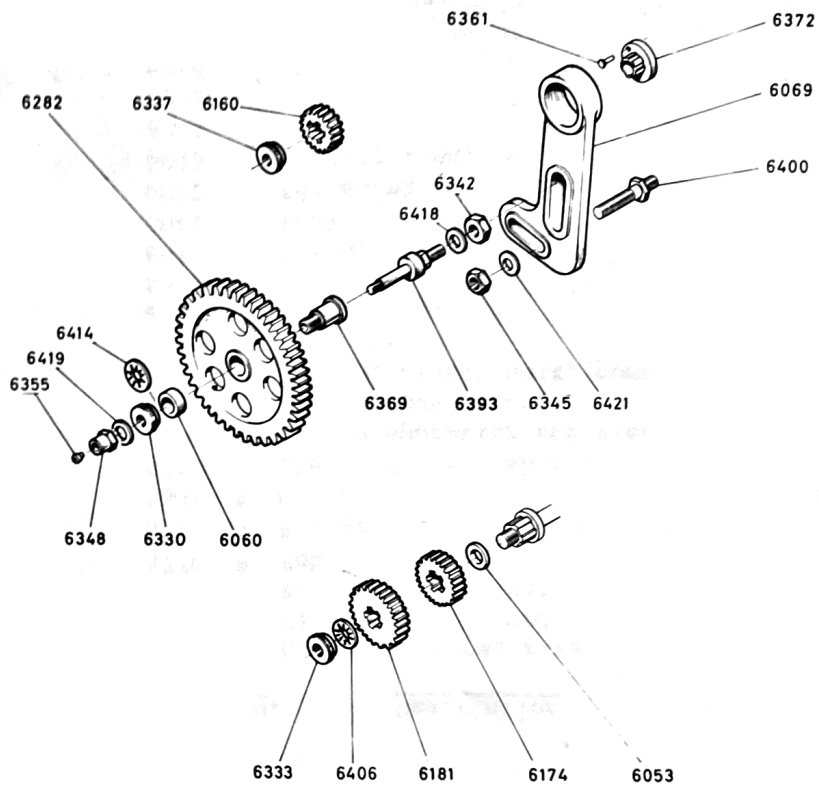
Order No.		Description
5065		Flanged bearing
5070	*	Pulley bearing - large 02-032
5071	*	Pulley bearing - small 02-061
5079		Clutch shifter bobbin
5094		Operating lever bolt
5110		Flanged bearing bush L.H.
5111		Flanged bearing bush R.H.
5140		Clutch driving shaft bushes (2)
5187	*	Pulley bearing circlip 12-773
5190	*	Clutch driving shaft circlip 11-749
5222		Clutch driving shaft thrust collar
5226		Driving shaft thrust collar
5241		Flanged bearing screwed collar
5256		Pulley bearing spacer collar
5322		Clutch shifting fork
5335		Flanged bearing gasket
5492		Operating lever
5556		Clutch rod operating link
5561	*	Pulley grease nipple 23-826
5586	*	Flanged bearing oilseal 79-062
5623		Shifting fork pads (2)
5651	*	Rod fork securing pins (2) 24-563
5723		Clutch driving pulley

Order No.		Description
5743	*	Clutch fork pad rivets (3) 28-905
5746		Clutch shifter rod
5766	*	Bobbin stop washer screw 55-318
5776	*	Bobbin securing screws (3) 45-207
5779	*	Flanged bearing screws (4) 55-319
5801	*	Operating rod link screws (2) 46-214
5849-1		Clutch driving shaft, 12T/10P
5906		Clutch operating rod sleeve
5974		Bobbin stop washer
6019		Matrix, clutch unit, complete, type ZC
6037		Hub, ZC1
6038		End flange, ZC3
6039		Fixed plates, ZC4 (4)
6040		Spinning plates, ZC5 (3)
6041		Lock plate, ZC7
6042		Adjusting nut, ZC8
6043		Locking ring, ZC9
6044		Spring, ZC10
6045		Track ring, ZC11
6046		Thrust washer, ZC12
6047		Operating collar, ZC13
6048		Bearing assembly, ZC15 (3)
6049		Circlips, ZC16 (2)



END GUARDS

From SER. No. 66840
To SER. No.



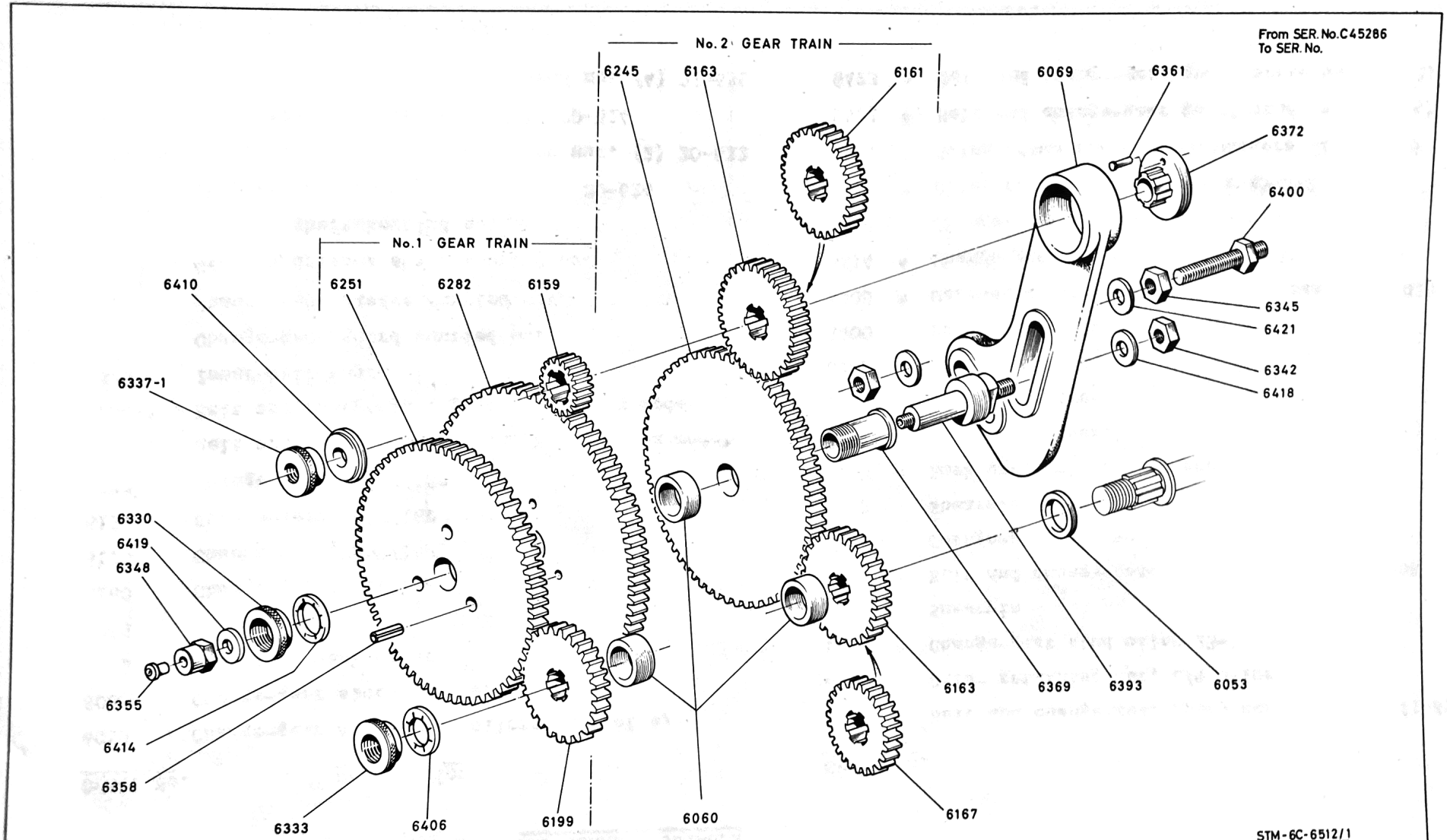
STM-4-6810

SWING FRAME : standard

Ref. Drg. STM-4-6810

END GUARDS, SWINGFRAME - STANDARD

Order No.		Description
6053		Change-gear alignment collars (set of 4)
6060		Change-gear sleeve spacer collar
6062		Headstock back cover
6069		Swing frame
6160		Change-gear, 21T/16P
6174		Change-gear, 35T/16P
6181		Change-gear, 42T/16P
6282		Change-gear, 120T/16P
6295-1		Belt and change-gear guard. Non gearbox model
6306-1		Belt and change-gear guard - gearbox model
6325		Inner belt guard
6326		Change-gear guard knurled nut
6330		Change-gear sleeve knurled nut
6333		Gearbox driving shaft knurled nut
6337		Reverse shaft knurled nut
6342	*	Change-gear sleeve stud locknut 20-624
6344	*	Guard plate/cabinet sec. screw nut. (2) 20-632
6345	*	Swing frame locking nuts (2) 20-624
6346	*	Belt and change-gear guard stud nut (4) 21-659
6347	*	Belt and change-gear guard screw nut (2) 21-658
6348		Oiler retaining nut, c/w oiler
6355	*	Change-gear stud oiler 23-124
6361		Shearpin
6363	*	Belt and change-gear guard screw (2) 73-608
6369		Change-gear sleeve
6372		Shearpin sleeve
6373	*	Back cover/plate sec. screw (2) 73-606
6381-1		Guard stud (hex.)
6385-1		Guard stud (round)
6393		Change-gear stud
6400		Swing frame fixing stud
6406	*	Gearbox driving shaft fan disc washer 86-029
6414	*	Change-gear sleeve fan disc washer 86-030
6418	*	Change-gear stud washer 85-695
6419	*	Oiler retaining nut washer 85-692
6421	*	Swing frame fixing stud washers (2) 85-695
6422	*	Belt and change-gear guard stud washer (4) 85-692
6423	*	Belt and change-gear guard screw washer (2) 85-691



SWING FRAME : continental

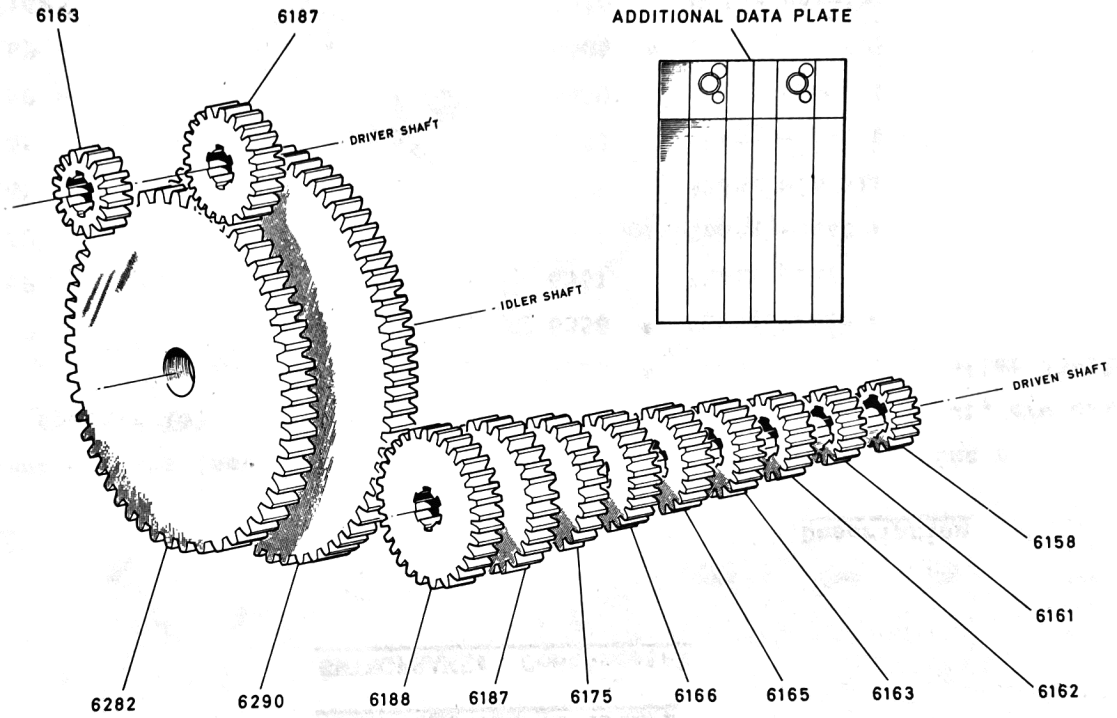
Ref. Drg. STM-6C-6512/1

SWINGFRAME: Continental

Order No.		Description
6053		Change-gear aligment collars (set of 4)
6060		Change-gear sleeve spacers (3)
6069		Swing frame
6159		Change-gear 20T/16P
6161		Change-gear 22T/16P
6163		Change-gear 24T/16P
6167		Change-gear 28T/16P
6199		Change-gear 60T/16P
6245		Change-gear 84T/16P
6251		Change-gear 90T/16P
6282		Change-gear 120T/16P
6330		Change-gear sleeve knurled nut
6333		Gearbox driving shaft knurled nut
6337		Reverse shaft knurled nut
6342	*	Change-gear stud locknut 20-624
6345	*	Swing frame locking nuts (2) 20-624
6348		Oiler retaining nut, c/w oiler
6355	*	Change-gear stud oiler 23-124
6358	*	Change-gear compounding pins (3) 14-131
6361		Shear pin
6369		Change-gear sleeve
6372		Shear pin sleeve
6393		Change-gear stud
6400		Swing frame fixing stud
6406	*	Gearbox driving shaft fan disc washer 86-030
6410		Oiler retaining nut washer
6414	*	Change-gear sleeve fan disc washer 86-030
6418	*	Change-gear stud washer 85-695
6419	*	Oiler retaining nut washer 85-692
6421	*	Swing frame fixing stud washers (2) 85-695

From SER. No. C45286
To SER. No.

ADDITIONAL EQUIPMENT REQUIRED FOR CUTTING ENGLISH THREADS WITH CONTINENTAL SWING FRAME



STM-7C-6512

SWING FRAME : continental

SM

Ref. Drg. STM-7C-6512

SWINGFRAME: Continental

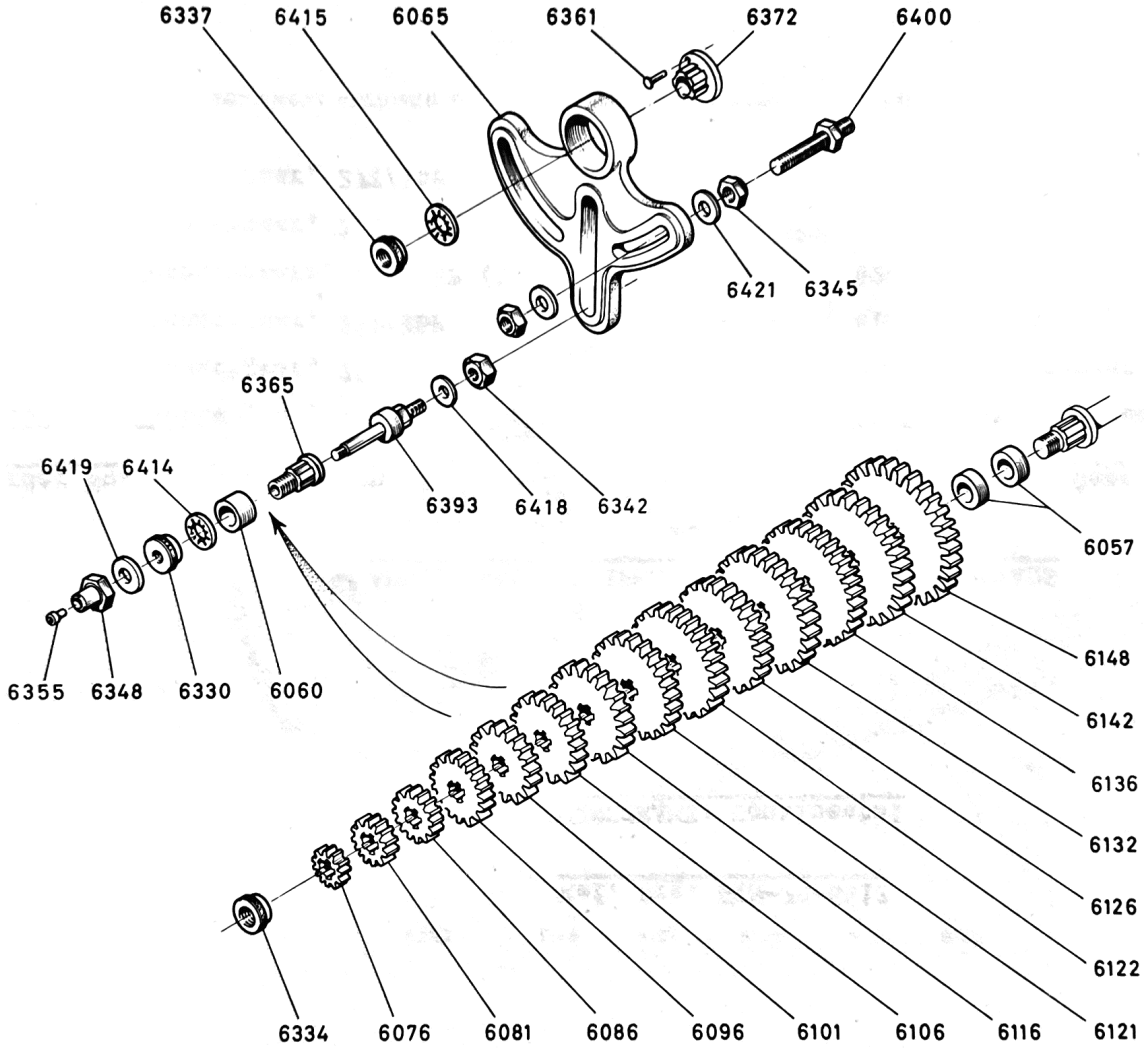
ADDITIONAL EQUIPMENT FOR ENGLISH THREADS

13

Order No.	Description
6158	Change-gear, 19T/16P
6161	Change-gear, 22T/16P
6162	Change-gear, 23T/16P
6163	Change-gears, 24T/16P (2)
6165	Change-gear, 26T/16P
6166	Change-gear, 27T/16P

Order No.	Description
6175	Change-gear, 36T/16P
6187	Change-gear, 48T/16P (2)
6188	Change-gear, 49T/16P
6282	Change-gear, 120T/16P
6290	Change-gear, 127T/16P
	Thread data plate - extra

From SER. No. 20551
To SER. No.



STM-5-6512/1

SWING FRAME : non-gearbox lathe

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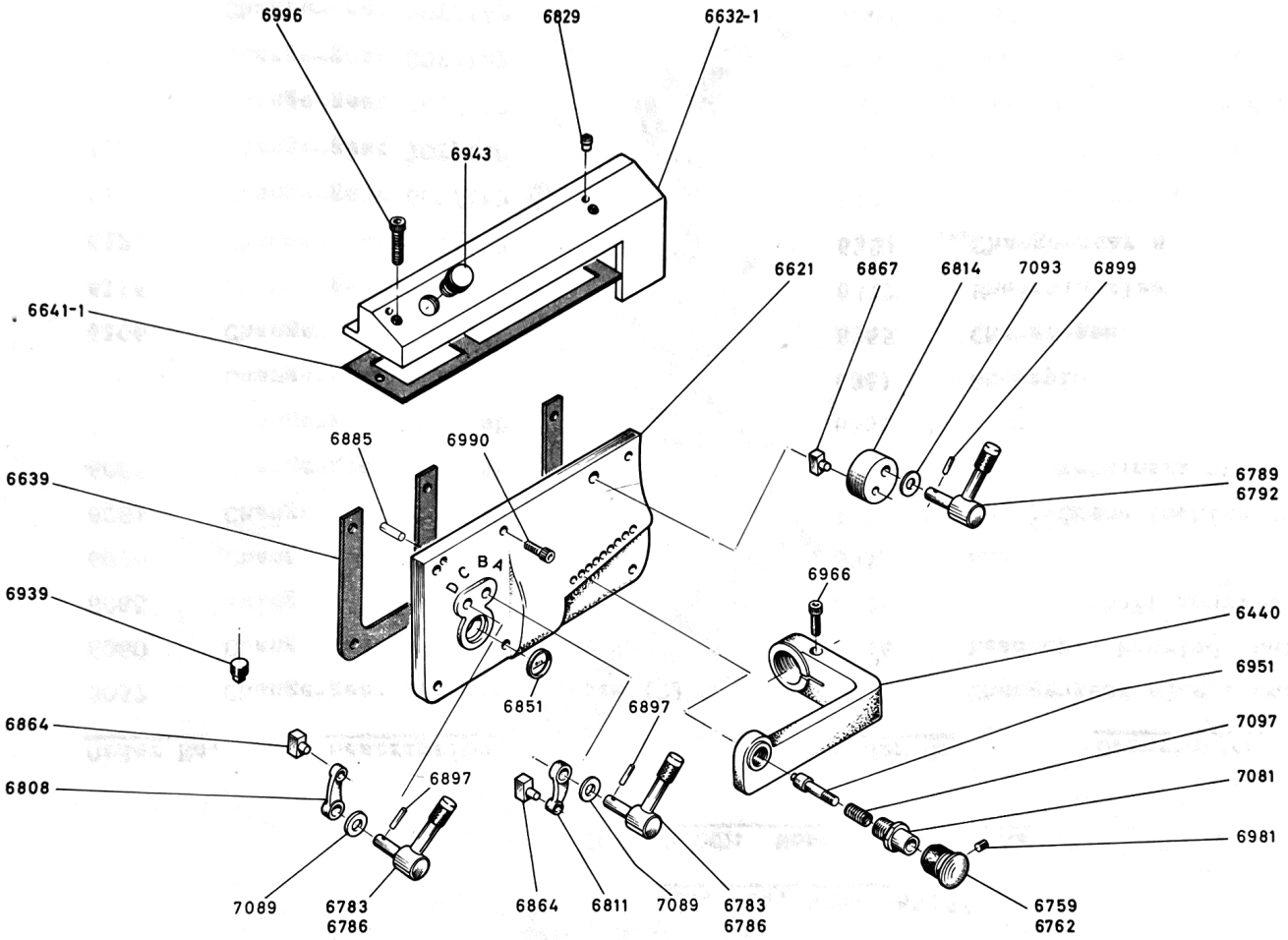
Ref. Drg. STM-5-6512/1

SWINGFRAME: Non-Gearbox Lathe

Order No.		Description
6057		Change-gear spacing collars (2)
6060		Change-gear sleeve spacer
6065		Swing frame
6076		Change-gear 20T/14P
6081		Change-gear 25T/14P
6086		Change-gear 30T/14P
6096		Change-gear 40T/14P
6101		Change-gear 45T/14P
6106		Change-gear 50T/14P
6116		Change-gear 60T/14P
6121		Change-gear 65T/14P
6122		Change-gear 66T/14P
6126		Change-gear 70T/14P
6132		Change-gear 76T/14P
6136		Change-gear 80T/14P
6142		Change-gear 90T/14P
6148		Change-gear 100T/14P

Order No.		Description
6330		Change-gear sleeve knurled nut
6334		Leadscrew knurled nut
6337		Reverse shaft knurled nut
6342	*	Change-gear stud locknut 20-624
6345	*	Swing-frame locking nuts (4) 20-624
6348		Oiler retaining nut c/w oiler
6355	*	Change gear stud oiler 23-124
6361		Shearpin
6365		Change-gear sleeve
6372		Shearpin sleeve
6393		Change-gear stud
6400		Swing frame fixing stud
6414	*	Change-gear sleeve fan disc washer 86-030
6415	*	Reverse shaft fan disc washer 86-119
6418	*	Change-gear stud washer 85-695
6419	*	Oiler retaining nut washer 85-692
6421	*	Swing frame fixing stud washers (4) 85-695

From SER. No. 66840
To SER. No.



STM-10-6810

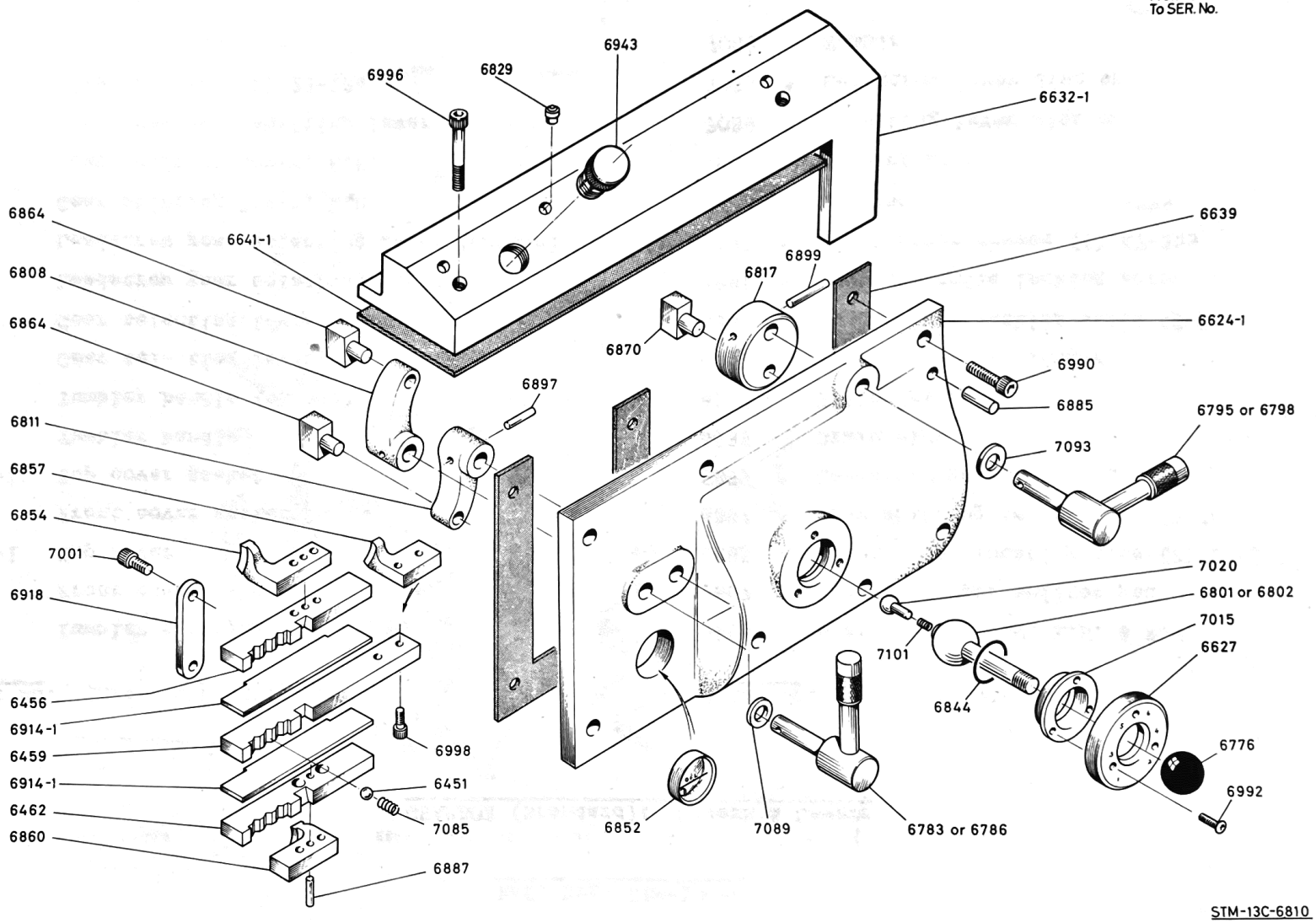
GEARBOX (Standard) : covers & levers

Ref. Drg. STM-10-6810

GEARBOX (Standard): Covers & Levers

Order No.		Description
6440		Tumbler shifting arm
6621		Front cover
6632-1		Top cover
6639		Front cover gasket
6641-1		Top cover gasket
6759		Tumbler handle
6762		Tumbler handle (chrome)
6783		Gear selecting lever, R.H.& L.H.
6786		Gear selecting lever (chrome)
6789		Leadscrew gear selecting lever
6792		Leadscrew gear selecting lever (chrome)
6808		Gear shifting lever, L.H.
6811		Gear shifting lever, R.H.
6814		Leadscrew gear shifting lever
6829	*	Oiler nipples (2) 23-124
6851	*	Oilsight glass 80-873
6864		Gear shifter pad, L.H. & R.H.
6867		Leadscrew gear shifter pad
6885	*	Front cover locating pins (2) 24-544
6897	*	Gear shifting lever pins (2) 24-543
6899	*	Leadscrew gear shifting lever pin 24-545
6939		Drain plug
6943		Filler plug
6951		Tumbler handle plunger
6966	*	Tumbler arm locking screw 48-242
6981	*	Tumbler handle locking screw 58-343
6990	*	Front cover screws (6) 47-225
6996	*	Top cover screws (2) 47-225
7081		Tumbler handle socket
7089	*	Selecting lever disc springs (2) 84-725
7093	*	Leadscrew lever disc spring 84-725
7097		Tumbler handle spring

From SER. No. 66840
To SER. No.



GEARBOX (Metric) : covers & levers

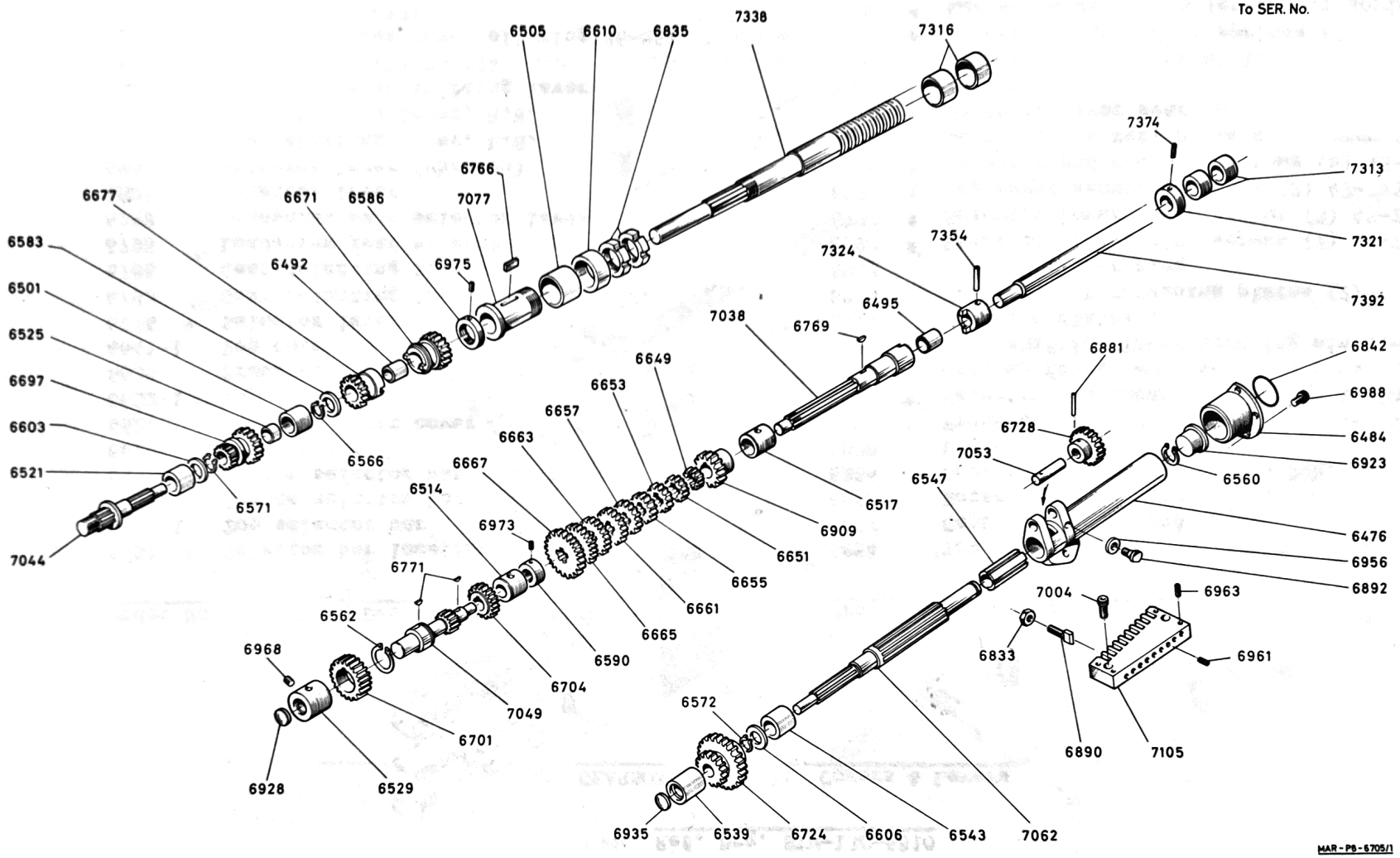
Ref. Drg. STM-13C-6810

GEARBOX (Metric): Covers & Levers

Order No.		Description
6451	*	Selector bar locating balls (3) 01-788
6456-1		Top selector bar
6459-1		Centre selector bar
6462-1		Bottom selector bar
6624-1		Front cover
6627		Selector lever cover
6632-1		Top cover
6639		Front cover gasket
6641-1		Top cover gasket
6776	*	Selector lever knob 18-838
6783		Gear selecting levers, R.H. & L.H.
6786		Gear selecting levers (chromed)
6795		Leadscrew gear selector lever
6798		Leadscrew gear selector lever (chromed)
6801		Selector lever
6802		Selector lever (chromed)
6808		Gear shifting lever, L.H.
6811		Gear shifting lever, R.H.
6817		Leadscrew gear shifting lever
6829	*	Oil nipples (2) 23-124
6844	*	Selector lever cover oil ring 26-851
6852	*	Oil sight 80-871

Order No.		Description
6854		Top selector pad
6857		Centre selector pad
6860		Bottom selector pad
6864		Gear shifting pads, L.H. & R.H.
6870		Leadscrew gear shifting pad
6885	*	Front cover locating pins (2) 24-544
6887	*	Selector pad locating pins (3) 14-104
6897	*	Gear shifting lever securing pins (2) 24-543
6899	*	Gear shifting lever securing pin 24-545
6914-1		Division plates (2)
6918		Selector bar retaining plates (2)
6943		Gearbox filler plug
6990	*	Front cover securing screws (7) 47-225
6992	*	Selector lever cover screws (3) 45-203
6996	*	Top cover securing screws (2) 47-225
6998	*	Selector pad securing screws (6) 45-203
7001	*	Selector bar ret. plate sec. screw (2) 46-213
7015		Selector lever seating
7020		Selector
7085	*	Selector bar spring 82-105
7089	*	Selecting lever disc springs (2) 84-725
7093	*	Leadscrew selecting lever disc spring 84-725
7101		Selector spring

From SER. No. 46634
To SER. No.



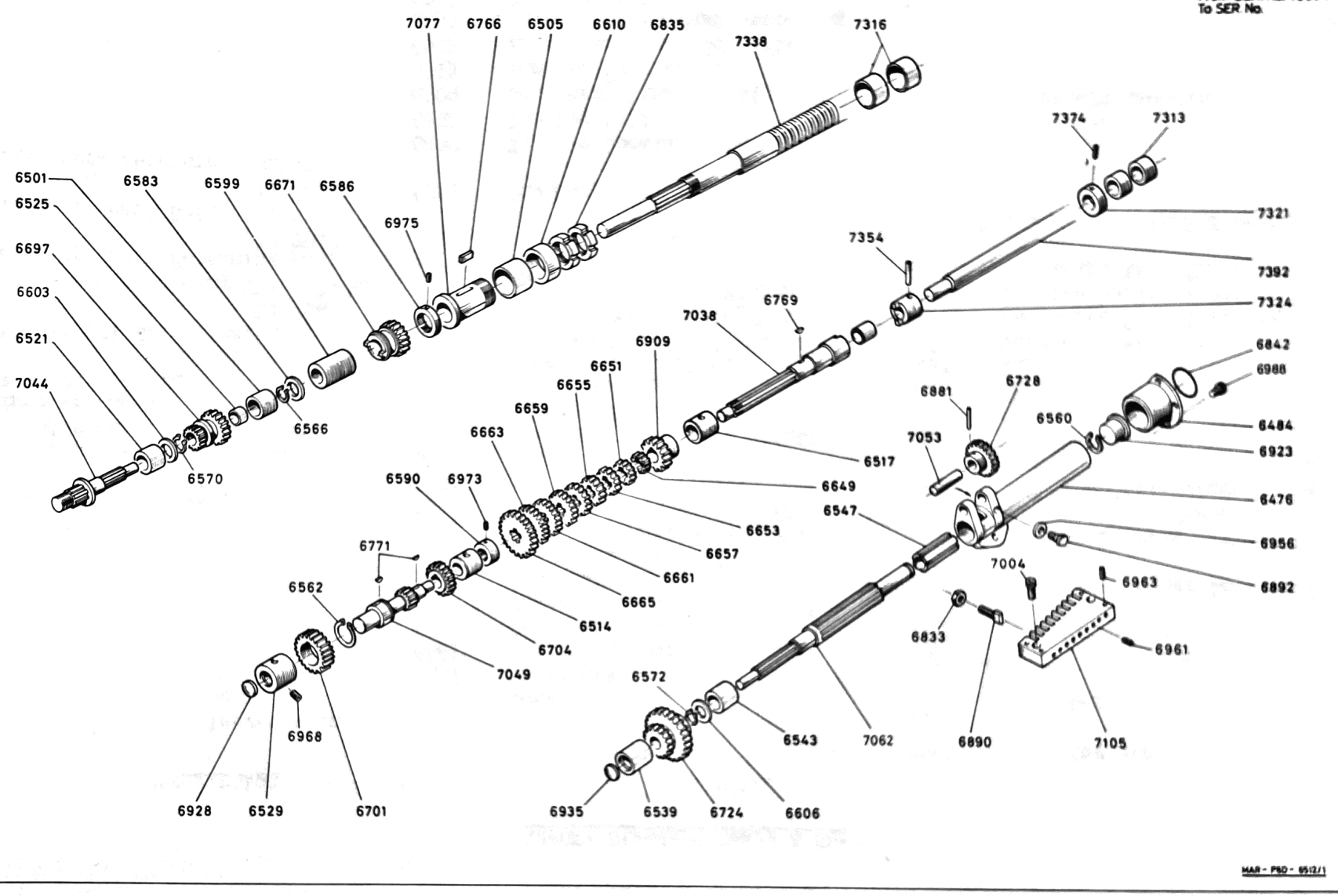
GEARBOX : Standard gears & shafts

Ref. Drg. MAR-P8-6705/1

GEARBOX: Standard Gears & Shafts

Order No.		Description
6476		Tumbler Bearing
6484		Tumbler Bearing Flanged Bush
6492	*	Leadscrew Metric Gear Bush 10-011
6495	*	Coneshaft Insert Bush 10-913
6501		Leadscrew Bush, L.H.
6505		Leadscrew Bush, R.H.
6514		Coneshaft Bush, L.H,
6517		Coneshaft Bush, R.H.
6521		Driving Shaft Bush, L.H.
6525		Driving Shaft Bush, R.H.
6529		Intershaft Bush
6539		Tumbler Shaft Bush, L.H.
6543		Tumbler Shaft Bush, Centre
6547		Tumbler Shaft Bush, R.H.
6560	*	R.H. Tumbler Bush Retaining Clip 11-745
6562	*	Intershaft Gear Retaining Clip 11-754
6566	*	Leadscrew Retaining Clip 11-745
6571	*	Driving Shaft Retaining Clip 13-794
6572	*	Tumbler Shaft Retaining Clip 11-743
6583		Leadscrew Retaining Collar
6586		Leadscrew Screwed Collar
6590		Coneshaft Screwed Collar
6603		Driving Shaft Spacer Collar
6606		Tumbler Shaft Spacer Collar
6610		Leadscrew Thrust Collar
6649		Coneshaft Gear, 16T
6651		Coneshaft Gear 18T
6653		Coneshaft Gear, 19T
6655		Coneshaft Gear, 20T
6657		Coneshaft Gear, 22T
6661		Coneshaft Gear, 24T
6663		Coneshaft Gear, 26T
6665		Coneshaft Gear, 28T
6667		Coneshaft Gear, 30T
6671		Leadscrew Gear,24T
6677		Leadscrew Metric Gear,22T
6697		Driving Shaft Gear, 16/24T
6701		Intershaft Gear, 32T
6704		Intershaft Gear, 24T
6724		Tumbler Shaft Gear, 24/42T
6728		Tumbler Gear 27T
6766		Leadscrew Key
6769	*	Coneshaft Key 17-001
6771	*	Intershaft Keys(2) 17-001
6833	*	Tumbler Pin Securing Nut 20-621
6835		Leadscrew Locknut
6842	*	Tumbler Bearing Bush O-Ring 26-852
6881	*	Tumbler Gear Driving Pin 24-543
6890		Tumbler Locating Pin
6892		Tumbler Roller Pin
6909		Coneshaft Pinion, 24T
6923		Tumbler Bearing Plug
6928		Intershaft Bush Core-Plug
6935		Tumbler Shaft Bush Core-Plug
6956		Tumbler Roller
6961	*	Locating Strip Adjusting Screws (9) 60-365
6963	*	Locating Strip Jacking Screws (4) 58-342
6968	*	Bush Locking Screws (3) 60 -365
6973	*	Coneshaft Collar Locking Screw 58-345
6975	*	Leadscrew Collar Locking Screw 59-350
6988	*	Tumbler Bearing Flanged Bush Screws (3) 45-203
7004	*	Locating Strip Securing Screws (2) 47-225
7038		Coneshaft C/W Bush
7044		Driving Shaft
7049		Intershaft, 14T
7053		Tumbler Gear Shaft
7062		Tumbler Shaft 15T
7077		Leadscrew Thrust Sleeve
7105		Tumbler Locating Strip
7313	*	Feedshaft Tail-End Bushes (2) 10-923
7316	*	Leadscrew Tail-End Bushes (2) 10-940
7321		Feedshaft Tail-End Collar
7324		Feedshaft Coupling
7338		Leadscrew
7354	*	Feedshaft Coupling Securing Pin 14-659
7374	*	Feedshaft Tail-End Collar Locking Screw 59-350
7392		Feedshaft

From SER. No. 46634
To SER No.



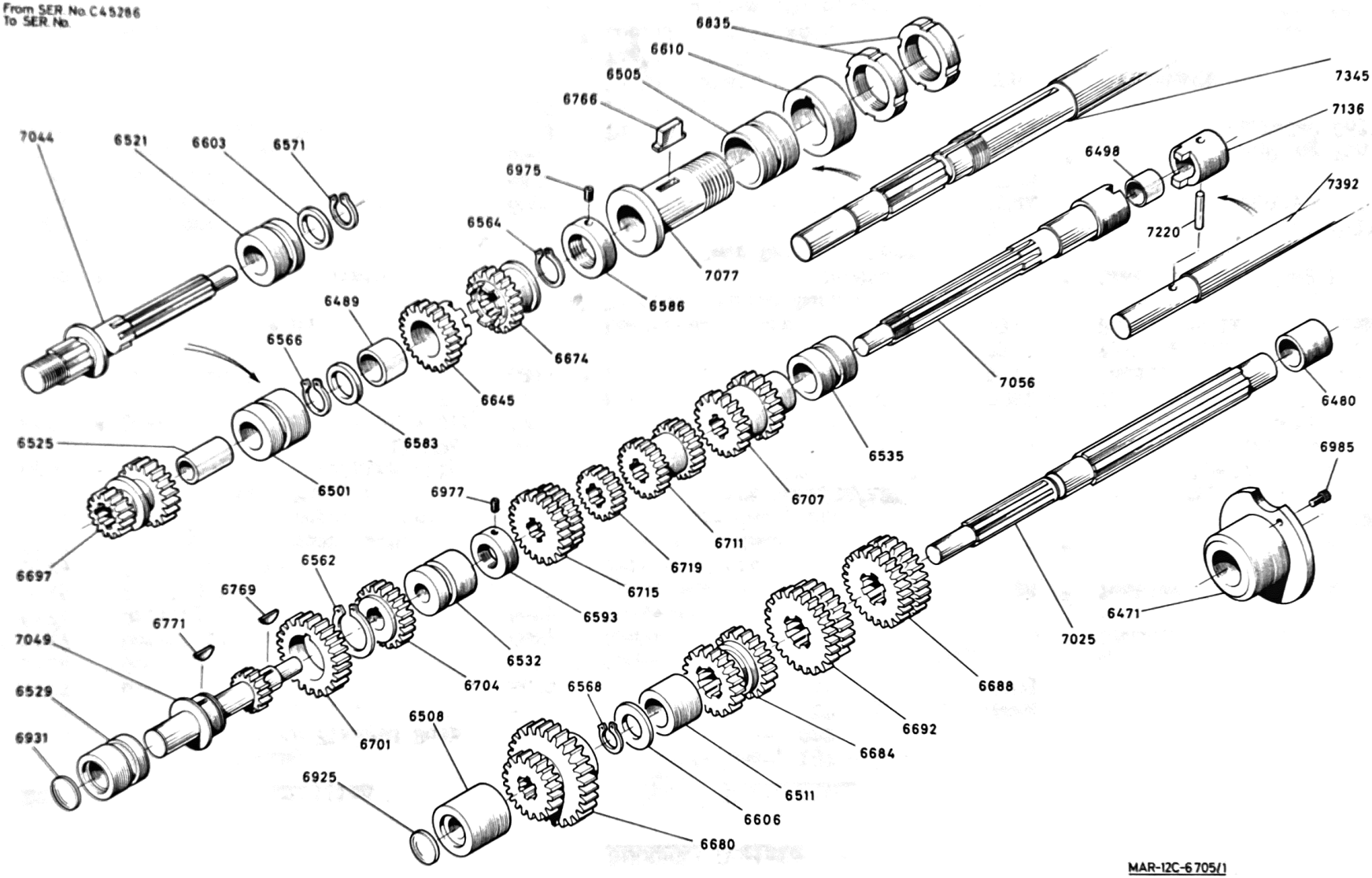
MAR - P&D - 9512/1

GEARBOX : Dominion gears & shafts

GEARBOX: Dominion Gears & Shafts

Order No.		Description
6476		Tumbler Bearing
6484		Tumbler Bearing Flanged Bush
6501		Leadscrew Bush, L.H.
6505		Leadscrew Bush, R.H.
6514		Coneshaft Bush, L.H.
6517		Coneshaft Bush, R.H.
6521		Driving Shaft Bush, L.H.
6525		Driving Shaft Bush, R.H.
6529		Intershaft Bush
6539		Tumbler Shaft Bush, L.H.
6543		Tumbler Shaft Bush, Centre
6547		Tumbler Shaft Bush, R.H.
6560	*	Tumbler Shaft Retaining Clip 13-794
6562	*	Intershaft Gear Retaining Clip 11-754
6566	*	Leadscrew Retaining Clip 11-745
6571	*	Driving Shaft Retaining Clip 11-744
6572	*	Tumbler Shaft Retaining Clip 11-743
6583		Leadscrew Retaining Collar
6586		Leadscrew Screwed Collar
6590		Coneshaft Screwed Collar
6599		Leadscrew Spacer Collar
6603		Driving Shaft Spacer Collar
6606		Tumbler Shaft Spacer Collar
6610		Leadscrew Thrust Collar
6649		Coneshaft Gear, 16T
6651		Coneshaft Gear, 18T
6653		Coneshaft Gear, 19T
6655		Coneshaft Gear, 20T
6657		Coneshaft Gear, 22T
6659		Coneshaft Gear, 23T
6661		Coneshaft Gear, 24T
6663		Coneshaft Gear, 26T
6665		Coneshaft Gear, 28T
6671		Leadscrew Gear, 24T
6697		Driving Shaft Gear, 16/24T
6701		Intershaft Gear, 32T
6704		Intershaft Gear, 24T
6724		Tumbler Shaft Gear, 24/42T
6728		Tumbler Gear, 27T
6766		Leadscrew Key
6769	*	Coneshaft Key 17-001
6771	*	Intershaft Keys(2) 17-001
6833	*	Tumbler Locating Pin Nut 20-621
6835		Leadscrew Locknuts (2)
6842	*	Tumbler Bearing Bush O-Ring 26-852
6881	*	Tumbler Gear Driving Pin 24-543
6890		Tumbler Locating Pin
6892		Tumbler Roller Pin
6909		Coneshaft Pinion, 24T
6923		Tumbler Bearing Plug
6928		Intershaft Bush Core-Plug
6935		Tumbler Shaft Bush Core-Plug
6956		Tumbler Roller
6961	*	Locating Strip Adjusting Screws (9) 60-365
6963	*	Locating Strip Jacking Screws (4) 58-342
6968	*	Bush Locking Screws (3) 60-365
6973	*	Coneshaft Collar Locking Screw 58-345
6975	*	Leadscrew Collar Locking Screw 59-350
6988	*	Tumbler Bearing Bush Screws (3) 45-203
7004	*	Locating Strip Securing Screws (2) 47-225
7038		Coneshaft, C/W Bush
7044		Driving Shaft
7049		Intershaft, 14T
7053		Tumbler Gear Shaft
7062		Tumbler Shaft 15T
7077		Leadscrew Thrust Screw
7105		Tumbler Location Strip
7313	*	Feedshaft Tail-End Bushes (2) 10-923
7316	*	Leadscrew Tail-End Bushes (2) 10-940
7321		Feedshaft Tail-End Collar
7324		Feedshaft Coupling
7338		Leadscrew
7354	*	Feedshaft Coupling Pin 14-659
7374	*	Feedshaft Tail-End Collar Screw 59-352
7392		Feedshaft

From SER No. C45286
To SER No.



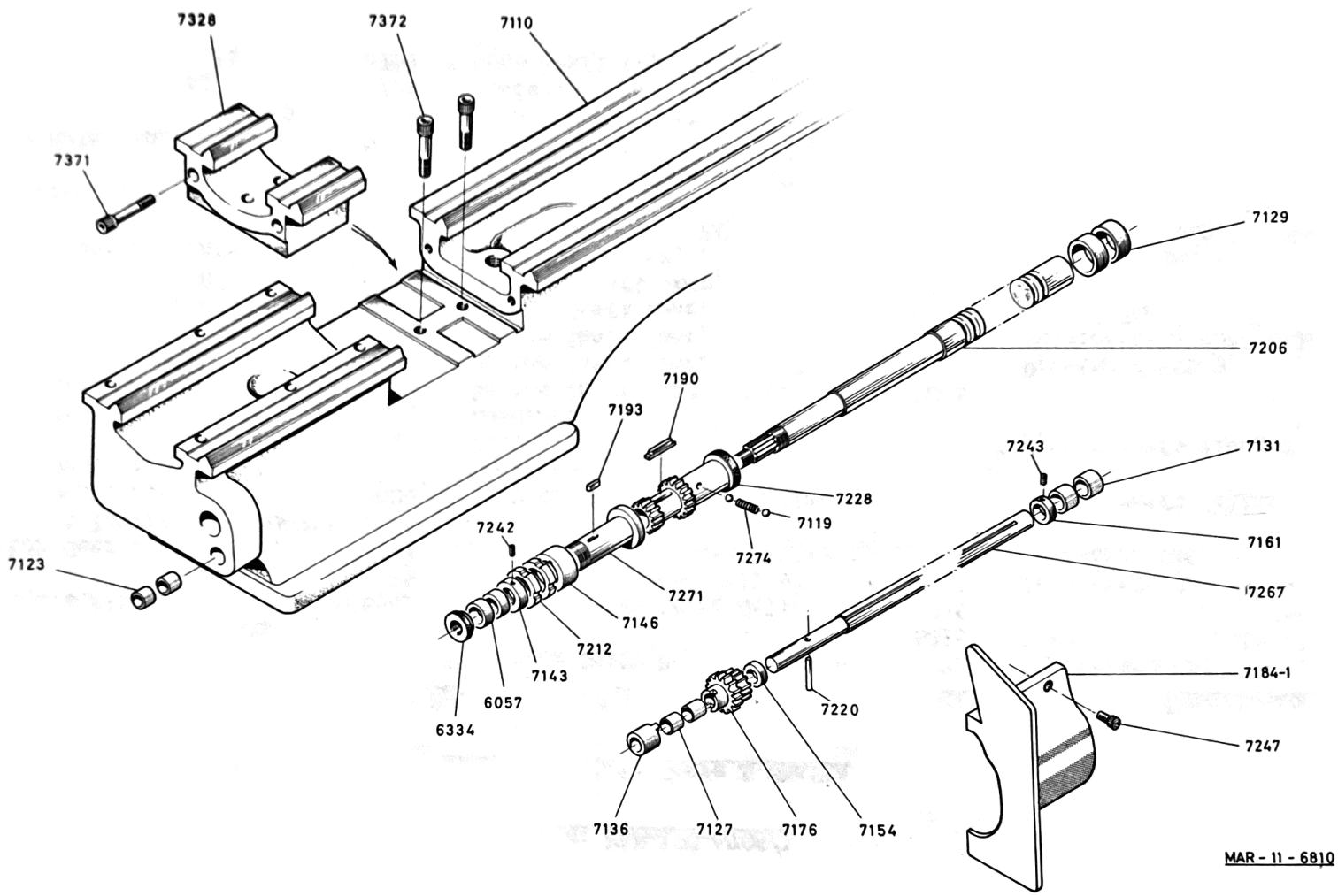
GEARBOX (Metric) : gears & shafts

Ref. Drg: MAR-12C-6705/1

GEARBOX: Metric Gears & Shafts

Order No.		Description
6471		Bottom Shaft Flanged Bearing C/W Bush
6480	*	Bottom Shaft Flanged Bearing Bush 10-949
6489	*	30T Clutch Gear Bush 10-948
6498	*	Second Shaft Insert Bush 10-913
6501		Leadscrew Bush, L.H.
6505		Leadscrew Bush, R.H.
6508		Bottom Shaft Bush, L.H.
6511		Bottom Shaft Bush, Centre
6521		Driving Shaft Bush, L.H.
6525		Driving Shaft Bush, R.H.
6529		Intershaft Bush
6532		Second Shaft Bush, L.H.
6535		Second Shaft Bush, R.H.
6562	*	Intershaft Gear Retaining Clip 11-754
6564	*	24T Leadscrew Gear Retaining Clip 11-749
6566	*	Leadscrew Retaining Clip 11-745
6568	*	Bottom Shaft Retaining Clip 11-743
6571	*	Driving Shaft Retaining Clip 13-794
6583		Leadscrew Retaining Collar
6586		Leadscrew Screwed Collar
6593		Second Shaft Screwed Collar
6603		Driving Shaft Spacer Collar
6606		Tumbler Shaft Spacer Collar
6610		Leadscrew Thrust Collar
6645		Clutch Gear, 30T
6674		Leadscrew Gear, 24T
6680		Bottom Shaft Gear, 24/42T
6684		Bottom Shaft Gear, 12/28T
6688		Bottom Shaft Gear, 35/18T
6692		Bottom Shaft Gear, 33/33T
6697		Driving Shaft Gear, 16/24T
6701		Intershaft Gear, 32T
6704		Intershaft Gear, 24T
6707		Second Shaft Gear 28/16T
6711		Second Shaft Gear 24/22T
6715		Second Shaft Gear 24/28T
6719		Second Shaft Gear 24T
6766		Leadscrew Key
6769	*	Cone Shaft Key 17-001
6771	*	Intershaft Key 17-001
6835		Leadscrew Locknuts (2)
6925		Bottom Shaft Bush Core Plug
6931		Intershaft Bush Core Plug
6975	*	Leadscrew Collar Locking Screw 59-350
6977	*	Second Shaft Collar Locking Screw 58-345
6985	*	Bottom Shaft Flanged Bearing Screws (2) 45-203
7025		Bottom Shaft
7044		Driving Shaft
7049		Intermediate Shaft, 14T
7056		Second Shaft
7077		Leadscrew Thrust Sleeve
7136		Slipping Clutch Collar
7220	*	Feedshaft Coupling Securing Pin 14-659
7345		Metric Leadscrew
7392		Feedshaft

From SER. No. 66840
To SER. No.



FEED SYSTEM : non-gearbox

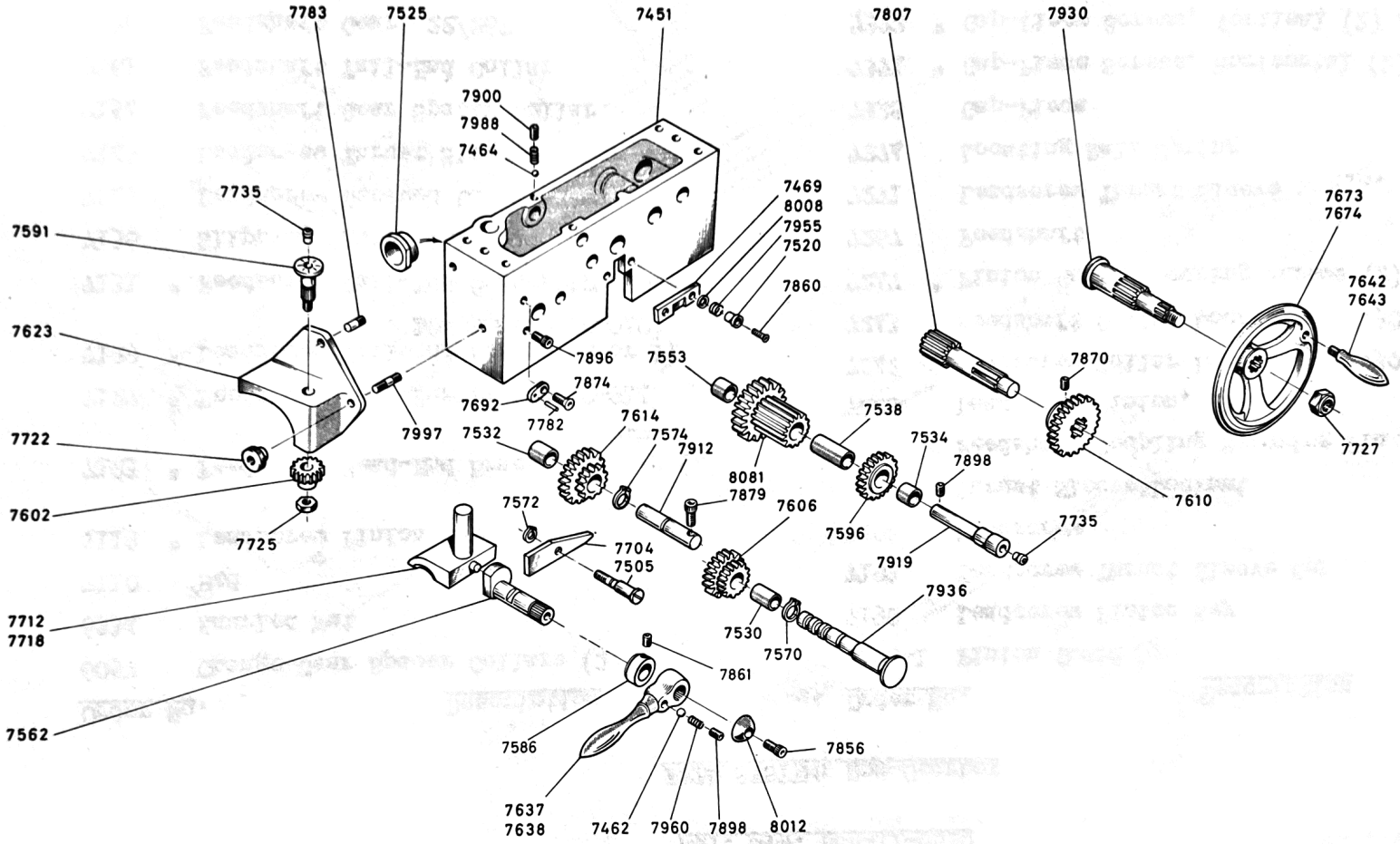
Ref. Drg. MAR-11-6810

FEED SYSTEM: Non-Gearbox

Order No.		Description
6057		Change-Gear Spacer Collars (2)
6334		Knurled Nut
7110		Bed
7119	*	Leadscrew Pinion Locating Balls (2) 01-788
7123	*	Feedshaft Head-End Bracket Bushes (2) 10-916
7127	*	Feedshaft Gear Bushes (2) 10-914
7129	*	Leadscrew Tail-End Bushes (2 or 1) 10-936 (or 10-940)
7131	*	Feedshaft Tail-End Bushes (2) 10-923
7136		Slipping Clutch Collar
7143		Leadscrew Screwed Collar
7146		Leadscrew Thrust Sleeve Collar
7154		Feedshaft Gear Spacer Collar
7161		Feedshaft Tail-End Collar
7176		Feedshaft Gear, 22/26T

Order No.		Description
7184-1		Pinion Guard
7190		Leadscrew Pinion Key
7193		Leadscrew Thrust Sleeve Key
7206		Leadscrew
7212		Thrust Sleeve Locknut
7220	*	Feedshaft Coupling Securing Pin 14-659
7228		Leadscrew Pinion, 22/26T
7242	*	Leadscrew Collar Lockscrew 53-300
7243	*	Feedshaft Collar Lockscrew 53-300
7247	*	Pinion Guard Securing Screws (2)46-214
7267		Feedshaft
7271		Leadscrew Thrust Sleeve
7274		Locating Ball Spring
7328		Gap-Piece
7371	*	Gap-Piece Screws, Horizontal (2)48-246
7372	*	Gap-Piece Screws, Vertical (2) 48-242

From SER. No. 67633
To SER. No.



STM-14-6810

APRON : Gap Bed

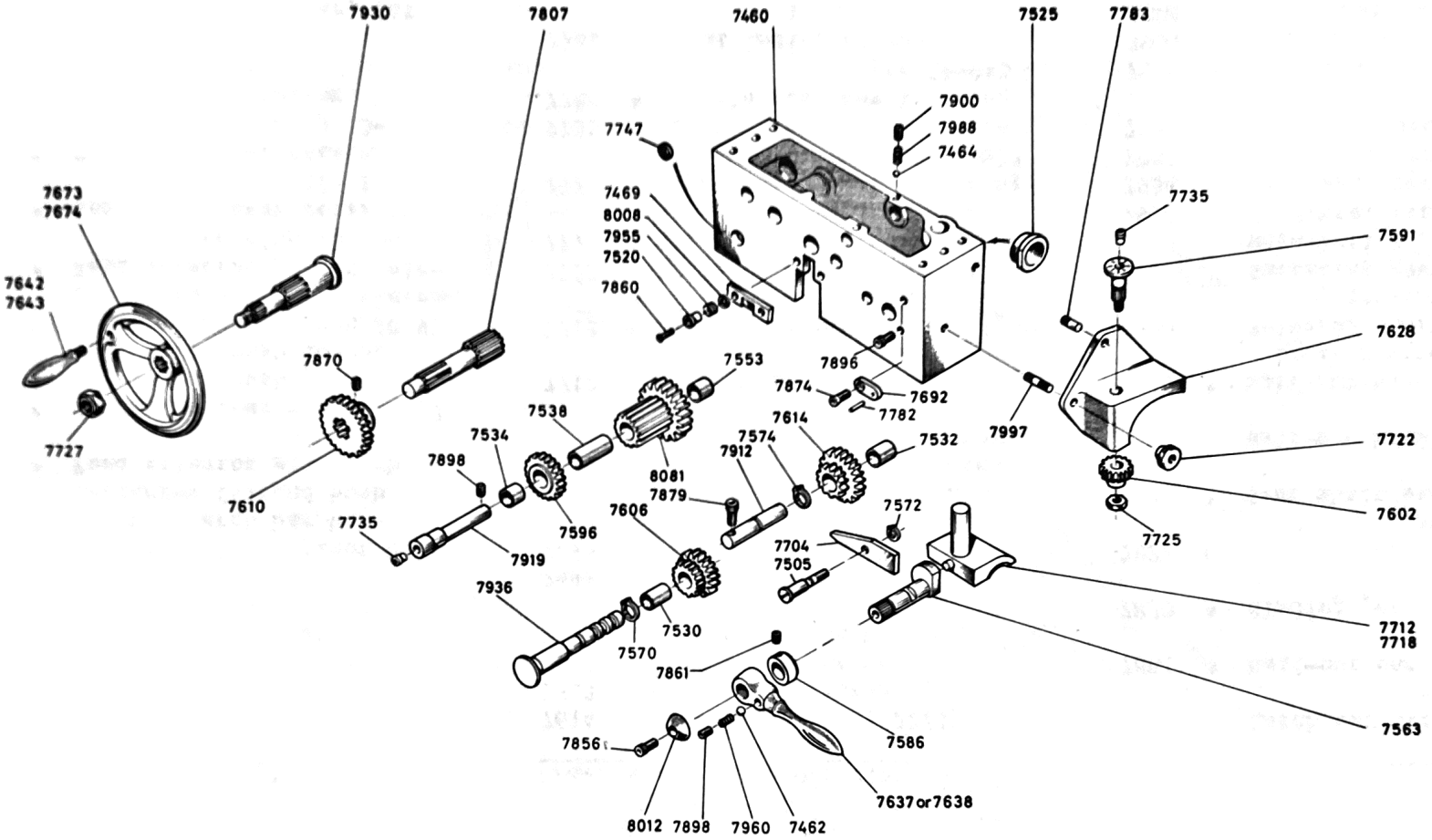
Ref. Drg. STM-14-6810

APRON: Gap Bed

Order No.		Description
7451		Apron casting
7462	*	Half-nut handle locating ball 01-788
7464	*	Feed selector shaft locating ball 01-788
7469		Wormbox latch bar
7505		Interlock lever pivot bolt
7520		Wormbox latch bar bush
7525		Leadscrew flanged bush
7530	*	Feed selector gear bush 10-957
7532	*	Surfacing gear bush 10-957
7534	*	Idler gear bush 10-964
7538	*	25T pinion bush 10-958
7553	*	Apron wormwheel bush 10-991
7562		Leadscrew nut eccentric cam
7570	*	Feed selector gear retaining clip 13-784
7572	*	Interlock lever retaining clip 11-778
7574	*	Surfacing gear retaining clip 13-784
7586		Half-nut cam collar
7591		+Indicator dial
7596		Idler gear, 33T
7602		+Dial indicator gear, 24T
7606		Feed selector gear, 25/32T
7610		Sliding gear, 42T
7614		Surfacing gear, 22/38T
7623		+Dial indicator guard
7637		Leadscrew nut handle
7638		Leadscrew nut handle (chromed)
7642		Apron handwheel handle
7643		Apron handwheel handle (chromed)
7673		Apron handwheel c/w handle
7674		Apron handwheel (chromed)
7692		Half-nut handle stop key
7704		Interlock lever
7712		Leadscrew half-nut (standard)
7718		Leadscrew half-nut (metric)
7722		+Dial indicator knurled nut
7725	*	+Dial indicator gear retaining nut 21-659
7727	*	Apron handwheel retaining nut 21-673
7735	*	Oiler nipples (2) 23-124
7782	*	Handle stop key locating pin 24-043
7783		+Dial indicator guard locating pin
7807		Rack pinion, 12T
7856	*	Half-nut handle retaining screw 46-212
7860	*	Latch bar securing screws (2) 53-305
7861	*	Half-nut cam collar sec. screw 59-350
7870	*	Sliding gear securing screw 60-362
7874	*	Handle stop key securing screw 53-303
7879	*	Gear shaft securing screw 45-204
7896		Half-nut handle stop screw 46-212
7898	*	Half-nut handle spring tension screw 60-362
7900	*	Selector shaft spring tension screw 60-364
7912		Surfacing gear shaft
7919		Wormwheel & pinion shaft
7930		Handwheel racking shaft 13T
7936		Feed selector shaft
7955		Latch bar springs (2)
7960		Half-nut handle spring 82-797
7988	*	Feed shaft spring 82-078
7997		+Dial indicator guard stud
8008		Latch bar damper washers (2)
8012		Half-nut handle domed washer
8081		Wormwheel & pinion, 33/ 5T

+ NOT on Continental lathes having metric gearbox

From SER. No. 67633
To SER. No.



STM-14D-6810

APRON : Straight bed

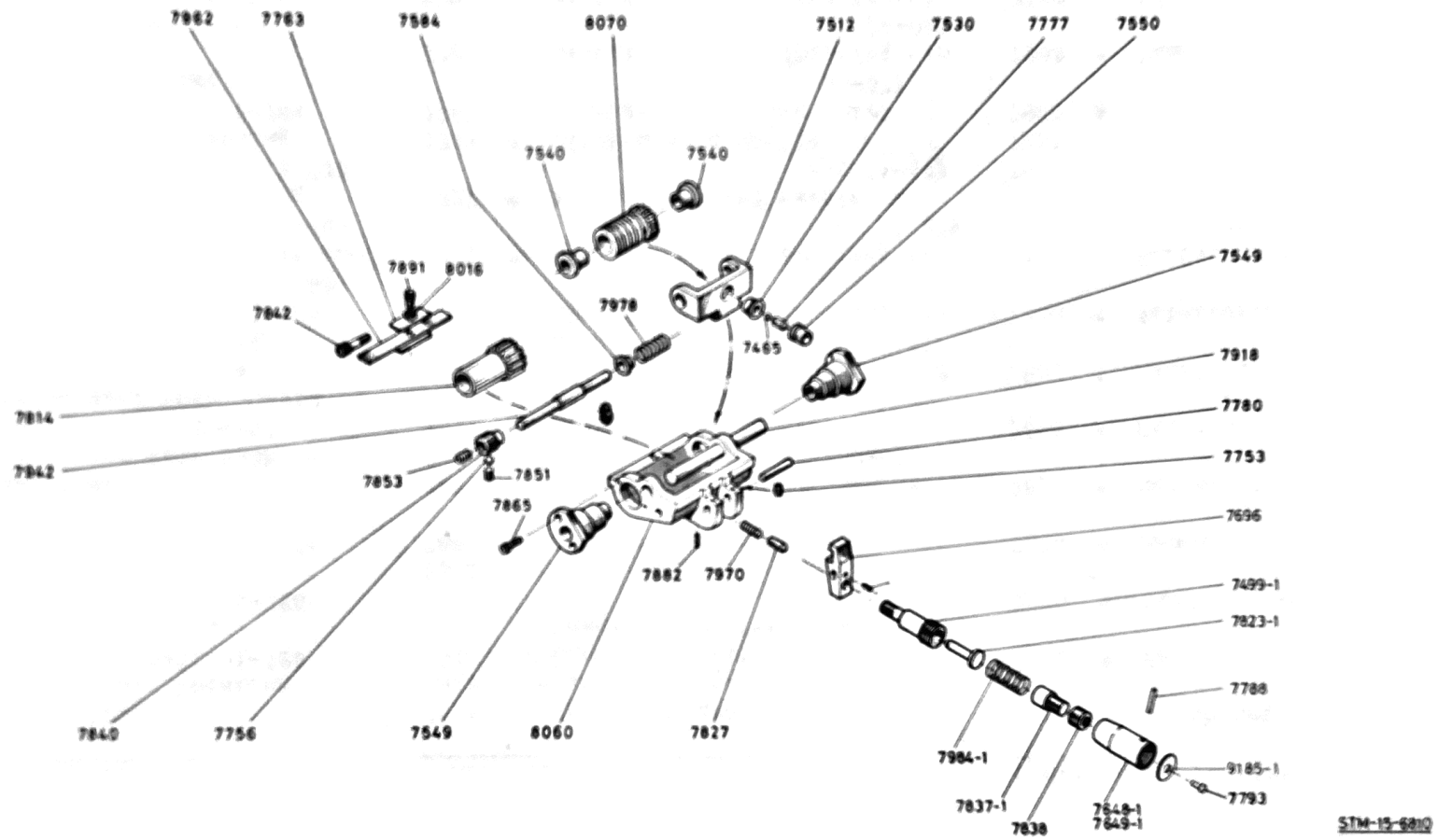
Ref. Drg. STM-14D-6810

APRON: Straight Bed

Order No.		Description
7460		Apron casting
7462	*	Half-nut handle locating ball 01-788
7464	*	Feed selector shaft locating ball 01-788
7469		Wormbox latch bar
7505		Interlock lever pivot bolt
7520		Latch bar bush
7525		Flanged bush
7530	*	Feed selector gear bush 10-957
7532	*	Surfacing gear bush 10-957
7534	*	Idler gear bush 10-964
7538	*	25T pinion bush 10-958
7553	*	Apron wormwheel bush 10-991
7563		Leadscrew nut eccentric cam
7570	*	Feed selector gear retaining clip 13-784
7572	*	Interlock lever retaining clip 11-778
7574	*	Surfacing gear retaining clip 13-784
7586		Half-nut cam collar
7591	+	Indicator dial
7596		Idler gear, 33T
7602	+	Dial indicator gear, 24T
7606		Feed selector gear, 25/32T
7610		Sliding gear, 42T
7614		Surfacing gear, 22/38T
7628	+	Dial indicator guard
7637		Leadscrew half-nut handle
7638		Leadscrew half-nut handle (chromed)
7642		Apron handwheel handle
7643		Apron handwheel handle (chromed)
7673		Apron handwheel c/w handle
7674		Apron handwheel (chromed)
7692		Half-nut handle stop key
7704		Interlock lever
7712		Leadscrew half-nut (standard)
7718		Leadscrew half-nut (metric)
7722	+	Dial indicator guard knurled nut
7725	* +	Dial indicator gear retaining nut 21-659
7727	*	Apron handwheel retaining nut 21-673
7735	*	Oiler nipple 23-124
7747	*	Oilsight (clausing only) 80-871
7782	*	Handle stop-key locating pin 24-043
7783	+	Dial indicator guard locating pin
7807		Rack pinion, 12T
7856	*	Half-nut handle retaining screw 46-212
7860	*	Latch bar securing screws (2) 53-305
7861	*	Half-nut cam collar sec screw 59-350
7870	*	Sliding gear securing screw 60-362
7874	*	Handle stop-key securing screw 53-303
7879	*	Surfacing gear shaft securing screw 45-204
7896	*	Half-nut handle stop screw 46-212
7898	*	Handle spring tension screw 60-362
7900	*	Selector shaft spring tension screw 60-364
7912		Surfacing gear shaft
7919		Wormwheel and pinion shaft
7930		Handwheel racking shaft, 13T
7936		Feed selector shaft
7955		Latch bar springs (2)
7960	*	Leadscrew half-nut handle spring 82-797
7988	*	Feed selector shaft spring 82-078
7997	+	Dial indicator guard stud
8008		Latch bar damper washers (2)
8012		Halfnut handle domed washer
8081		Wormwheel & pinion, 33/25T

+ NOT on Continental lathes having metric gearbox

From SER No. 67633
To SER No.



APRON WORMBOX

Ref. Drg. STM-15-6810

APRON WORMBOX

Order No.		Description
7465	*	Wormbox knock-off ball 01-789
7499-1		Wormbox handle plunger
7512		Wormbox bracket
7530		25/32T feed selector gear bush
7540	*	Worm & pinion bush 10-909 (2)
7549		Wormbox support bushes (2)
7550		Knock-off pin bush
7584		Pressure spring collars (2)
7648-1		Wormbox handle
7649-1		Wormbox handle (chromed)
7696		Wormbox latch
7753		Wormbox damping pads (2)
7756		Pressure adjusting screw pads (2)
7763		Leaf spring packing pieces (2)
7777		Knock-off pin
7780		Wormbox latch pin
7787	*	Wormbox rest pins (2) 24-543
7788	*	Wormbox handle plunger body sec. pin 14-644
7793		Wormbox engagement lever pin
7814		Wormbox pinion
7823-1		Handle plunger
7827		Latch return plunger
7837-1		Handle adjusting screw
7838		Wormbox handle plunger body screw
7840		Knock-off pressure adjusting screws (2)
7851	*	Adjusting screw locking screws (2) 58-342
7853	*	Spring support shaft locking screws (2) 68-428
7865	*	Wormbox support bush securing screws (4) 45-203
7875	*	Latch securing screw 59-350
7882	*	Shaft securing screw 58-347
7891	*	Leaf-spring securing screw 45-203
7918		Worm & pinion shaft
7942		Spring support shaft
7962		Leaf spring
7970	*	Handle plunger spring 82-824
7978		Knock-off pressure springs (2)
7984-1		Latch return spring
8016	*	Spring securing screw washer 86-738
8060		Wormbox casting
8070		Worm & pinion
9185		Wormbox engagement lever plate

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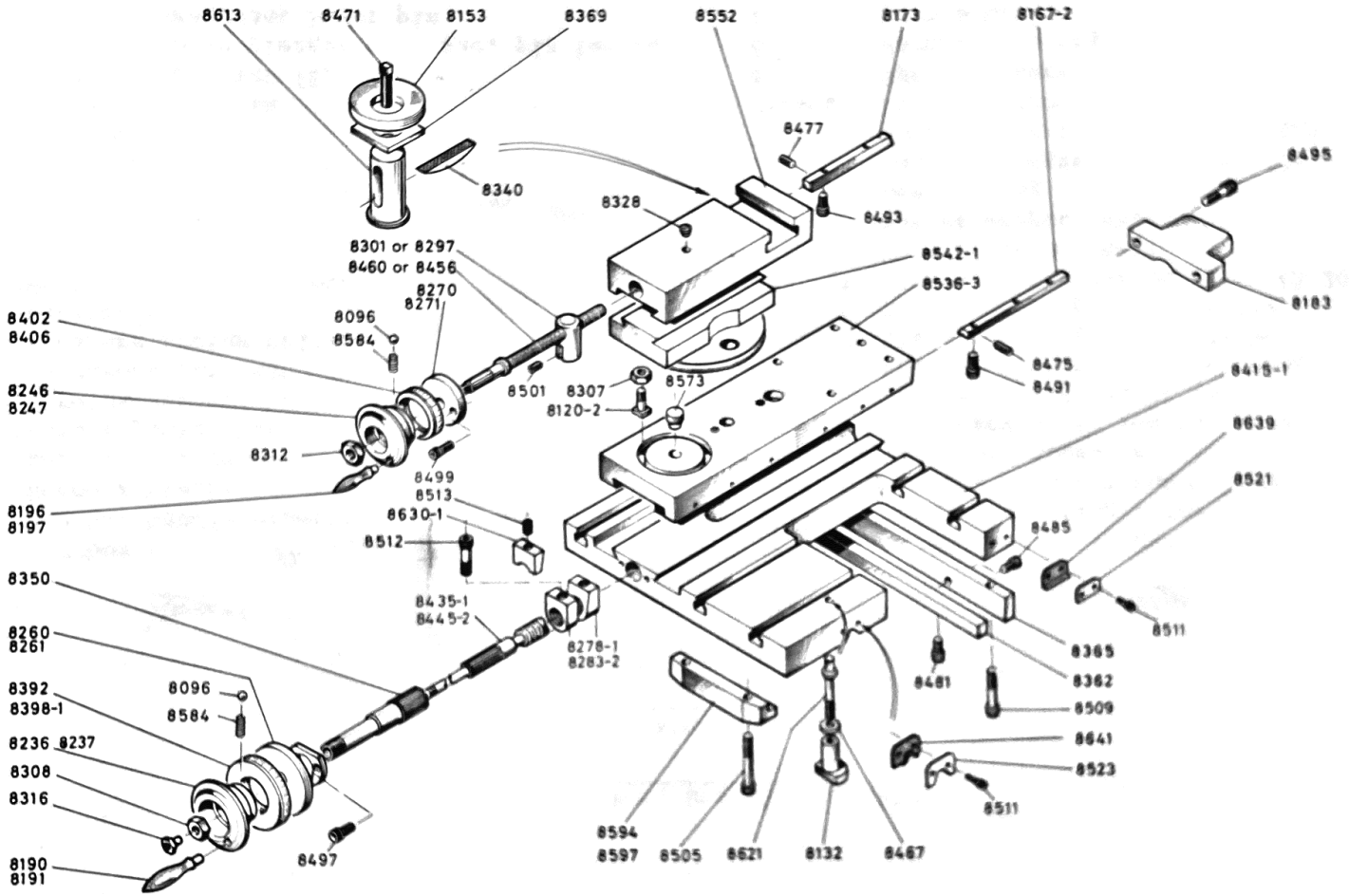
To SER. No.



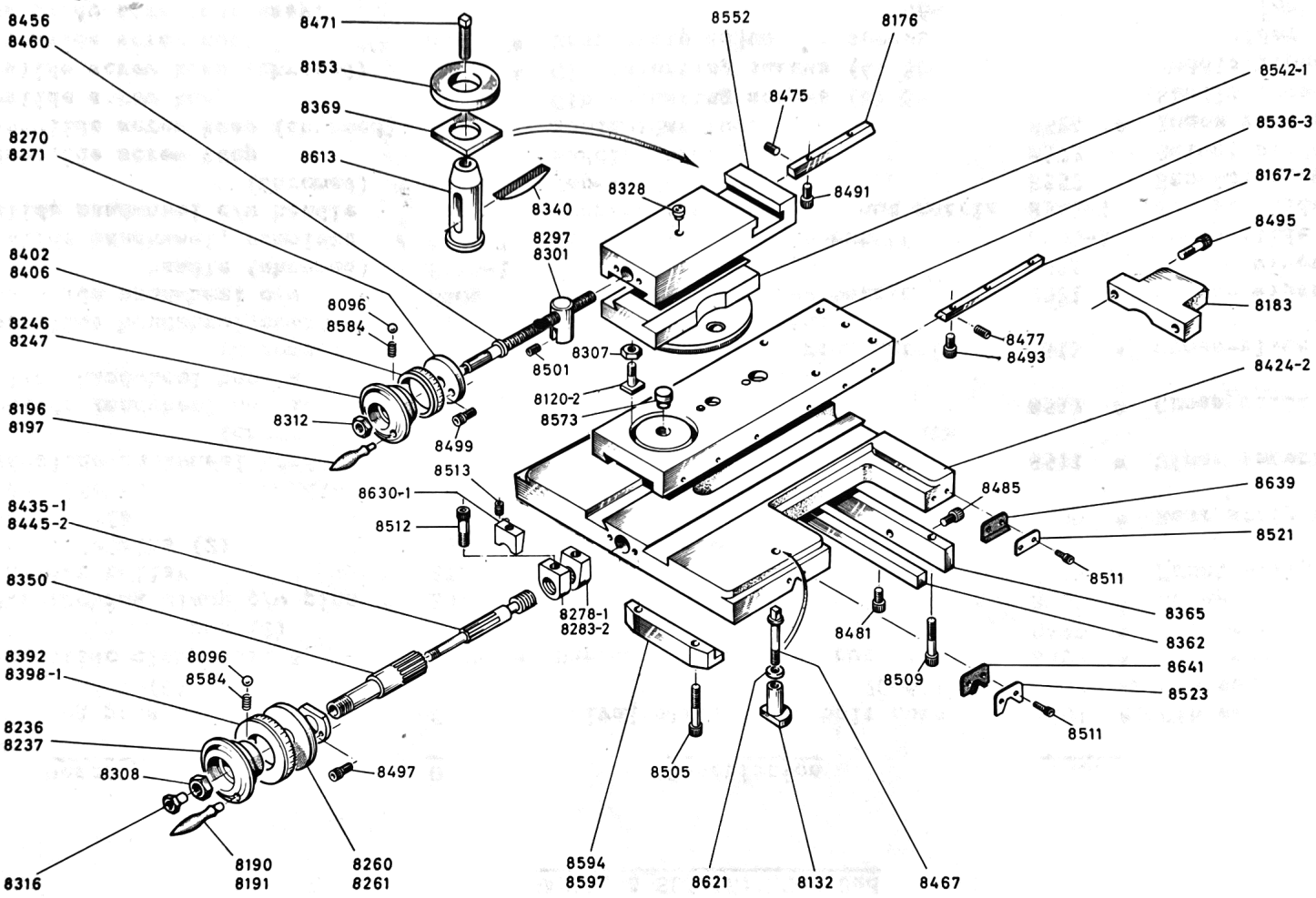
SADDLE & SLIDES : gap bed

Ref. Drg. STM-16-6810

SADDLE & SLIDES: Gap Bed

Order No.		Description
8096	*	Index ring pressure balls (6) 01-788
8120-2		Swivel slide clamp bolt & nut (2)
8132		Saddle locking clamp c/w pins
8153		Toolholder collar
8167-2		Cross-slide gibs (2)
8173		Top-slide gib
8190		Cross-slide handwheel handle
8191		Cross-slide handwheel handle (chromed)
8196		Top-slide handwheel handles (2)
8197		Topslide handwheel handle (chromed)
8236		Cross-slide handwheel,complete
8237		Cross-slide handwheel c/w handle (chromed)
8246		Top-slide handhweel, complete
8247		Topslide handwheel c/w handle (Chromed)
8260		Cross-slide screw keep
8261		Cross-slide screw keep (chromed)
8270		Top-slide screw keep
8271		Top-slide screw keep (chromed)
8278-1		Cross-slide screw nut
8283-2		Cross-slide screw nut assy. metric
8297		Top-slide screw nut
8307	*	Swivel slide clamp bolt nuts 20-691
8308	*	Handwheel retaining nut 21-654
8312	*	Handwheel retaining nut 21-651
8316		Cross-slide screw retaining nut
8328	*	Oiler nipples (8) 23-124
8340		Toolholder swivel piece
8350		Cross-slide screw pinion
8362		Saddle rear strip adjusting plate
8365		Saddle rear strip fixed plate
8369		Toolholder clamp plate
8392		Cross-slide index ring
8398-1		Cross-slide index ring metric
8402		Top-slide index ring
8406		Topslide index ring metric
8415-1		Saddle casting
8435-1		Cross-slide screw & nut
8445-2		Cross-slide screw c/w nut metric
8456		Top-slide screw & nut
8467		Saddle locking screw
8471		Toolholder tool screw
8475	*	Gib adjusting screws (6) 58-345
8477	*	Gib adjusting screws (4) 58-345
8481	*	Rear strip adjusting screws (4) 46-214
8485	*	Rear strip locking screws (2) 46-213
8491	*	Gib securing screws (6) 45-201
8493	*	Gib securing screws (4) 45-201
8497	*	Keep securing screws (2)45-206
8499	*	Keep securing screws (2) 45-203
8501	*	Screw nut securing screws 60-363
8505	*	Front strip securing screws (2) 46-218
8509	*	Rear strip securing screws (2) 47-229
8511	*	Wiper securing screws (8) 45-202
8512	*	Cross-slide screw nut sec. screw (2) 47-223
8513	*	Cross-slide wedge nut sec. screw 73-531
8521		Bedway wiper shields, flat (2)
8523		Bedway wiper shields, vee (2)
8536-3		Cross-slide c/w gib
8542-1		Swivel slide
8552		Standard top-slide c/w gib
8573		Swivel slide spigot
8584	*	Index ring springs (6) 82-795
8594		Saddle front strip (A-beds)
8597		Saddle front strip (B-beds)
8613		Toolholder c/w toolscrew
8621		Saddle locking screw washer
8630-1		Anti-backlash cross-slide wedge
8639		Bedway wipers, flat (2)
8641		Bedway wipers, vee (2)

From SER.No. 67633
To SER.No.



STM-17-6810

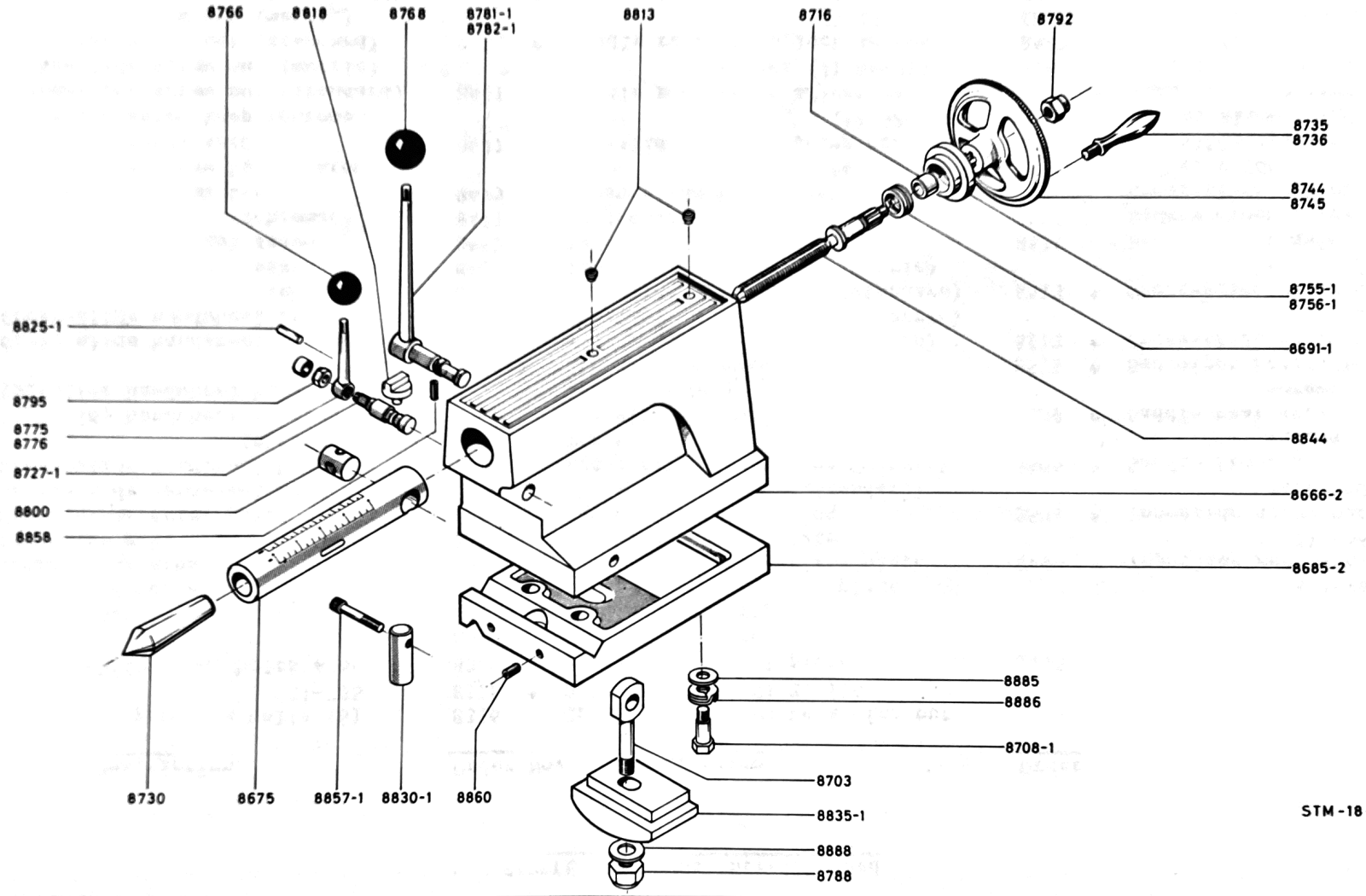
SADDLE & SLIDES : straight bed

Ref. Drg. STM-17-6810

SADDLE & SLIDES: Straight Bed

Order No.		Description
8096	*	Index ring pressure balls (6) 01-788
8120-2		Swivel slide clamp bolts & nuts (2)
8132		Saddel locking clamp c/w pins
8153		Toolholder collar
8167-2		Cross-slide gibs (2)
8176		Top-slide gib
8183		Cross-slide screw guard
8190		Cross-slide handwheel handle
8191		Cross-slide handwheel handle (chromed)
8196		Top-slide handwheel handles (2)
8197		Top-slide handwheel handles (2) (chromed)
8236		Cross-slide handwheel assembly
8237		Cross-slide handwheel assembly (chromed)
8246		Top-slide handwheel assembly
8247		Top-slide handwheel assembly (chromed)
8260		Cross-slide screw keep
8261		Cross-slide screw keep (chromed)
8270		Top-slide screw keep
8271		Top-slide screw keep (chromed)
8278-1		Cross-slide screw nut (standard)
8283-2		Cross-slide screw nut (metric)
8297		Top-slide screw nut (standard)
8301		Top-slide screw nut (metric)
8307	*	Swivel slide clamp-bolt nuts (2) 20-621
8308	*	Cross-slide handwheel nut 21-654
8312	*	Top-slide handwheel nut 21-651
8316		Cross-slide screw retaining nut
8328	*	Oiler nipples (8) 23-124
8340		Toolholder swivel piece
8350		Cross-slide screw pinion
8362		Saddle rear-strip adjusting plate
8365		Saddle rear-strip fixed plate
8369		Toolholder clamp plate
8392		Cross-slide index ring (standard)
8398-1		Cross-slide index ring (metric)
8402		Top-slide index ring (standard)
8406		Top-slide index ring (metric)
8424		Saddle casting
8435-1		Cross-slide screw & nut (Standard)
8445-2		Cross-slide screw & nut (metric)
8456		Top-slide screw & nut (standard)
8460		Top-slide screw & nut (metric)
8467		Saddle locking screw
8471		Toolholder tool screw
8475	*	Cross-slide gib adjusting screws (4) 58-345
8477	*	Top-slide gib adjusting screws (6) 58-345
8481	*	Saddle rear strip adjusting screws (4) 46-214
8485	*	Saddle rear strip lock screws (2) 46-213
8491	*	Cross-slide gib securing screws (4) 45-201
8493	*	Top-slide gib securing screws (6) 45-201
8495	*	Cross-slide screw guard sec. screw (2) 46-216
8497	*	Cross-slide keep securing screws (2)45-206
8499	*	Top-slide keep securing screws (2) 45-203
8501	*	Top-slide screw nut securing screw 60-363
8505	*	Saddle front strip securing screws (2) 46-218
8509	*	Saddle rear strip securing screws (2) 47-229
8511	*	Bed wiper screws (8) 45-202
8512	*	Cross-slide screw nut sec. screw (2) 47-223
8513	*	Cross-slide wedge nut sec. screw 73-531
8521		Bedway wiper shields, flat (2)
8523		Bedway wiper shields, vee (2)
8536-3		Cross-slide c/w gib
8542-1		Swivel slide
8552		Top-slide c/w gib
8573		Swivel slide spigot
8584	*	Index ring springs (6) 82-795
8594		Saddle front-strip (A-bed)
8597		Saddle front-strip (B-bed)
8613		Toolholder c/w toolscrew
8621		Saddle lock screw washer
8630-1		Anti-backlash cross-slide wedge
8639		Bedway wipers, flat (2)
8641		Bedway wipers, vee (2)

From SER.No.66840
To SER.No.



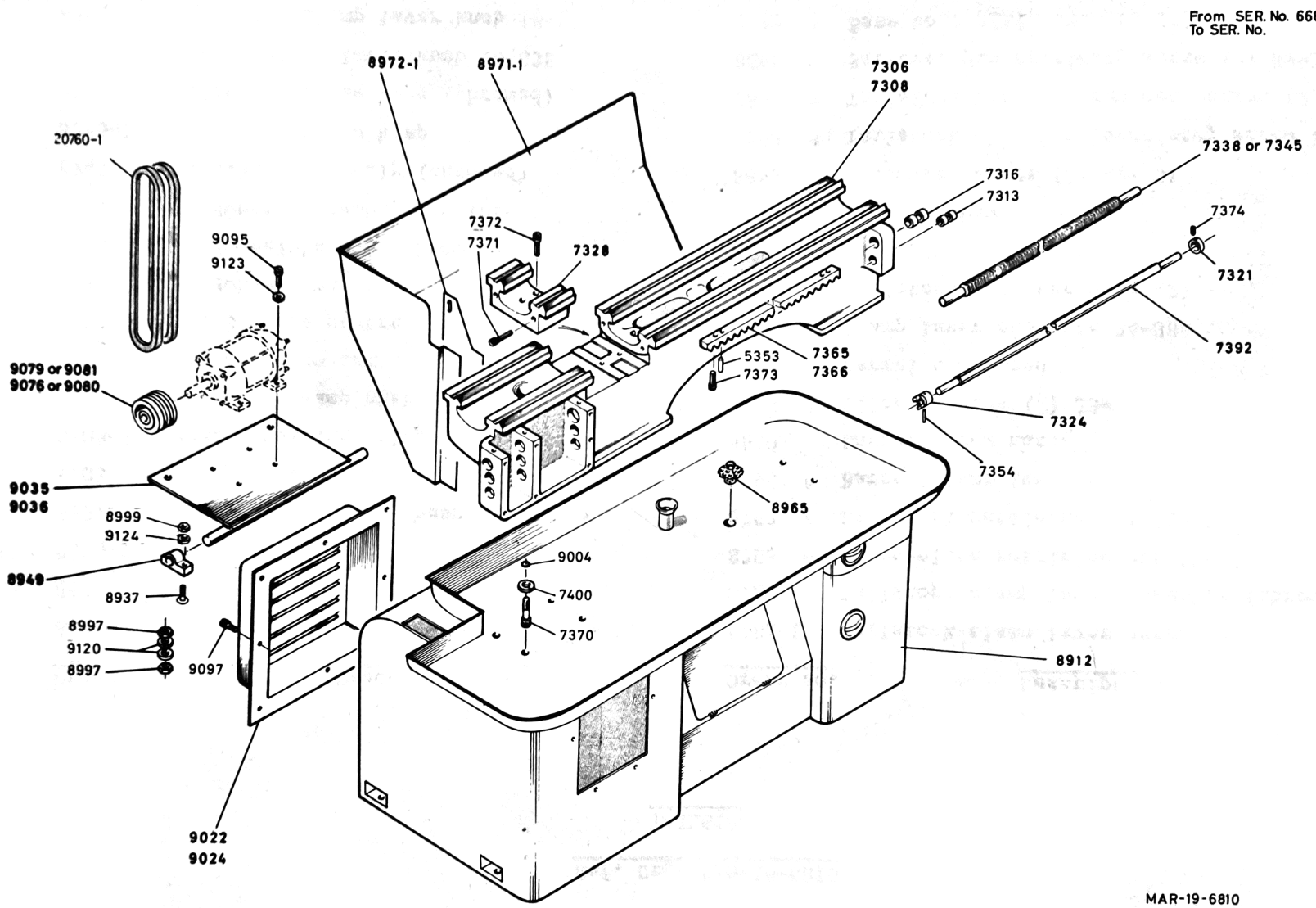
TAILSTOCK

Ref. Drg. STM-18-6810

TAILSTOCK

Order No.		Description
8666-2		Tailstock main casting
8675		Tailstock barrel
8685-2		Tailstock base
8691-1*		Barel screw thrust bearing 04-905
8703		Clamping eye-bolt
8708-1		Base retaining bolts (2)
8716		Tailstock keep bush
8727-1		Barrel clamp cam
8730		No. 3 Morse centre
8735		Handwheel handle
8736		Handwheel handle (chromed)
8744		Handwheel assembly complete
8745		Handwheel assembly (chromed)
8755-1		Tailstock screw keep
8756-1		Tailstock screw keep (chromed)
8766	*	Barrel clamp lever knob 18-838
8768	*	Tailstock clamp lever knob 18-836
8775		Barrel clamp lever
8776		Barrel clamp lever (chromed)

Order No.		Description
8781-1		Tailstock clamp lever assembly
8782-1		Tailstock clamp lever assembly (chromed)
8788	*	Clamp-plate retaining nut 21-675
8792	*	Handwheel retaining nut 21-687
8795	*	Barrel clamp lever nut 22-696
8800		Barrel screw nut
8813	*	Oiler nipples (2) 23-124
8818		Barrel clamp pad
8825-1*		Clamp lever stop pin 24-384
8830-1		Tailstock set-over pins (2)
8835-1		Tailstock clamp plate
8844		Barrel screw
8857-1*		Set-over screws (2) 47-231
8858	*	Tailstock clamping lever stop screw 73-531
8859	*	Tailstock barrel screw sec. screw (2) 58-343
8860	*	Set-over pin retaining screw (2) 59-354
8885	*	Base bolt plain washers (2) 85-695
8886	*	Base bolt spring washers (2) 84-716
8888	*	Clamp plate ret. nut washer 85-742



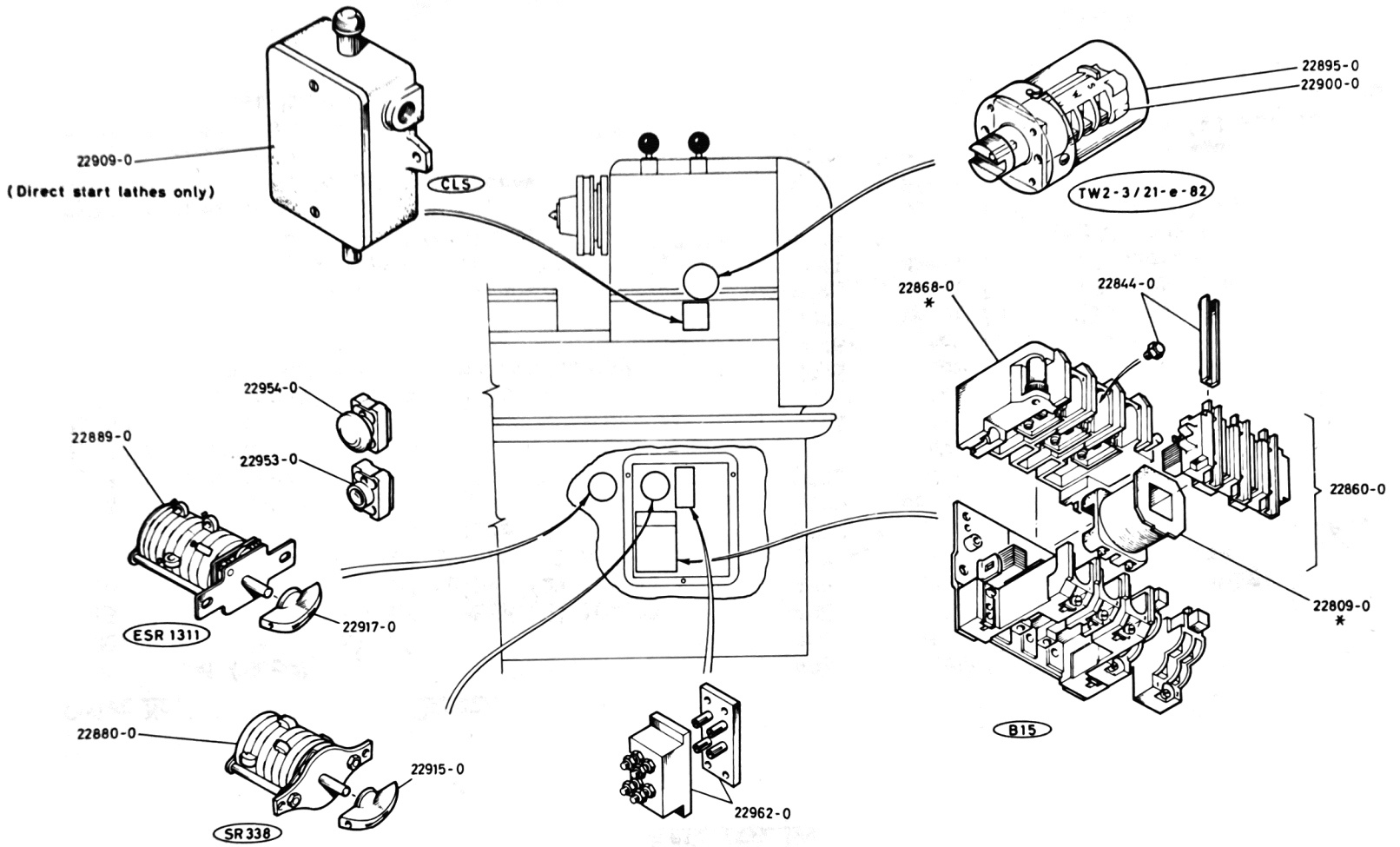
CABINET, BED & TRANSMISSION

Ref. Drg. MAR-19-6810

CABINET, BED & TRANSMISSION

Order No.		Description
7306		Bed (Gap-Type)
7308		Bed (Straight)
7313	*	Feedshaft Tail-End Bushes (2) 10-923
7316	*	Leadscrew Tail-End Bushes (2) 10-936 (or 10-940 - 1 off)
7321		Feedshaft Tail-End Collar
7324		Feedshaft Coupling
7328		Gap-Piece
7338		Leadscrew, English
7345		Leadscrew, Metric
7353	*	Rack Locating Pins (3) 24-539
7354	*	Shaft-Coupling Securing Pin 14-659
7365		Rack (A-Bed)
7366		Rack (B-Bed)
7370	*	Bed Securing Screws (6) 50-260
7371	*	Gap-Piece Screws (Horizontal)(2)48-246
7372	*	Gap-Piece Screws (Vertical) (2) 48-242
7373	*	Rack Securing Screws (2) 45-201
7374	*	Feedshaft Collar Lock Screw 59-350
7391		Feedshaft
7400	*	Bedscrew Spring Washers (6) 84-706
8912		Cabinet Base Assembly

Order No.		Description
8937	*	Bracket Securing Bolts (2) 88-055
8949		Motor Platform Bracket
8965		Coolant Drain Filter
8971-1		Back Splash Guard Assembly
8972-1		Splash Guard Fixed-Plate
8997	*	Platform Adjusting Nuts (4) 20-639
8999	*	Bracket Bolt Nuts (2) 22-698
9004	*	Bed Bolt Oil-Rings (6) 27-060
9022		Louvre Plate, Flat
9024		Louvre Plate, Boxed
9035		Motor Platforms (1-Speed)
9036		Motor Platforms (2-Speed)
9076		Motor Pulley (1-Speed, 60 C/S)
9079		Motor Pulley (1-Speed, 50 C/S)
9080		Motor Pulley (2-Speed. 60 C/S)
9081		Motor Pulley (2-Speed) 50 C/S)
9095	*	Motor Securing Screws (4) 47-229
9097	*	Cover Plate Screws (7) 45-202
9120	*	Platform Adjusting Nut Washers (4) 85-695
9123	*	Motor Securing Screw Washers (4) 85-692
9124	*	Bracket Bolt Washers (2) 84-704
20760-1		Vee belts A82



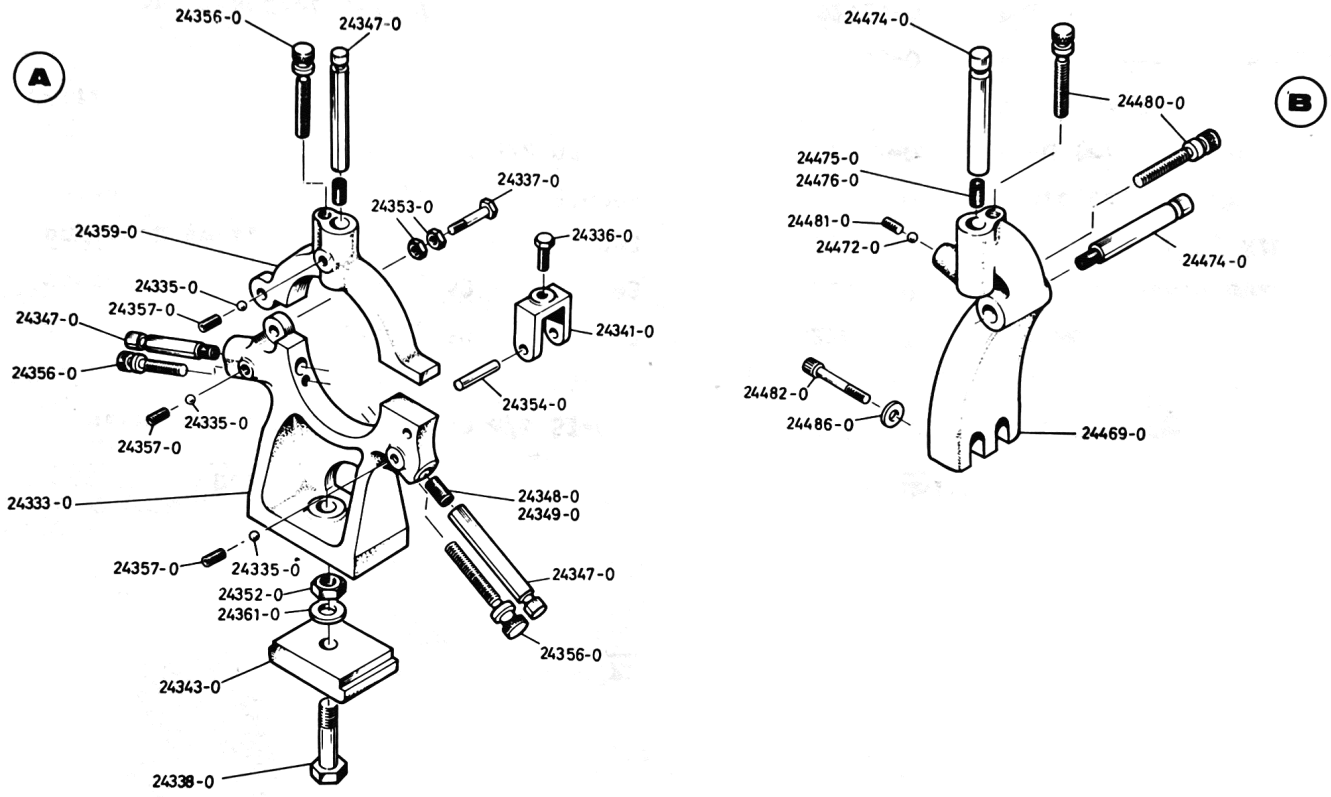
STM-20-6705/1

ELECTRICAL EQUIPMENT

Ref. Drg. STM-20-6705/1

ELECTRICAL EQUIPMENT

Order No.		Description
22809-0	*	Contactor coil, 200-220v., 50 c/s 83-093
22810-0		Contactor coil, 220-240v., 50 c/s 83-093
22811-0		Contactor coil, 380-420v., 50 c/s 83-093
22813-0		Contactor coil, 500-550v., 50 c/s 83-093
22815-0		Contactor coil, 200-220v., 60 c/s 83-093
22816-0		Contactor coil, 440-480v., 60 c/s 83-093
22817-0		Contactor coil, 550-600v., 60 c/s 83-093
22844-0		Contactor fixed & moving contacts (set) 83-087 83-088
22860-0		Contactor, Crabtree B-15 (complete) 83-094
22868-0		Contactor overload unit, 3-6A 83-092
22869-0		Contactor overload unit, 5-10A
22880-0		Main motor switch, Santon SR338 83-993
22889-0		Two-speed switch, Santon SR1311 83-991
22895-0		Reverse switch unit, complete
22900-0		Reverse switch, Klockner-Moeller
22909-0		Limit switch, Craig & Derricott CLS 83-985
22915-0		Knob for 22880-0
22917-0		Knob for 22889-0
22953-0		Button-switch, start (green) 83-049
22954-0		Button-switch, stop (red) 83-050
22962-0		Isolator plug & socket (set)



STM-101-6810

STEADIES (steady rests)

Ref. Drg. STM-101-6810

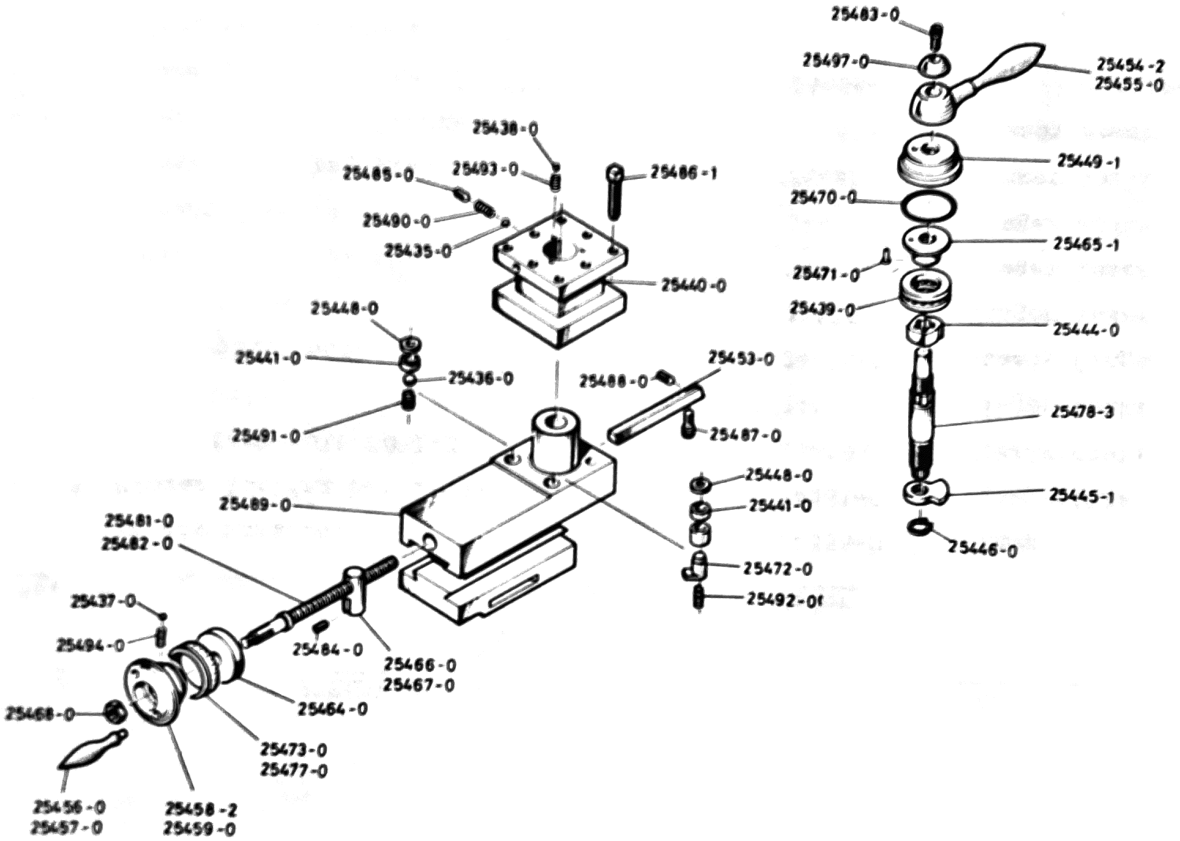
STEADY RESTS

A - STATIONARY STEADY

Order No.		Description
24333-0		Steady base casting
24335-0	*	Finger locking balls (3) 01-793
24336-0	*	Clamp fork bolt 08-112
24337-0		Pivot bolt
24338-0		Clamp-plate bolt
24341-0		Clamp fork
24343-0		Steady clamp plate
24347-0		Steady fingers (3)
24348-0		Finger inserts, plastic (3)
24349-0		Finger inserts, bronze (3)
24352-0	*	Clamp-plate bolt nut 20-614
24353-0	*	Pivot bolt locknuts (2) 20-637
24356-0		Finger adjusting screws (3)
24357-0	*	Finger locking screws (3) 60-363
24359-0		Steady top casting

B - TRAVELLING STEADY

Order No.		Description
24354-0		Clamp fork hinge-pin
24361-0	*	Clamp-plate bolt washer 85-695
24469-0		Steady casting
24472-0	*	Finger locking balls (2) 01-793
24474-0		Steady fingers (2)
24475-0		Finger inserts, plastic (2)
24476-0		Finger inserts, bronze (2)
24480-0		Finger adjusting screws (2)
24481-0	*	Finger locking screws (2) 60-365
24482-0	*	Steady securing screws (2) 49-253
24486-0	*	Securing screw washers (2) 85-694



STM-102-65/1

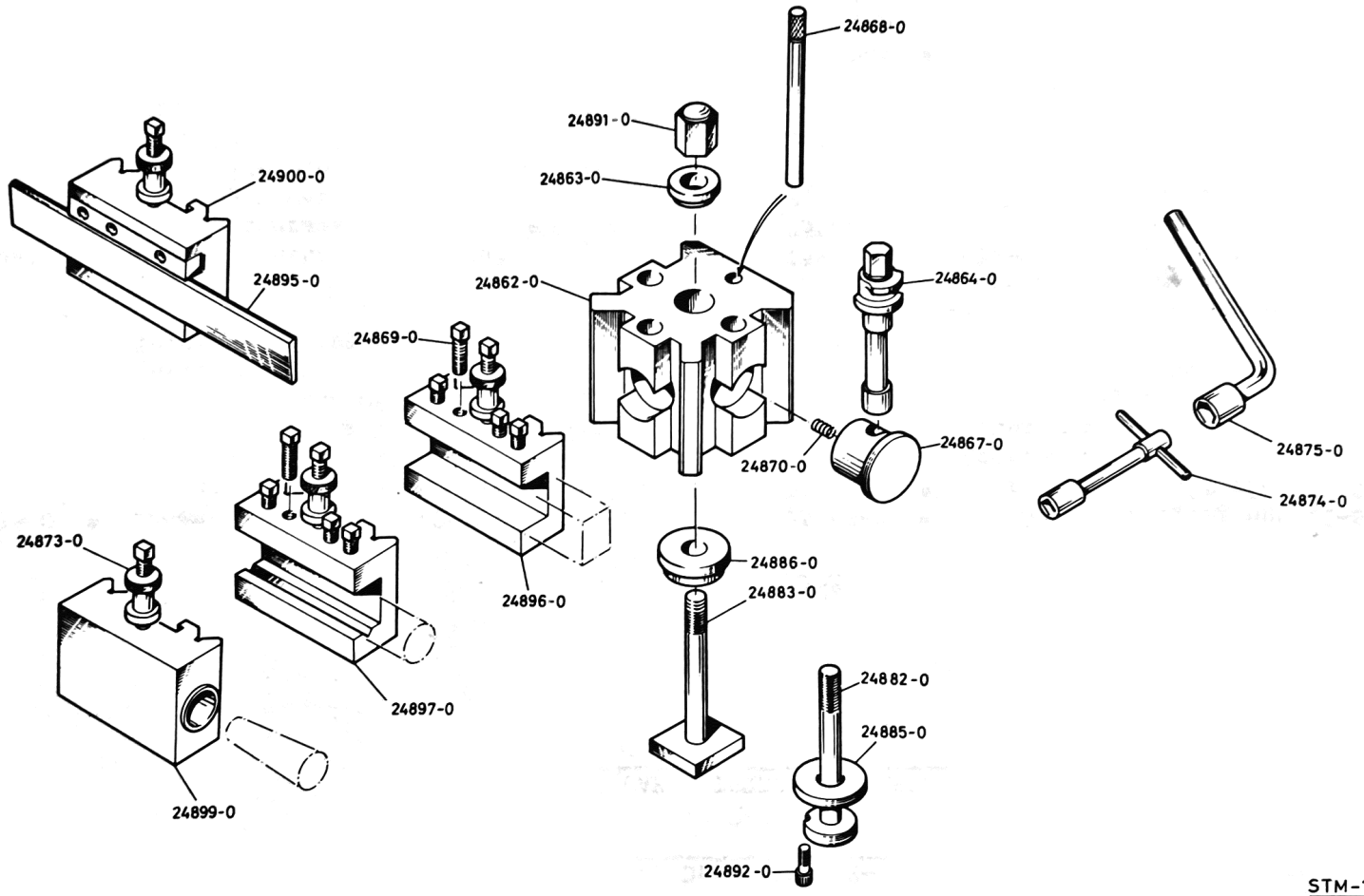
SQUARE TURRET TOOLPOST

Ref. Drg. STM-102-65/1

SQUARE TURRET TOOLPOST

Order No.		Description
25435-0	*	Indexing-cam balls (2) 01-788
25436-0	*	Turret locating ball 01-792
25437-0	*	Indexing ring balls (3) 01-788
25438-0	*	Pre-load spring balls (3) 01-786
25439-0	*	Thrust bearing 04-884
25440-0		Turret block
25441-0		Turret locating bushes (4)
25444-0		Indexing cam
25445-1		Plunger cam
25446-0	*	Cam retaining clip 11-743
25448-0		Bush withdrawal collars (4)
25449-1		Bearing cover
25453-0		Top-slide gib
25454-2		Clamping handle
25455-0		Clamping handle (chromed)
25456-0		Handwheel handle
25457-0		Handwheel handle (chromed)
25458-2		Top-slide handwheel
25459-0		Top-slide handwheel (chromed)
25464-0		Top-slide screw keep
25465-1		Turret clamp nut
25466-0		Top-slide screw nut, standard
25467-0		Top-slide screw nut, metric

Order No.		Description
25468-0	*	Handwheel securing nut 21-651
25470-0	*	Bearing-cover oil ring 27-855
25471-0		Locking pin
25472-0		Plunger c/w bush
25473-0		Index ring, standard
25477-0		Index ring, metric
25478-3		Clamping screw
25481-0		Top-slide screw c/w nut - standard
25482-0		Top-slide screw c/w nut - metric
25483-0	*	Clamping handle screw 46-214
25484-0	*	Topslide screw-nut screw 68-430
25485-0	*	Index cam-ball tension screws (4) 60-362
25486-1		Tool screws (8)
25487-0	*	Gib securing screws (4) 45-201
25488-0	*	Gib adjusting screws (4) 58-345
25489-0		Square-turret topslide c/w gib
25490-0	*	Indexing cam springs (2) 82-078
25491-0		Turret locating spring
25492-0		Plunger spring
25493-0		Pre-load springs (3)
25494-0	*	Index-ring springs (3) 82-795
25497-0		Clamping-handle domed washer



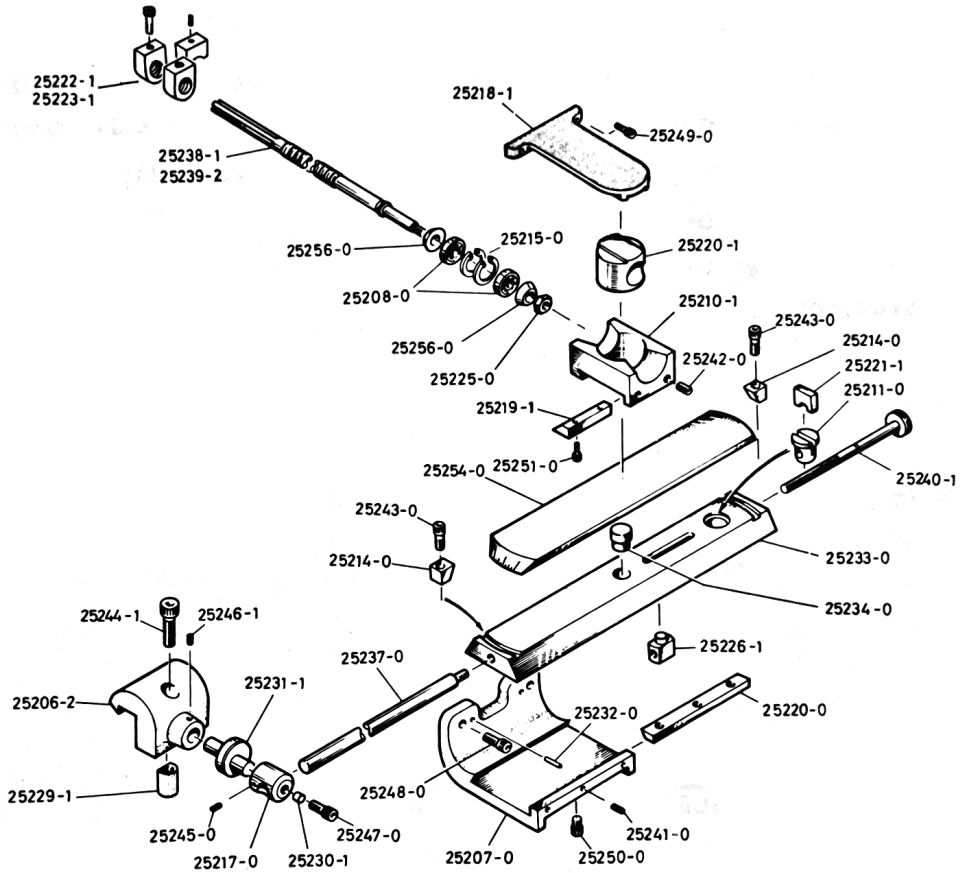
QUICK-CHANGE TOOLPOST

Ref. Drg. STM-106-65/1

QUICK-CHANGE TOOLPOST

Order No.	Description
24862-0	Toolpost body
24863-0	Toolpost clamping collar
24864-0	Toolholder clamp cam
24867-0	Toolholder clamp pad
24868-0	Toolpost locating pin
24869-0	Tool-clamping screws
24870-0	Clamp pad spring
24873-0	Height-adjusting stop
24874-0	Tool clamping-screw wrench
24875-0	Toolholder clamping wrench

Order No.		Description
24882-0		Toolpost bolt (solid topslide)
24883-0		Toolpost bolt (slotted topslide)
24885-0		Toolpost locating collar (solid topslide)
24886-0		Toolpost locating collar (slotted topslide)
24891-0	*	Toolpost clamping nut 21-685
24892-0	*	Toolpost securing screw 45-202
24895-0		Pa ting-off blade
24896-0		Standard toolholder
24897-0		Boring-bar toolholder
24899-0		No. 2 morse-taper toolholder
24900-0		Parting-off toolholder



STM-104-6810

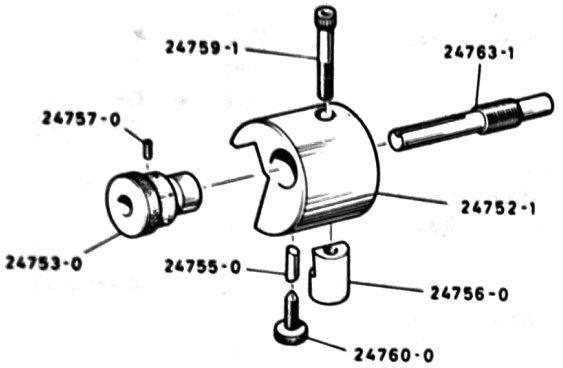
TELESCOPIC TAPER TURNING ATTACHMENT

Ref. Drg. STM-104-6810

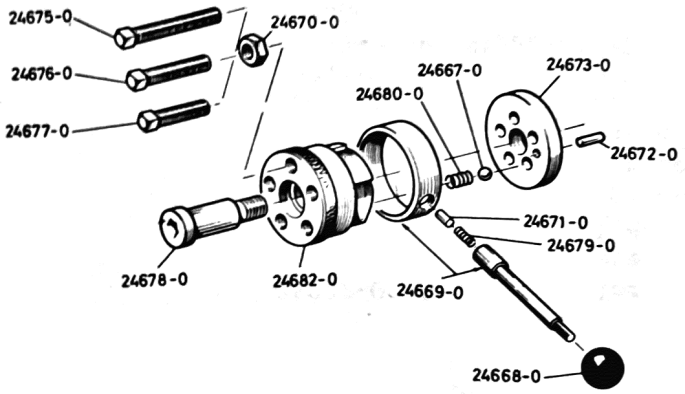
TELESCOPIC TAPER TURNING ATTACHMENT

Order No.		Description
25206-2		Anchor bracket
25207-0		Taper-turner bracket
25208-0	*	Cross-slide screw bearings 02-872
25210-1		Slide block
25211-0		Adjusting screw keep bush
25214-0		Swivel-slide clamps (2)
25215-0	*	Bearing retaining clips 12-766
25217-0		Anchor bracket extension
25218-1		Cross-slide extension
25219-1		Slide-block gib
25220-0		Bracket gib
25220-1		Bearing housing
25221-1		Adjusting screw keep
25222-1		Saddle screw nut (standard)
25223-1		Saddle screw nut (metric)
25225-0	*	Thrust bearing adjusting nut 21-660
25226-1		Swivel slide adjusting screw nut
25229-1		Anchor bracket clamp piece
25230-1		Connecting-rod clamp pad
25231-1		Eccentric pin

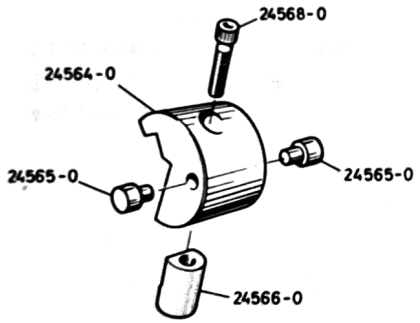
Order No.		Description
25232-0	*	Bracket locating pins 24-542
25233-0		Fixed plate
25234-0		Swivel-slide pivot
25237-0		Connecting-rod
25238-1		Cross-slide screw c/w nut (metric)
25239-2		Cross-slide c/w nut (standard)
25240-1		Swivel slide adjusting screw
25241-0	*	Bracket-gib adjusting screws 58-345
25242-0	*	Slide-block gib adjusting screws 58-343
25243-0	*	Swivel-slide clamping screws 46-213
25244-1	*	Anchor bracket locking screw 48-242
25245-0	*	Bracket extension locking screw 59-350
25246-1	*	Eccentric-pin locking screw 60-361
25247-0	*	Connecting-rod locking screw 48-237
25248-0	*	Bracket securing screws 46-214
25249-0	*	Extension securing screws 46-216
25250-0	*	Bracket-gib securing screws 45-202
25251-0	*	Slide-block gib securing screws 45-202
25254-0		Swivel slide
25256-0		Bearing thrust washers



MICROMETER STOP



5 - POSITION TURRET STOP



SINGLE STOP

STM - 105 - 67/1

BED STOPS

Ref. Drg. STM-105-67/1

BEDSTOPS

SINGLE STOP

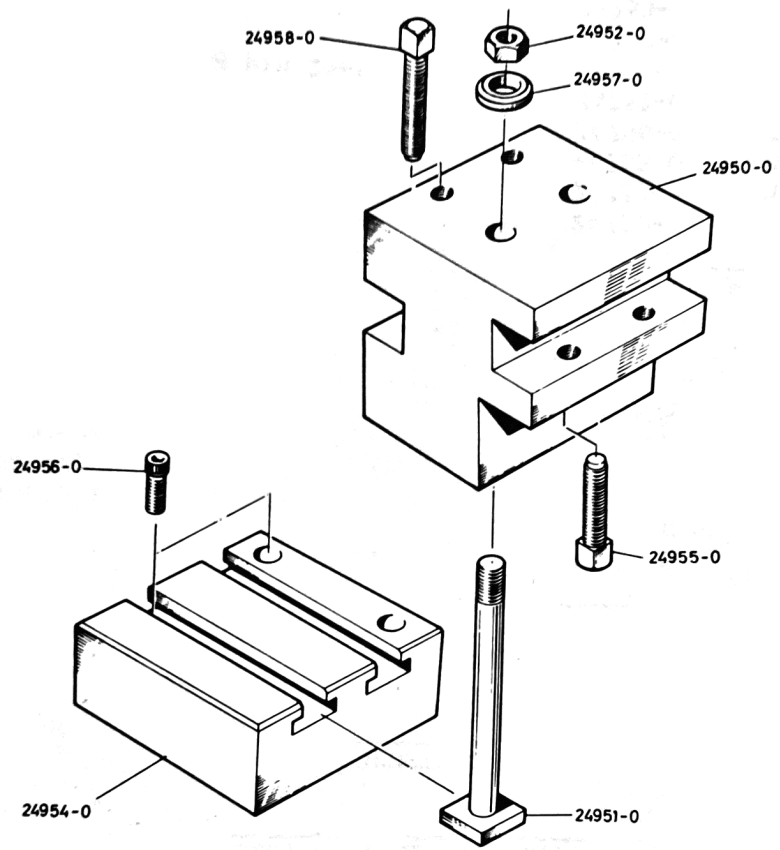
Order No.		Description
24564-0		Body, single type
24565-0		Stop pads (2)
24566-0		Clamping piece
24568-0	*	Locking screw 48-247

5 POSITION STOP

Order No.		Description
24667-0	*	Turret locating ball 01-788
24668-0	*	Ratchet-lever knob 18-840
24669-0		Ratchet lever & ring assembly
24670-0	*	Stop screw locknuts 20-636
24671-0		Ratchet locating pin
24672-0	*	Turret-plate locating pin 24-541
24673-0		Turret plate
24675-0		Stop screw, long
24676-0		Stop screw, medium
24677-0		Stop screw, short
24678-0		Turret spindle
24679-0		Ratchet lever spring
24680-0		Turret locating-ball spring
24682-0		5-position turret

MICROMETER STOP

Order No.		Description
24752-0		Body
24753-0		Micro dial
24755-0		Micro dial locking piece
24756-0		Clamping piece
24757-0		Micro dial pin
24759-0	*	Locking screw 51-270
24760-0		Micro dial locking screw
24763-1		Spindle



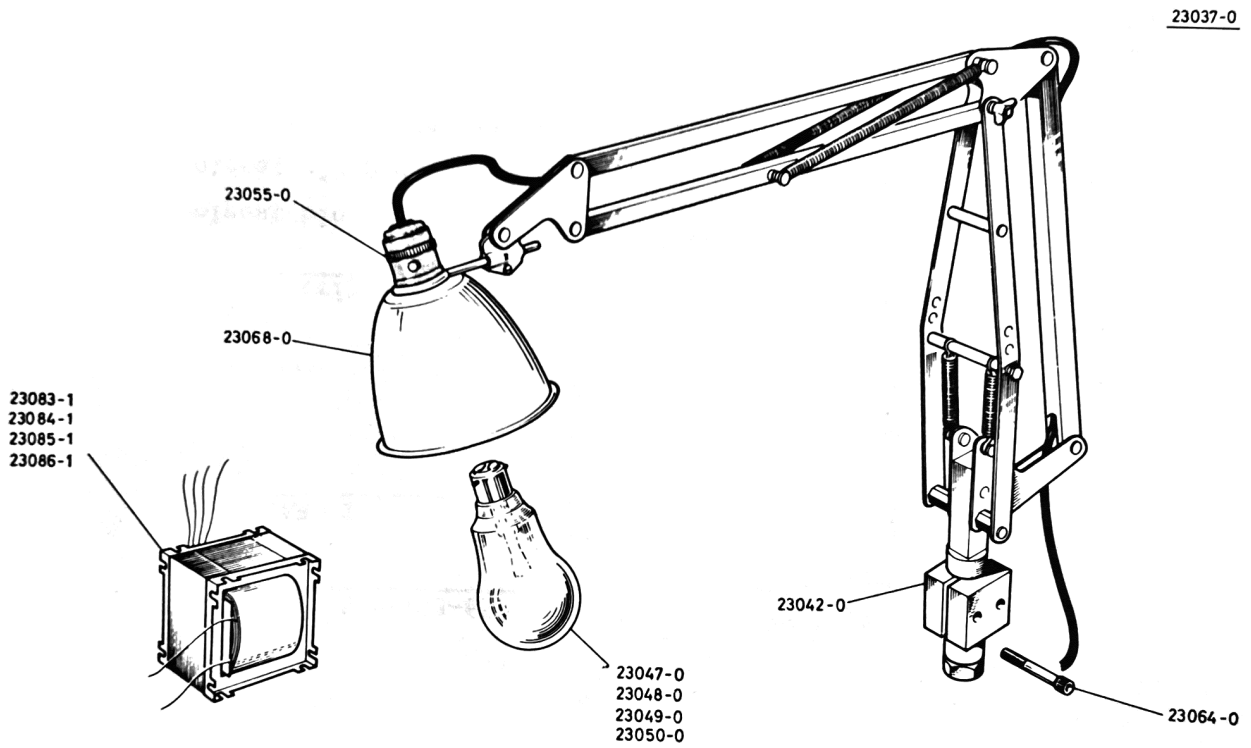
STM-103-65/1

REAR TOOLPOST

Ref. Drg. STM-103-65/1

REAR TOOLPOST

Order No.		Description
24950-0		Toolpost block
24951-0		Toolpost clamping bolts (2)
24952-0	*	Clamping-bolt nuts (2) 21-661
24954-0		Base plate
24955-0		Tool screw (2) bottom
24956-0	*	Base-plate securing screws (4) 47-228
24957-0	*	Clamping-bolt washers (2) 85-694
24958-0		Tool screws (2) top



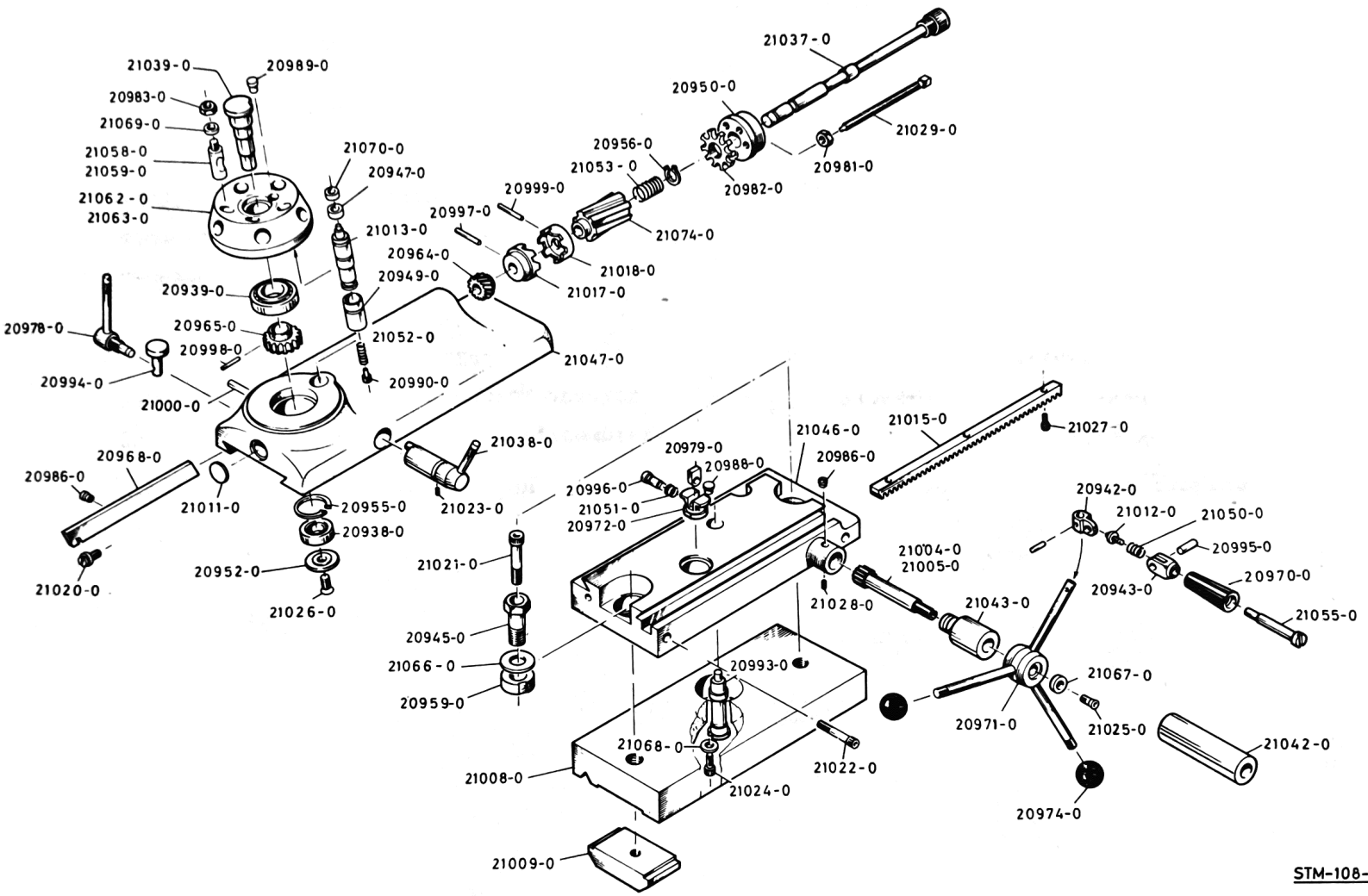
STM-107-6810.

LOW VOLT LIGHT UNIT

Ref. Drg. STM-107-6810

LOW VOLT LIGHT UNIT

Order No.	Description	Order No.	Description
23037-0	Low volt light unit, complete	23064-0 *	Mounting bracket screws (2) 45-206
23042-0	Light unit mounting bracket	23068-0	Light shade
23047-0	Light bulb, 12v.	23083-1	Transformer, 12v.
23048-0	Light bulb, 25v.	23084-1	Transformer, 25v.
23049-0	Light bulb, 32v.	23085-1	Transformer, 32v.
23050-0	Light bulb, 50v.	23086-1	Transformer, 50v.
23055-0	Light switch		

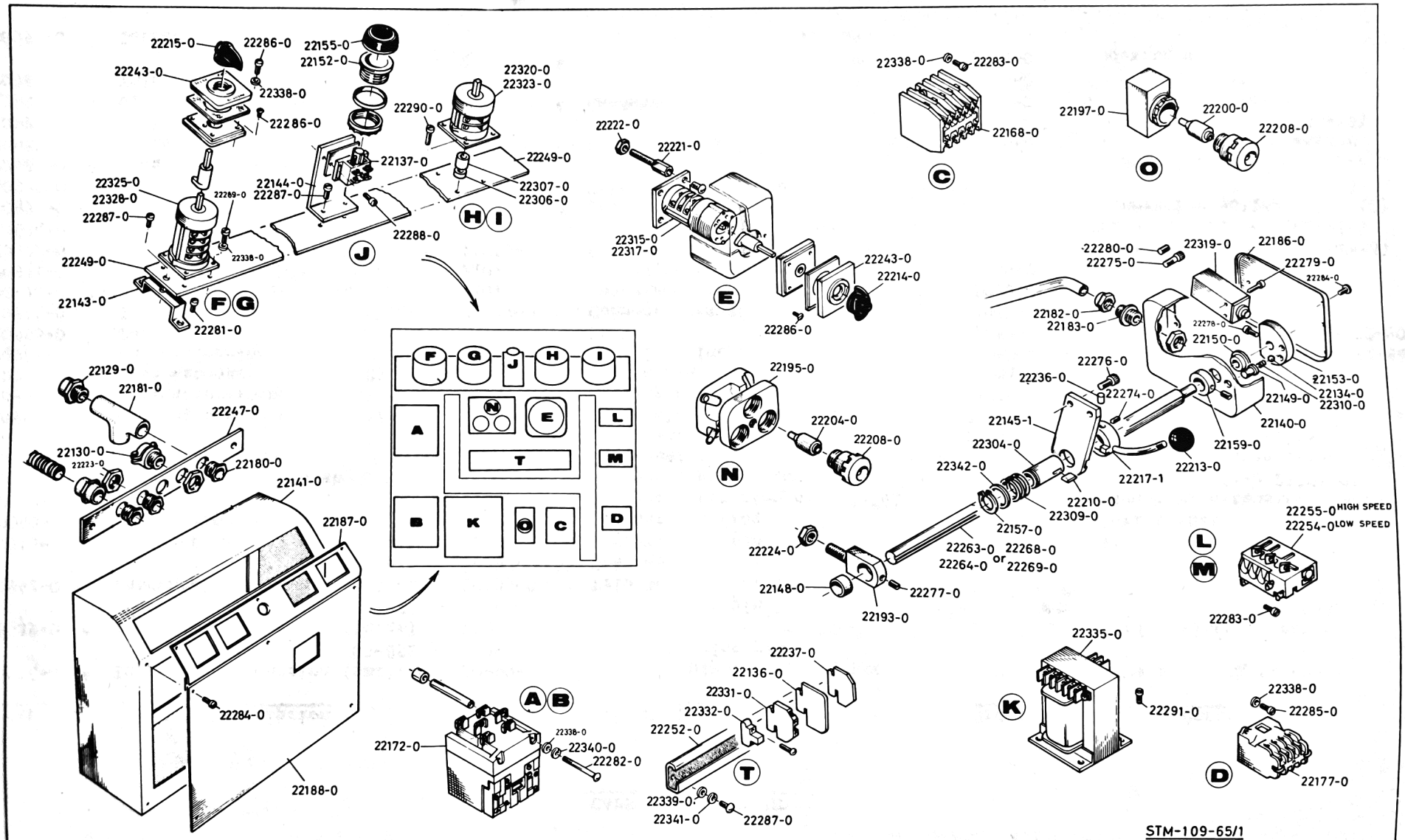


CAPSTAN ATTACHMENT UNIT

Ref. Drg. STM-108-67/1

CAPSTAN ATTACHMENT

Order No.		Description
20938-0	*	Turret-shaft bearing (small) 03-892
20939-0	*	Turret-shaft bearing (large) 03-896
20942-0		Handwheel handle fixed block and pin
20943-0		Handwheel handle pivot block
20945-0		Base hollow bolts (2)
20947-0		Turret locating bush
20949-0		Indexing plunger bush
20950-0		Stop-screw bush
20952-0		Bearing cap
20955-0	*	Bearing retaining clip 12-767
20956-0	*	Spring retaining clip 11-737
20959-0		Base set-over collars (2)
20964-0		Connecting-shaft gear
20965-0		Turret-shaft gear
20968-0		Top-slide gib
20970-0	*	Handwheel handle 16-841
20971-0		Handwheel assembly
20972-0		Trip lever housing
20974-0	*	Handwheel knobs 18-837
20978-0		Slide locking lever assembly
20979-0		Trip lever
20981-0	*	Stop-screw locknuts 20-621
20982-0		Connecting-shaft nut
20983-0	*	Camlock -stud nuts 20-621
20986-0	*	Oiler nipples 23-827
20988-0		Trip lever housing locating peg
20989-0		Turret-shaft locating peg
20990-0		Indexing plunger spring peg
20993-0		Worm actuating pin
20994-0		Locking pin
20995-0		Handle pivot pin
20996-0		Trip lever pivot pin
20997-0	*	Gear securing pin 24-533
20998-0	*	Turret gear securing pin 24-534
20999-0	*	Ratchet securing pin 24-535
21000-0	*	Locking-lever stop pin 24-541
21004-0		Handwheel pinion (standard)
21005-0		Handwheel pinion (extended)
21008-0		Base plate
21009-0		Clamp plates (2)
21011-0		Casting core plug
21012-0		Handle plunger
21013-0		Indexing plunger
21015-0		Rack
21017-0		Connecting-shaft ratchet
21018-0		Indexing-worm ratchet
21020-0		Gib adjusting screw
21021-0	*	Capstan clamping screws (2) 48-249
21022-0	*	Set-over screws (4) 61-376
21023-0	*	Trip shaft locating screw 67-419
21024-0	*	Worm actuating pin locating screw 46-211
21025-0	*	Handwheel retaining screw 53-305
21026-0	*	Bearing-cap securing screw 73-534
21027-0	*	Rack securing screws (3) 45-202
21028-0	*	Pinion sleeve securing screw 59-351
21029-0		Stop screws
21037-0		Connecting shaft
21038-0		Trip-shaft assembly
21039-0		Turret shaft
21042-0		Handwheel extension sleeve (see 21005-0)
21043-0		Handwheel pinion sleeve
21046-0		Capstan bottom slide
21047-0		Capstan top-slide
21050-0	*	Handle spring 83-063
21051-0		Trip lever spring
21052-0	*	Indexing-plunger spring 82-846
21053-0	*	Connecting-shaft spring 82-807
21055-0		Handle stem
21058-0		Cam-lock studs (standard)
21059-0		Cam-lock studs (metric)
21062-0		Turret c/w bushes (standard)
21063-0		Turret c/w bushes (metric)
21066-0	*	Washers for hollow bolts (2) 85-699
21067-0		Handwheel retaining washer
21068-0	*	Pin-locating screw washer 85-691
21069-0		Cam-lock stud washers
21070-0		Bush withdrawal washers
21074-0		Indexing worm



THIRD-ROD CONTROL UNIT

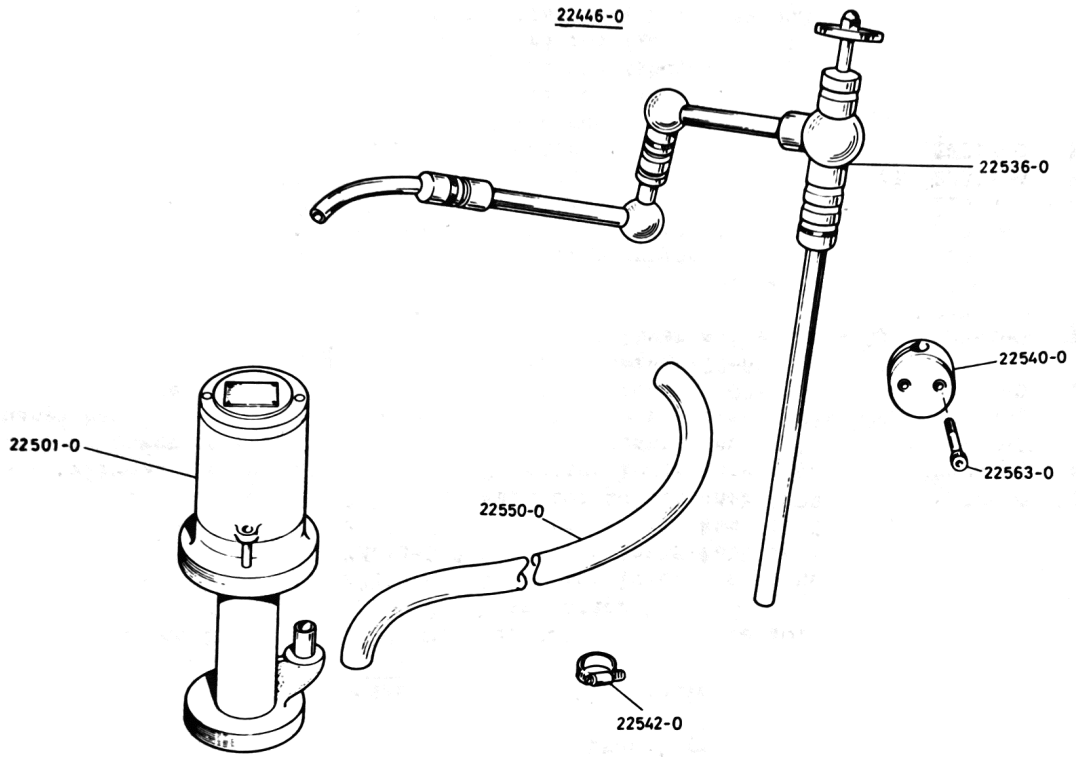
Ref. Drg. STM-109-65/1

THIRD ROD CONTROL UNIT

UNIT IDENTIFICATION

A	Forward contactor
B	Reverse contactor
C	Star point contactor
D	No-volt contactor
E	Main isolator switch
F	Forward speed selector
G	Reverse speed selector
H	Motor brake selector
I	Coolant pump selector
J	Inch button
K	Control transformer
L	Low-speed overload
M	High speed overload
N	Main phase fuse
O	Transformer and control circuit fuse
T	Terminal block

Order No.	Description
22128-0	Female conduit adaptor 1034
22129-0	Male conduit adaptor 1037
22130-0	Pump conduit adaptor 1035
22134-0 *	Cam locating ball 01-788
22136-0	Terminal barrier 1026
22137-0	Inch-contactor block 1031
22140-0	Switch box, tail-end c/w cover screws
22141-0	Control panel box
22143-0	Switch mounting-plate bracket
22144-0	Inch-switch bracket
22145-1	Operating lever bracket
22148-0 *	Eye-bolt bush 10-920
22149-0	Cam locating-spring bush
22150-0	Third rod support bush
22152-0	Inch-button 1011 c/w cap and ring
22153-0	Switch operating cam
22155-0	Inch-button cap 1010
22157-0 *	Lever-spring clip 11-753
22159-0	Third rod tail-end collar
22168-0	Star-point contactor 1022
22172-0	Forward/Reverse contactor 1020
22177-0	No-volt contactor 1023
22180-0	Male-conduit coupling 1033
22181-0	Three-way female coupling 1036
22182-0	Female coupling 1041
22183-0	Male coupling 1042
22186-0	Switch box cover
22187-0	Control panel top cover
22188-0	Control panel front cover
22193-0	Eyebolt
22195-0	Main fuse unit 1015
22197-0	Control-circuit fuse unit 1016
22200-0	Main phase fuse 1019
22204-0	Control-circuit fuse 1018
22208-0	Fuse holder 1017
22210-0	Operating lever sleeve key
22213-0 *	Operating lever knob 18-145
22214-0	Isolator switch knob 1008
22215-0	Selector switch knob 1009
22217-1	Operating lever assembly
22221-0	Switch adjusting nut 1051
22222-0	Adjusting nut locknut 1054
22223-0	Coupling locknut 1038
22224-0 *	Eyebolt locknut 20-652
22236-0	Operating lever swivel pins(2)
22237-0	Terminal end-plate 1027
22243-0	Switch indicator plate 1007
22247-0	Conduit mounting plate
22249-0	Switch mounting plate
22252-0	Terminal rail 1029
22254-0	Overload relay 1024 (low speed)
22255-0	Overload relay (high speed)
22263-0	Third rod (short) - 6½" & 13"
22264-0	Third rod (long) - 6½" & 13"
22268-0	Third rod (short) - 7½" & 15"
22269-0	Third rod (long) - 7½" & 15"
22273-0 *	Collar lock screw 59-350
22274-0 *	Swivel-pin lock screw 58-343
22275-0 *	Switch-box screws 46-213
22276-0 *	Bracket securing screws 46-213
22277-0 *	Eye-bolt bush screw 59-350
22278-0 *	Cam securing screw 46-217
22279-0 *	Limit-switch screws 45-208
22280-0 *	Jacking screws 59-354
22281-0	Support bracket securing screw 1052
22282-0	Forward & reverse contactor sec. screw
22283-0	Switch & contactor securing screw 1045
22284-0	Control panel cover securing screw 1053
22285-0	Contactor & overload securing screw 1046
22286-0	Indicator plate securing screw 1043
22287-0	Switch mounting plate sec. screw 1050
22288-0	Inch switch securing screw 1047
22289-0	Motor switch securing screw
22290-0	Brake & pump switch securing screw 1048
22291-0	Transformer securing screw 1050
22304-0	Operating lever sleeve
22306-0	Switch mounting spacer - short
22307-0	Switch mounting spacer - long
22309-0 *	Operating-lever spring 82-132
22310-0 *	Cam locating spring 82-795
22315-0	Main isolator switch handle com. 1003
22317-0	Main isolator switch T26-3-V 1003
22319-0	Limit switch 1032
22320-0	Brake & pump switch handle com. 1002
22323-0	Brake & pump switch T26-2-V 1002
22325-0	Motor speed selector switch handle com. 1001
22328-0	Motor speed selector switch T2-4/90-2 1001
22331-0	Connecting terminals 1025
22332-0	Terminal & Clamp 1028
22335-0	Transformer 1021
22338-0	Screw washers 1055
22339-0	Rail-screw washers 1057
22340-0	Spring washers 1056
22341-0	Rail-screw spring washers 1058
22342-0	Lever-spring stop washer



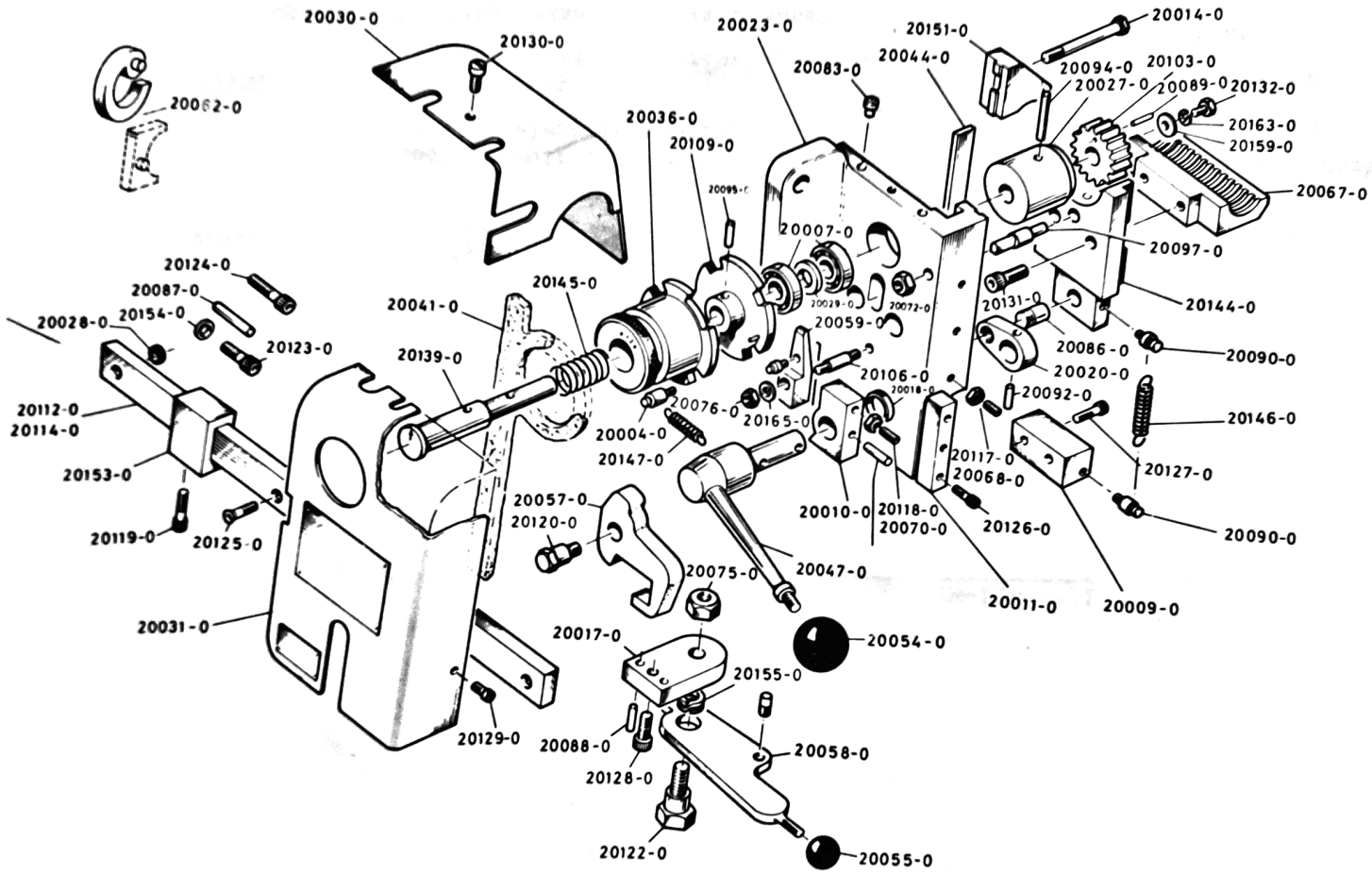
STM-110-65/1

COOLANT UNIT

Ref. Drg. STM-110-65/1

COOLANT UNIT

Order No.	Description
22446-0	Coolant unit c/w fittings (state electric supply)
22501-0	Coolant pump (state details on existing pump)
22536-0	Feedpipe assembly, c/w bracket
22540-0	Feedpipe bracket
22542-0	Hose clips (2)
22550-0	Flexible hose
22563-0 *	Pipe-bracket screws (2) 45-206



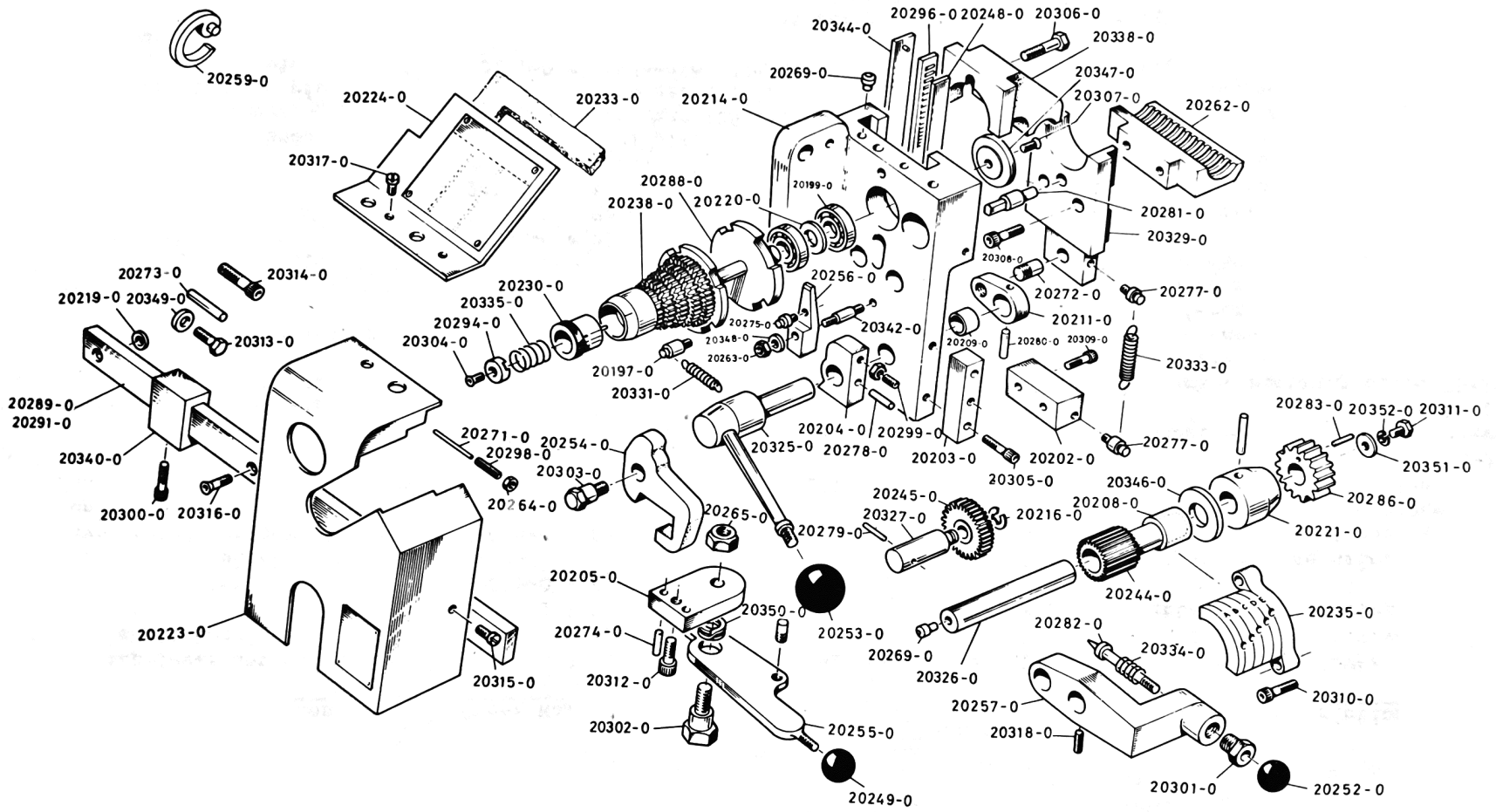
STM-111-65/1

RAPID THREADER : English

Ref. Drg. STM-111-65/1

RAPID THREADER: ENGLISH

Order No.	Description
20004-0	Locking-lever spring anchor
20007-0 *	Dial shaft bearings (2) 02-890
20009-0	Spring anchor-block
20010-0	Handle-shaft block
20011-0	Cover spacing-block
20014-0	Top steady bolt
20017-0	Knock-off lever bracket
20018-0 *	Handle-shaft bush 10-006
20020-0	Handle-shaft cam
20023-0	Threader main casting
20027-0	Pinion driving collar
20028-0	Stop-bar spacers
20029-0	Dial-shaft bearing spacer
20030-0	Back cover
20031-0	Front cover
20036-0	Setting dial assembly
20041-0	Cover gasket (felt)
20044-0	Slide gib
20047-0	Handle
20054-0	Handle knob
20055-0	Knock-off lever knob
20057-0	Dis-engaging lever
20058-0	Knock-off lever & pin
20059-0	Locking-lever & pin
20062-0	Half-nut lever lock (C-type) for lathe
20067-0	Half-nut (threader unit)
20068-0 *	Nuts for gib adjusting screws 22-690
20070-0 *	Nut for locking-lever adjusting screw 22-690
20072-0 *	Nut for top-steady screw 22-689
20075-0 *	Knock-off lever securing nut 22-691
20076-0 *	Locking-lever securing nut 22-689
20083-0 *	Oiler nipples 23-124
20086-0	Slide driving pin
20087-0 *	Attachment location pin 14-131
20088-0	Lever-bracket locating pins
20089-0 *	Pinion locating pin 24-046
20090-0	Main spring retaining pins (2)
20091-0 *	Shaft-block securing pin 24-543
20092-0 *	Shaft-cam securing pin 24-543
20094-0 *	Pinion driving-collar pin 25-608
20095-0 *	Dial plate securing pin 24-543
20097-0	Selector pin
20103-0	Pinion
20106-0	Locking-lever pivot
20109-0	Dial plate
20112-0	Stop bar (26 in.)
20114-0	Stop bar (46 in.)
20117-0 *	Slide-gib adjusting screws (3) 73-195
20118-0 *	Locking-lever adjusting screw 73-473
20119-0 *	Adjusting-stop locking screw 73-489
20120-0	Dis-engaging lever pivot screw
20122-0	Knock-off lever pivot screw
20123-0 *	Attachment securing screw (short) 47-227
20124-0 *	Attachment securing screws (long) 47-228
20125-0 *	Stop-bar securing screws 73-520
20126-0 *	Spacing-block securing screws 46-214
20127-0 *	Anchor-block securing screws 73-197
20128-0 *	Bracket securing screw 73-199
20129-0 *	Front-cover securing screws 73-472
20130-0 *	Back cover securing screws 73-472
20131-0 *	Half-nut securing screws (2) 73-196
20132-0 *	Pinion securing screw 73-198
20139-0	Dial shaft
20144-0	Slide
20145-0	Dial spring
20146-0	Main spring
20147-0	Locking-lever spring
20151-0	Top steady
20153-0	Adjusting stop
20154-0 *	Securing screw washer 85-692
20155-0 *	Knock-off lever spring-washer 84-714
20159-0 *	Pinion securing screw washer 85-720
20163-0 *	Pinion screw spring washer 84-701
20165-0 *	Locking-lever securing nut washer 85-691



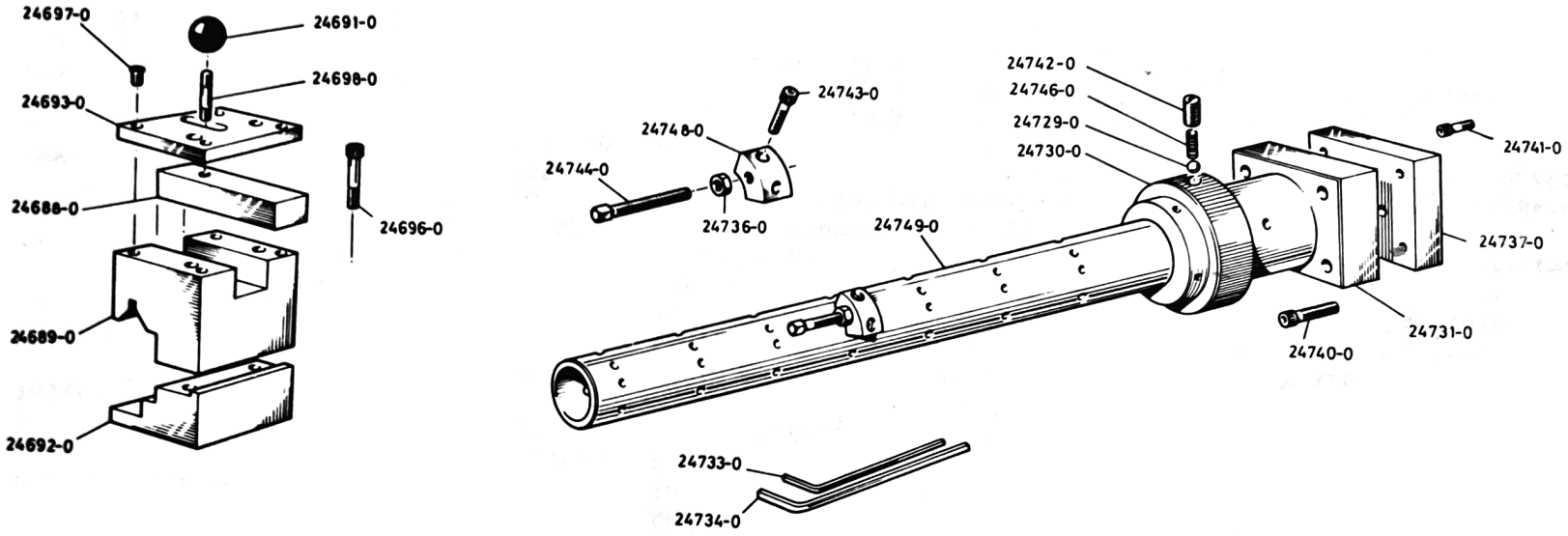
STM-112C-65/1

RAPID THREADER : Metric

Ref. Drg. STM-112C-65/1

RAPID THREADER: METRIC

Order No.		Description
20197-0		Locking-lever spring anchor
20199-0	*	Cone-gear bearings (2) 02-890
20202-0		Spring anchor block
20203-0		Cover spacing block
20204-0		Handle-shaft block
20205-0		Knock-off lever bracket
20208-0	*	Driving gear bush 10-009
20209-0	*	Handle-shaft bush 10-007
20211-0		Handle-shaft cam
20214-0		Main casting
20216-0	*	Idler-gear retaining clip 11-731
20219-0		Stop bar spacers
20220-0		Bearing spacer
20221-0		Pinion driving collar
20223-0		Front cover
20224-0		Back cover
20230-0		Setting dial
20233-0		Cover gasket (felt)
20235-0		Gear selector gate
20238-0		Cone gear assembly
20244-0		Driving gear
20245-0		Idler gear
20248-0		Slide gib
20249-0		Knock-off lever knob
20252-0		Gear selector knob
20253-0		Handle knob
20254-0		Disengaging lever
20255-0		Knock-off lever & pin
20256-0		Locking-lever c/w pin
20257-0		Gear selector lever assembly
20259-0		Half-nut lever lock (C-type)
20262-0		Half-nut
20263-0	*	Locking lever nut 22-689
20264-0	*	Gib-screw nuts (3) 22-690
20265-0	*	Knock-off lever nut 22-691
20266-0	*	Locking-lever screw nut 22-690
20268-0	*	Driving gear shaft oiler 23-691
20269-0	*	Slide oiler 23-124
20271-0		Gib-screw extension pin
20272-0		Slide-driving pin
20273-0	*	Attachment locating pin 14-668
20274-0		Bracket locating pins (2)
20275-0		Locking-lever pin
20276-0	*	Pinion driving-collar pin 25-608
20277-0		Spring retaining pins (2)
20278-0	*	Handle-shaft block pin 24-542
20279-0	*	Idler-gear shaft pin 24-046
20280-0	*	Handle-shaft cam pin 24-542
20281-0		Selector pin
20282-0		Gear-selector pin
20283-0		Pinion locating pin
20286-0		Pinion
20288-0		Cone-gear plate
20289-0		Stop bar (26 in.)
20291-0		Stop bar (46 in.)
20294-0		Dial spring retainer
20296-0		Slide flat-cage roller
20298-0	*	Gib-adjusting screws (3) 73-195
20299-0	*	Locking-lever adjusting screw 73-473
20300-0	*	Adjustable-stop locking screw 73-489
20301-0		Gear-selector pin guide screw
20302-0		Knock-off lever pivot screw
20303-0		Disengaging-lever pivot screw
20304-0		Dial-spring retaining screw
20305-0	*	Cover spacing-block screws 46-214
20306-0	*	Steady securing screw 73-194
20307-0	*	Setting-dial & cone gear screw 73-195
20308-0	*	Half-nut securing screws (2) 73-196
20309-0	*	Anchor-block securing screws 73-197
20310-0	*	Selector gate securing screws 73-197
20311-0	*	Pinion retaining screw 73-198
20312-0	*	Bracket securing screw 73-199
20313-0	*	Attachment screw (short) 47-227
20314-0	*	Attachment screw (long) 08-052
20315-0	*	Cover securing screws 73-472
20316-0	*	Stop-bar securing screw 73-520
20317-0	*	Back cover screw 73-472
20318-0		Gear selector-lever securing screw
20325-0		Handle shaft assembly
20326-0		Driving-gear shaft
20327-0		Idler-gear shaft
20329-0		Slide
20331-0		Locking-lever spring
20333-0		Main spring
20334-0		Gear selector-pin spring
20335-0		Setting-dial spring
20338-0		Leadscrew steady
20340-0		Adjustable stop
20342-0		Locking-lever pivot stud
20344-0		Slide-roller track
20346-0		Driving-gear washer
20347-0		Dial assembly retaining washer
20348-0	*	Locking-lever washer 85-691
20349-0	*	Securing screw washer 85-692
20350-0	*	Lever spring-washer 84-714
20351-0		Pinion retaining washer
20352-0	*	Screw spring-washer 84-701



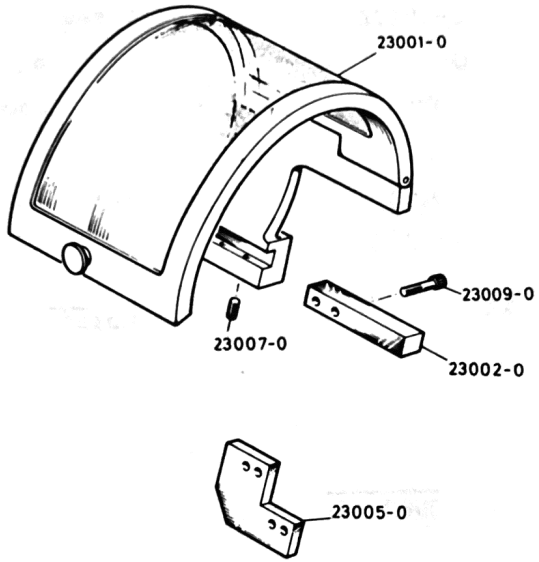
STM - 113 - 6609/1

BED STOP : long type

STM-113-6609/1

BEDSTOP: LONGITUDINAL

Order No.		Description
24688-0		Latch bar
24689-0		Bedstop body
24691-0		Latch bar knob
24692-0		Clamping piece
24693-0		Body top-plate
24696-0		Clamp piece screws (2)
24697-0		Top-plate screws (4)
24698-0		Latch bar stud
24729-0		Stop tube locating-ball
24730-0		Indexing barrel
24731-0		Mounting block
24733-0	*	Allen key 81-159
24734-0	*	Allen key 81-160
24736-0	*	Stop screw locknut 20-621
24737-0		Auxiliary plate
24740-0	*	Mounting block screws (4) 46-216
24741-0	*	Auxiliary plate screws (3) 46-216
24742-0		Spring-tension screw
24743-0	*	Stop securing screws (2) 45-205
24744-0		Stop screws
24746-0		Locating-ball spring
24748-0		Turret stop
24749-0		Stop tube



STM-114-65/1

CHUCK · CHIP GUARD

STM-114-65/1

CHUCK-CHIP GUARD

Order No.		Description
23001-0		Chuck chip guard assembly
23002-0		Guard mounting bar
23005-0		Profiler clearance bracket
23007-0	*	Guard to bed securing screw (2) 59-354
23009-0	*	Mounting bar securing screw (2) 46-217

SPECIFICATION OF STANDARD PARTS

Ref. No.	
01-786	Ball, steel 5/32" dia.
01-787	Ball, steel 3/16" dia.
01-788	Ball, steel 1/4" dia.
01-789	Ball, steel 5/16" dia.
01-790	Ball, steel 3/8" dia.
01-792	Ball, steel 5/8" dia.
01-793	Ball, Ph/b. 1/4" dia.
02-032	Bearing, Hoffman XLS, 2.1/4" dia.
02-061	Bearing, Hoffman XLS, 2" dia.
02-872	Bearing, Hoffman A10, 10 mm x 28 mm.
02-890	Bearing, Hoffman S5-V3-0
02-896	Bearing, FIFNIR DN 110 or FAG 60102Z
03-892	Bearing, roller, 17mm x 40 mm x 13 mm KGS taper KE 30203
03-896	Bearing, roller, 25 mm x 52 mm x 16 mm KGS taper KE 30205
04-884	Bearing, thrust Hoffman W 1.1/8"
04-905	Bearing, thrust Hoffman W.S.P. 5/8"
08-052	Bolt, Hex. head 5/16" UNC x 1.1/4" long
08-112	Bolt, Hex head 5/8" UNC x 1.1/4" long
10-006	Bush, 5/8" O.D. 1/2" I.D. C.T. 51 x 5/8" long
10-007	Bush, 5/8" O.D. 1/2" I.D. C.T. 51 x 7/8" long
10-009	Bush, B.S. 71 x 1.1/2" long
10-011	Bush, 15/16" O.D. 3/4" I.D. C.T. 30 x 1.3/16" long
10-012	Bush, 15/16" O.D. 3/4" I.D. C.T. 30 x 3/4" long
10-013	Bush, 15/16" O.D. 3/4" I.D. C.T. 30 x 1" long
10-909	Bush, 13/16" O.D. 9/16" I.D. F.C.T. 211 x 5/8" long
10-913	Bush, 3/4" O.D. 5/8" I.D. C.T. 174 x 5/8" long
10-914	Bush, 3/4" O.D. 5/8" I.D. C.T. 174 x 3/4" long
10-916	Bush, 7/8" O.D. 5/8" I.D. C.T. 56 x 3/4" long
10-920	Bush, 1" O.D. 3/4" I.D. C.T. 18 x 5/8" long
10-923	Bush, 1" O.D. 3/4" I.D. C.T. 18 x 3/4" long
10-940	Bush, 1.3/8" O.D. 1.1/8" I.D. B.S. 68 x 1.3/4" long
10-957	Bush, 11/16" O.D. 9/16" I.D. C.T. 40 x 7/8" long
10-958	Bush, 11/16" O.D. 9/16" I.D. C.T. 40 x 1.1/4" long
10-964	Bush, 3/4" O.D. 5/8" I.D. F.C.T. 29 x 9/16" long
10-991	Bush, oilite C.T. 40 x 1/2" long
11-731	Circlip, external, 3/8" dia. Anderton type 1500 E.303
11-736	Circlip, external, 1/2" dia. Anderton type 1400
11-737	Circlip, external, 1/2" dia. Anderton type 1500 E.396
11-743	Circlip, external, 5/8" dia. Anderton type 1400
11-745	Circlip, external, 3/4" dia. Anderton type 1400
11-749	Circlip, external, 7/8" dia. Anderton type 1400
11-753	Circlip, external, 1" dia. Anderton type 1400
11-754	Circlip, external, 1.1/8" dia. Anderton type 1400
11-778	Circlip, external, 5/16" dia. Anderton type 1500 E.250
11-845	Circlip, external, 3/16" dia. Anderton type 1500 E.125X
11-859	Circlip, external, 50 mm Anderton type 1400 364
12-766	Circlip, internal, 28 mm (1.102) Anderton type 1300
12-767	Circlip, internal, 40 mm (1.574) Anderton type 1300
12-770	Circlip, internal, 80 mm (3.150) Anderton type 1300
12-773	Circlip, internal, 3.464 dia. Anderton type 1300

Ref. No.	
13-784	Circlip, special,Anderton 1500 E.468 'E' type
13-786	Circlip, special,Anderton type 1200 size 8 int.
13-794	Circlip, special, Salter No. 5101/66 ext.
14-103	Spring dowel, 1/8" dia. x 1/2" long
14-104	Spring dowel, 1/8" dia. x 3/4" long
14-131	Spring dowel, 1/4" dia. x 1" long
14-613	Spring dowel, 3/32" dia. x 1/2" long
14-643	Spring Dowel 5/32" dia. x 1" long
14-644	Spring dowel 5/32" dia.x 1.1/8" long
14-652	Spring dowel, 3/16" dia. x 1" long
14-659	Spring dowel, 7/32" dia. x 1" long
14-644	Spring dowel, 1/4" dia. x 3/4" long
14-668	Spring dowel, 1/4" dia. x 1.1/4" long
14-686	Spring dowel, 5/16" dia x 1.3/4" long
16-842	Handle, black, 3/8" bore x 3" long
17-001	Key, No.3 Woodruff BS 404
17-002	Key, No.9 Woodruff BS 606
17-009	Key, 1/4" x 1/4" x 1.1/4" long, round end BS 46
18-145	Knob, 1.1/4" dia. x 3/4" UNC red
18-830	Knob, 1.1/2" dia. x 7/16" UNC black
18-833	Knob, 1.1/2" dia. x 5/16" UNC red
18-835	Knob, 1.1/4" dia. x 7/16" UNC black
18-836	Knob, 1.1/4" x 3/8" UNC black
18-837	Knob, 1.1/4" x 3/8" UNC cream
18-838	Knob, 1" x 3/8" UNC black
18-840	Knob, 3/4" x 1/4" UNC black
20-612	Nut, 3/8" UNC deep
20-614	Nut, 1/2" UNC deep
20-621	Nut, 5/16" UNC std.
20-622	Nut, 3/8" UNC std.
20-624	Nut, 1/2" UNC std.
20-635	Nut, 1/4" UNC thin
20-636	Nut, 5/16" UNC thin
20-637	Nut, 3/8" UNC thin
20-639	Nut, 1/2" UNC thin
20-652	Nut, 3/8" UNF thin
21-651	Locknut, 7/16" UNF
21-654	Locknut, 5/8" UNF
21-659	Nut, 5/16" UNC std. (Simmonds Aero)
21-660	Nut, 3/8" UNC std. (Simmonds Aero)
21-661	Nut, 7/16" UNC std. (Simmonds Aero)
21-673	Nut, 1/2" UNF thin 'T' (Simmonds type NT/D166)
21-675	Nut, 5/8" UNF thin (Simmonds type NT)
21-685	Nut, 5/8" UNC thin 'T' (Simmonds NT/N206)
21-687	Locknut, 1/2" UNF Philidas c/w cap
22-663	Nut, 1/2" UNC Wedglok
22-689	Nut, 1/4" BSW stiff
22-690	Nut, 2 BA thin
22-691	Nut, 3/8" BSF thin
22-696	Nut, 3/8" UNF Philidas type JUFP/1 c/w plastic cap 495
23-124	Oilcup, 1/4" dia. Springwell
23-826	Nipple, grease, 1/4" BSF
23-827	Oiler, 1/4" dia. Garland diaphram

Ref. No.	
24-043	Mills pin, 1/8" dia. x 3/8" long G.P.3
24-046	Mills pin, 1/8" dia. x 3/4" long G.P.3
24-384	Mills pin, 5/16" dia. x 1.3/8" long G.P.4
24-525	Mills pin, 1/8" dia. x 9/16" long G.P.3
24-533	Mills pin, 5/32" dia. x 3/4" long G.P.3.
24-534	Mills pin, 5/32" dia x 1" long G.P.3
24-535	Mills pin, 5/32" dia x 1.1/4" long G.P.3
24-536	Mills pin, 3/16" dia x 1/2" long G.P.1
24-539	Mills pin, 3/16" dia. x 1/2" long G.P.3
24-541	Mills pin, 3/16" dia. x 5/8" long G.P.3.
24-542	Mills pin, 3/16" dia. x 3/4" long G.P.3
24-543	Mills pin, 3/16" dia. x 7/8" long G.P.3
24-544	Mills pin 3/16" dia. x 1" long G.P.3
24-545	Mills pin, 3/16" dia. x 1.1/4" long G.P.3
24-546	Mills pin 3/16" dia x 1.1/2" long G.P.3
24-563	Mills pin, 1/4" dia x 1.1/4" long G.P.3
24-620	Mills pin, 3/16" dia. x 15/16" long G.P.1
25-608	Taper pin, 5/32" x 1.1/2" long
25-629	Dowel pin 3/16" dia. x 5/8" long BS 1804 Grade 11
26-848	Oil ring, 11/16" dia. x .103 thick Pioneer PO/08706810
26-851	Oil ring, 1" dia. x .139 thick Pioneer PO/12510013
26-852	Oil ring, 1.1/2" dia. x .139 thick Pioneer PO/17515013
27-060	Oil ring, 1/2" I.D. B4/1115
27-148	Oil ring, Dowty list 5 MK 26 pp 49
27-192	Oil ring, Dowty MK 7 list 1 pp 49c
27-846	Oil ring, 5/8" O.D. x 424 I.D. x .070 thick Pioneer PO/06204310
27-855	Oil ring, Pioneer PO/23720021
27-858	Oil ring, POS/2506/MP/658
28-905	Rivet, 1/8" dia. x 7/16" long copper countersunk head
29-011	Union nut, Benton & Stone 'ENOTS' B-1731-D
29-024	Tubing sleeve, Benton & Stene 'ENOTS' Z-403
45-201	Cap screw, 10 x 24 T.P.I. x 3/8" long
45-202	Cap screw, 10 x 24 T.P.I. x 1/2" long
45-203	Cap screw, 10 x 24 T.P.I. x 5/8" long
45-204	Cap screw, 10 x 24 T.P.I. x 3/4" long
45-205	Cap screw, 10 x 24 T.P.I. x 7/8" long
45-206	Cap screw, 10 x 24 T.P.I. x 1" long
45-207	Cap screw, 10 x 24 T.P.I. x 1.1/4" long
45-208	Cap screw, 10 x 24 T.P.I. x 1.1/2" long
46-211	Cap screw, 1/4" UNC x 3/8" long
46-212	Cap screw, 1/4" UNC x 1/2" long
46-213	Cap screw, 1/4" UNC x 5/8" long
46-214	Cap screw, 1/4" UNC x 3/4" long
46-215	Cap screw, 1/4" UNC x 7/8" long
46-216	Cap screw, 1/4" UNC x 1" long
46-217	Cap screw, 1/4" UNC x 1.1/4" long
46-218	Cap screw, 1/4" UNC x 1.1/2" long
46-219	Cap screw, 1/4" UNC x 1.3/4" long
47-223	Cap screw, 5/16" UNC x 1/2" long
47-225	Cap screw, 5/16" UNC x 3/4" long
47-226	Cap screw, 5/16" UNC x 7/8" long
47-227	Cap screw, 5/16" UNC x 1" long
47-228	Cap screw, 5/16" UNC x 1.1/4" long
47-229	Cap screw, 5/16" UNC x 1.1/2" long

Ref No.	
48-237	Cap screw, 3/8" UNC x 5/8" long
48-240	Cap screw, 3/8" UNC x 1" long
48-242	Cap screw, 3/8" UNC x 1.1/2" long
48-246	Cap screw, 3/8" UNC x 2.1/2" long
48-249	Cap screw, 3/8" UNC x 4" long
49-253	Cap screw, 7/16" UNC x 2" long
50-260	Cap screw, 1/2" UNC x 1.1/2" long
53-300	Countersunk screw, 10 x 24 T.P.I. x 1/4" long
53-303	Countersunk screw, 10 x 24 T.P.I. x 1/2"
53-305	Countersunk screw, 10 x 24 T.P.I. x 3/4" long
55-318	Countersunk screw, 5/16" UNC x 3/4" long
55-319	Countersunk screw, 5/16" UNC x 1" long
58-342	Cup point screw, 10 x 24 T.P.I. x 3/16" long
58-343	Cup Point screw, 10 x 24 T.P.I. x 1/4" long
58-345	Cup point screw, 10 x 24 T.P.I. x 3/8" long
58-347	Cup point screw, 10 x 24 T.P.I. x 1/2" long
59-350	Cup point screw, 1/4" UNC x 1/4" long
59-351	Cup point screw, 1/4" UNC x 5/16" long
59-352	Cup point screw, 1/4" UNC x 3/8" long
59-354	Cup point screw, 1/4" UNC x 1/2" long
59-355	Cup point screw, 1/4" UNC x 5/8" long
60-361	Cup point screw 5/16" UNC x 5/16" long
60-362	Cup point screw, 5/16" UNC x 3/8" long
60-363	Cup point screw, 5/16" UNC x 7/16" long
60-364	Cup point screw, 5/16" UNC x 1/2" long
60-365	Cup point screw, 5/16" UNC x 5/8" long
60-366	Cup point screw, 5/16" UNC x 3/4" long
61-376	Cup point screw, 3/8" UNC x 1.1/2" long
63-385	Cup point screw, 1/2" UNC x 5/8" long
64-391	Cup point screw, 5/8" UNC x 5/8" long
67-419	1/2 Dog screw, 1/4" UNC x 3/8" long
68-428	1/2 Dog screw, 5/16" UNC x 5/16" long
68-430	1/2 Dog screw, 5/16" UNC x 7/16" long
72-495	Cap screw, 3 BA x 3/4" long
73-194	Set screw, 5/16" BSW x 1.1/4" long hex head
73-195	Set screw, 2 BA x 1/2" long, Hollow socket
73-196	1/4" BSW x 5/8" long S.H.C.S.
73-197	1/4" BSW x 7/8" long S.H.C.S.
73-198	Set screw, 2BA x 1/2" long hex head
73-199	1/4" BSW x 1/2" long S.H.C.S.
73-472	Cheese head screw, 2 BA x 1/4" long
73-473	Socket set screw, 2 BA x 1" long oval point
73-489	1/4" BSF x 3/8" long S.H.C.S.
73-520	Flat head screw, 1/4" UNC x 1" long
73-531	Socket set screw, 1/4" UNC x 1/2" long full dog Wedglok
73-534	Countersunk head screw, 5/16" UNF x 3/4" long socket
73-545	Cap screw, 8 x 32 x 3/4" long socket head.
79-062	Oilseal, Weston W.16211237.R.
79-181	Oilseal, Weston W.B. 16911037.R.21
79-865	Oilseal, 11/16" I.D. x 1.5/8" O.D. 5/16" wide W.16210641 R4

Ref. No.	
80-871	Oilsight, 1.1/4" O.D. Tecalemit IC.4610
80-873	Oilsight, 1.1/2" Tecalemit IC 4612
81-159	Key, 3/16" A/F Allen Hexagon
81-160	Key, 5/32" A/F Allen Hexagon
82-063	Spring, Flexo. 163208
82-078	Spring, 707-0028 0.237 dia. x 1.1/8" free length
82-105	Spring, Flexo 82504 1/4" dia. x 5/32" x 1/2" F.L. 6.1/2" coils
82-132	Spring, 707-0034 1.1/64" dia. x 1" free length
82-795	Spring, 707-0021, 1/4" dia. O.D. x 1/2" free length
82-797	Spring, 1/4" O.D. x 5/8" free length
82-803	Spring, Flexo 103210
82-807	Spring, Flexo 223412
82-812	Spring, 707-0014 .180 dia. x 21/32" free length
82-813	Spring, Flexo 143008
82-815	Spring. 707-0015 5/16" dia x 1.7/8" O.A.
82-817	Spring, 707-0016 1/2" dia. x 2.3/16" free length
82-823	Spring, Flexo 62704
82-830	Spring, Flexo 123306
82-838	Spring, Flexo 112807
82-839	Spring, Flexo 112908
82-840	Spring, Flexo 62703
82-846	Spring, Flexo 93114
84-701	Washer, 3/16" dia. bore single coil locking
84-704	Washer, 3/8" dia. bore single coil locking
84-706	Washer, 1/2" dia. bore single coil locking
84-714	Washer, 3/8" dia. bore double coil locking
84-716	Washer, 1/2" dia. bore double coil locking
84-718	Washer, 5/8" dia. bore double coil locking
84-725	Washer, Schnorr disc spring Type K.6201
85-691	Washer, 1/4" dia. bore standard
85-692	Washer, 5/16" dia. bore standard
85-693	Washer, 3/8" dia. bore standard
85-694	Washer, 7/16" dia. bore standard
85-695	Washer, 1/2" dia. bore x 1" O.D. x .092"W. standard
85-696	Washer, 1/2" dia. bore x 1" O.D. x .062"W. standard
85-698	Washer, 5/8" dia. bore standard
85-699	Washer, 3/4" dia. bore standard
85-720	Washer, 2 BA standard plain
85-742	Washer, 5/8" I.D. x 1.3/8" O.D. 15 SWG BS 3410 table 4 std.
86-029	Washer, 3/4" internal fan disc.
86-030	Washer, 7/8" internal fan disc
86-118	Washer, 1.1/4" O.D. x 7/8" I.D. x 1/8" SKT leather
86-119	Washer, 1/2" I.D. fan disc.
86-735	Washer, Beryllium copper washer ref. LSE 8596
86-738	Washer, 1/4" shakeproof
86-740	Washer, Dobo No.105
88-070	Drain plug 3/4" BSP Tecalemit 4377/6