

Apsley Grammar School

FC 2 66664

Block No 59793

Model NO. N 52LO

Gear driving shaft { 53561 }  
gear { 14/42 }

# COLCHESTER STUDENT

Machine Serial No FC 2 66664



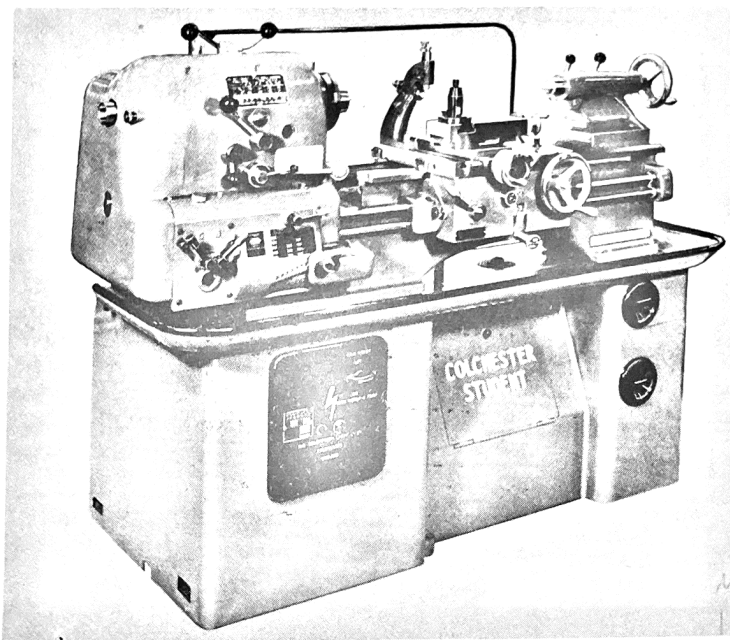
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## INSTRUCTION AND SPARE PARTS MANUAL

THE COLCHESTER LATHE COMPANY LTD., COLCHESTER, ENGLAND

# **COLCHESTER** HIGH SPEED SAFETY LATHES

## **6" x 24" STUDENT** **&** **12" x 24" DOMINION**



This Instruction and Spare Parts manual applies to the Colchester 6" Student Safety Lathe and 12" swing Dominion Safti-Lathe. A thorough understanding of its contents will help the user to obtain the best results from his machine.

Our Technical Sales Department is at your disposal and will always be pleased to discuss problems concerning the application of Colchester Lathes and their attachments. Our aim is to ensure that the user obtains the maximum satisfaction from his Colchester Lathe.

The construction number of all Student machines is stamped at the tailstock end of the bed between the vees. All communications regarding a machine must quote the machine construction number. This point is important because due to our policy of continuous improvement designs may be changed so that our machines will better meet the users requirements and therefore this manual should be considered as applying to the particular machine with which it is issued.

ONE COPY OF THIS MANUAL IS SUPPLIED FREE WITH EACH MACHINE. FURTHER COPIES MAY BE OBTAINED AT A COST OF 5/- EACH.

## BRIEF SPECIFICATION OF THE MACHINE

This specification applies to all four standard models of Colchester "Student" lathe, as follows:

- COLT** —gap bed machine with quick change gearbox.  
**CUB** —gap bed machine without quick change gearbox.  
**DIME** —straight bed machine with quick change gearbox.  
**PENNY**—straight bed machine without quick change gearbox.

	English	Metric
Height of centres ... ..	6"	152 mm.
Turning diameter		
Over bed ... ..	12"	305 mm.
Over carriage ... ..	9"	229 mm.
Over cross slide... ..	8"	203 mm.
Distance between centres ... ..	24"	610 mm.
Diameter of faceplate ... ..	12"	305 mm.
Gap bed models		
Turning diameter in gap ... ..	18"	457 mm.
Width in front of faceplate ... ..	4 $\frac{3}{8}$ "	111 mm.
Width of bed ... ..	8 $\frac{3}{8}$ "	213 mm.
Spindle bore (max. bar diameter) ... ..	1 $\frac{1}{2}$ "	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		
No. of sliding feeds ... ..	45	45
Range of sliding feeds per rev. of spindle ... ..	0.0025"-0.068"	0.06 mm.-1.7 mm.
No. of surfacing feeds ... ..	45	45
Range of surfacing feeds per rev. of spindle... ..	0.0006"-0.017"	0.015 mm.-0.43 mm.
Threads		
No. of Whitworth pitches ... ..	45	
Range of Whitworth pitches ... ..	4-120 t.p.i.	
No. of metric pitches ... ..	12	
Range of metric pitches ... ..	0.25 mm.-6 mm.	
Pitch of leadscrew ... ..	6 t.p.i.	
Total travel of bottom slide ... ..	6 $\frac{3}{4}$ "	171 mm.
Total travel of topslide ... ..	3 $\frac{5}{8}$ "	92 mm.
Height from top of topslide to centre line of spindle ... ..	1 $\frac{7}{8}$ "	48 mm.
Maximum tool shank size (pillar type tool post)	$\frac{9}{16}$ " x $1\frac{1}{8}$ "	
Travel of tailstock barrel (Std. No. 3 M.T. centre fitted) ... ..	5 $\frac{1}{8}$ "	130 mm.
Travel of tailstock barrel (Std. tang drill fitted)... ..	3 $\frac{3}{4}$ "	95 mm.
Taper in tailstock barrel ... ..	No. 3 morse	
Overall length ... ..	61"	1550 mm.
Overall width ... ..	30"	770 mm.
Weight ... ..	1372 lb.	625 kg.
Motor (standard single speed) ... ..	3 h.p. 50 cycles, 1425 r.p.m.	
Motor (2 speed) ... ..	3/1 $\frac{1}{2}$ h.p., 50 cycles, 1440/720 r.p.m.	

### STANDARD EQUIPMENT SUPPLIED WITH THE MACHINE

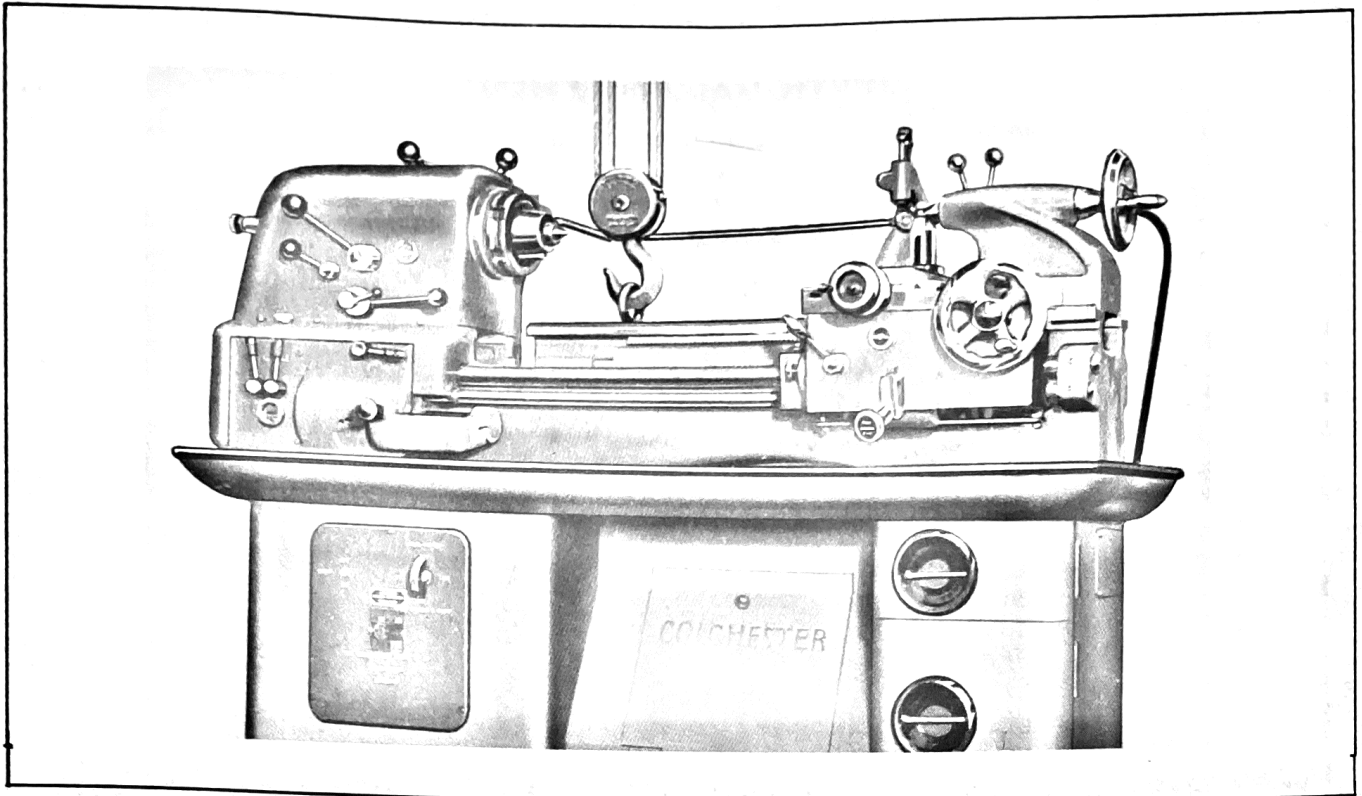
(For details of additional equipment, see pages 24-39)

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

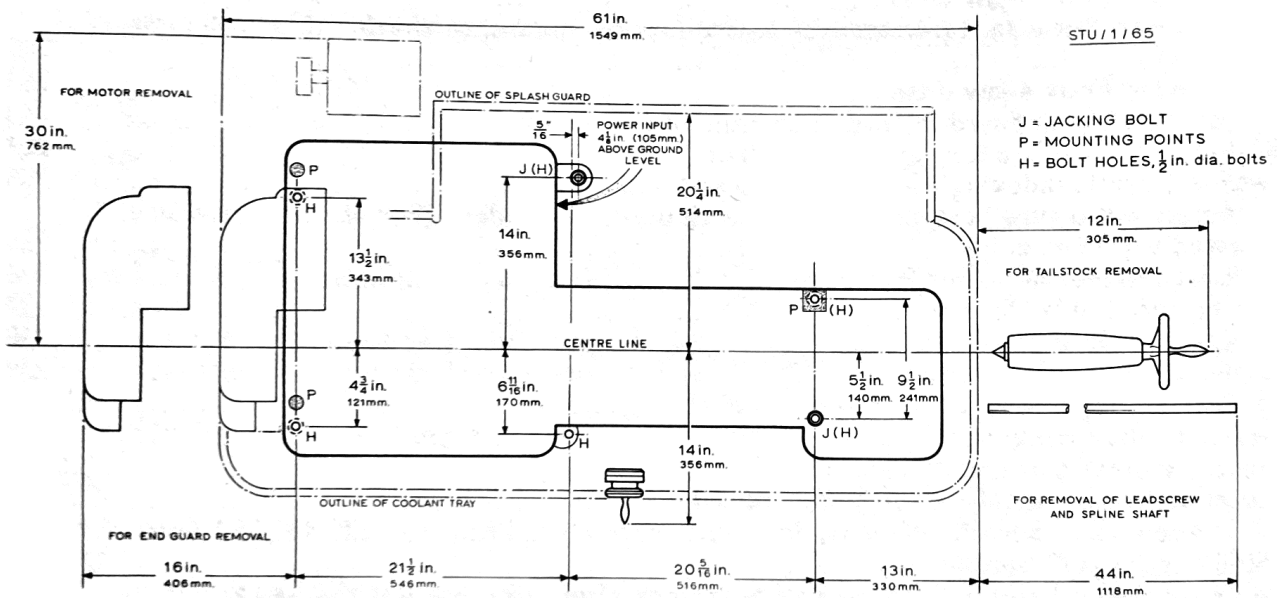
## ADDITIONAL EQUIPMENT

A comprehensive range of additional equipment is available for the Colchester "Student" lathe. All items are designed specifically for the "Student" 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.

	Code
High speed threading attachment ... ..	234
Hydraulic copying attachment, with 60° slide (Specify electrical supply required) ...	228
Hydraulic copying attachment with 90° slide (Specify electrical supply required) ...	233
5-station hand-operated inclined head capstan slide with adjustable stops and maximum working stroke of 4½" ... ..	241
Air-operated swing forward type bar feed for use with above with maximum capacity for bars up to 1½" dia. x 10 ft. long, complete with pressure gauge, reducing valve and warning device... ..	242
Burnerd lever-operated "Multisize" collet chuck model LC.15/LO for direct-on mounting on spindle nose, complete with anchor bracket (for details of collets see Code Nos. 227, 245 and 246) ... ..	243
1½" capacity Burnerd "Multisize" collet chuck KC.15/LO (key operated) ... ..	226
Flexible round bore collets for "Multisize" collet chucks, each having ⅛" capacity in steps from ⅙" to 1½" (12 in full set) ... ..	227
Flexible square pattern collets for "Multisize" collet chucks, each having ⅛" capacity in steps from ⅛" to 1" A/F. (7 in full set) ... ..	245
Hexagon pattern collets for "Multisize" collet chucks, each having ⅛" capacity in steps from ⅛" to 1¼" A/F. (9 in full set) ... ..	246
7½" diameter Burnerd 3-jaw geared scroll direct-on mounting chuck. (No backplate required) ... ..	201
7½" diameter Pratt 3-jaw ditto ... ..	257
10" diameter Burnerd 4-jaw independent direct-on mounting chuck. (No backplate required) ... ..	202
10" diameter Pratt 4-jaw ditto ... ..	258
Perspex chuck/chip guard for fitting to lathe bed or saddle ... ..	244
18" diameter faceplate for gap bed machines ... ..	203
4-way automatic indexing turret with top and middle slides ... ..	205
Colchester multi-type toolpost complete with universal holder. (For use with standard slotted toplides only) ... ..	235
Additional universal holder for above ... ..	236
Turning-tool holder for above ... ..	237
Boring-bar holder for above ... ..	238
Parting-off tool holder for above ... ..	239
No. 2 Morse taper sleeve for above ... ..	240
Electric coolant pump and fittings ... ..	208
Telescopic taper turning attachment ... ..	209
3-point stationary steady, 4" diameter capacity ... ..	210
Terry Anglepoise 50-volt, 48-watt, low volt machine lighting for 220/440/550 volts, 50/60 cycles A.C. supply only ... ..	211
Matrix mechanical clutch for fitting to headstock after lathe has left the works ...	213
3 M.T. Gamet super-precision rotating centre ... ..	215
Machined backplates for fitting to customers own chucks ... ..	218
Heavy duty plastic cover to protect the machine to tray level ... ..	219
Additional change wheels for special thread pitches (To be specified when ordering) ...	220
Rear toolpost ... ..	230
5-position turret type bed stop ... ..	231
Single type bed stop ... ..	232



**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 1,400 lb. and proper equipment for handling this weight should be available. Every bed is drilled and tapped  $\frac{7}{8}$ " Whitworth between the bedways at the point of balance when both the tailstock and saddle are at the tail end of the bed. It is recommended that a suitable eyebolt is obtained for this tapped hole 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 head end and 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.**

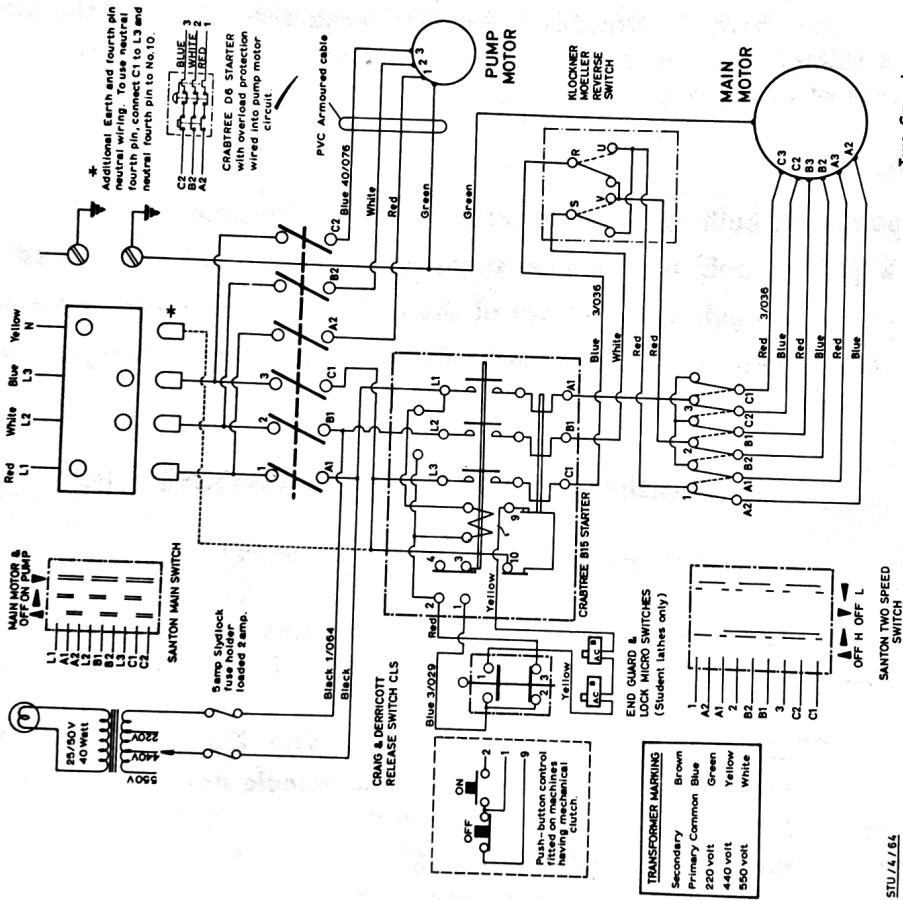
### CLEANING

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.**

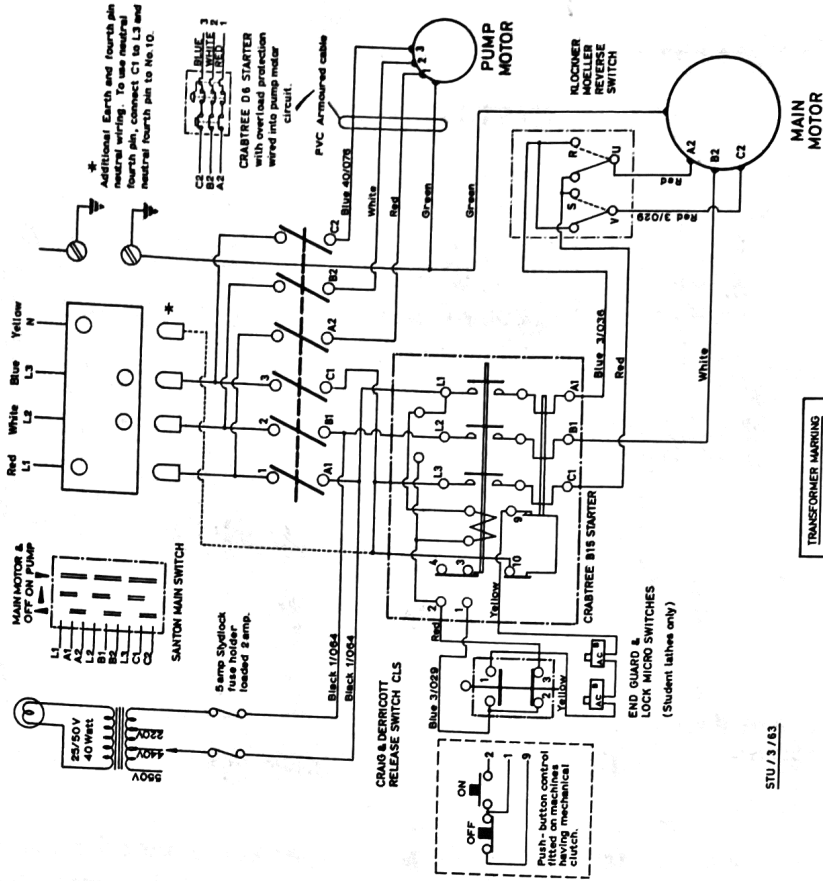
Particular attention should be paid to the slides and spindle nose, and it is essential that the end guard is removed and the end gear train carefully cleaned. All traces of the cleaning agent should then be removed and the bright surfaces given a light coating of Shell Tellus 33 oil.

**WIRING two-speed**



STU/4/761

**WIRING single-speed**



STU/3/763

## **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.

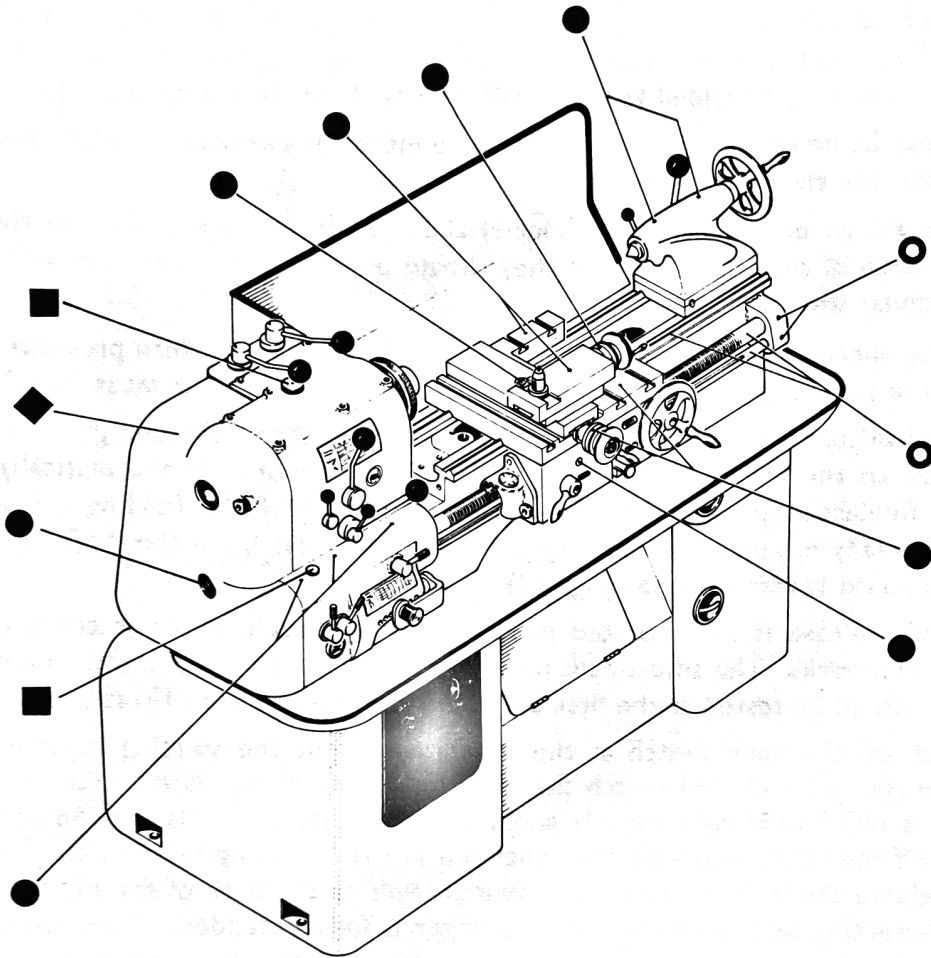
1. In the right-hand side of the cabinet base is a lockable drawer which prevents unauthorised use of the machine. In order to start the machine, this drawer must be UNLOCKED.
2. A special safety switch is built into the end guard, so that if the end guard is removed for attention to the change gears 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.

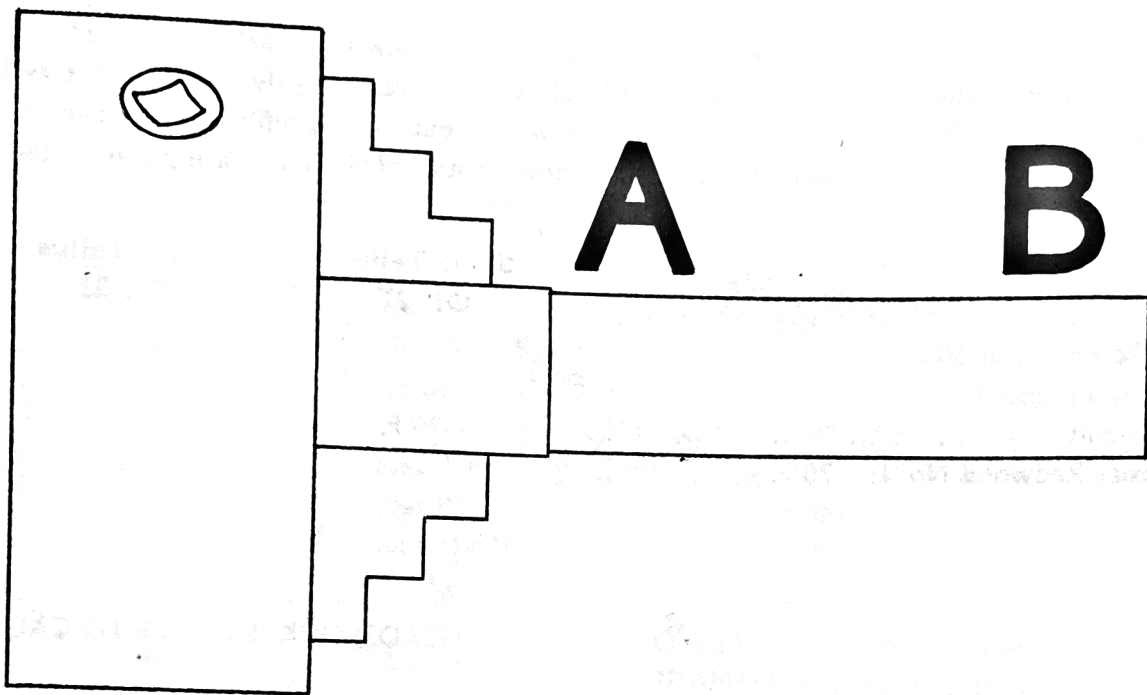
After the machine has been in operation for 150 to 200 hours both the headstock and gearbox should be drained, flushed with clean flushing oil and then refilled with the appropriate grade of oil to the correct level.

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.

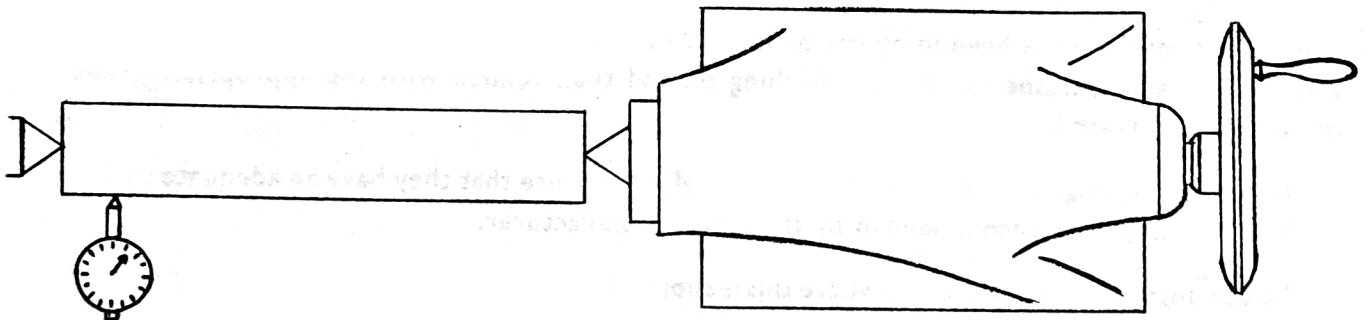
The bearings of the pump motor (where this is supplied) should be lubricated with Shell Alvania 3 grease or a water repellent grease.



**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.

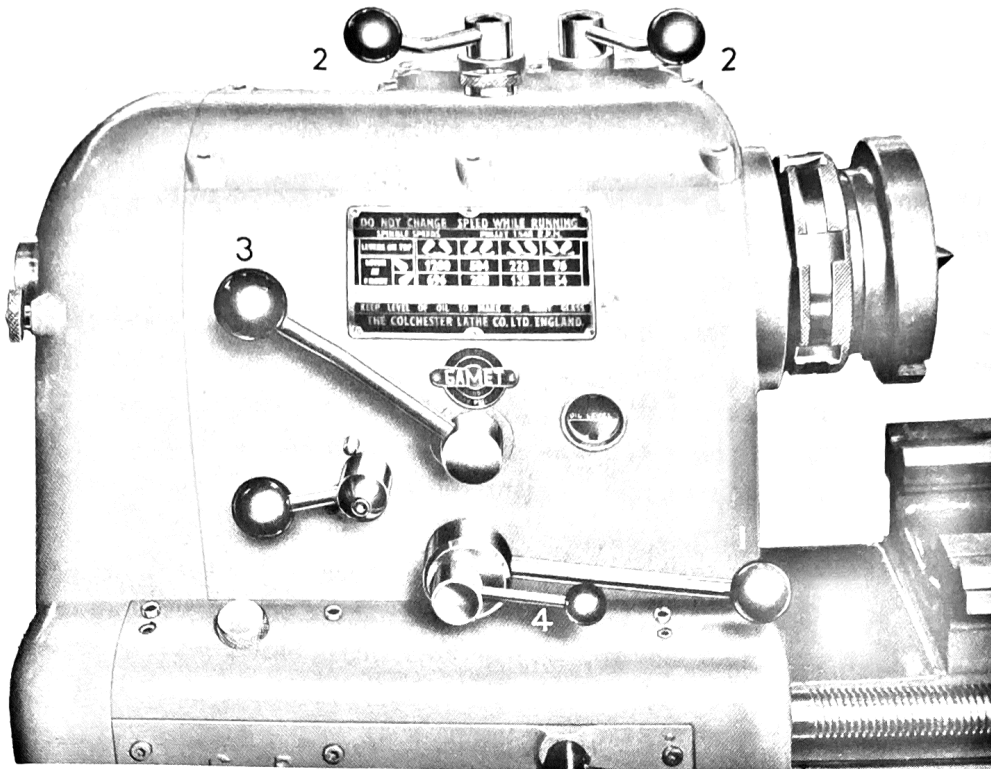
### **Headstock alignment**

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**

DO NOT CHANGE SPEED WHILE RUNNING					
SPINDLE SPEEDS		PULLEY 1548 R.P.M.			
LEVERS ON TOP					
LEVER AT FRONT		1200	504	228	96
		696	288	138	54
USE SHELL TELLUS OIL 27					
OBTAINABLE FROM SHELL OIL COMPANIES THROUGHOUT THE WORLD					
KEEP LEVEL OF OIL TO MARK ON SIGHT GLASS					
THE COLCHESTER LATHE CO. LTD. ENGLAND.					

**Spindle speeds using single speed motor**

DO NOT CHANGE SPEED WHILE RUNNING					
SPINDLE SPEEDS		PULLEY 1936 & 968 R.P.M.			
LEVERS ON TOP					
LEVER AT FRONT		1500	630	282	120
		860	360	160	68
FRONT		750	315	141	60
		430	180	80	34
USE SHELL TELLUS OIL 27					
OBTAINABLE FROM SHELL OIL COMPANIES THROUGHOUT THE WORLD					
KEEP LEVEL OF OIL TO MARK ON SIGHT GLASS					
THE COLCHESTER LATHE CO. LTD. ENGLAND					

**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 accidentally. 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).

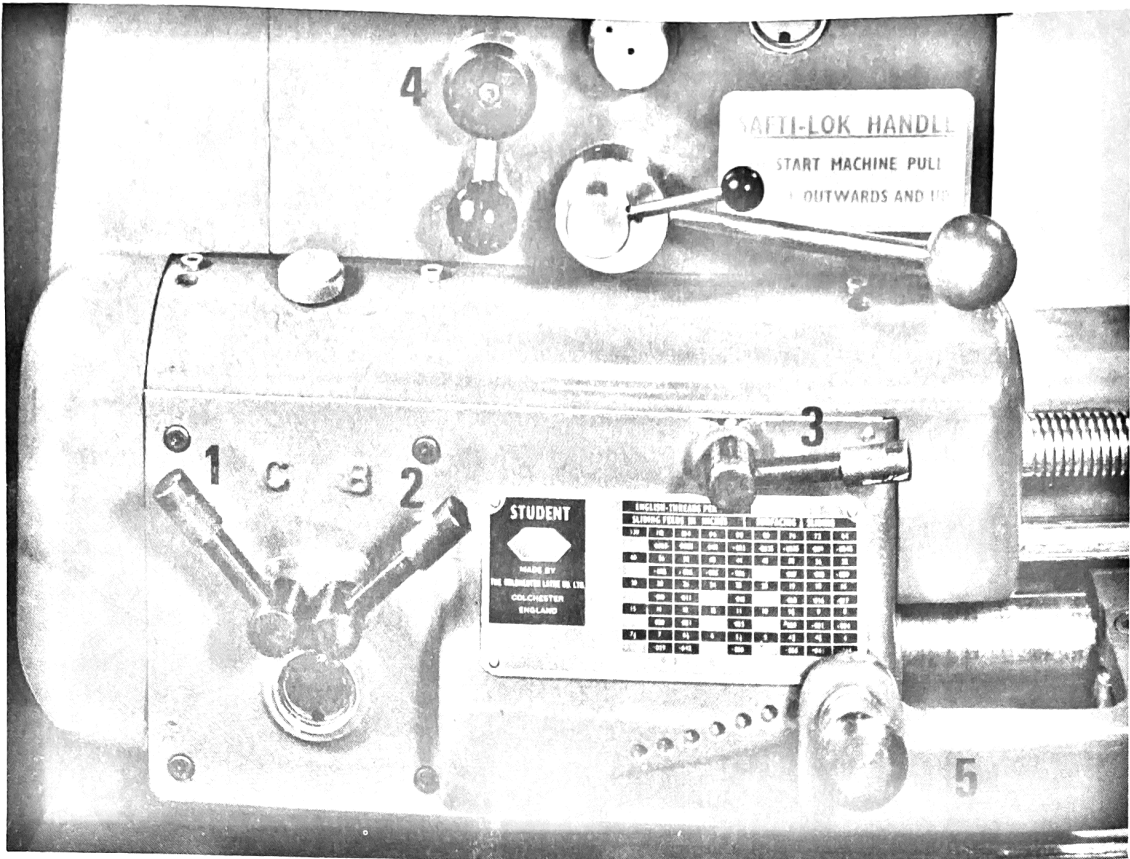
If specially ordered, a Matrix multi-plate machine tool clutch may be incorporated in the drive, in which case the starting lever controls the engagement of this clutch, the motor being left running all the time the main switch is on. (This clutch is supplied as standard on machines constructed for operation 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.**

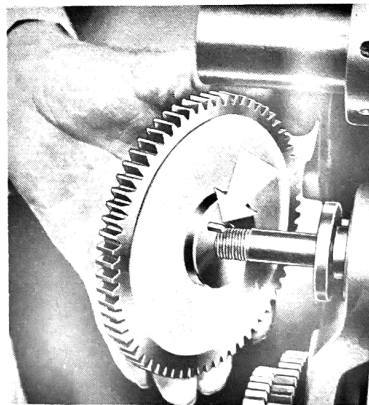


**Gearbox control levers**

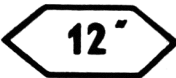
STUDENT  MADE BY THE COLCHESTER LATHE CO. LTD. COLCHESTER ENGLAND		LEVERS		ENGLISH-THREADS PER INCH					METRIC-PITCH IN M/M			
				SLIDING FEEDS IN INCHES - SURFACING $\frac{1}{2}$ SLIDING								
				D	B	120	112	104	96	88	80	76
C	B	.25 M/M	.0025	.0025	.003	.003	.0035	.0035	.004	.0045		
		60	56	52	48	44	40	38	36	32		
		5 M/M	.005	.005	.006	.006	.007	.007	.008	.009		
D	A	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		
C	A	15	14	13	12	11	10	9 $\frac{1}{2}$	9	8		
		2 M/M	.020	.021	2.5 M/M	.025	3 M/M	.029	.031	.034		
		7 $\frac{1}{2}$	7	6 $\frac{1}{2}$	6	5 $\frac{1}{2}$	5	4 $\frac{1}{2}$	4 $\frac{1}{2}$	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 COMPANIES THROUGHOUT THE WORLD

**Feeds & threads available from standard gearbox**



**Shear pin safety device**

DOMINION  MADE BY THE COLCHESTER LATHE CO. LTD. COLCHESTER ENGLAND		LEVERS		THREADS PER INCH							
				SLIDING FEEDS IN INCHES - SURFACING $\frac{1}{2}$ SLIDING							
				D	B	112	104	96	92	88	80
C	B	.0025	.0025	.003	.003	.003	.0035	.0035	.004	.0045	
		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	.012	.013	.014	.015	.016	.017	
C	A	14	13	12	11 $\frac{1}{2}$	11	10	9 $\frac{1}{2}$	9	8	
		.020	.021	.023	.024	.025	.027	.029	.031	.034	
		7	6 $\frac{1}{2}$	6	5 $\frac{1}{2}$	5 $\frac{1}{2}$	5	4 $\frac{1}{2}$	4 $\frac{1}{2}$	4	
		.039	.042	.046	.048	.050	.055	.058	.061	.068	

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

**Feeds & threads available from Dominion gearbox**

## 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  $11\frac{1}{2}$  and 23 t.p.i.). The full range of feeds and threads for both gearboxes is shown opposite.

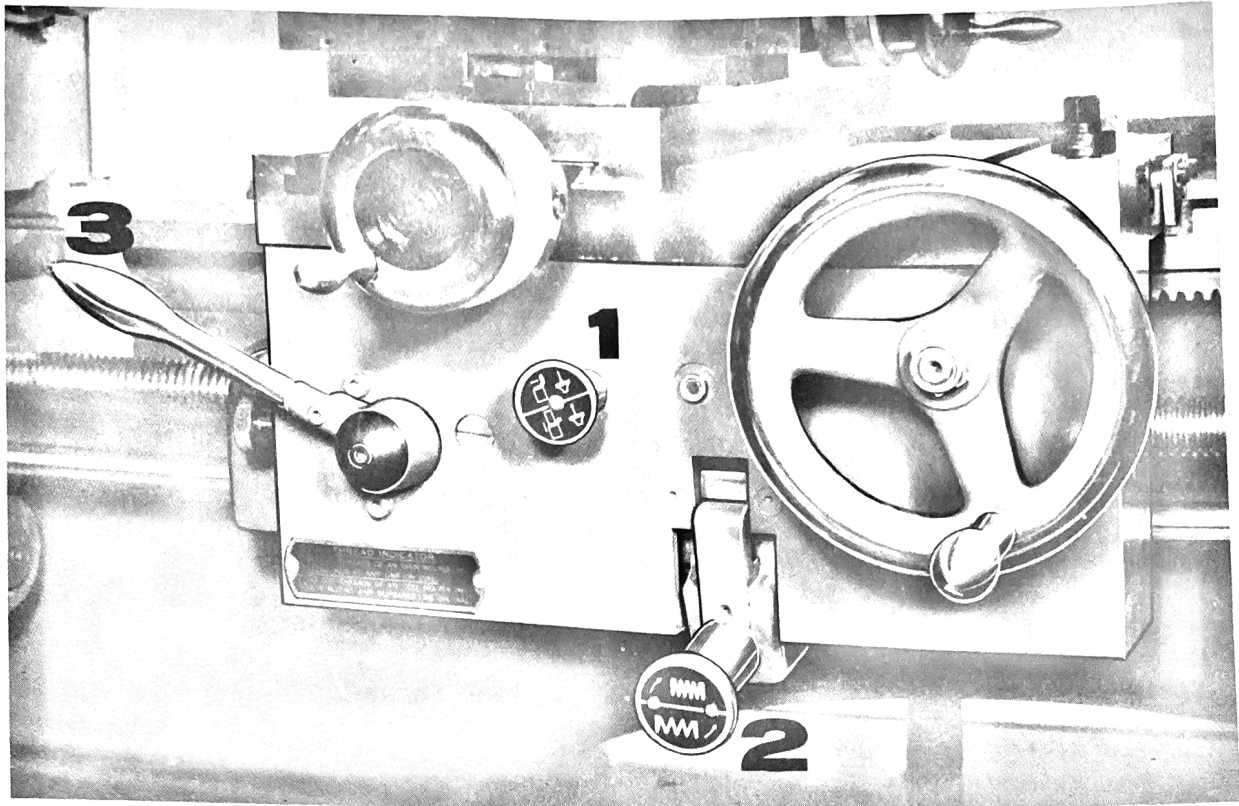
Control of the gearbox is by four levers (1-4) and a tumbler shaft (5) as illustrated. The tumbler shaft is provided with a spring-loaded plunger which engages in holes in the front of the gearbox cover, to provide positive positioning and locking. There are two selection levers (1) and (2) at the left-hand 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**

### **I. 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								DOMINION GEARBOX							
○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
30	28	26	24	22	20	19	18	28	26	24	23	22	20	19	18

#### 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.

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

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:—

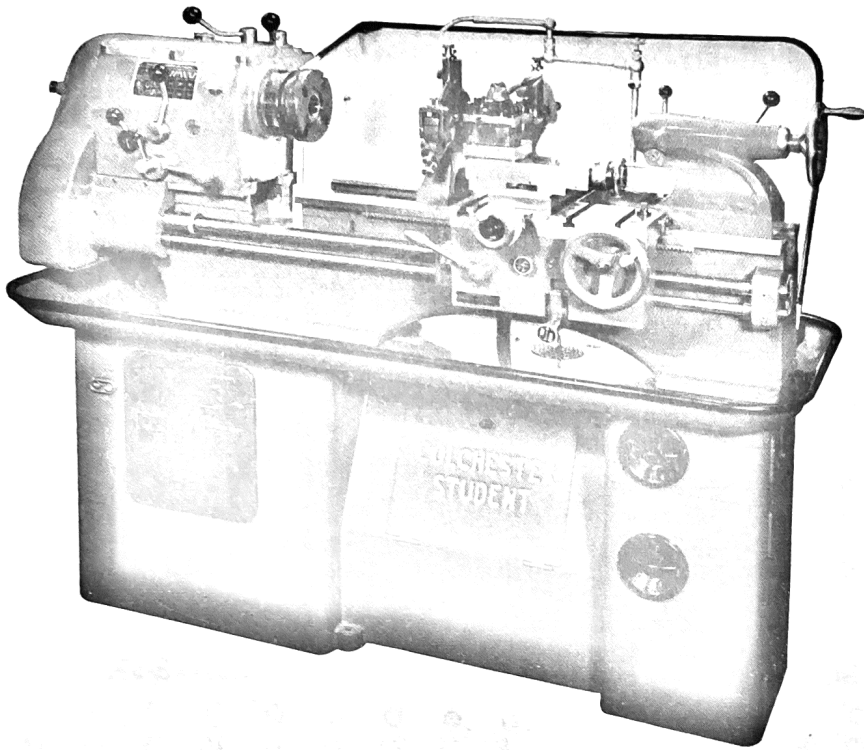
$$\text{t.p.i.} = \frac{25.4}{\text{pitch in m.m.}}$$

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.

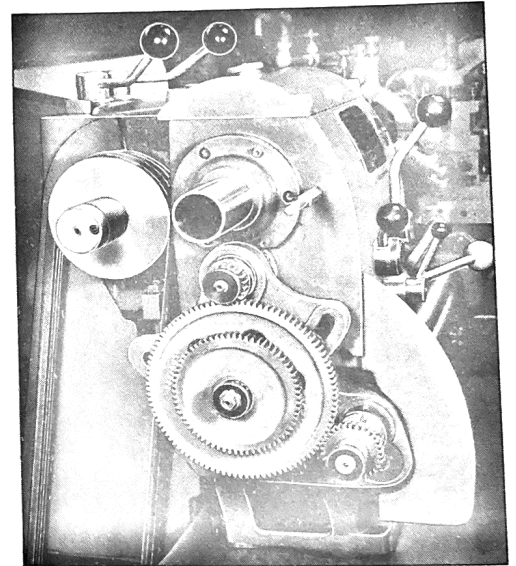
### 3. Multi-start threads

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.



**Non-gearbox type 'Student' lathe**



**The end gear train of the non-gearbox machine**

## THE STUDENT 6 INCH LATHE

### THREADS PER INCH

THREADS	4	4.5	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	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
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	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:—

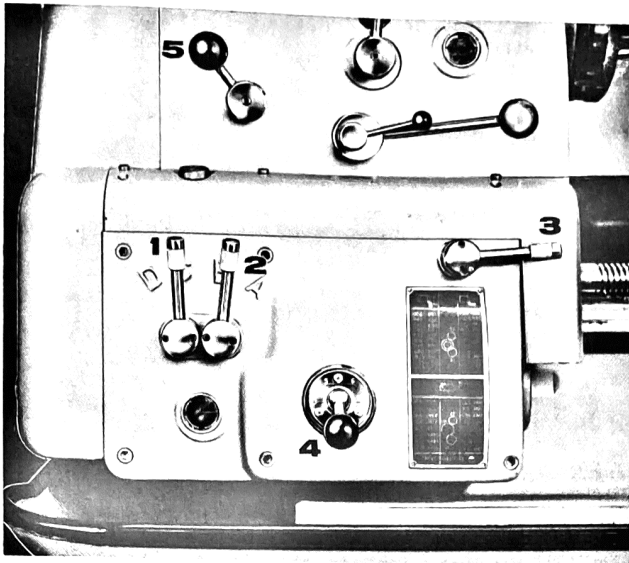
$$\frac{6 \text{ Driver}}{26 \text{ Driven}}$$

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:—

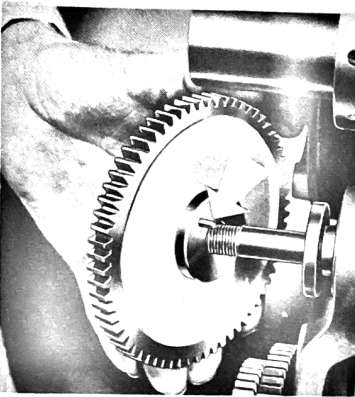
$$\frac{6 \times 5}{26 \times 5} = \frac{30 \text{ Driver}}{130 \text{ Driven}}$$

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

$$\frac{30}{130} = \frac{30 \times 50}{65 \times 100} = \frac{\text{Drivers}}{\text{Driven}}$$



**Gearbox control levers**



**Shear pin**

mm		mm	
0.04	DB1	0.02	DB2
0.05	DB3	0.025	DB4
0.06	DB5	0.03	DB6
0.07	CB1	0.04	CB2
0.10	CB3	0.05	CB4
0.12	CB5	0.06	CB6
0.15	DA1	0.08	DA2
0.20	DA3	0.10	DA4
0.25	DA5	0.13	DA6
0.35	CA2	0.17	CA2
0.45	CA4	0.21	CA4
0.53	CA6	0.25	CA6

20  
90  
60

mm		mm	
0.3	DB6E	1.25	DA4F
0.4	CB2E	1.5	DA6F
0.5	CB4E	1.75	CA1F
0.6	CB6E	2.0	CA2F
0.7	DA1E	2.25	CA3F
0.8	DA2E	2.5	CA4F
0.9	DA3E	2.75	CA5F
1.0	DA4E	3.0	CA6F

22  
7mm

SHELL TELLUS 33

**METRIC FEEDS & THREADS**

**ENGLISH**

lin	127 (X)			lin	127 (X)		
	120 (Y)	X			Y	X	
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

mm				
<p>20 90 60</p>	0.3	DB6E	1.0	DA4E
	0.35	CB1E	1.1	DA5E
	0.4	CB2E	1.2	DA6E
	0.45	CB3E	1.25	DA4F
	0.5	CB4E	1.4	CA1E
	0.6	CB6E	1.5	DA6F
	0.7	DA1E	1.75	CA1F
	0.75	CB6F	2.0	CA2F
	0.8	DA2E	2.5	CA4F
0.9	DA3E	3.0	CA6F	
<p>24 120</p>	3.5	DA1F	7.0	CA1F
	4.0	DA2F	8.0	CA2F
	4.5	DA3F	9.0	CA3F
	5.0	DA4F	10.0	CA4F
	5.5	DA5F	12.0	CA6F
	6.0	DA6F		

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

### I. 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:  $1.4 \text{ Module} = \frac{14}{10}$  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:

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

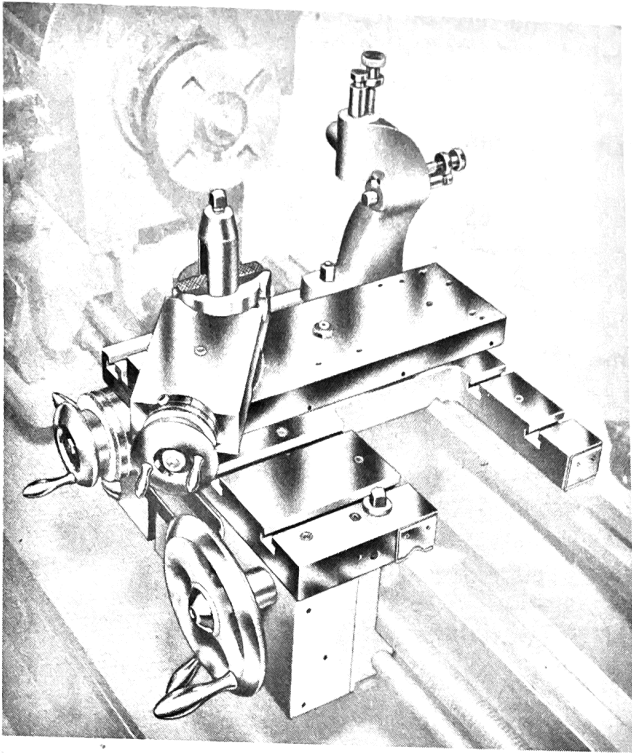
**Example:**

It is required to cut 15 threads per inch

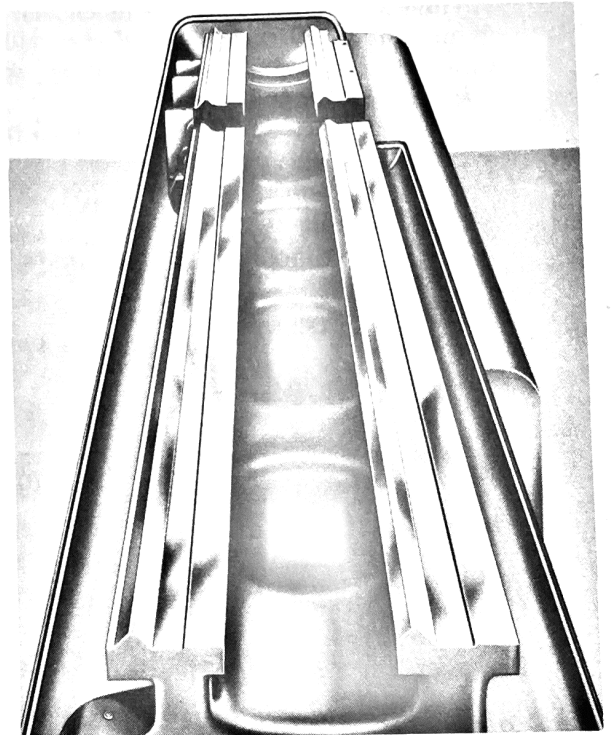
$$\frac{\text{DRIVER}}{\text{DRIVEN}} \times \frac{127}{120} = \frac{960}{VZT} \times \frac{172}{120} = \frac{960}{8 \times 10 \times 15} \times \frac{127}{120} = \frac{24}{30} \times \frac{127}{120}$$

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

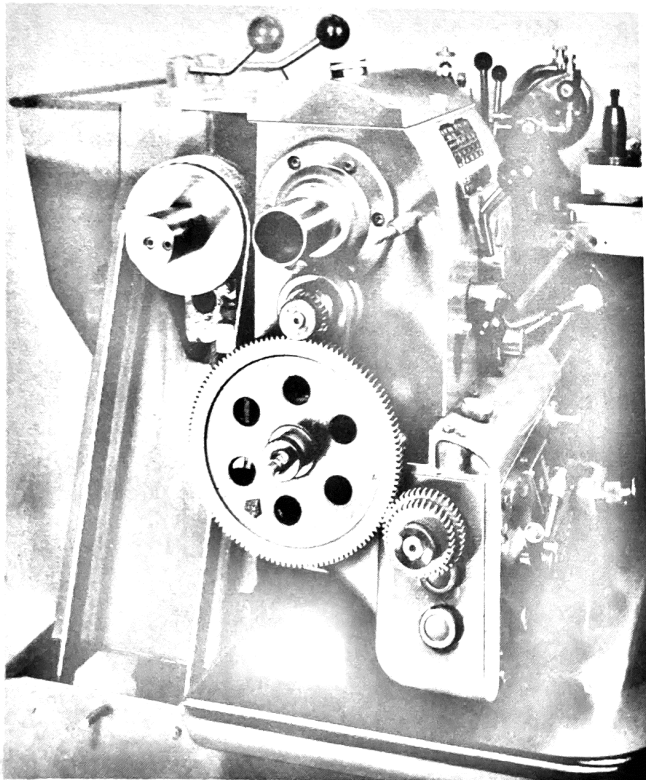




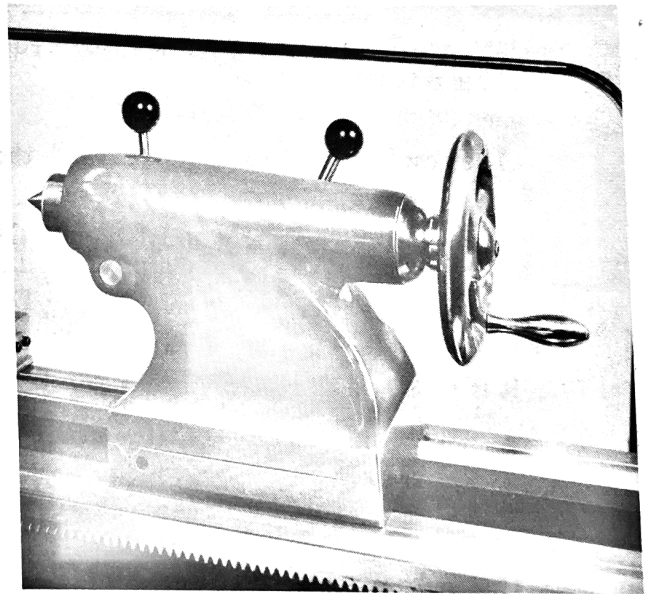
**The saddle and slides**



**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 cross slide is radially graduated  $90^{\circ}$ - $0^{\circ}$ - $90^{\circ}$  each side for accurate setting of the compound slide. Large diameter micrometer dials are graduated in 0.001" on both slides, or, in the case of metric machines, in 0.01 mm. on cross slide and 0.02 mm. on top slide.

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.

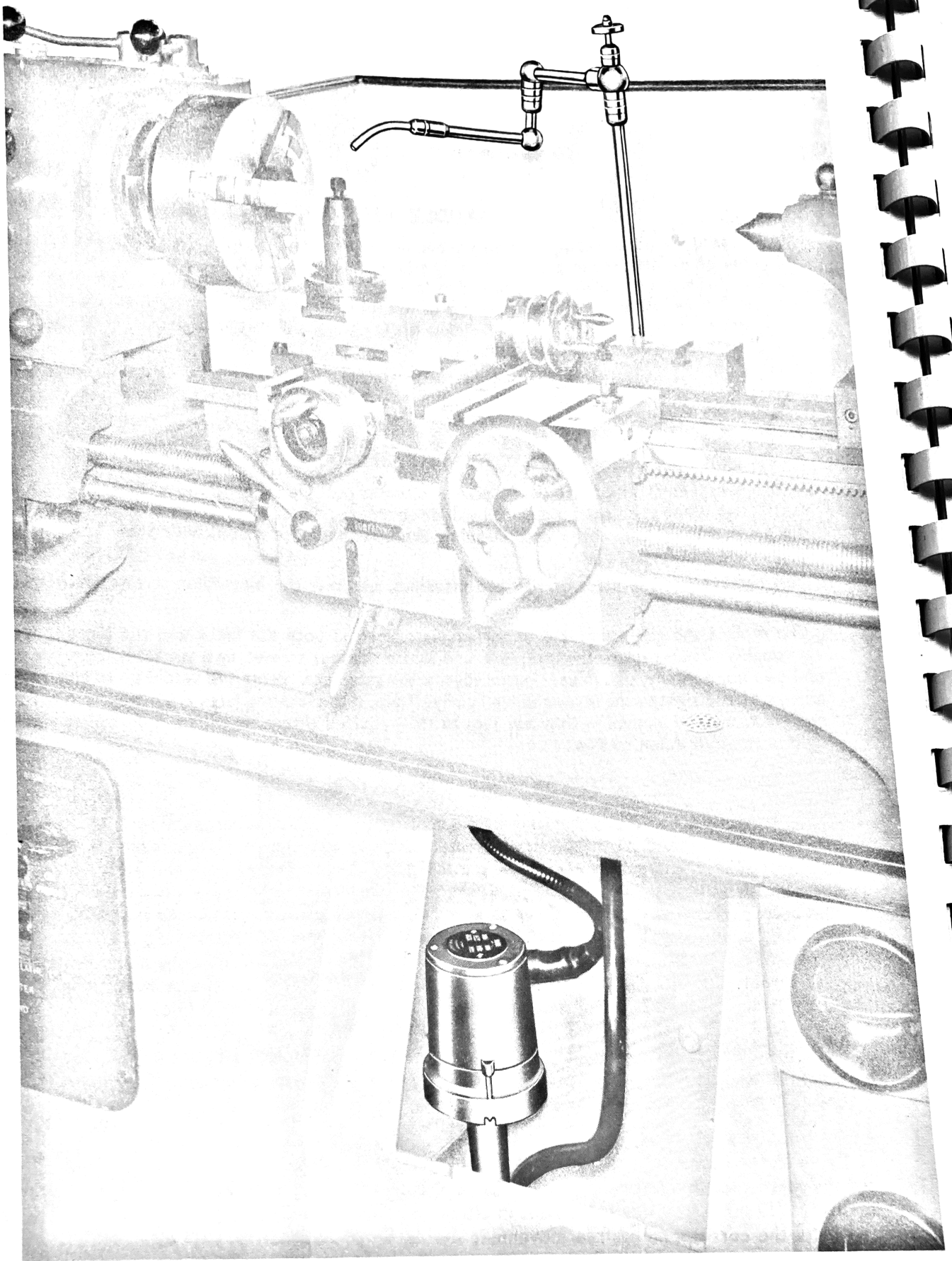
To replace the gap piece, it is important first to clean both the block and the locating faces thoroughly. Then replace the gap piece, and locate the four screws, two vertically from the top and two horizontally, one in each outer edge of the gap piece. Bring the saddle up to give rough alignment and 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**

THE

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## 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  $5\frac{1}{2}$  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.

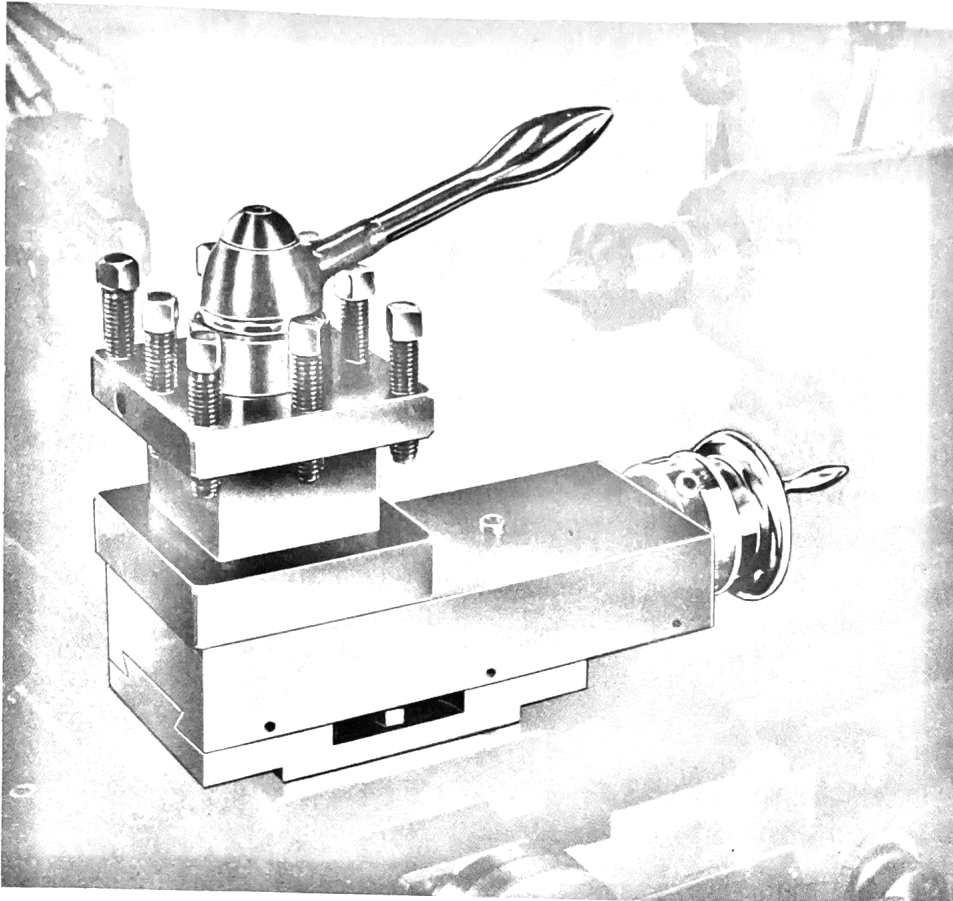
Shell Dromus Oil D—translucent soluble oil mixed with water in the ratio 40 : 1.

Shell Dromus Oil 908—extreme pressure oil mixed with water in the ratio 10/15 : 1.

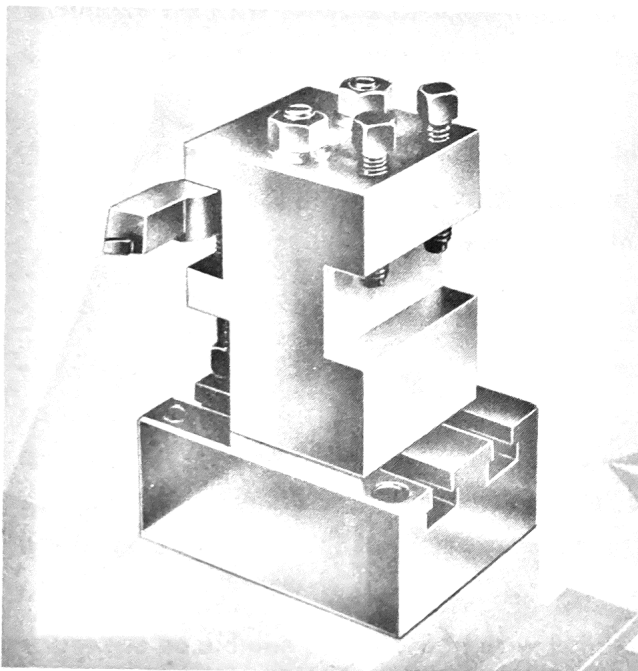
### Soluble oils and machine maintenance

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.

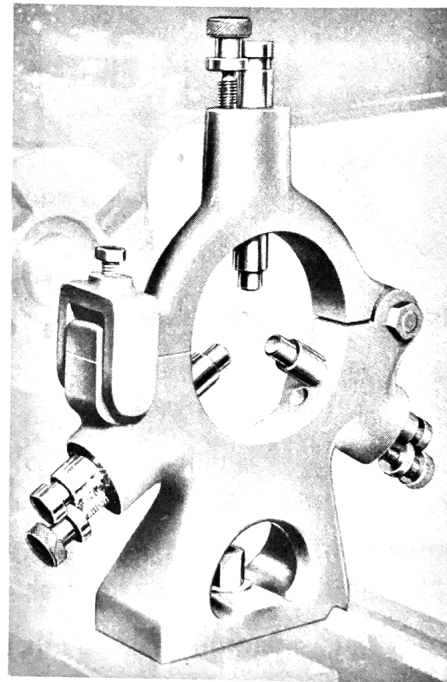
The sump should be emptied, cleaned out and re-filled with newly mixed soluble oil at regular intervals.



**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**

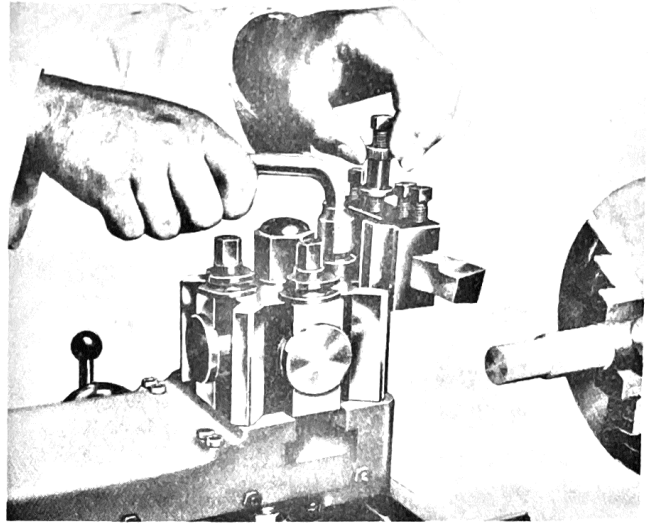
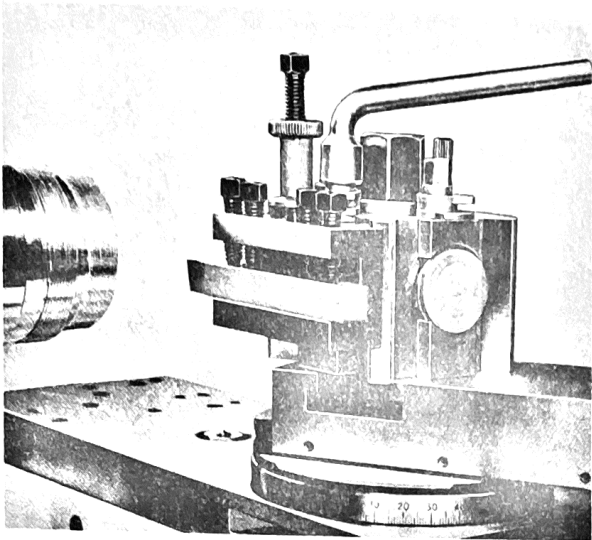
As an aid to production, a rear toolpost is available for fitting direct to the cross slide, which is drilled and tapped ready to receive it.

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.

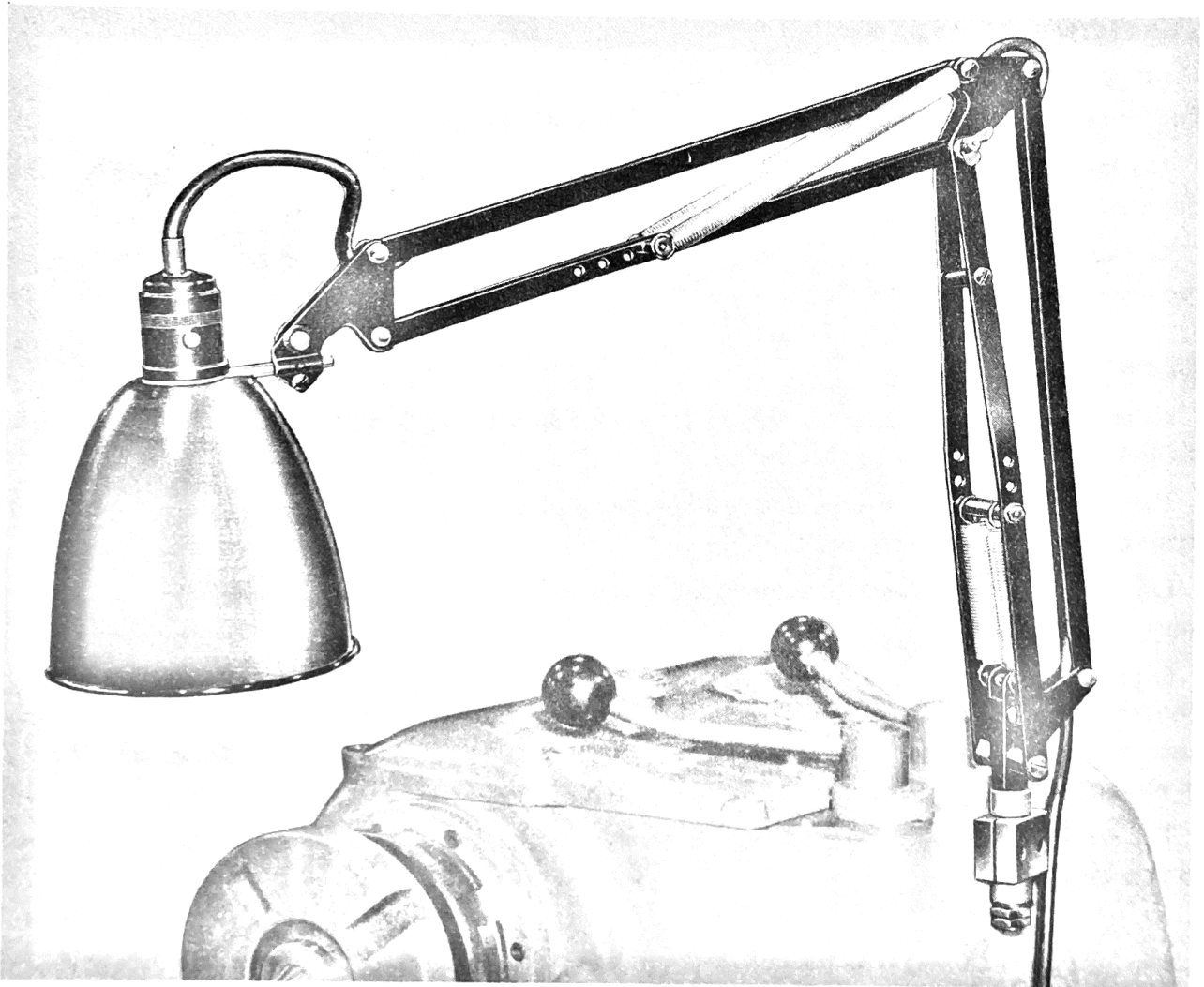
Supplied complete with all the necessary fixing screws, the only fitting required is the physical bolting of the base pad to the cross slide. Tee slots are provided in the base pad so that the toolpost may be adjusted in position on the base. Maximum tool depths that can be accommodated in either position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

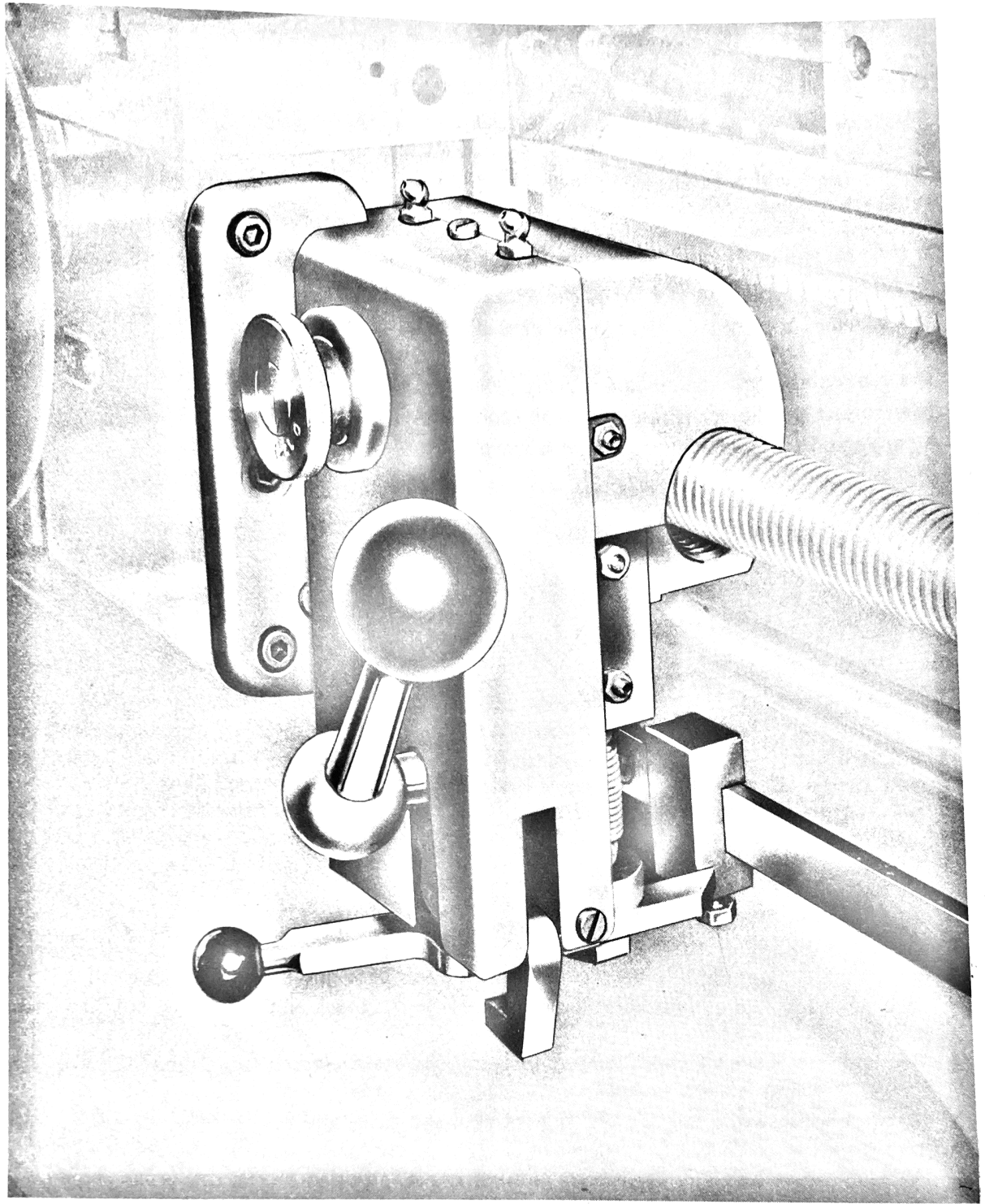
The "Anglepose" lighting unit offers the positive virtue that it will really "stay put" in any position through all normal speed and cutting ranges.

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 colours of the wires i.e., secondary wiring—brown; primary common—blue; 220 volts—green; 440 volts—yellow; 550 volts—white.
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.

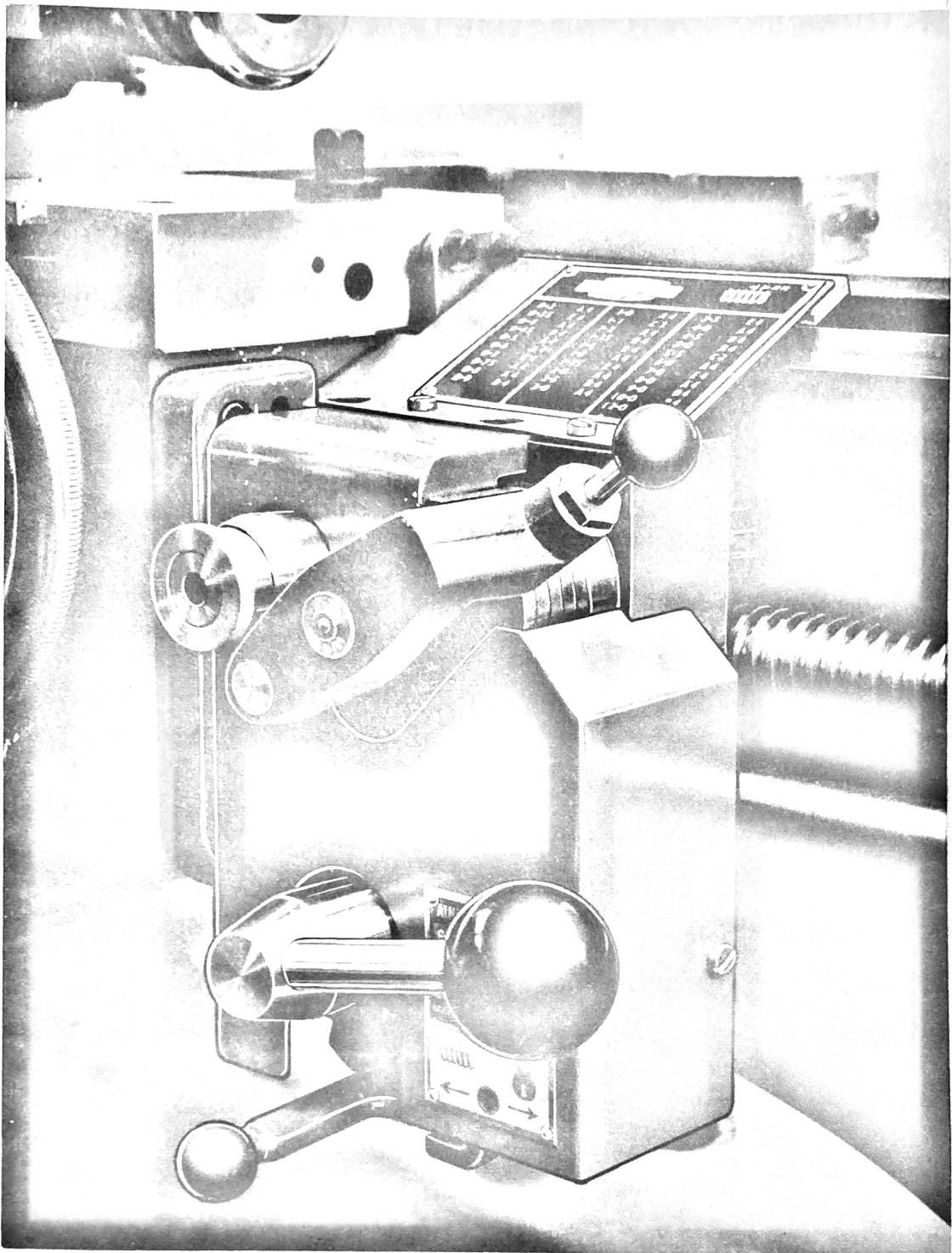
A graduated dial may be set in any one of four positions for cutting the following threads.

- 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 accidentally 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.

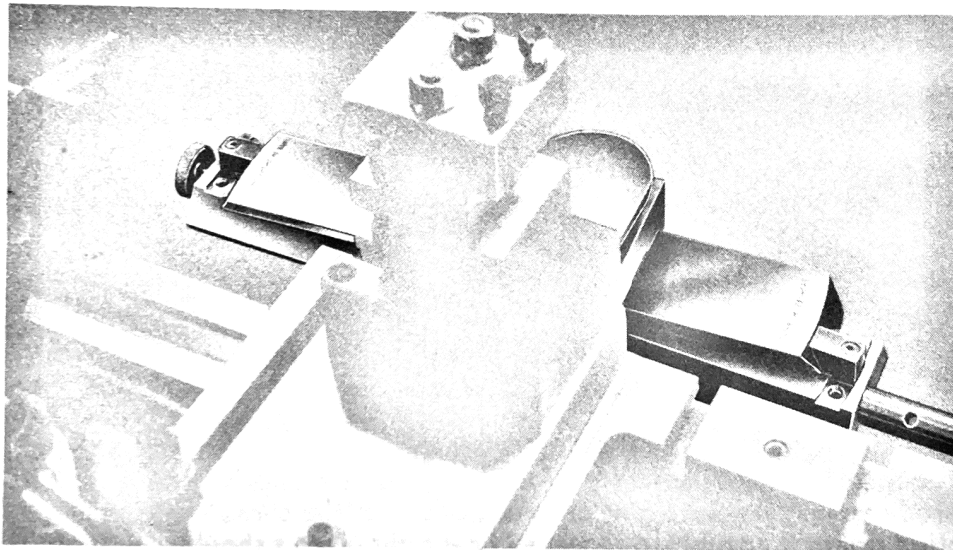
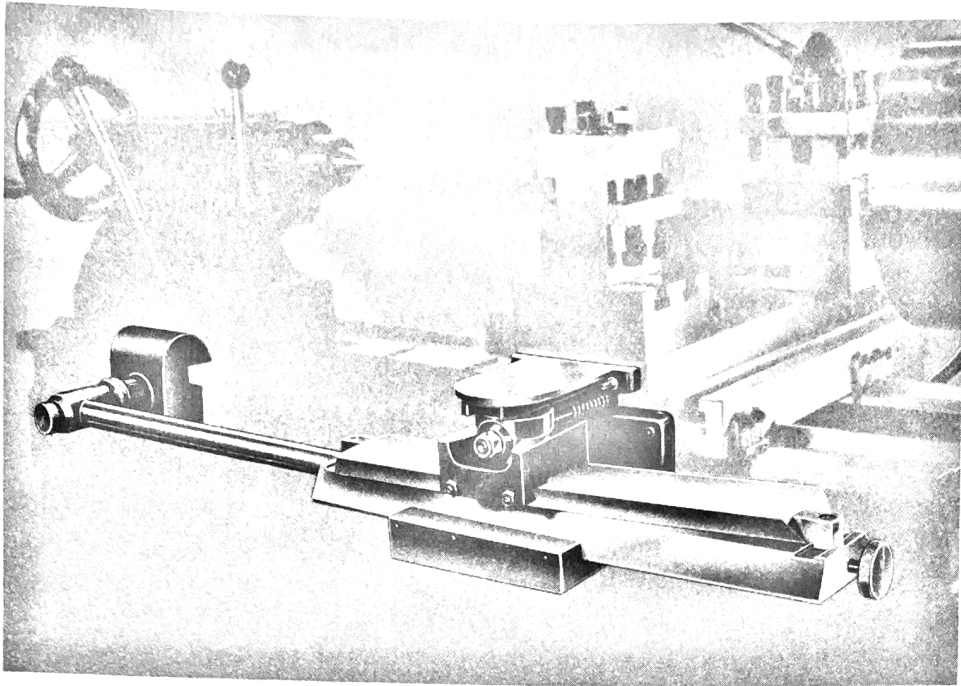
### METRIC THREADS - settings

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  $10^\circ$  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  $\frac{1}{4}^\circ$  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.

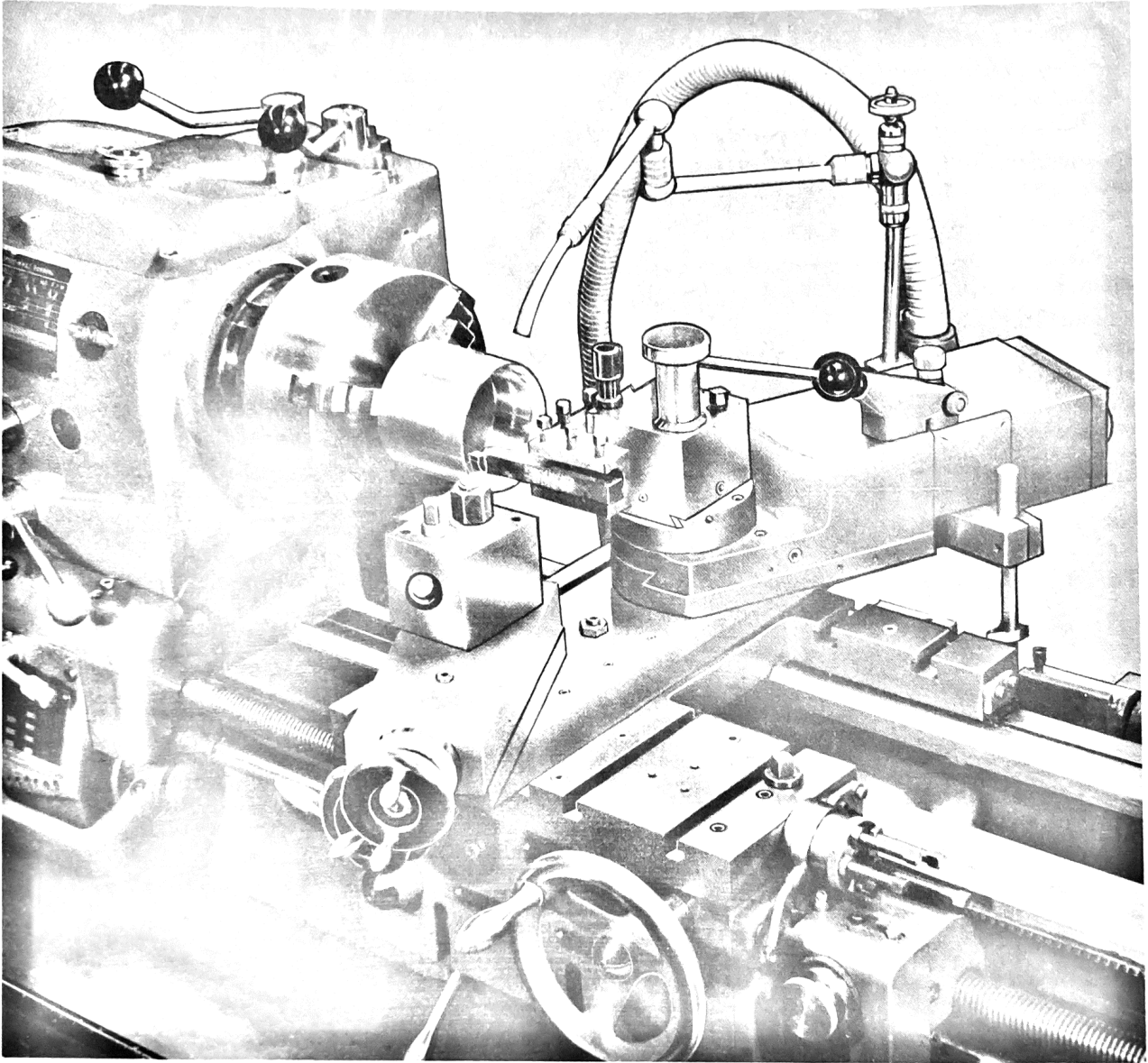
After attaching to the machine, all that is required to prepare the taper turner for use is the clamping of the connecting rod in the anchor bracket by means of the knurled thumb screw.

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 Multi-type 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  $\pm 0.005$  ins. can be achieved. The change in copy diameter at 90° is  $5\frac{1}{2}$  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  $\frac{1}{2}$  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.

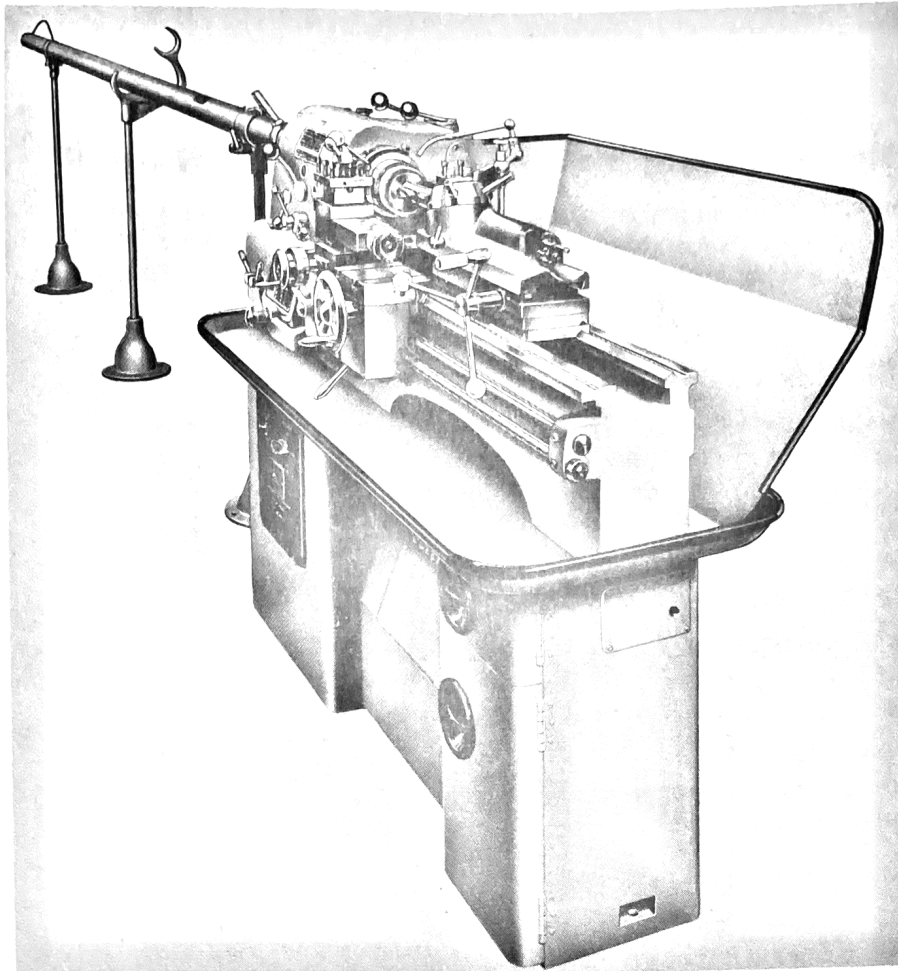
### Facing Beam

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 lateral adjustment.

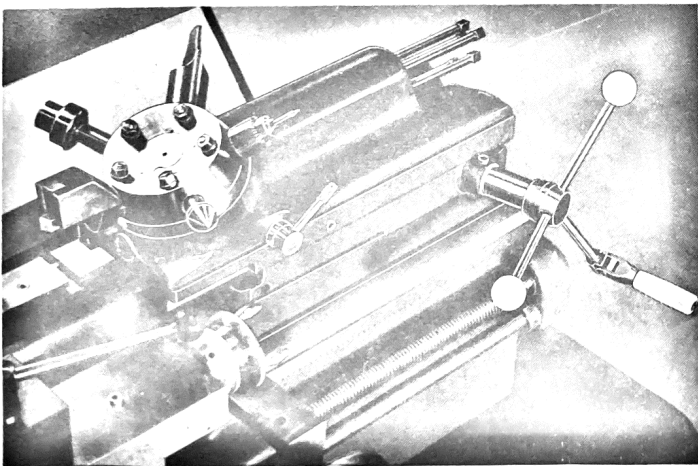
## BRIEF SPECIFICATION OF COLCHESTER SERIES 300 PROFILER

Cylinder stroke	3 in	Stylus load	6 oz.
Max. approach/retraction speed	110 in/min	Change in copy diameter at 90°	$5\frac{1}{2}$ in
Velocity characteristic	12 in/min/0.001 in stylus deflection	Change in copy diameter at 60°	5 in
Hydraulic reproduction accuracy	$\pm 0.0005$ in	Working pressure	300 lb/in <sup>2</sup>
		Pump motor $\frac{1}{2}$ h.p. at	1500 r.p.m.

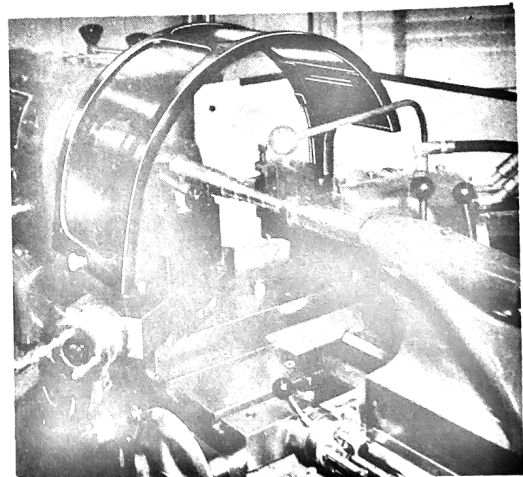




**'Student' lathe complete with capstan unit, lever operated collet chuck and air-operated bar feed**



**Close up view of capstan unit**



**Perspex chuck/chip guard**

## **COLCHESTER CAPSTAN UNIT WITH BAR FEED AND LEVER-OPERATED COLLET CHUCK**

Designed to give capstan facilities on the Student lathe, the five station manually-operated capstan head is fitted in place of the tailstock. No alteration or fitting is required other than the final boring of the tool-holder holes from a boring bar held in the spindle nose.

The capstan unit is of the inclined-head type, with  $\frac{3}{4}$ " tool-holder holes having single clamping bolts, suitable for accommodating standard single-spindle auto tooling. Five separately adjustable stops control the forward feed of each tool and these stops are automatically rotated as the capstan head is indexed.

A retractable spring-loaded plunger provides positive location and locking of the capstan head, and provision has been made for rotating the capstan by hand where necessary. An accuracy of indexing of 0.0004" at a point 3" from the turret face is guaranteed.

The bar feed is of the air-operated swing forward type, and will accommodate standard 10 ft. bars up to  $1\frac{1}{2}$ " diameter. A warning device is incorporated to signal the passing of the end of the bar, and a reducing valve and pressure gauge are included in the equipment.

The lever-operated collet chuck is of the Burnerd "Multisize" pattern in which each collet has a capacity of  $\frac{1}{8}$ " and only 12 collets are needed to cater for all sizes between  $\frac{1}{16}$ " and  $1\frac{1}{2}$ ".

## **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.

## 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

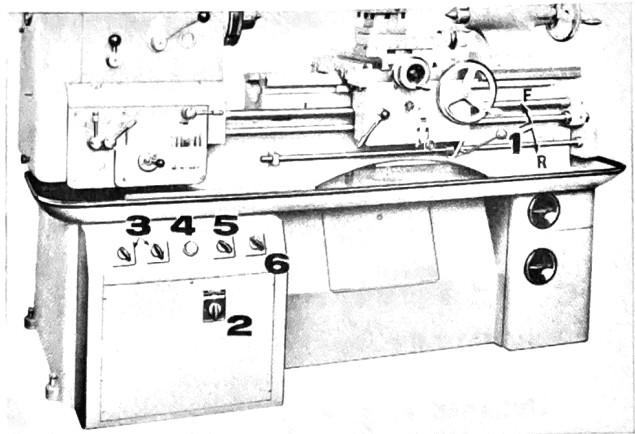
A two-speed motor is employed, giving the same range of sixteen spindle speeds as for standard centre lathes.

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

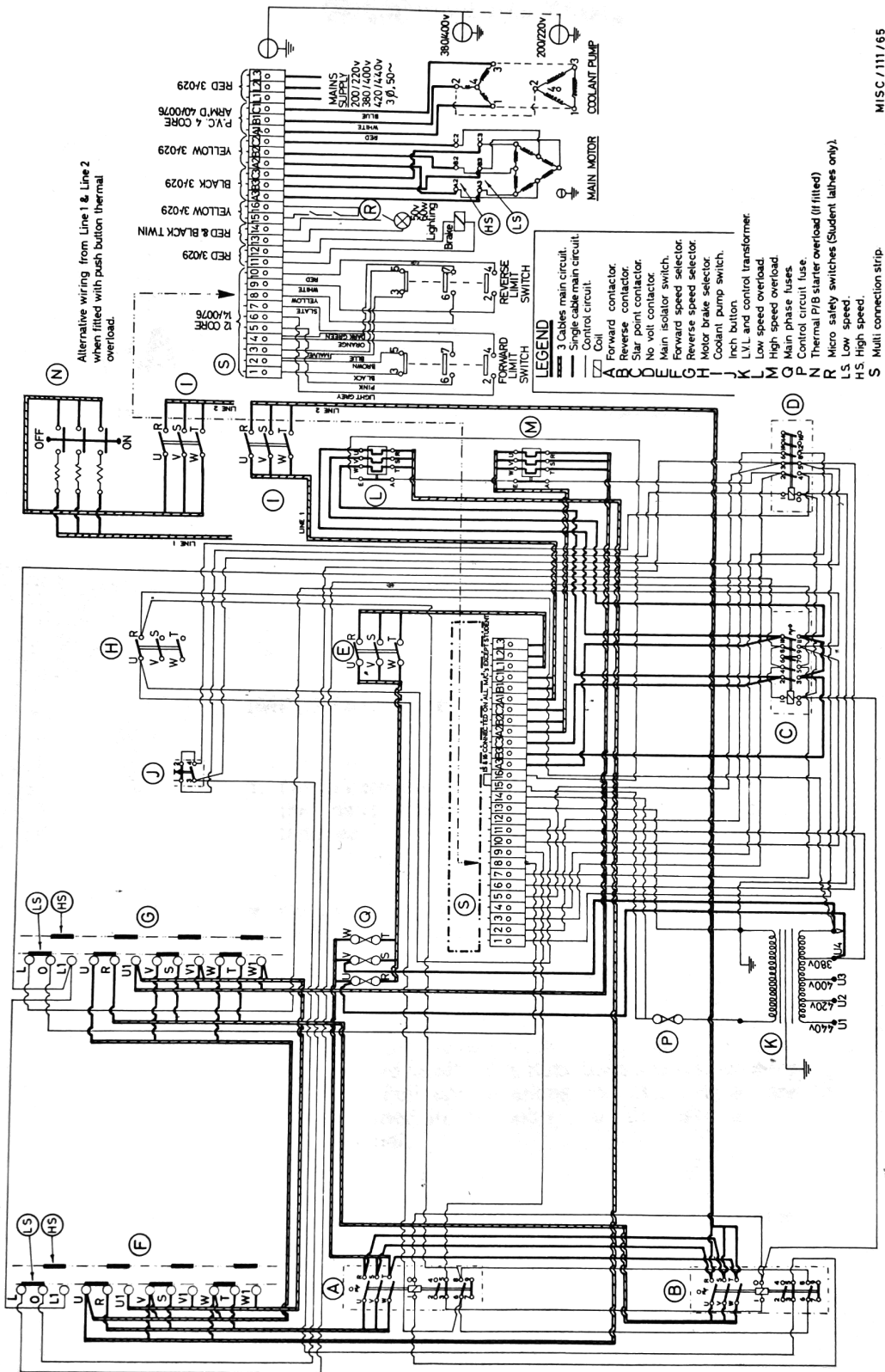
The electrical control panel, built into the cabinet houses the pre-select switches providing high or low spindle speeds in either forward or reverse direction of rotation. The switches can be pre-selected to give a slow feed and fast return with subsequent reduction in production time when screwcutting. 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



MISC / 111 / 65



# COLCHESTER

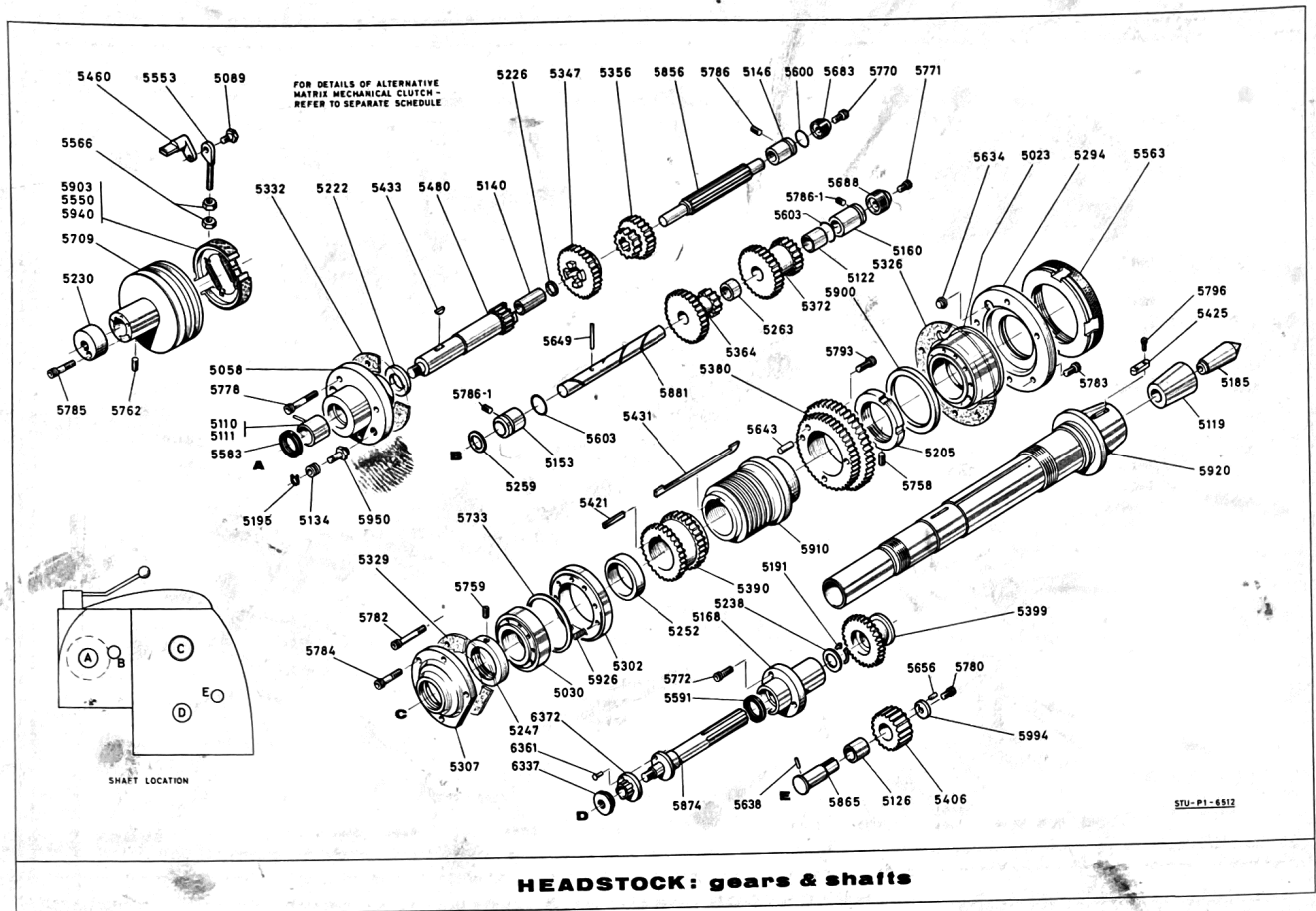
## **PARTS SECTION**

### **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.

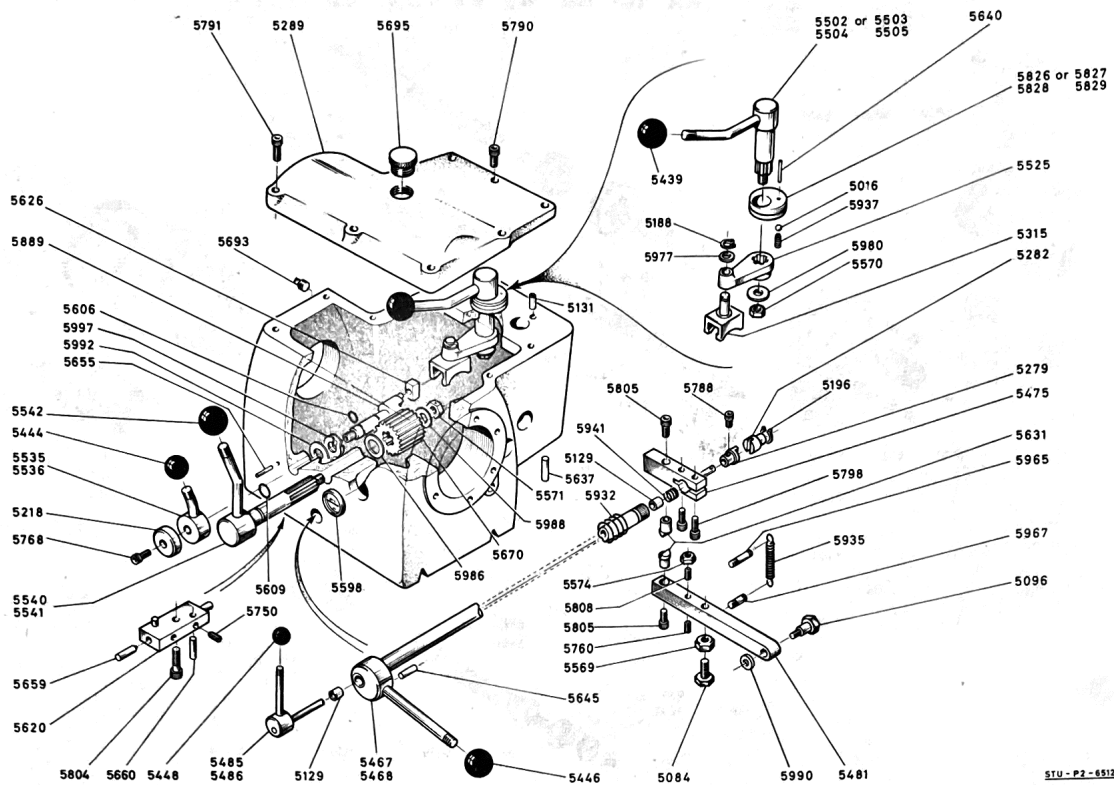
Note:—Those component Order Numbers followed by asterisk(\*) in the parts list are for standard items which can generally be purchased locally; e.g. nuts, bolts screws, washers etc. Full specifications for these items are included in Appendix 1 at the back of this manual.

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



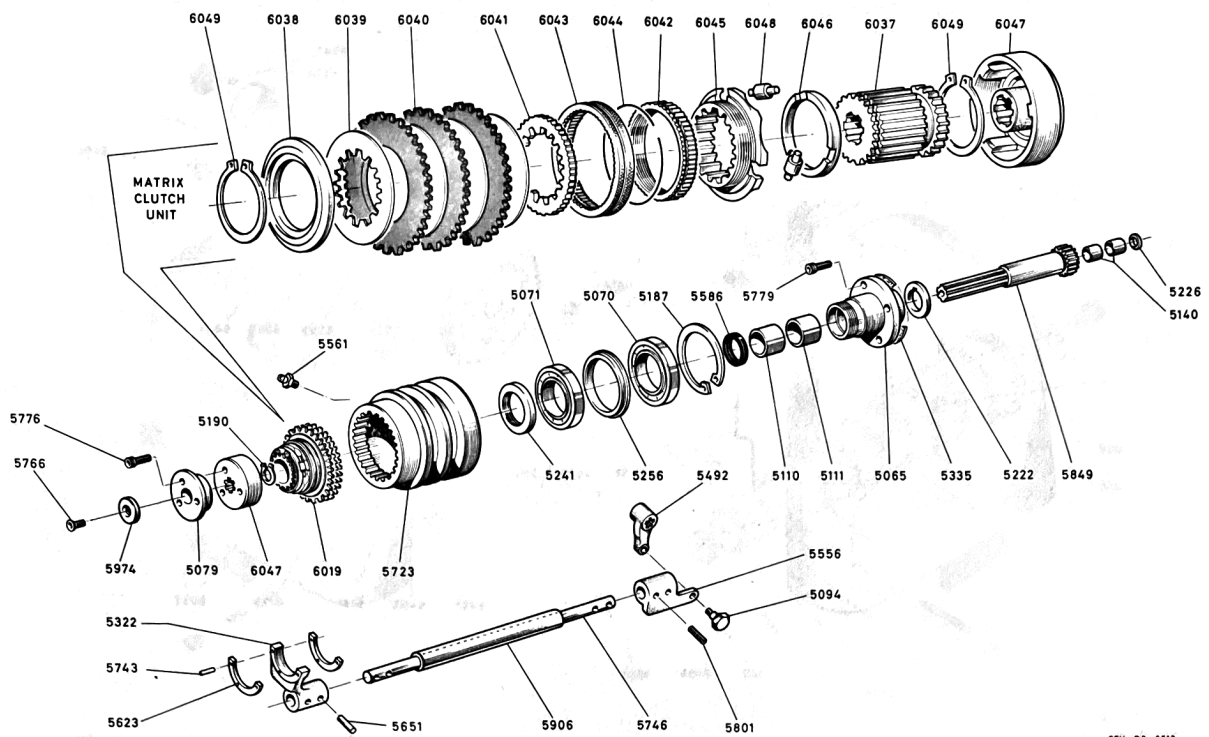
**HEADSTOCK: gears & shafts**

Order No.	Description	Order No.	Description	Order No.	Description
5023 *	Front roller bearing (GAMET)	5372	Second shaft gear 20/28T	5771 *	Screwed plug retaining screw 47-226
5030 *	Back roller bearing (GAMET)	5380	Double gear on spindle, 44/51T	5772 *	Stop washer retaining screws (2) 46-212
5058	Flanged bearing	5390	Reverse gear on spindle, 30/30T	5778 *	Flanged bearing securing screws (3) 47-228
5089	Expanding-lever bolt	5399	Reverse shaft gear, 30T	5780 *	Reverse shaft flanged bearing screws (2) 46-212
5110	Flanged bearing bush (L.H.)	5406	Inter-reverse shaft gear, 20T	5782 *	Back bearing inside cover screws (3) 46-219
5111	Flanged bearing bush (R.H.)	5421 *	Spindle reverse gear driving key 17-009	5783 *	Front bearing cover screws (3) 46-213
5119	Centre bush	5425	Spindle nose key	5784 *	Back bearing outside cover screws (3) 46-213
5122	Second shaft 28/40T gear bush	5431	Sliding sleeve key	5785 *	Pulley retaining collar screw 46-217
5126	Inter-reverse gear bush	5433 *	Clutch driving shaft key 17-002	5786 *	Driving shaft bush screw 67-419
5134	Brake shoe flanged bush	5460	Brake shoe expanding lever	5786-1*	Bush securing screws (2) 67-419
5140	Clutch driving shaft bush	5550 *	Brake linings c/w rivets (Ferodo 4")	5793 *	Double gear securing screws (3) 47-229
5146	Driving shaft bush	5553	Expanding lever link	5796 *	Nose key securing screws (2) 45-201
5153	Second shaft bush (L.H.)	5563	Spindle nose draw nut	5840	Clutch driving shaft, 12T
5160	Second shaft bush (R.H.)	5566 *	Brake adjusting locknuts (2) 20-637	5856	Driving shaft
5168	Reverse shaft flanged bush	5583 *	Flanged bearing oil seal 79-863	5865	Inter-reverse shaft
5185	Centre, No.3 morse	5591 *	Reverse shaft oil seal 79-865	5874	Reverse shaft
5191 *	Reverse shaft circlip 11-749	5600	Driving shaft bush O-ring 27-858	5881 *	Second shaft
5195 *	Brake shoe flanged bush clip 11-845	5603 *	Second shaft bush O-ring 27-858	5900	Front bearing shield
5205	Front bearing adjusting collar	5634	Front bearing peg	5903 *	Brake shoes c/w linings 09-997
5222	Clutch driving shaft thrust collar	5638 *	Inter-reverse shaft locating pin 24-539	5910	Sliding sleeve
5226	Driving shaft thrust collar	5643 *	Double gear locating pin 24-590	5920	Main spindle
5230	Driving pulley retaining collar	5649 *	Second shaft gear pin 14-607	5926 *	Back bearing pressure springs (15) 82-812
5238	Reverse shaft collar	5656	Inter-reverse gear stop washer pin 24-520	5940 *	Brake shoe springs (2) 82-815
5247	Screwed collar on spindle	5683	Driving shaft bush screwed plug	5950	Brake shoe fixing stud
5252	Back bearing spacer collar	5688	Second shaft bush screwed plug	5994	Inter-reverse gear stop washer
5259	Second shaft bush spacer collar	5709	Driving pulley (twin vee)	6337	Reverse shaft knurled nut
5263	Second shaft gear spacer collar	5733	Back bearing thrust ring	6361	Shear-pin
5294	Front bearing outside cover	5738 *	Front bearing adjusting collar lock-screw 60-361	6372	Shear-pin sleeve
5302	Back bearing inside cover	5759 *	Spindle screwed collar lock-screw 60-361		
5307	Back bearing outside cover	5762 *	Driving pulley lock screws (2) 60-363		
5326	Front bearing cover gasket	5770 *	Screwed plug retaining screw 47-223		
5329	Back bearing outside cover gasket				
5332	Flanged bearing gasket				
5347 *	Driving shaft gear, 30T				
5356	Driving shaft gear, 14/42T				
5364	Second shaft gear, 13/30T				



**HEADSTOCK: castings & levers**

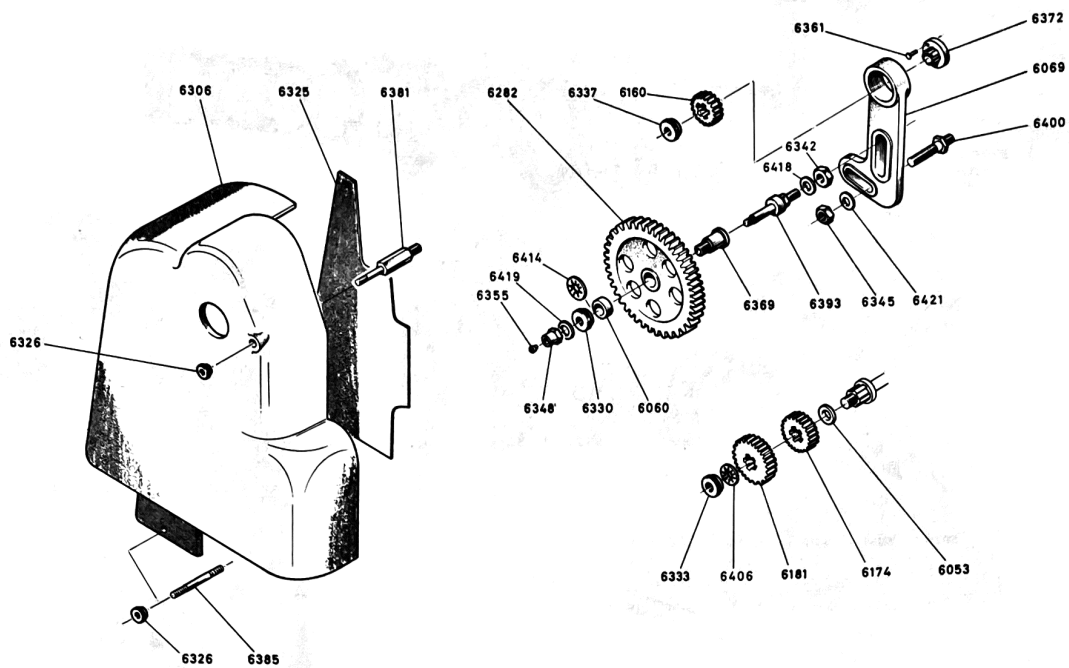
Order No.	Description	Order No.	Description	Order No.	Description
5016 *	Selector locating balls (2) 01-789	5505	Gear shifting lever, R.H. (chrome)	5788 *	Switch coupling screw 72-495
5084	Switch actuating bolt	5525	Internal gear levers (2)	5790 *	Headstock cover screws (6) 46-215
5096	Pivot bolt	5535	Reverse gear shifting lever	5791 *	Headstock cover screws (3) 46-217
5129	Reverse switch lever bushes (2)	5536	Reverse gear shifting lever (chrome)	5798 *	Brake operating lever screws (2) 46-214
5131	Selector locating bush	5540	Sliding sleeve shifting lever	5804 *	Pad securing screw 47-227
5188 *	Shifting fork circlips (2) 11-736	5541	Sliding sleeve shifting lever (chrome)	5805 *	Locking pawl screws (2) 45-203
5196 *	Reverse switch coupling circlip 11-743	5569 *	Switch actuating bolt locknut 20-637	5808 *	Lever stop screw 59-355
5218	Reverse gear shifting lever collar	5570 *	Lever retaining nuts (2) 22-663	5826	Driving shaft gear selector, L.H.
5279	Reverse switch coupling, male	5571 *	Pinion retaining nut 22-663	5827	Driving shaft gear selector, R.H.
5282	Reverse switch coupling, female	5574 *	Lever stop locknut 20-635	5828	Driving shaft gear selector, L.H. (chrome)
5289	Headstock cover	5598 *	Oil-level sight 80-873	5829	Driving shaft gear selector, R.H. (chrome)
5315	Gear shifting forks (2)	5606 *	Operating shaft O-rings (2) 27-846	5889	Reverse gear shifting shaft
5439 *	Gear shift lever knobs (2) 18-830	5609 *	Sleeve lever O-ring 26-848	5932	Operating lever spring
5444 *	Reverse gear lever knob 18-835	5620 *	Set-over pad	5935 *	Switch lever return spring 82-817
5446 *	Operating lever knob 18-833	5626	Reverse gear shifting pad	5937 *	Gear selector springs (2) 82-803
5448 *	Reverse switch lever knob 18-840	5631	Locking pawls (2)	5941 *	Switch rod spring 82-813
5452 *	Sleeve shifting lever knob 18-830	5637	Headstock/bed locating pin	5965	Return spring stud, long
5467	Operating lever assembly	5640 *	Selector locating pins (2) 24-546	5967	Return spring stud, short
5468	Operating lever assembly (chrome)	5645 *	Lever locking pin 24-539	5977 *	Gear lever washer 85-695
5475	Brake operating lever	5655 *	Lever stop pin 24-520	5980 *	Internal shift lever washers (2) 85-696
5481	Switch operating lever	5659	Set-over pins (2)	5986 *	Leather washer 86-118
5485	Reverse switch lever assembly	5660 *	Pad locating pin 14-131	5988 *	Sleeve pinion washer 85-696
5486	Reverse switch lever assembly (chrome)	5670	Sliding sleeve shifting pinion 17T	5990	Switch lever washer
5502	Gear shifting lever, L.H.	5693 *	Drain plug 88-070	5992 *	Reverse gear shift shaft washer 85-698
5503	Gear shifting lever, R.H.	5695	Oil filler plug	5997 *	Reverse gear shift shaft spring washer 84-718
5504	Gear shifting lever, L.H. (chrome)	5750 *	Pin adjusting screws (2) 73-522		
		5760 *	Lockscrew for lever stop screw 59-352		
		5768 *	Reverse gear lever retaining screw 46-212		



**HEADSTOCK: matrix clutch**

<u>Order No.</u>	<u>Description</u>	<u>Order No.</u>	<u>Description</u>
5065	Flanged bearing	5743 *	Clutch fork pad rivets (3) 29-905
5070 *	Pulley bearing - large 02-032	5746	Clutch shifter rod
5071 *	Pulley bearing - small 02-061	5766 *	Bobbin stop washer screw 55-318
5079	Clutch shifter bobbin	5776 *	Bobbin securing screws (3) 45-207
5094	Operating lever bolt	5779 *	Flanged bearing screws (4) 55-319
5110	Flanged bearing bush L.H.	5801 *	Operating rod link screws (2) 46-214
5111	Flanged bearing bush R.H.	5849	Clutch driving shaft, 12T/10P
5140	Clutch driving shaft bushes (2)	5906	Clutch operating rod sleeve
5187 *	Pulley bearing circlip 12-773	5974	Bobbin stop washer
5190 *	Clutch driving shaft circlip 11-749	6019	Matrix, clutch unit, complete, type 031
5222	Clutch driving shaft thrust collar	6037	Hub, ZC1
5226	Driving shaft thrust collar	6038	End flange, ZC3
5241	Flanged bearing screwed collar	6039	Fixed plates, ZC4 (4)
5256	Pulley bearing spacer collar	6040	Spinning plates, ZC5 (3)
5322	Clutch shifting fork	6041	Lock plate, ZC7
5335	Flanged bearing gasket	6042	Adjusting nut, ZC8
5492	Operating lever	6043	Locking ring, ZC9
5556	Clutch rod operating link	6044	Spring, ZC10
5561 *	Pulley grease nipple 23-326	6045	Track ring, ZC11
5586 *	Flanged bearing oilseal 79-062	6046	Thrust washer, ZC12
5623	Shifting fork pads (2)	6047	Operating collar, ZC13
5651 *	Rod fork securing pins (2) 24-563	6048	Bearing assembly, ZC15 (3)
5723	Clutch driving pulley	6049	Circlips, ZC16 (2)



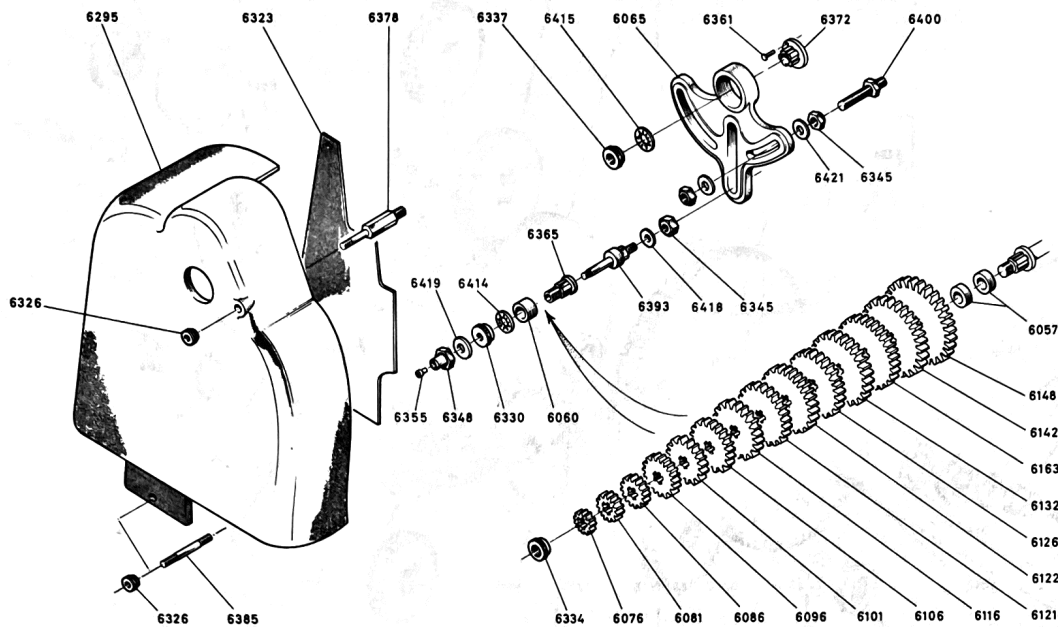


STU-PA-8512

**SWING FRAME : standard**

<u>Order No.</u>	<u>Description</u>
6053	Change-gear alignment collars (set of 4)
6060	Change-gear sleeve spacer collar
6069	Swing frame
6160	Change-gear, 21T/16P
6174	Change-gear, 35T/16P
6181	Change-gear, 42T/16P
6282	Change-gear, 120T/16P
6306	Belt and change-gear guard
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
6345	* Swing frame locking nuts (2) 20-624

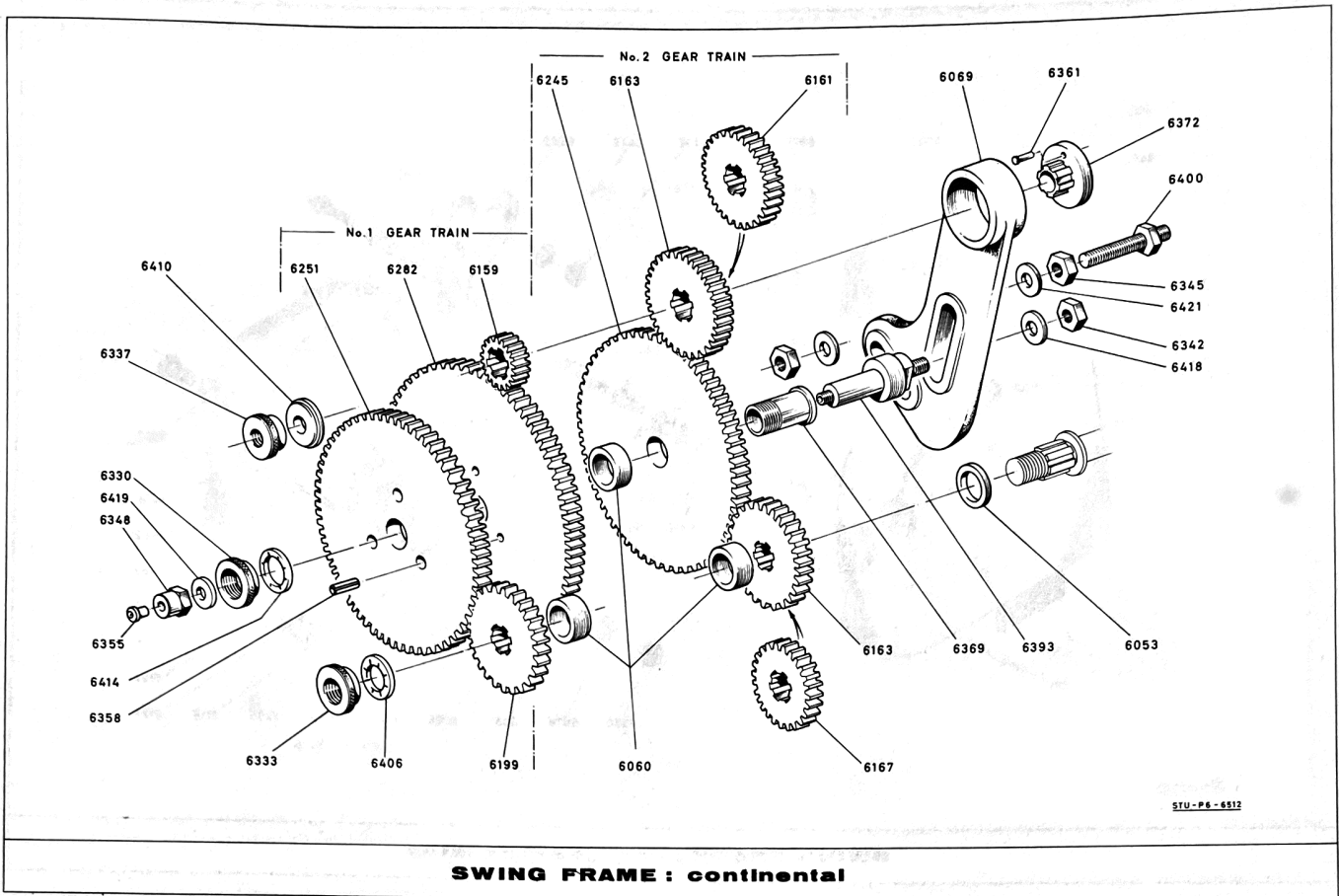
<u>Order No.</u>	<u>Description</u>
6348	Oiler retaining nut, c/w oiler
6355	* Change-gear stud oiler 23-124
6361	Shearpin
6369	Change-gear sleeve
6372	Shearpin sleeve
6381	Guard stud (hex.)
6385	Guard stud (round)
6393	Change-gear stud
6400	Swing frame fixing stud
6406	* Gearbox driving shaft fan disc 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



**SWING FRAME : non-gearbox lathe**

<u>Order No.</u>	<u>Description</u>
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
6295	Belt and change-gear guard
6323	Inner belt guard

<u>Order No.</u>	<u>Description</u>
6326	Change-gear guard knurled nut
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
6378	Guard stud (hex.)
6385	Guard stud (round)
6393	Change-gear stud
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

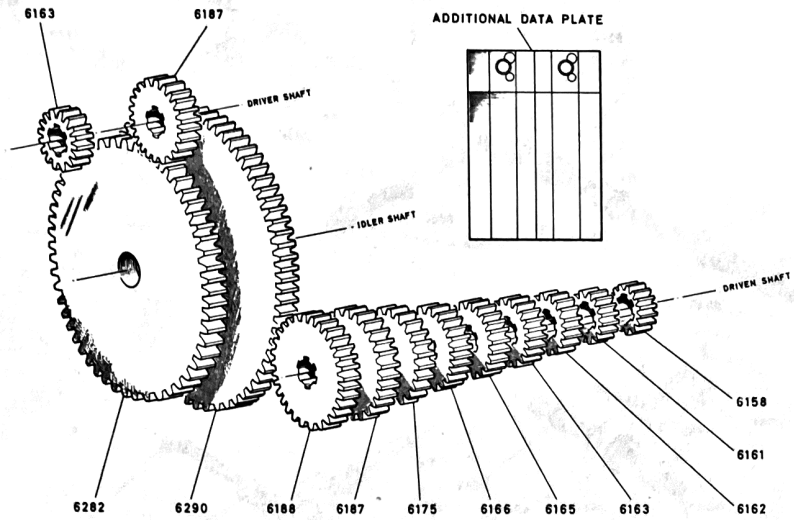


**SWING FRAME : continental**

<u>Order No.</u>	<u>Description</u>
6053	Change-gear alignment 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

<u>Order No.</u>	<u>Description</u>
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
6369	Change-gear 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
6421 *	Swing frame fixing stud washers (2) 85-695

ADDITIONAL EQUIPMENT REQUIRED FOR CUTTING ENGLISH THREADS WITH CONTINENTAL SWING FRAME

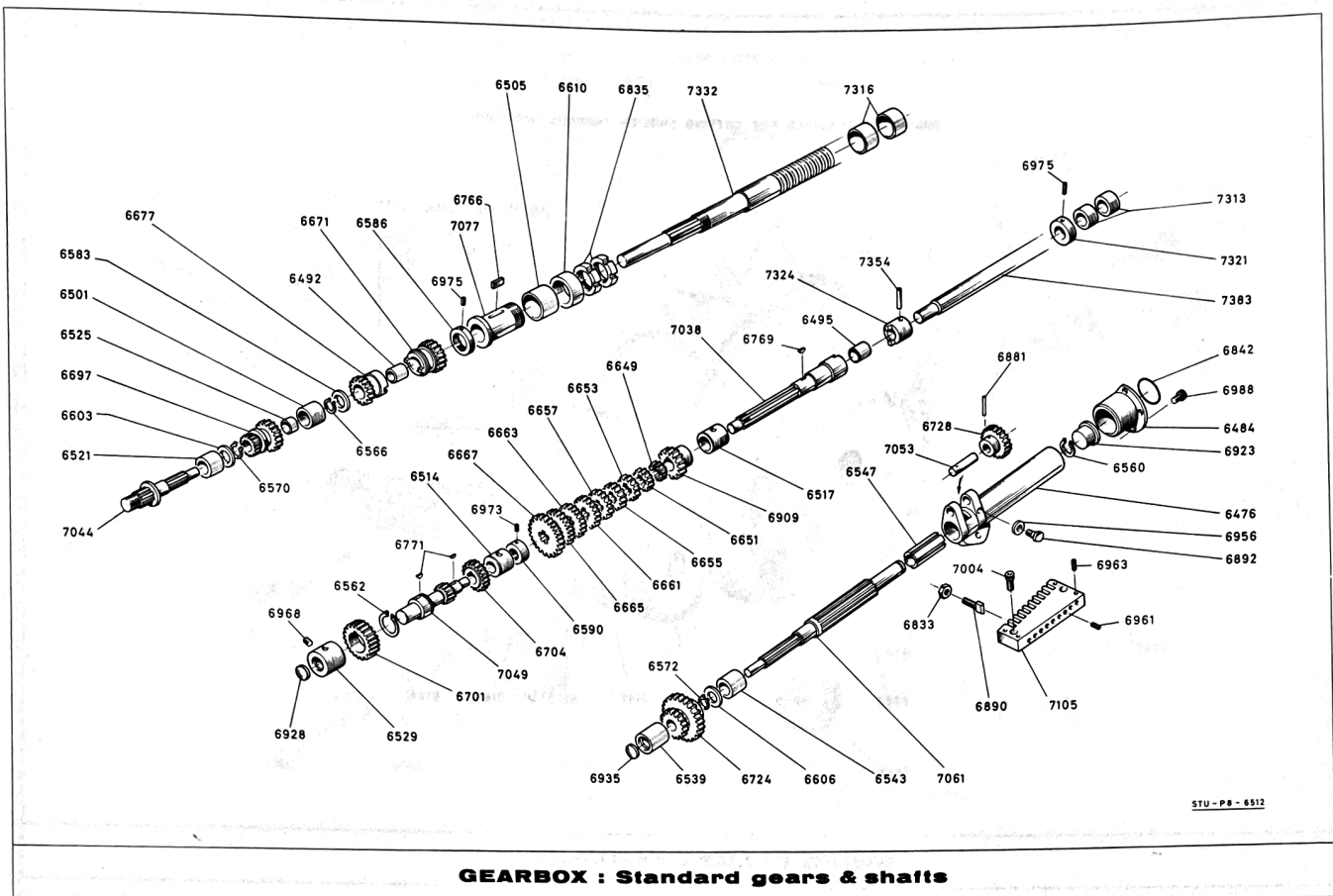


STU-P7-6812

**SWING FRAME : continental**

ADDITIONAL EQUIPMENT FOR ENGLISH THREADS

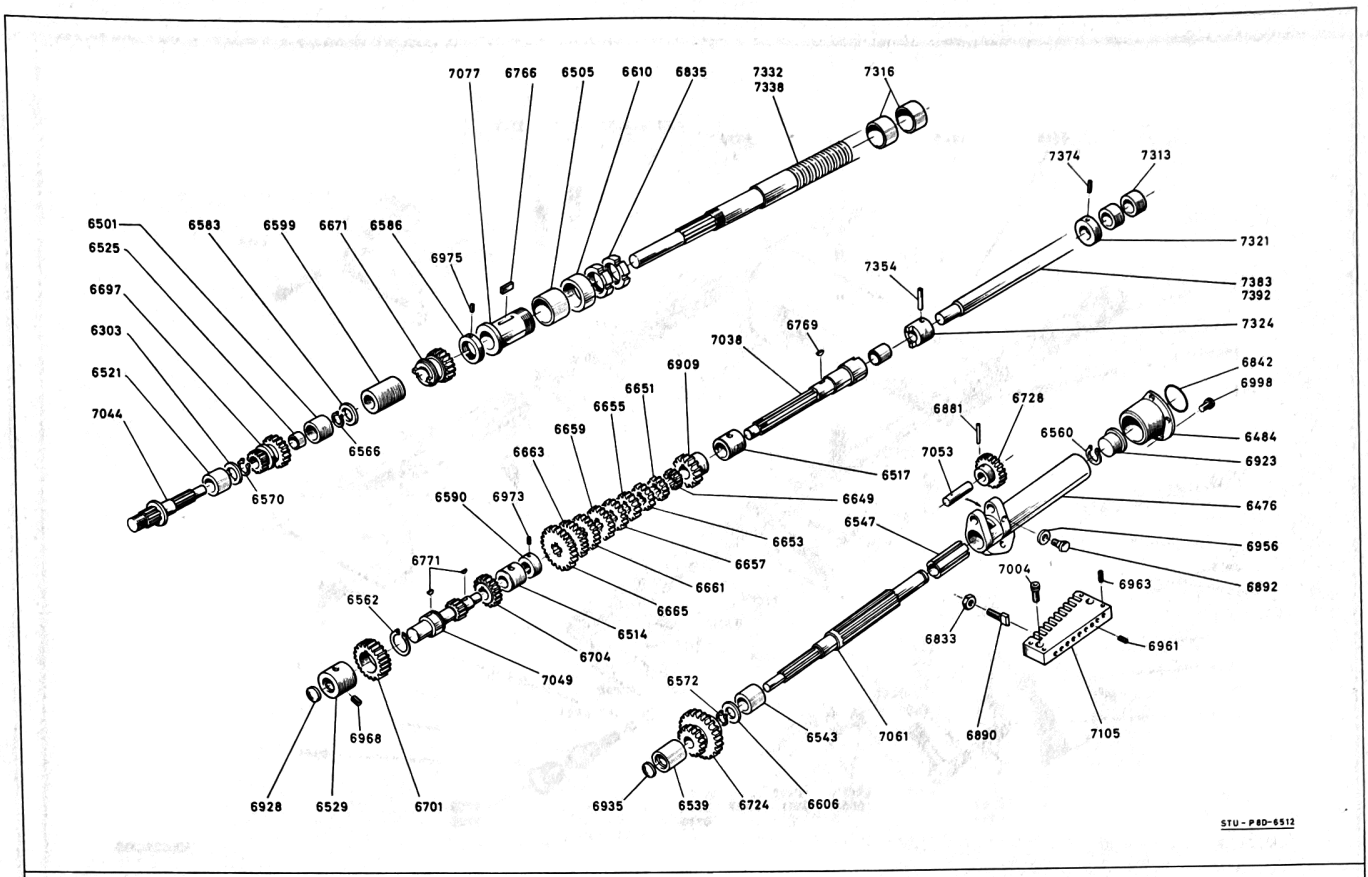
<u>Order No.</u>	<u>Description</u>	<u>Order No.</u>	<u>Description</u>
6158	Change-gear, 19T/16P	6175	Change-gear, 36T/16P
6161	Change-gear, 22T/16P	6187	Change-gear, 48T/16P (2)
6162	Change-gear, 23T/16P	6188	Change-gear, 49T/16P
6163	Change-gears, 24T/16P (2)	6282	Change-gear, 120T/16P
6165	Change-gear, 26T/16P	6290	Change-gear, 127T/16P
6166	Change-gear, 27T/16P		Thread data plate - extra



**GEARBOX : Standard gears & shafts**

STU - PB - 6512

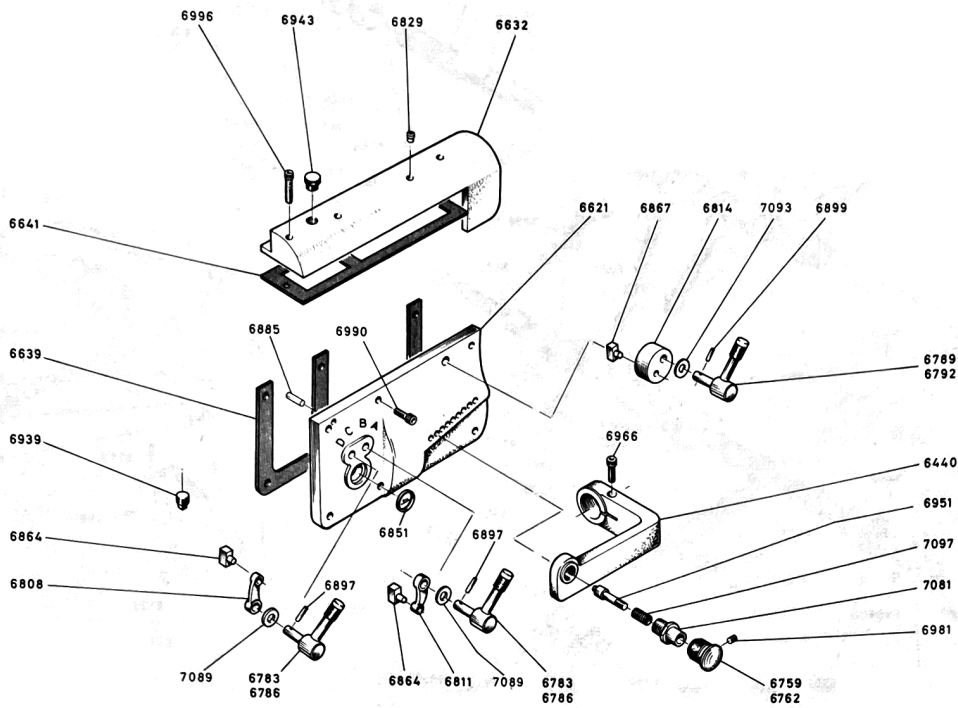
Order No.	Description	Order No.	Description	Order No.	Description
6476	Tumbler bearing	6653	Coneshaft gear, 19T	6961	* Locating strip adjusting screws (9) 60-365
6484	Tumbler bearing flanged bush	6655	Coneshaft gear, 20T	6963	* Locating strip jacking screws (4) 58-342
6495	* Coneshaft insert bush 10-913	6657	Coneshaft gear, 22T	6968	* Bush locking screws (3) 60-365
6501	Leadscrew bush, L.H.	6661	Coneshaft gear, 24T	6973	* Coneshaft collar locking screw 58-345
6505	Leadscrew bush, R.H.	6663	Coneshaft gear, 26T	6975	* Leadscrew collar locking screw 59-350
6514	Coneshaft bush, L.H.	6665	Coneshaft gear, 28T	6988	* Tumbler bearing flanged bush screws (3) 45-203
6517	Coneshaft bush, R.H.	6667	Coneshaft gear, 30T	7004	* Locating strip securing screws (2) 47-225
6521	Driving shaft bush, L.H.	6671	Leadscrew gear, 24T	7038	Coneshaft c/w bush
6525	Driving shaft bush, R.H.	6677	Leadscrew metric gear, 22T	7044	Driving shaft
6529	Intershaft bush	6697	Driving shaft gear, 16/24T	7049	Intershaft, 14T
6539	Tumbler shaft bush, L.H.	6701	Intershaft gear, 32T	7053	Tumbler gear shaft
6543	Tumbler shaft bush, centre	6704	Intershaft gear, 24T	7061	Tumbler shaft
6547	Tumbler shaft bush, R.H.	6724	Tumbler shaft gear, 24/42T	7077	Leadscrew thrust sleeve
6560	* R.H. tumbler bush retaining clip 11-745	6728	Tumbler gear, 27T	7105	Tumbler locating strip
6562	* Intershaft gear retaining clip 11-754	6766	Leadscrew key	7313	* Feedshaft tail-end bushes (2) 10-923
6566	* Leadscrew retaining clip 11-745	6769	* Coneshaft key 17-001	7316	* Leadscrew tail-end bushes (2) 10-936
6570	* Driving shaft retaining clip 11-744	6771	* Intershaft keys (2) 17-001	7321	Feedshaft tail-end collar
6572	* Tumbler shaft retaining clip 11-743	6833	* Tumbler pin securing nut 20-621	7324	Feedshaft coupling
6583	Leadscrew retaining collar	6835	Leadscrew locknut	7354	* Feedshaft coupling securing pin 14-659
6586	Leadscrew screwed collar	6842	* Tumbler bearing bush 0-ring 26-852	7374	* Feedshaft tail-end collar locking screw 59-350
6590	Coneshaft screwed collar	6881	* Tumbler gear driving pin 24-543	7383	Feedshaft
6603	Driving shaft spacer collar	6890	Tumbler locating pin		
6606	Tumbler shaft spacer collar	6892	Tumbler roller pin		
6610	Leadscrew thrust collar	6909	Coneshaft pinion, 24T		
6649	Coneshaft gear, 16T	6923	Tumbler bearing plug		
6651	Coneshaft gear 18T	6928	Intershaft bush core-plug		
		6935	Tumbler shaft bush core-plug		
		6956	Tumbler roller		



STU-P40-6512

**GEARBOX: Dominion gears & shafts**

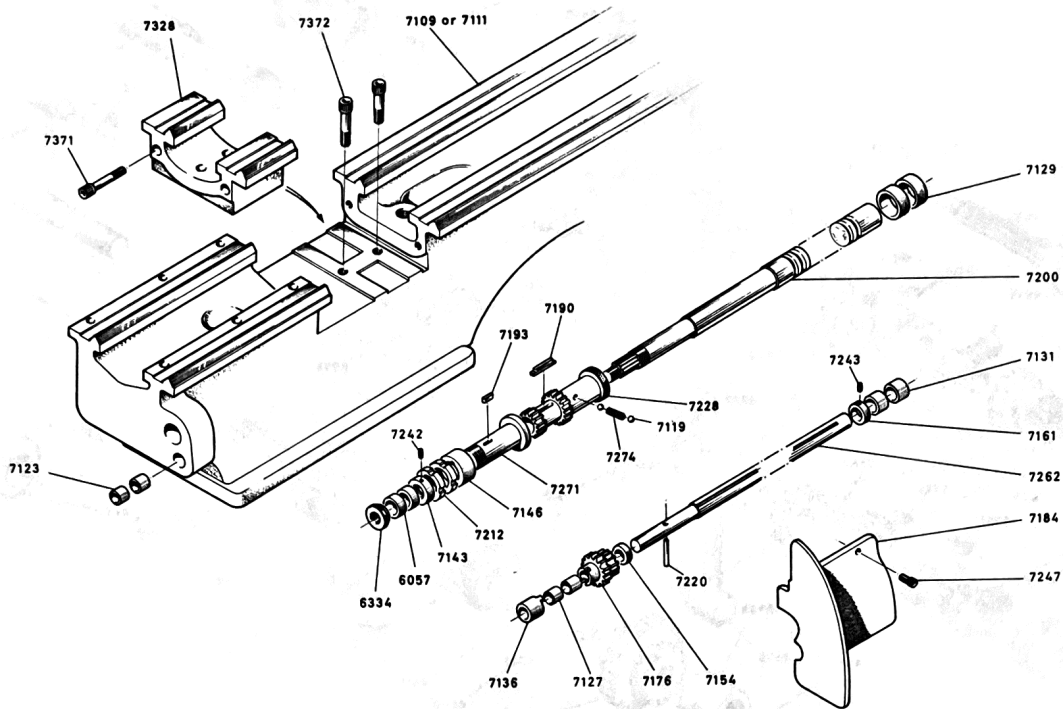
Order No.	Description	Order No.	Description	Order No.	Description
6476	Tumbler bearing	6653	Coneshaft gear, 19T	6963	* Locating strip jacking screws (4) 58-342
6484	Tumbler bearing flanged bush	6655	Coneshaft gear, 20T	6968	* Bush locking screws (3) 60-365
6501	Leadscrew bush, L.H.	6657	Coneshaft gear, 22T	6973	* Coneshaft collar locking screw 58-345
6505	Leadscrew bush, R.H.	6659	Coneshaft gear, 23T	6975	* Leadscrew collar locking screw 59-350
6514	Coneshaft bush, L.H.	6661	Coneshaft gear, 24T	6988	* Tumbler bearing bush screws (3) 45-203
6517	Coneshaft bush, R.H.	6663	Coneshaft gear, 26T	7004	* Locating strip securing screws (2) 47-225
6521	Driving shaft bush, L.H.	6665	Coneshaft gear, 28T	7038	Coneshaft, c/w bush
6525	Driving shaft bush, R.H.	6671	Leadscrew gear, 24T	7044	Driving shaft
6529	Intershaft bush	6697	Driving shaft gear, 16/24T	7049	Intershaft, 14T
6539	Tumbler shaft bush, L.H.	6701	Intershaft gear, 32T	7053	Tumbler gear shaft
6543	Tumbler shaft bush, centre	6704	Intershaft gear, 24T	7061	Tumbler shaft 15T
6547	Tumbler shaft bush, R.H.	6724	Tumbler shaft gear, 24/42T	7077	Leadscrew thrust screw
6560	* Tumbler shaft retaining clip 11-745	6728	Tumbler gear, 27T	7313	* Feedshaft tail-end bushes (2) 10-923
6562	* Intershaft gear retaining clip 11-754	6766	Leadscrew key	7316	* Leadscrew tail-end bushes (2) 10-936
6566	* Leadscrew retaining clip 11-745	6769	* Coneshaft key 17-001	7321	Feedshaft tail-end collar
6570	* Driving shaft retaining clip 11-744	6771	* Intershaft keys (2) 17-001	7324	Feedshaft coupling
6572	* Tumbler shaft retaining clip 11-743	6833	* Tumbler locating pin nut 20-621	7332	Leadscrew, 24 in.
6583	Leadscrew retaining collar	6835	* Leadscrew locknuts (2)	7338	Leadscrew, 36 in.
6586	Leadscrew screwed collar	6842	* Tumbler bearing bush O-ring 26-852	7354	* Feedshaft coupling pin 14-659
6590	Coneshaft screwed collar	6881	* Tumbler gear driving pin 24-543	7374	* Feedshaft tail-end collar screw 59-350
6599	Leadscrew spacer collar	6890	Tumbler locating pin	7383	Feedshaft, 24 in.
6603	Driving shaft spacer collar	6892	Tumbler roller pin	7392	Feedshaft, 36 in.
6606	Tumbler shaft spacer collar	6909	Coneshaft pinion, 24T		
6610	Leadscrew thrust collar	6923	Tumbler bearing plug		
6649	Coneshaft gear, 16T	6928	Intershaft bush core-plug		
6651	Coneshaft gear, 18T	6935	Tumbler shaft bush core-plug		
		6956	Tumbler roller		
		6961	* Locating strip adjusting screws (9) 60-365		



STU-P10-6512

**GEARBOX (Standard) : covers & levers**

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

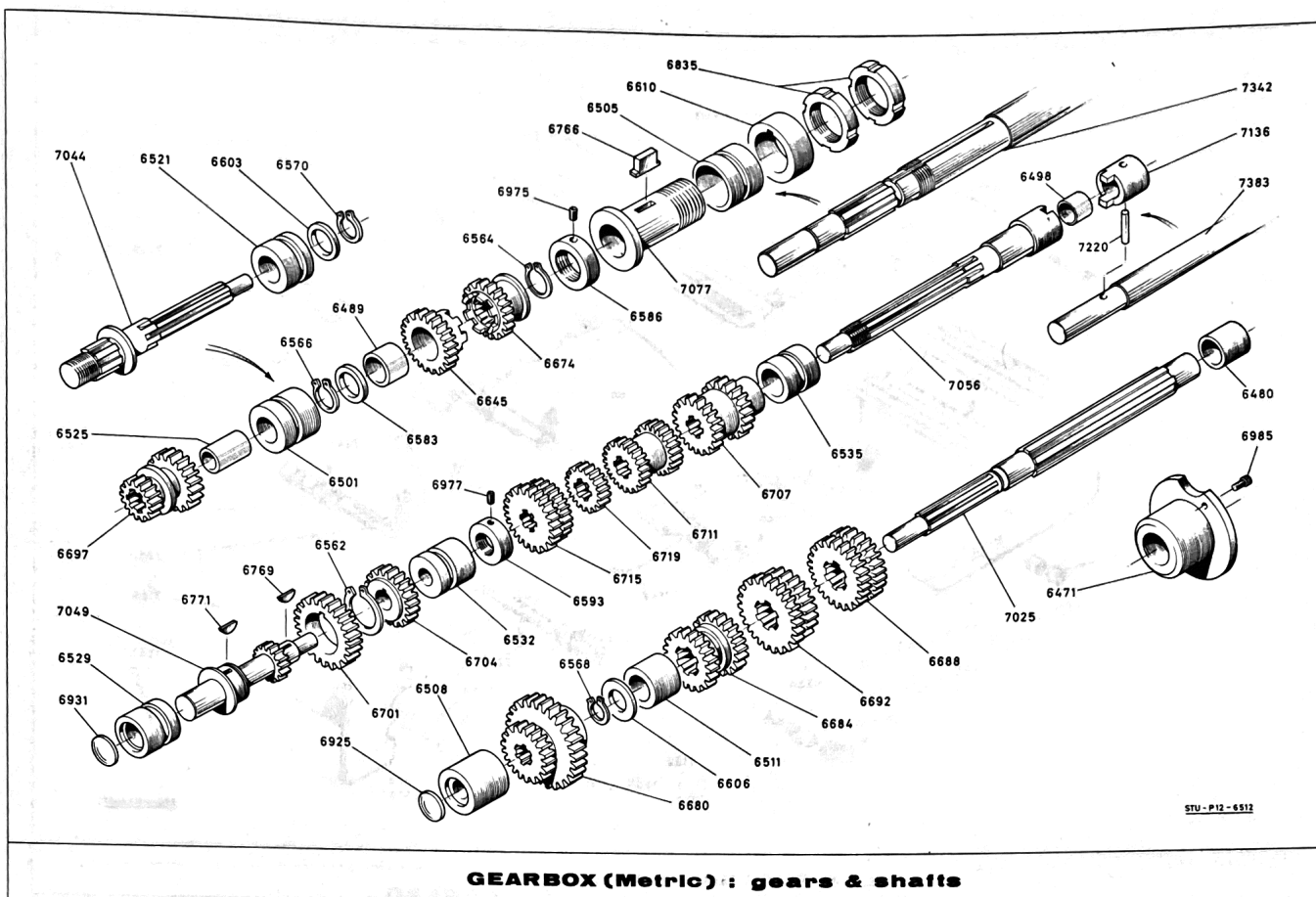


STU-P11-6512

**FEED SYSTEM : non-gearbox**

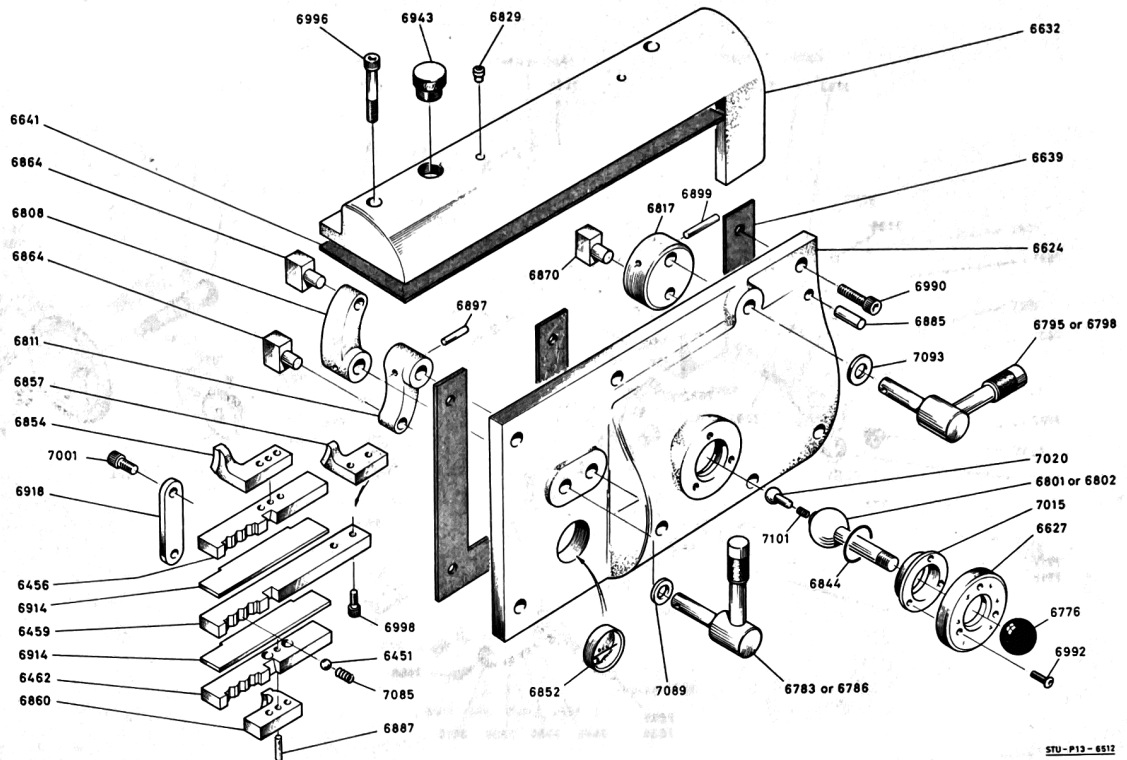
<u>Order No.</u>	<u>Description</u>	<u>Order No.</u>	<u>Description</u>
6057	Change-gear spacer collars (2)	7190	Leadscrew pinion key
6334	Knurled nut	7193	Leadscrew thrust sleeve key
7109	Bed - gap type	7200	Leadscrew, 24 in.
7111	Bed - straight type	7212	Thrust sleeve locknut
7119	* Leadscrew pinion locating balls (2) 01-788	7220	* Feedshaft coupling securing pin 14-659
7123	* Feedshaft head-end bracket bushes (2) 10-916	7228	Leadscrew pinion, 22/26T
7127	* Feedshaft gear bushes (2) 10-914	7242	* Leadscrew collar lock screw 53-300
7129	* Leadscrew tail-end bushes (2 or 1) 10-936 (or 10-940)	7243	* Feedshaft collar lock screw 53-300
7131	* Feedshaft tail-end bushes (2) 10-923	7247	* Pinion guard securing screws (2) 46-214
7136	Slipping clutch collar	7262	Feedshaft, 24 in.
7143	Leadscrew screwed collar	7271	Leadscrew thrust sleeve
7146	Leadscrew thrust sleeve collar	7274	Locating ball spring
7154	Feedshaft gear spacer collar	7328	Gap-piece
7161	Feedshaft tail-end collar	7371	* Gap-piece screws, horizontal (2) 48-246
7176	Feedshaft gear, 22/26T	7372	* Gap-piece screws, vertical (2) 48-242
7184	Pinion guard		





**GEARBOX (Metric) : gears & shafts**

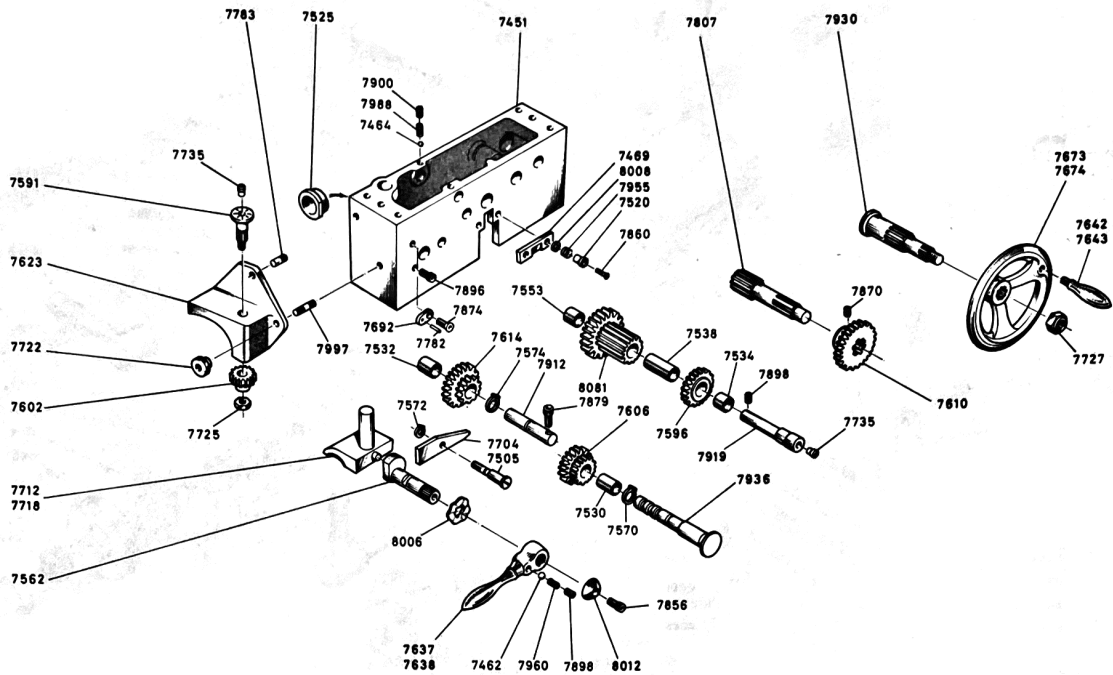
<u>Order No.</u>	<u>Description</u>	<u>Order No.</u>	<u>Description</u>	<u>Order No.</u>	<u>Description</u>
6471	Bottom shaft flanged bearing c/w bush	6570 *	Driving shaft retaining clip 11-745	6766	Leadscrew key
6480 *	Bottom shaft flanged bearing bush 10-949	6583	Leadscrew retaining collar	6769 *	Cone shaft key 17-001
6489 *	30T clutch gear bush 10-948	6586	Leadscrew screwed collar	6771 *	Intershaft key 17-001
6498 *	Second shaft insert bush 10-913	6593	Second shaft screwed collar	6835 *	Leadscrew locknuts (2)
6501	Leadscrew bush, L.H.	6603	Driving shaft spacer collar	6925	Bottom shaft bush core plug
6505	Leadscrew bush, R.H.	6606	Tumbler shaft spacer collar	6931	Intershaft bush core plug
6508	Bottom shaft bush, L.H.	6610	Leadscrew thrust collar	6975 *	Leadscrew collar locking screw 59-350
6511	Bottom shaft bush, centre	6645	Clutch gear, 30T	6977 *	Second shaft collar locking screw 58-345
6521	Driving shaft bush, L.H.	6674	Leadscrew gear, 24T	6985 *	Bottom shaft flanged bearing screws (2) 45-203
6525	Driving shaft bush, R.H.	6680	Bottom shaft gear, 24/42T	7025	Bottom shaft
6529	Intershaft bush	6684	Bottom shaft gear, 12/28T	7044	Driving shaft
6532	Second shaft bush, L.H.	6688	Bottom shaft gear, 35/18T	7049	Intermediate shaft, 14T
6535	Second shaft bush, R.H.	6692	Bottom shaft gear, 33/33T	7056	Second shaft
6562 *	Intershaft gear retaining clip 11-754	6697	Driving shaft gear, 16/24T	7077	Leadscrew thrust sleeve
6564 *	24T Leadscrew gear retaining clip 11-749	6701	Intershaft gear, 32T	7136	Slipping clutch collar
6566 *	Leadscrew retaining clip 11-745	6704	Intershaft gear, 24T	7220 *	Feedshaft coupling securing pin 14-659
6568 *	Bottom shaft retaining clip 11-743	6707	Second shaft gear 28/16T	7342	Metric leadscrew, 24 in.
		6711	Second shaft gear 24/22T	7383	Feedshaft
		6715	Second shaft gear 24/28T		
		6719	Second shaft gear 24T		



**GEARBOX (Metric) : covers & levers**

Order No.	Description
6451 *	Selector bar locating balls (3) 01-788
6456	Top selector bar
6459	Centre selector bar
6462	Bottom selector bar
6624	Front cover
6627	Selector lever cover
6632	Top cover
6639	Front cover gasket
6641	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

Order No.	Description
6852 *	Oil sight 80-871
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	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
7015	Selector lever seating
7020	Selector
7089 *	Selecting lever disc springs (2) 84-725
7093 *	Leadscrew selecting lever disc spring 84-725

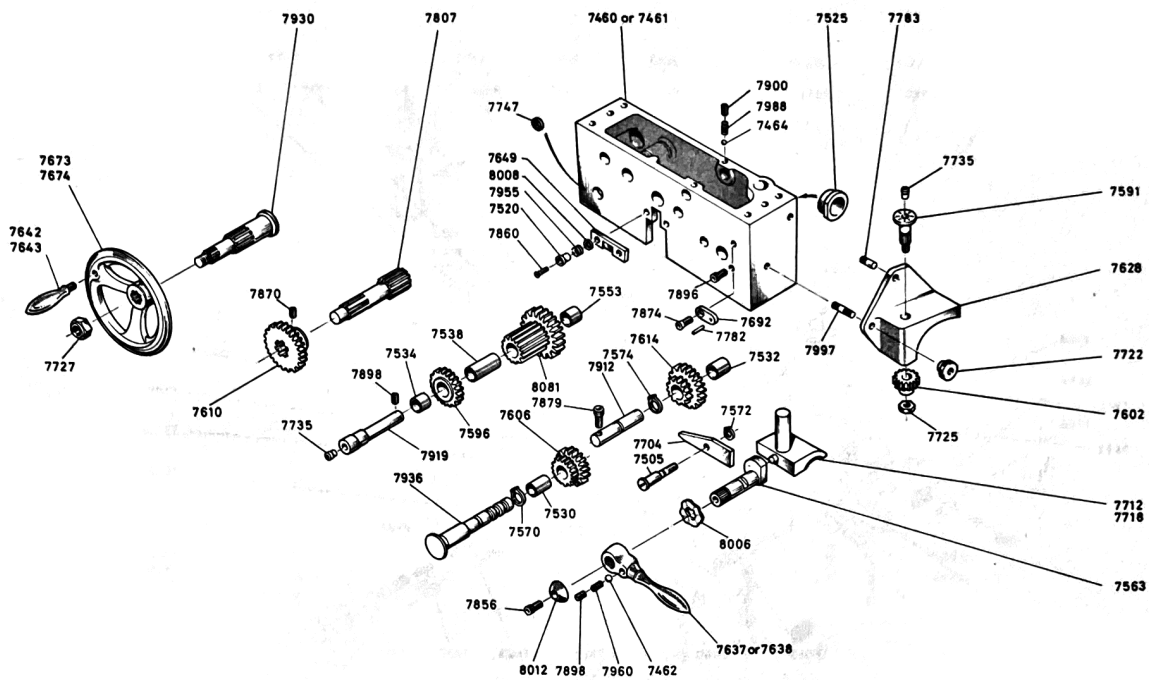


STU-214 - 8812

**APRON : Standard**

Order No.	Description	Order No.	Description	Order No.	Description
7451	Apron casting	7610	Sliding gear, 42T	7860	* Latch bar securing screws (2) 53-305
7462	* Half-nut handle locating ball 01-788	7614	Surfacing gear 22/38T	7870	* Sliding gear securing screw 60-362
7464	* Feed selector shaft locating ball 01-788	7623	+Dial indicator guard	7874	* Handle stop key securing screw 53-303
7469	Wormbox latch bar	7637	Leadscrew nut handle	7879	* Gear shaft securing screw 45-204
7505	Interlock lever pivot bolt	7638	Leadscrew nut handle (chromed)	7896	Half-nut handle stop screw 46-212
7520	Wormbox latch bar bush	7642	Apron handwheel handle	7898	* Half-nut handle spring tension screw 60-362
7525	Leadscrew flanged bush	7643	Apron handwheel handle (chromed)	7900	* Selector shaft spring tension screw 60-364
7530	* Feed selector gear bush 10-957	7673	Apron handwheel c/w handle	7912	Surfacing gear shaft
7532	* Surfacing gear bush 10-957	7674	Apron handwheel (chromed)	7919	Wormwheel & pinion shaft
7534	* Idler gear bush 10-964	7692	Half-nut handle stop key	7930	Handwheel racking shaft 13T
7538	* 25T pinion bush 10-958	7704	Interlock lever	7936	Feed selector shaft
7553	* Apron wormwheel bush 10-991	7712	Leadscrew half-nut (standard)	7960	Half-nut handle spring 82-797
7562	Leadscrew nut eccentric cam	7718	Leadscrew half-nut (metric)	7988	* Feed shaft spring 82-078
7570	* Feed selector gear retaining clip 13-784	7722	+Dial indicator knurled nut	7997	+Dial indicator guard stud
7572	* Interlock lever retaining clip 11-778	7725	* +Dial indicator gear retaining nut 21-659	8006	* Half-nut cam crinkle washer 86-735
7574	* Surfacing gear retaining clip 13-784	7727	* Apron handwheel retaining nut 21-673	8008	Latch bar damper washers (2)
7591	+Indicator dial	7735	* Oiler nipples (2) 23-124	8012	Half-nut handle domed washer
7596	Idler gear, 33T	7782	* Handle stop key locating pin 24-043	8081	Wormwheel & pinion, 33/25T
7602	+Dial indicator gear, 24T	7783	+Dial indicator guard locating pin		
7606	Feed selector gear, 25/32T	7807	Rack pinion, 12T		
		7856	* Half-nut handle retaining screw 46-212		

+ NOT on Continental lathes having metric gearbox.

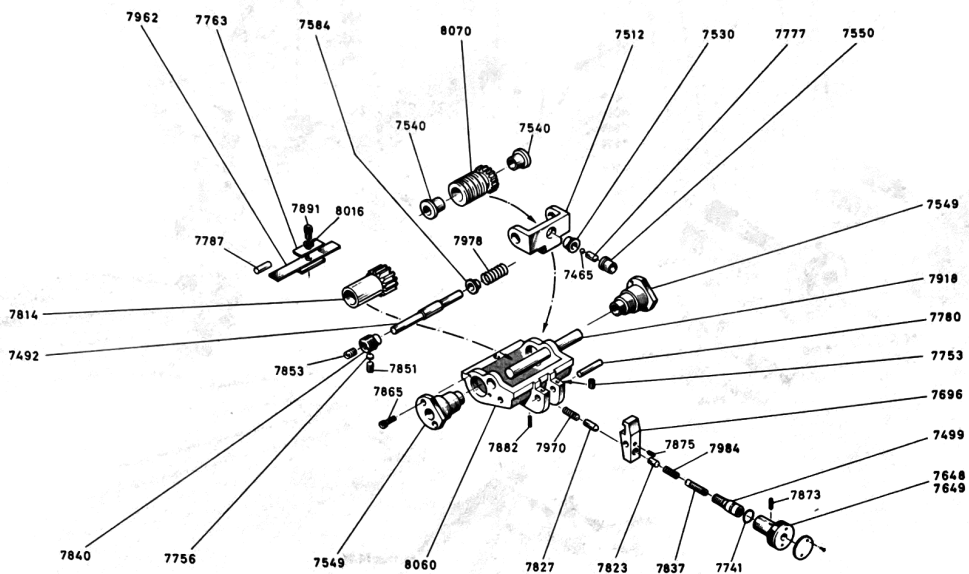


STU - P140 - 8817

**APRON : Straight bed**

Order No.	Description	Order No.	Description	Order No.	Description
7460	Apron casting	7614	Surfacing gear, 22/38T	7860	* Latch bar securing screws (2) 53-305
7461	Apron casting (clausung only)	7628	+Dial indicator guard	7870	* Sliding gear securing screw 60-362
7462	* Half-nut handle locating ball 01-788	7637	Leadscrew half-nut handle	7874	* Handle stop-key securing screw 53-303
7464	* Feed selector shaft locating ball 01-788	7638	Leadscrew half-nut handle (chromed)	7879	* Surfacing gear shaft securing screw 45-204
7469	Wormbox latch bar	7642	Apron handwheel handle	7896	* Half-nut handle stop screw 46-212
7505	Interlock lever pivot bolt	7643	Apron handwheel handle (chromed)	7898	* Handle spring tension screw 60-362
7520	Latch bar bush	7673	Apron handwheel c/w handle	7900	* Selector shaft spring tension screw 60-364
7525	Flanged bush	7674	Apron handwheel (chromed)	7912	Surfacing gear shaft
7530	* Feed selector gear bush 10-957	7692	Half-nut handle stop key	7919	Wormwheel & pinion shaft
7532	* Surfacing gear bush 10-957	7704	Interlock lever	7930	Handwheel racking shaft, 13T
7534	* Idler gear bush 10-964	7712	Leadscrew half-nut (standard)	7936	Feed selector shaft
7538	* 25T pinion bush 10-958	7718	Leadscrew half-nut (metric)	7960	* Leadscrew half-nut handle spring 82-797
7553	* Apron wormwheel bush 10-991	7722	+Dial indicator guard knurled nut 21-659	7988	* Feed selector shaft spring 82-078
7563	Leadscrew nut eccentric cam	7725	* +Dial indicator gear retaining nut 21-659	7997	+Dial indicator guard stud
7570	* Feed selector gear retaining clip 13-784	7727	* Apron handwheel retaining nut 21-673	8006	* Half-nut cam crinkle washer 86-735
7572	* Interlock lever retaining clip 11-778	7735	* Oiler nipple 23-124	8008	Latch bar damper washers (2)
7574	* Surfacing gear retaining clip 13-784	7747	* Oilsight (clausung only) 80-871	8012	Halfnut handle domed washer
7591	+Indicator dial	7782	* Handle stop-key locating pin 24-043	8081	Wormwheel & pinion, 33/25T
7596	Idler gear, 33T	7783	+Dial indicator guard locating pin		
7602	+Dial indicator gear, 24T	7807	Rack pinion, 12T		
7606	Feed selector gear, 25/32T	7856	* Half-nut handle retaining screw 46-212		
7610	Sliding gear, 42T				

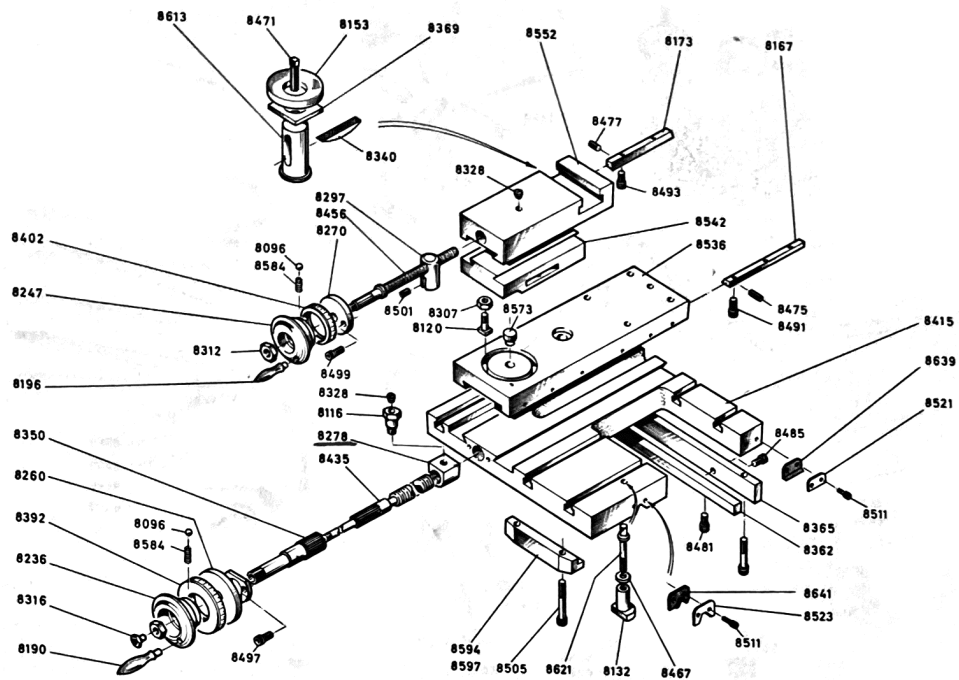
+ NOT on Continental lathes having metric gearbox



STU-P18-6812

**APRON WORMBOX - standard**

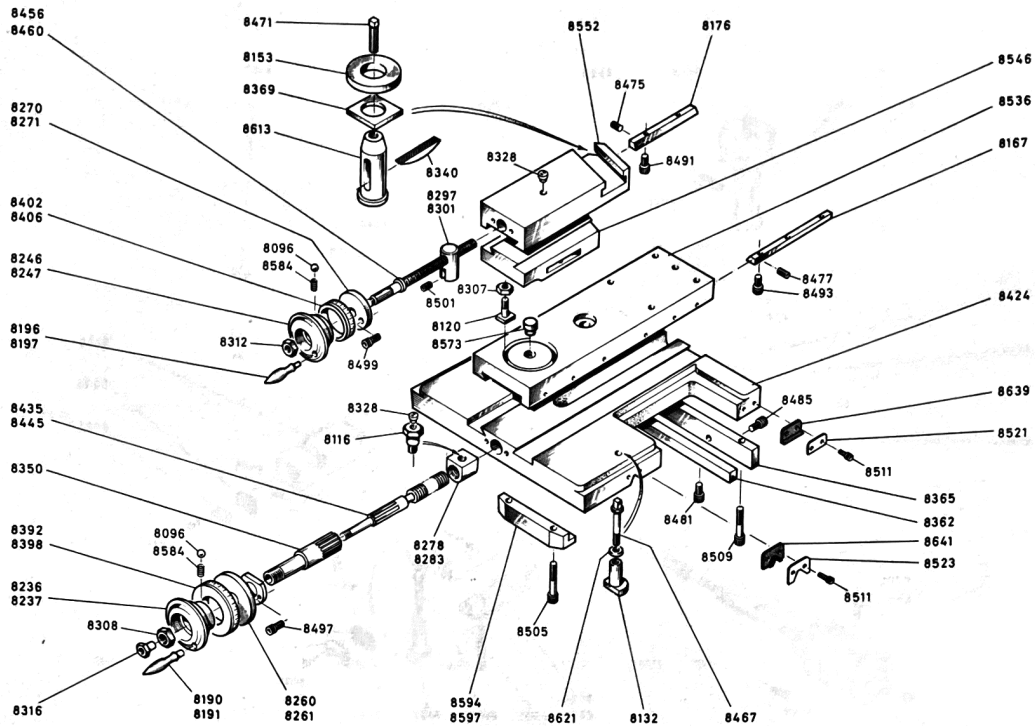
<u>Order No.</u>	<u>Description</u>	<u>Order No.</u>	<u>Description</u>
7465 *	Wormbox knock-off ball 01-789	7827	Latch return plunger
7499	Wormbox handle plunger	7837	Handle adjusting screw
7512	Wormbox bracket	7840	Knock-off pressure adjusting screws (2)
7530	25/32I feed selector gear bush	7851 *	Adjusting screw locking screws (2) 58-342
7540 *	Worm & pinion bush 10-909	7853 *	Spring support shaft locking screws (2) 68-428
7549	Wormbox support bushes (2)	7865 *	Wormbox support bush securing screws (4) 45-203
7550	Knock-off pin bush	7873 *	Wormbox handle securing screw 58-411
7584	Pressure spring collars (2)	7875 *	Latch securing screw 59-350
7648	Wormbox handle	7882 *	Shaft securing screw 58-347
7649	Wormbox handle (chromed)	7891 *	Leaf-spring securing screw 45-203
7696	Wormbox latch	7918	Worm & pinion shaft
7741 *	Wormbox handle oil-ring 27-862	7942	Spring support shaft
7753	Wormbox damping pads (2)	7962	Leaf spring
7756	Pressure adjusting screw pads (2)	7970 *	Handle plunger spring 82-324
7763	Leaf spring packing pieces (2)	7978	Knock-off pressure springs (2)
7777	Knock-off pin	7984	Latch return spring
7780	Wormbox latch pin	8016 *	Spring securing screw washer 86-738
7787 *	Wormbox rest pins (2) 24-543	8060	Wormbox casting
7814	Wormbox pinion	8070	Worm & pinion
7823	Handle plunger		



STU - P16 - 6512

**SADDLE & SLIDES : gap bed**

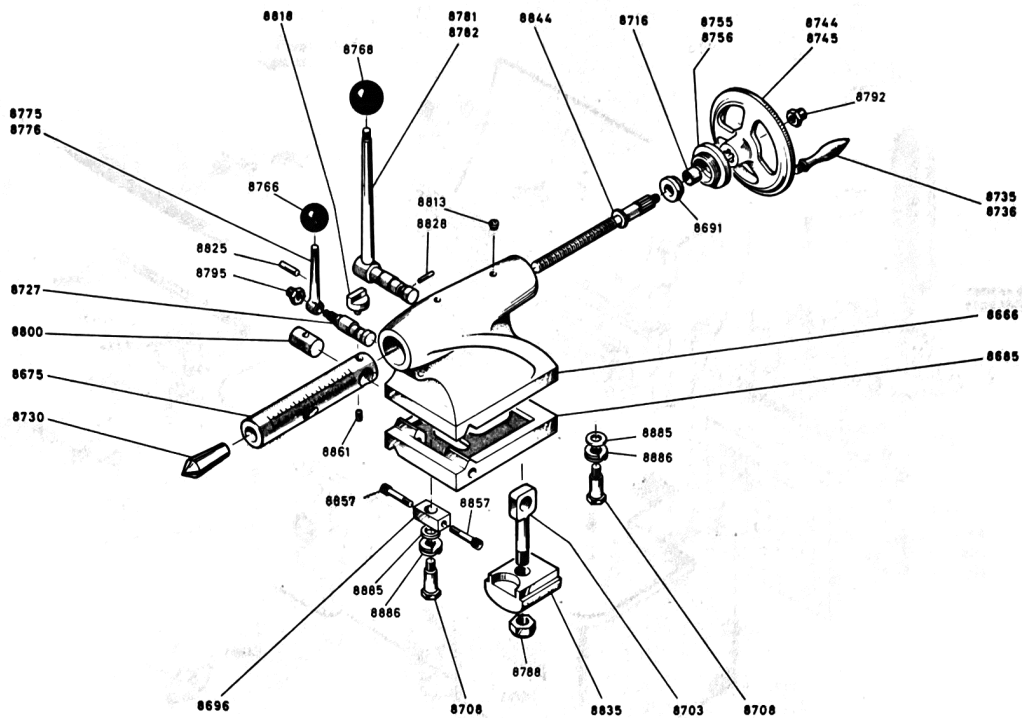
Order No.	Description	Order No.	Description	Order No.	Description
8096 *	Index ring pressure balls (6) 01-788	8328 *	Oiler nipples (9) 23-124	8497 *	Keep securing screws (2) 45-206
8116	Saddle screw nut fixing bolt	8340	Toolholder swivel piece	8499 *	Keep securing screws (2) 45-203
8120	Swivel slide clamp bolt & nut (2)	8350	Cross-slide screw pinion	8501 *	Screw nut securing screws 60-363
8132	Saddle locking clamp c/w pins	8362	Saddle rear strip adjusting plate	8505 *	Front strip securing screws (2) 46-218
8153	Toolholder collar	8365	Saddle rear strip fixed plate	8509 *	Rear strip securing screws (2) 47-229
8167	Cross-slide gibs (2)	8369	Toolholder clamp plate	8511 *	Wiper securing screws (8) 45-202
8173	Top-slide gib	8392	Cross-slide index ring	8521	Bedway wiper shields, flat (2)
8190	Cross-slide handwheel handle	8402	Top-slide index ring	8523	Bedway wiper shields, vee (2)
8196	Top-slide handwheel handles (2)	8415	Saddle casting	8536	Cross-slide c/w gib
8236	Cross-slide handwheel, complete	8435	Cross-slide screw & nut	8542	Swivel slide (standard)
8246	Top-slide handwheel, complete	8456	Top-slide screw & nut	8552	Standard top-slide c/w gib
8260	Cross-slide screw keep	8467	Saddle locking screw	8573	Swivel slide spigot
8270	Top-slide screw keep	8471	Toolholder tool screw	8584 *	Index ring springs (6) 82-795
8278	Cross-slide screw nut	8475 *	Gib adjusting screws (6) 58-345	8594	Saddle front strip (A-beds)
8297	Top-slide screw nut	8477 *	Gib adjusting screws (4) 58-345	8597	Saddle front strip (B-beds)
8307 *	Swivel slide clamp bolt nuts 20-621	8481 *	Rear strip adjusting screws (4) 46-214	8613	Toolholder c/w toolscrew
8308 *	Handwheel retaining nut 21-654	8485 *	Rear strip locking screws (2) 46-213	8621	Saddle locking screw washer
8312 *	Handwheel retaining nut 21-651	8491 *	Gib securing screws (6) 45-201	8639	Bedway wipers, flat (2)
8316	Cross-slide screw retaining nut	8493 *	Gib securing screws (4) 45-201	8641	Bedway wipers, vee (2)



STU-P17-8512

**SADDLE & SLIDES : straight bed**

Order No.	Description	Order No.	Description	Order No.	Description
8096 *	Index ring pressure balls (6) 01-788	8308 *	Cross-slide handwheel nut 21-654	8485 *	Saddle rear strip lock screws (2) 46-213
8116	Saddle screw nut fixing bolt	8312 *	Top-slide handwheel nut 21-651	8491 *	Cross-slide gib securing screws (4) 45-201
8120	Swivel slide clamp bolts & nuts (2)	8316	Cross-slide screw retaining nut	8493 *	Top-slide gib securing screws (6) 45-201
8132	Saddle locking clamp c/w pins	8328 *	Oiler nipples (9) 23-124	8497 *	Cross-slide keep securing screws (2) 45-206
8153	Toolholder collar	8340	Toolholder swivel piece	8499 *	Top-slide keep securing screws (2) 45-203
8167	Cross-slide gibs (2)	8350	Cross-slide screw pinion	8501 *	Top-slide screw nut securing screw 60-363
8176	Top-slide gib	8362	Saddle rear-strip adjusting plate	8505 *	Saddle front strip securing screws (2) 46-218
8190	Cross-slide handwheel handle	8365	Saddle rear-strip fixed plate	8509 *	Saddle rear strip securing screws (2) 47-229
8191	Cross-slide handwheel handle (chromed)	8369	Toolholder clamp plate	8511 *	Bed wiper screws (8) 45-202
8196	Top-slide handwheel handles (2)	8392	Cross-slide index ring (standard)	8521	Bedway wiper shields, flat (2)
8197	Top-slide handwheel handles (2) (chromed)	8398	Cross-slide index ring (metric)	8523	Bedway wiper shields, vee (2)
8236	Cross-slide handwheel assembly	8402	Top-slide index ring (standard)	8536	Cross-slide c/w gib
8237	Cross-slide handwheel assembly (chromed)	8406	Top-slide index ring (metric)	8546	Swivel slide (angular)
8246	Top-slide handwheel assembly	8424	Saddle casting	8552	Top-slide c/w gib (standard)
8247	Top-slide handwheel assembly (chromed)	8435	Cross-slide screw & nut (standard)	8573	Swivel slide spigot
8260	Cross-slide screw keep	8445	Cross-slide screw & nut (metric)	8584 *	Index ring springs (6) 82-795
8261	Cross-slide screw keep (chromed)	8456	Top-slide screw & nut (standard)	8594	Saddle front-strip (A-bed)
8270	Top-slide screw keep	8460	Top-slide screw & nut (metric)	8597	Saddle front-strip (B-bed)
8271	Top-slide screw keep (chromed)	8467	Saddle locking screw	8613	Toolholder c/w toolscrew
8278	Cross-slide screw nut (standard)	8471	Toolholder tool screw	8621	Saddle lock screw washer
8283	Cross-slide screw nut (metric)	8475 *	Cross-slide gib adjusting screws (4) 58-345	8639	Bedway wipers, flat (2)
8297	Top-slide screw nut (standard)	8477 *	Top-slide gib adjusting screws (6) 58-345	8641	Bedway wipers, vee (2)
8301	Top-slide screw nut (metric)	8481 *	Saddle rear strip adjusting screws (4) 46-214		
8307 *	Swivel slide clamp-bolt nuts (2) 20-621				

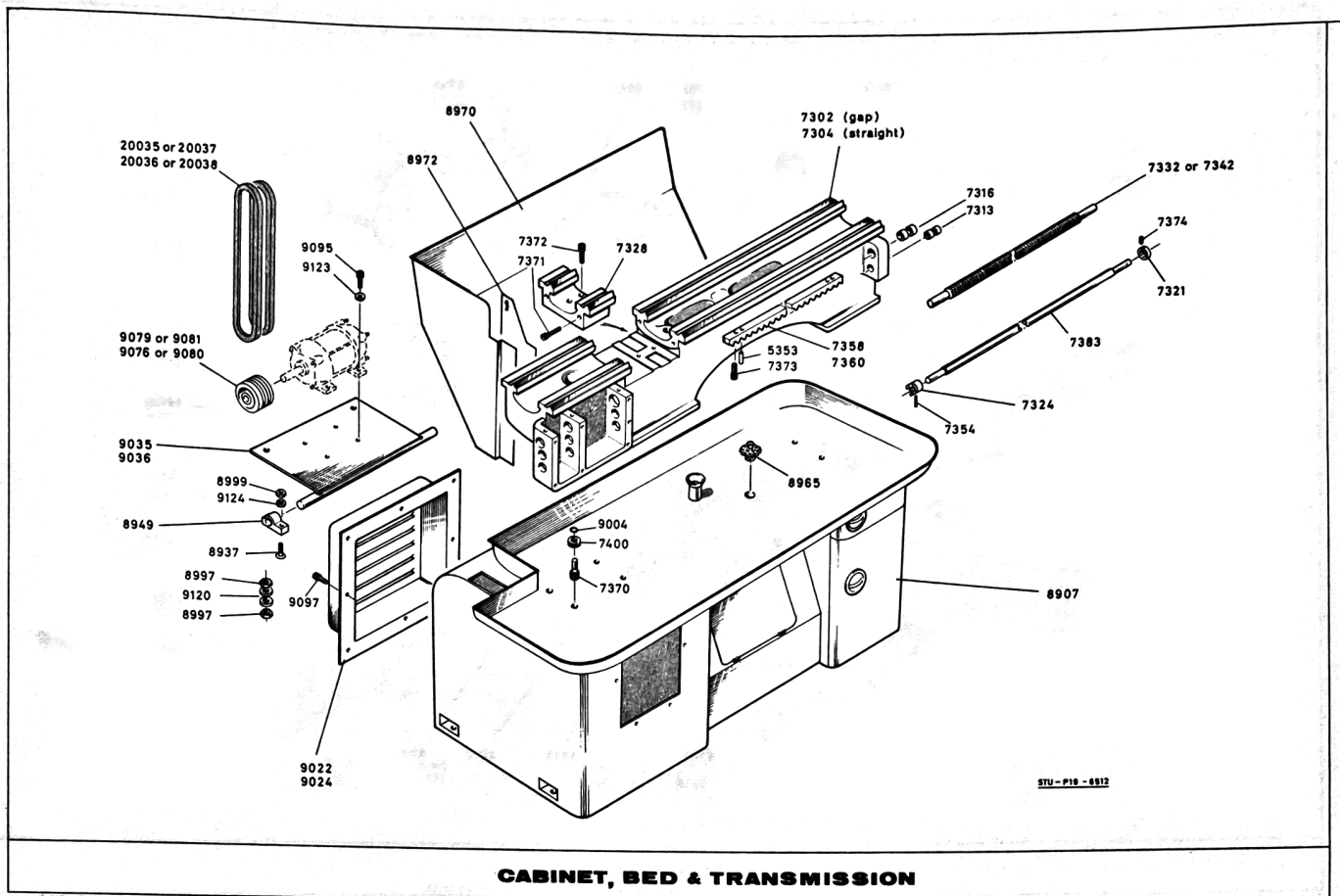


STU-P18-6600

**TAILSTOCK**

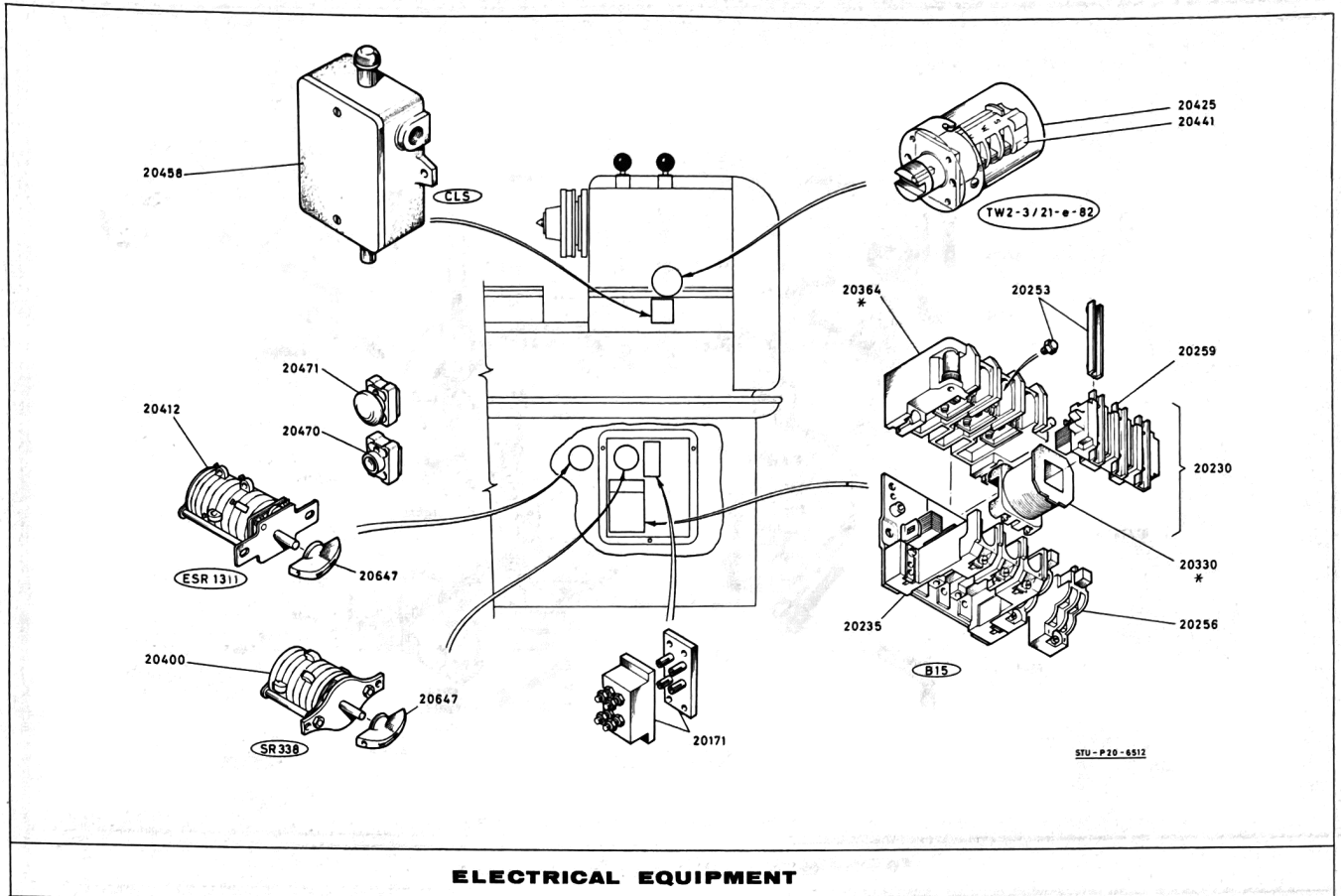
<u>Order No.</u>	<u>Description</u>	<u>Order No.</u>	<u>Description</u>
8666	Tailstock main casting	8775	Barrel clamp lever
8675	Tailstock barrel	8776	Barrel clamp lever (chromed)
8685	Tailstock base	8781	Tailstock clamp lever assembly
8691	* Barrel screw thrust bearing 04-882	8782	Tailstock clamp lever assembly (chromed)
8696	Set-over block	8788	* Clamp-plate retaining nut 21-675
8703	Clamping eye-bolt	8792	* Handwheel retaining nut 21-687
8708	Base retaining bolts (2)	8795	* Barrel clamp lever nut 22-696
8716	Tailstock keep bush	8800	Barrel screw nut
8727	Barrel clamp cam	8813	* Oiler nipples (2) 23-124
8730	No. 3 Morse centre	8818	Barrel clamp pad
8735	Handwheel handle	8825	* Clamp lever stop pin 24-577
8736	Handwheel handle (chromed)	8828	* Clamp lever stop pin 24-558
8744	Handwheel assembly complete	8835	Tailstock clamp plate
8745	Handwheel assembly (chromed)	8844	Barrel screw
8755	Tailstock screw keep	8857	* Set-over screws (2) 47-230
8756	Tailstock screw keep (chromed)	8861	* Clamp lever screw 73-531
8766	* Barrel clamp lever knob 18-838	8885	* Base bolt plain washers (2) 85-695
8768	* Tailstock clamp lever knob 18-836	8886	* Base bolt spring washers (2) 84-716





Order No.	Description
7302	Bed (gap-type)
7304	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
7332	Leadscrew, 24 in. (standard)
7342	Leadscrew, 24 in. (metric)
7353	* Rack locating pins (3) 24-539
7354	* Shaft-coupling securing pin 14-659
7358	Rack (A-bed)
7360	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
7383	Feedshaft
7400	* Bedscrew spring washers (6) 84-706
8907	Cabinet base assembly
8937	* Bracket securing bolts (2) 88-055
8949	Motor platform bracket
8969	Coolant drain filter

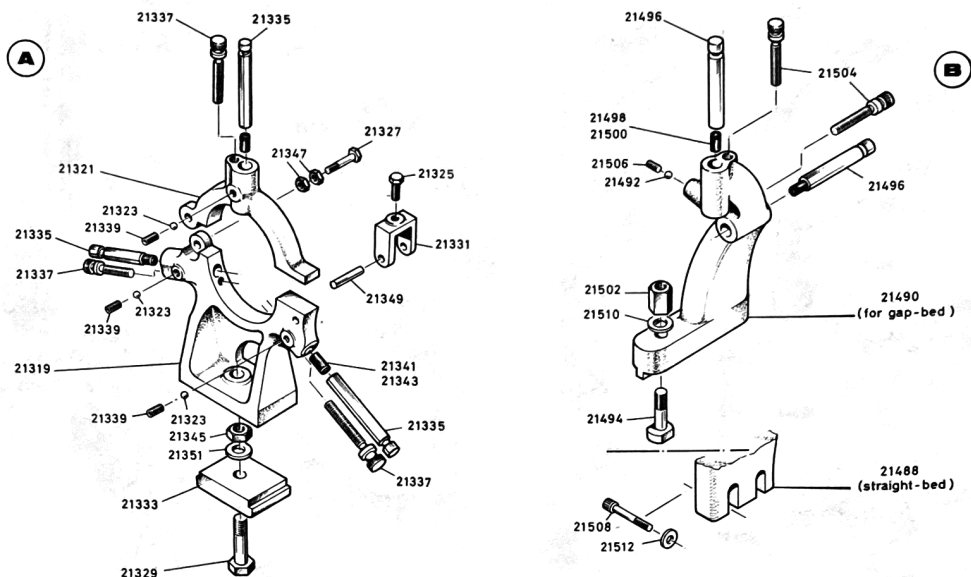
Order No.	Description
8970	Back splash guard assembly (short)
8972	Splash guard fixed-plate
8997	* Platform adjusting nuts (4) 20-639
8999	* Bracket bolt nuts (2) 22-698
9004	* Bed bolt oil-rings (6) 27-060
9022	Louvre plate, flat
9024	Louvre plate, boxed
9035	Motor platforms (1-speed)
9036	Motor platforms (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
20035	Vee belts, (1-speed, 50 c/s)
20036	Vee belts, (1-speed, 60 c/s)
20037	Vee belts, (2-speed, 50 c/s)
20038	Vee belts, (2-speed, 60 c/s)



**ELECTRICAL EQUIPMENT**

<u>Order No.</u>	<u>Description</u>	<u>Order No.</u>	<u>Description</u>
20171	Isolator plug & socket (set)	20344	Contacteur coil, 550-600v., 60 c/s
20230	Contacteur, Crabtree B-15 (complete)	20364 +	Contacteur overload unit, 2-4A
20235	Contacteur base block	20365	Contacteur overload unit, 3-6A
20253	Contacteur fixed & moving contacts (set)	20366	Contacteur overload unit, 5-10A
20256	Contacteur auxiliary contact	20400	Main motor switch, Santon SR338
20259	Contacteur traverse block	20412	Two-speed switch, Santon ESR1311
20330 +	Contacteur coil, 200-220v., 50 c/s	20425	Reverse switch unit, complete
20331	Contacteur coil, 200-240v., 50 c/s	20441	Reverse switch, Klockner-Moeller
20333	Contacteur coil, 380-420v., 50 c/s	20458	Limit switch, Craig & Derricott GLS
20335	Contacteur coil, 500-550v., 50 c/s	20470	Button-switch, start (green)
20340	Contacteur coil, 200-220v., 60 c/s	20471	Button-switch, stop (red)
20342	Contacteur coil, 440-480v., 60 c/s	20647	Knobs for 20400 & 20412 (2)

+ STATE ELECTRICAL DETAILS OF INSTALLATION WHEN ORDERING



ACC-ST-P101-65

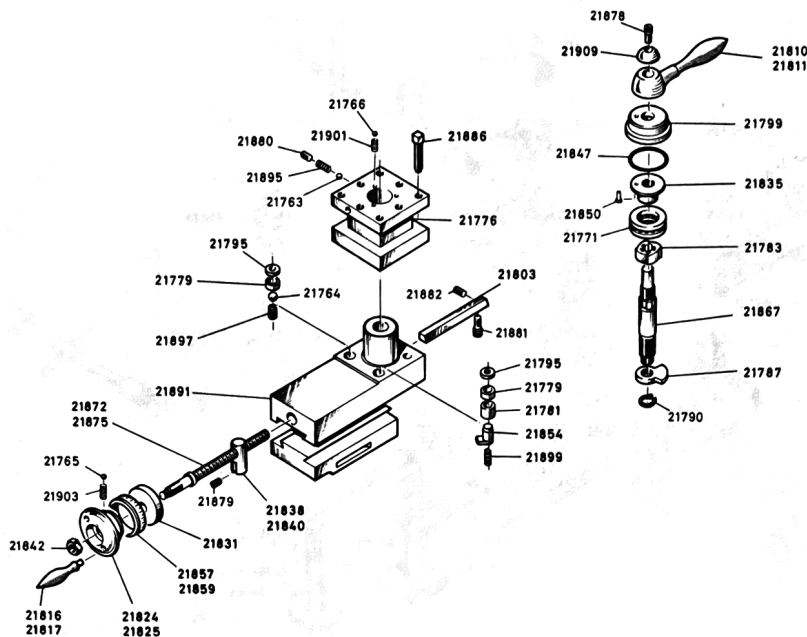
**STEADIES (steady rests)**

**A - STATIONARY STEADY**

Order No.	Description
21319	Steady base casting
21321	Steady_top casting
21323	* Finger locking balls (3) 01-793
21325	* Clamp fork bolt 08-112
21327	Pivot bolt
21329	Clamp-plate bolt
21331	Clamp fork
21333	Steady clamp plate
21335	Steady fingers (3)
21337	Finger adjusting screws (3)
21339	* Finger locking screws (3) 60-363
21341	Finger inserts, plastic (3)
21343	Finger inserts, bronze (3)
21345	* Clamp-plate bolt nut 20-614
21347	* Pivot bolt locknuts (2) 20-637

**B - TRAVELLING STEADY**

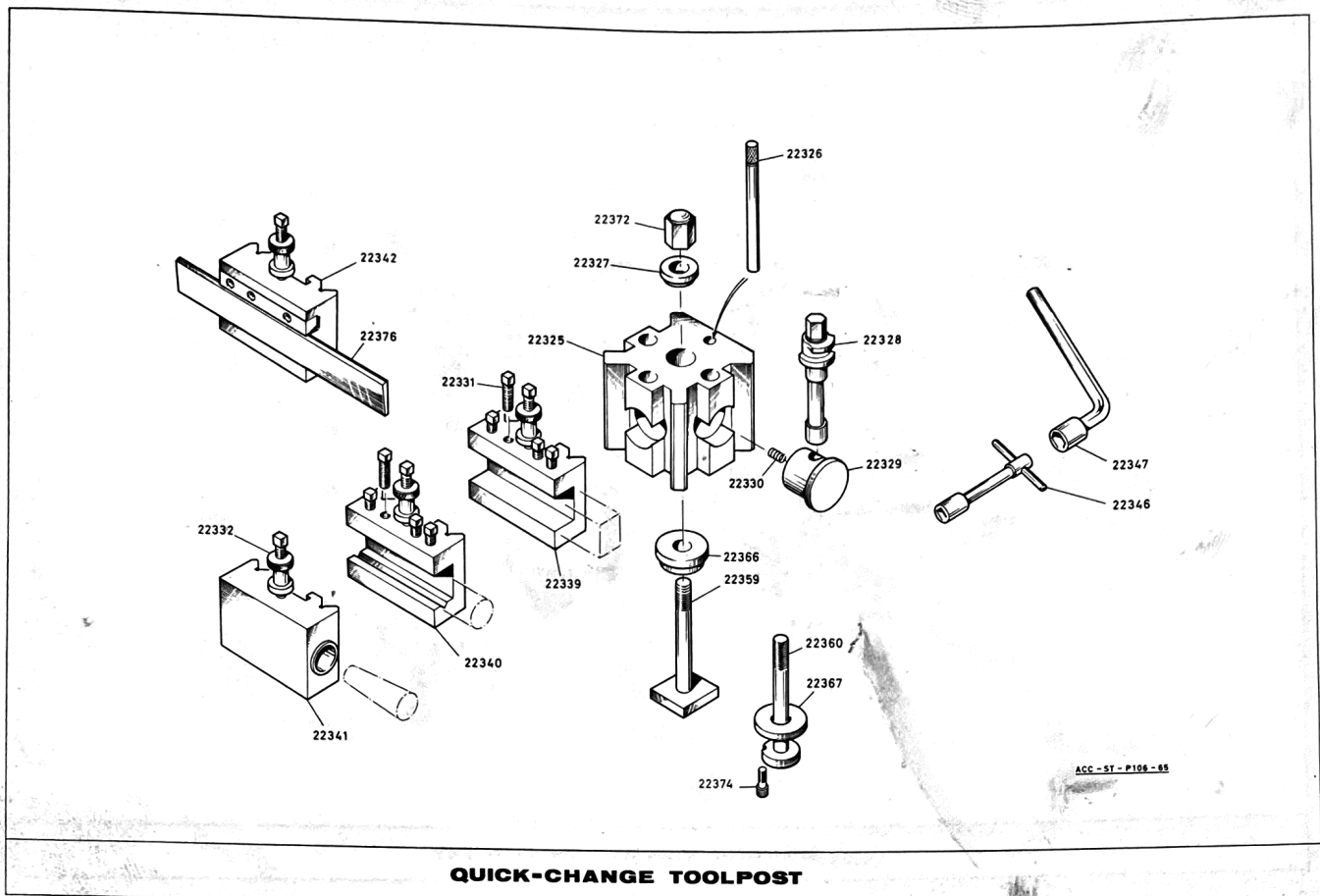
Order No.	Description
21349	Clamp fork hinge-pin
21351	* Clamp-plate bolt washer 85-695
21488	Steady casting (straight)
21490	Steady casting (gap)
21492	* Finger locking balls (2) 01-793
21494	Steady securing bolt
21496	Steady fingers (2)
21498	Finger inserts, plastic (2)
21500	Finger inserts, bronze (2)
21502	* Steady securing bolt nut 20-612
21504	Finger adjusting screws (2)
21506	* Finger locking screws (2) 60-365
21508	* Steady securing screws (2) 49-253
21510	* Securing bolt washer 85-695
21512	* Securing screw washers (2) 85-694



ACC-ST-P102-65

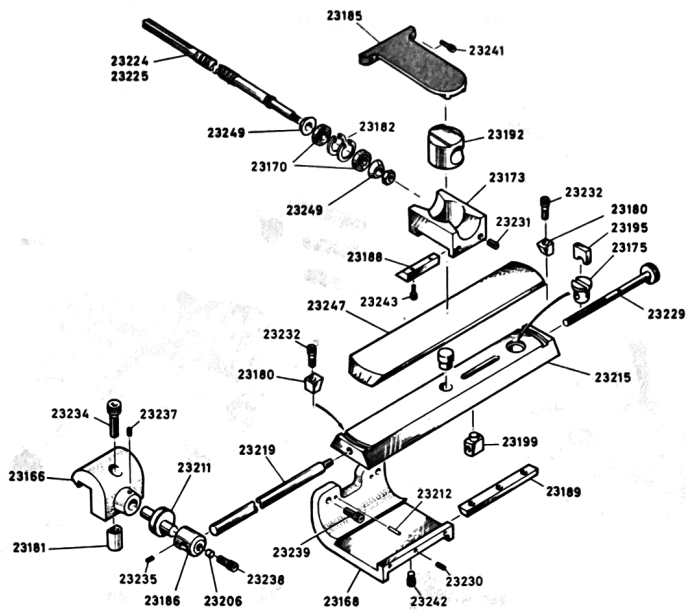
### SQUARE TURRET TOOLPOST

<u>Order No.</u>	<u>Description</u>	<u>Order No.</u>	<u>Description</u>
21763	* Indexing-cam balls (2) 01-788	21840	Top-slide-screw nut, metric
21764	* Turret locating ball 01-792	21842	* Handwheel securing nut 21-651
21765	* Indexing ring balls (3) 01-788	21847	* Bearing-cover oil ring 27-855
21766	* Pre-load spring balls (3) 01-786	21850	Locking pin
21771	* Thrust bearing 04-884	21854	Plunger c/w bush
21776	Turret block	21857	Index ring, standard
21779	Turret locating bushes (4)	21859	Index ring, metric
21781	Plunger bush	21867	Clamping screw
21783	Indexing cam	21872	Top-slide screw - standard
21787	Locking cam	21875	Top-slide screw, metric
21790	* Cam retaining clip 11-745	21878	* Clamping handle screw 46-214
21795	Bush withdrawal collars (4)	21879	* Topslide screw-nut screw 68-430
21799	Bearing cover	21880	* Index cam-ball tension screws (4) 60-362
21803	Top-slide gib	21881	* Gib securing screws (4) 45-201
21810	Clamping handle	21882	* Gib adjusting screws (4) 58-345
21811	Clamping handle (chromed)	21886	Tool screws (8)
21816	Handwheel handle	21891	Square-turret topslide
21817	Handwheel handle (chromed)	21895	* Indexing cam springs (2) 82-078
21824	Top-slide handwheel	21897	Turret locating spring
21825	Top-slide handwheel (chromed)	21899	Plunger spring
21831	Top-slide screw keep	21901	Pre-load springs (3)
21835	Turret clamp nut	21903	* Index-ring springs (3) 82-795
21838	Top-slide-screw nut, standard	21909	Clamping-handle domed washer



**QUICK-CHANGE TOOLPOST**

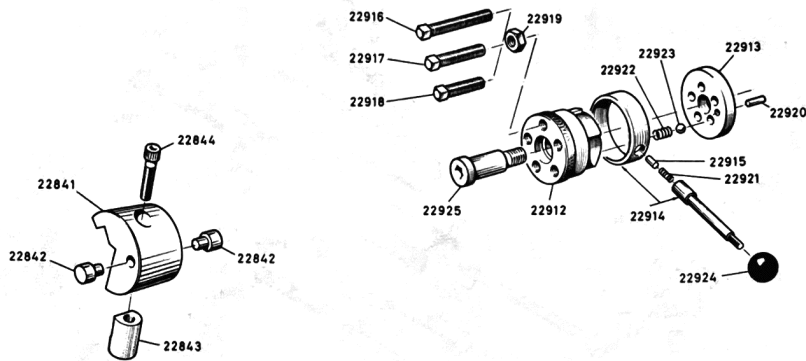
<u>Order No.</u>	<u>Description</u>	<u>Order No.</u>	<u>Description</u>
22325	Toolpost body	22341	No. 2 morse-taper toolholder
22326	Toolpost locating pin	22342	Parting-off toolholder
22327	Toolpost clamping collar	22346	Tool clamping-screw wrench
22328	Toolholder clamp cam	22347	Toolholder clamping wrench
22329	Toolholder clamp pad	22359	Toolpost bolt (slotted topslide)
22330	Clamp pad spring	22360	Toolpost bolt (solid topslide)
22331	Tool-clamping screws	22366	Toolpost locating collar (slotted topslide)
22332	Height-adjusting stop	22367	Toolpost locating collar (solid topslide)
22339	Standard toolholder	22372	* Toolpost clamping nut 21-685
22340	Boring-bar toolholder	22374	* Toolpost securing screw 45-202



ACC-ST-P104-65

**TELESCOPIC TAPER TURNING ATTACHMENT**

<u>Order No.</u>	<u>Description</u>	<u>Order No.</u>	<u>Description</u>
23166	Anchor bracket	23215	Fixed plate
23168	Taper-turner bracket	23217	Swivel-slide pivot
23170	* Cross-slide screw bearings 02-872	23219	Connecting-rod
23173	Slide block	23224	Cross-slide screw (standard)
23175	Adjusting screw keep bush	23225	Cross-slide screw (metric)
23180	Swivel-slide clamps (2)	23230	* Bracket-gib adjusting screws 58-345
23181	Anchor bracket clamp piece	23231	* Slide-block gib adjusting screws 58-345
23182	* Bearing retaining clips 12-766	23232	* Swivel-slide clamping screws 46-213
23185	Cross-slide extension	23234	* Anchor bracket locking screw 48-242
23186	Anchor bracket extension	23235	* Bracket extension locking screw 59-350
23188	Slide-block gib	23237	* Eccentric-pin locking screw 60-361
23189	Bracket gib	23238	* Connecting-rod locking screw 48-237
23192	Bearing housing	23239	* Bracket securing screws 46-214
23195	Adjusting screw keep	23241	* Extension securing screws 46-216
23197	* Thrust bearing adjusting nut 21-660	23242	* Bracket-gib securing screws 45-202
23199	Swivel slide adjusting screw nut	23243	* Slide-block gib securing screws 45-202
23206	Connecting-rod clamp pad	23247	Swivel slide
23211	Eccentric pin	23249	Bearing thrust washers
23212	* Bracket locating pins 24-542		

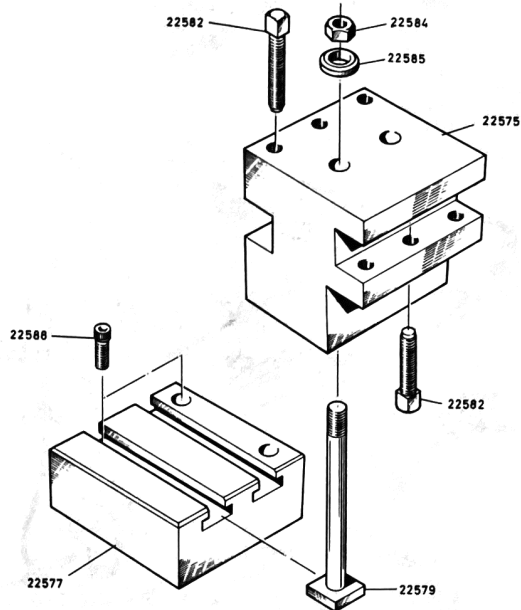


ACC-ST-P105-85

**BED STOPS (single & 5-pos.)**

<u>Order No.</u>	<u>Description</u>
22841	Body, single type
22842	Stop pads (2)
22843	Clamping piece
22844	* Locking screw 64-391
22912	5-position turret
22913	Turret plate
22914	Ratchet lever & ring assembly
22915	Ratchet locating pin
22916	Stop screw, long

<u>Order No.</u>	<u>Description</u>
22917	Stop screw, medium
22918	Stop screw, short
22919	* Stop screw locknuts 20-636
22920	* Turret-plate locating pin 24-541
22921	Ratchet lever spring
22922	Turret locating-ball spring
22923	* Turret locating ball 01-788
22924	* Ratchet-lever knob 18-840
22925	Turret spindle

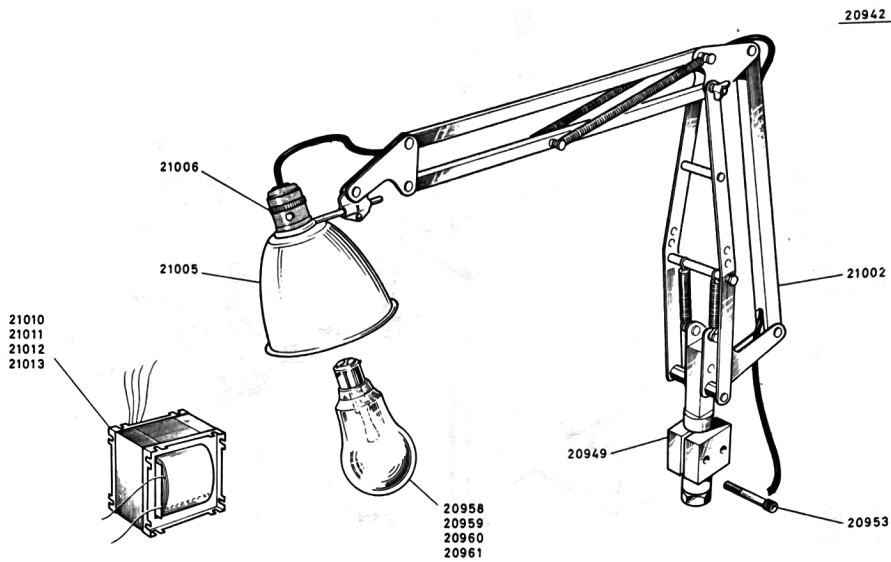


ACC-ST-P103-88

**REAR TOOLPOST**

<u>Order No.</u>	<u>Description</u>
22575	Toolpost block
22577	Base plate
22579	Toolpost clamping bolts (2)
22582	Tool screws (6)
22584	* Clamping-bolt nuts (2) 21-661
22585	* Clamping-bolt washers (2) 85-694
22588	* Base-plate securing screws (4) 47-228

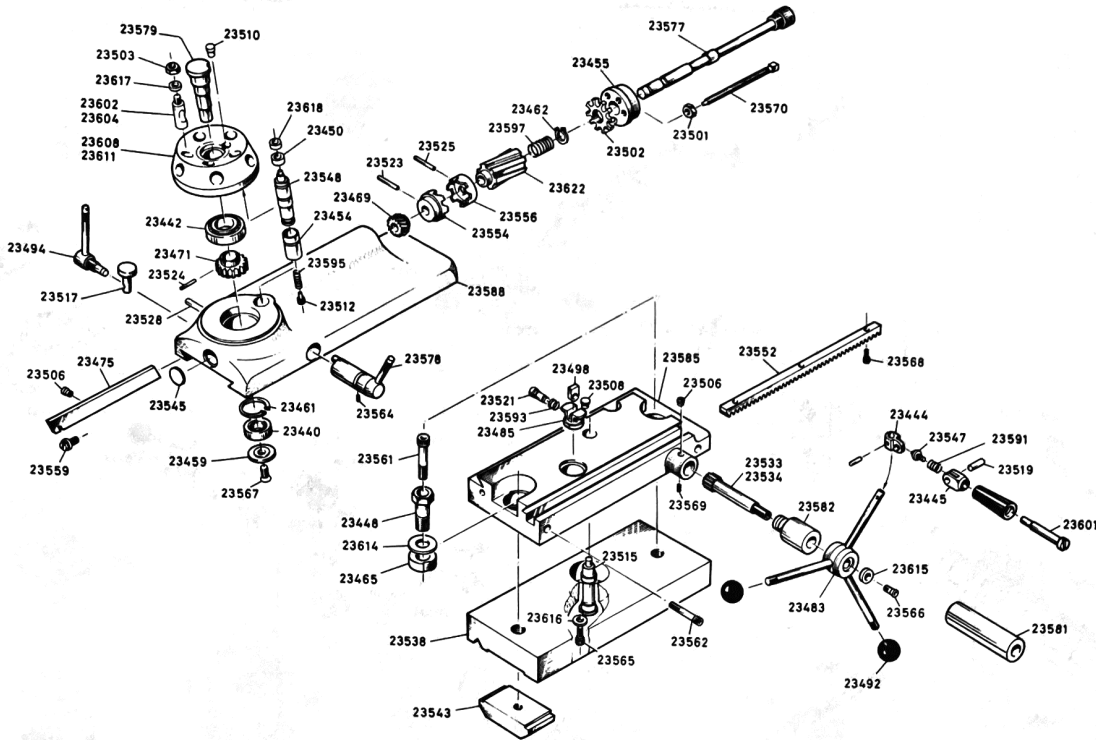




ACC-ST-P107-65

**LOW VOLT LIGHT UNIT**

<u>Order No.</u>	<u>Description</u>	<u>Order No.</u>	<u>Description</u>
20942	Low volt light unit, complete	21002	Low volt light frame
20949	Light unit mounting bracket	21005	Light shade
20953	* Mounting bracket screws (2) 45-206	21006	Light switch
20958	Light bulb, 12v.	21010	Transformer, 12v.
20959	Light bulb, 25v.	21011	Transformer, 25v.
20960	Light bulb, 32v.	21012	Transformer, 32v.
20961	Light bulb, 50v.	21013	Transformer, 50v.

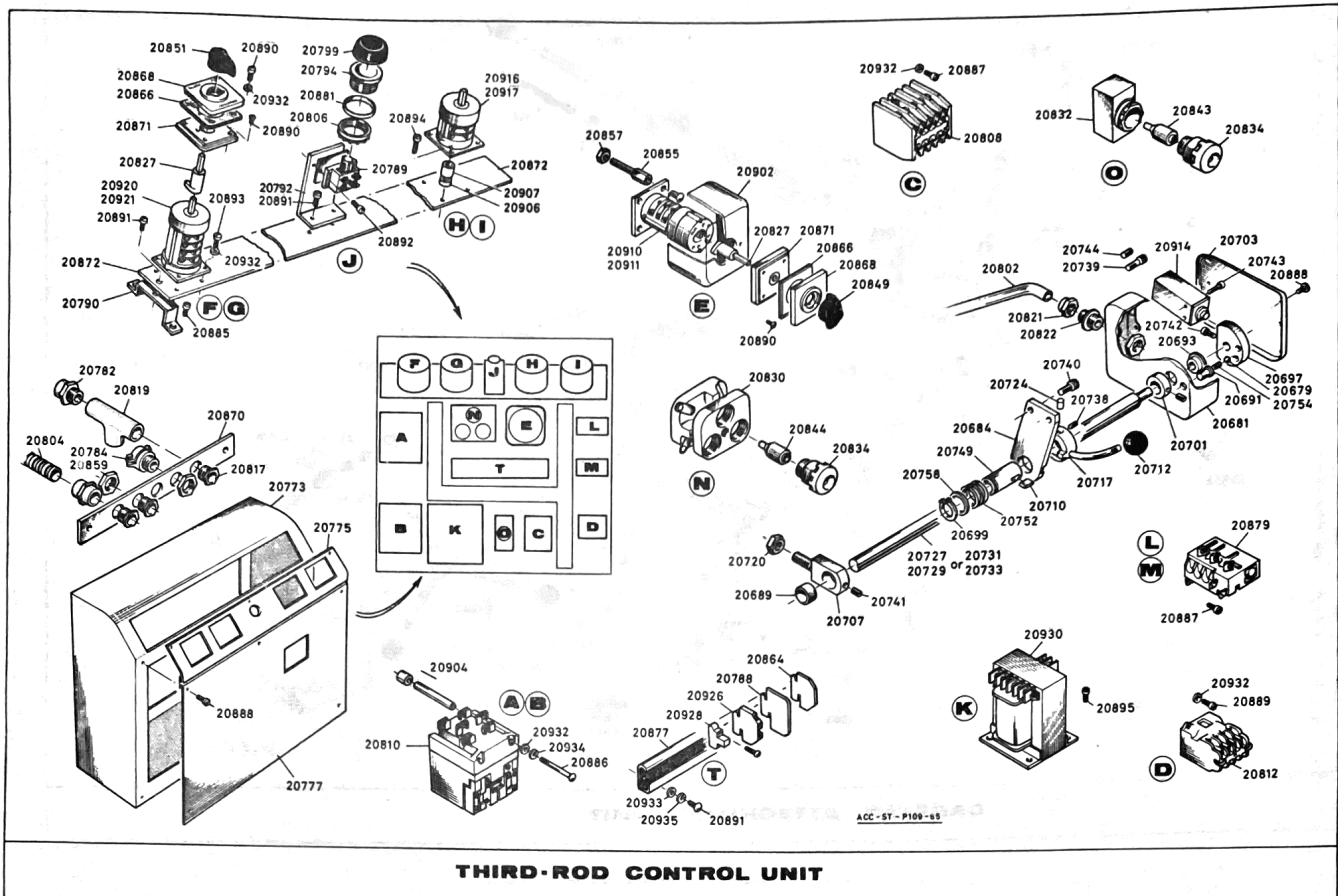


**CAPSTAN ATTACHMENT UNIT**

Order No.	Description
23440	* Turret-shaft bearing (small) 03-892
23442	* Turret-shaft bearing (large) 03-896
23444	Handwheel handle fixed block & pin
23445	Handwheel handle pivot block
23448	Base hollow bolts (2)
23450	Turret locating bush
23454	Indexing plunger bush
23455	Stop-screw bush
23459	Bearing cap
23461	* Bearing retaining clip 12-767
23462	* Spring retaining clip 11-737
23465	Base set-over collars (2)
23469	Connecting-shaft gear
23471	Turret-shaft gear
23475	Top-slide gib
23482	* Handwheel handle 16-842
23483	Handwheel assembly
23485	Trip lever housing
23492	* Handwheel knobs 18-837
23494	Slide locking lever assembly
23498	Trip lever
23501	* Stop-screw locknuts 20-621
23502	Connecting-shaft nut
23503	* Camlock-stud nuts 20-621
23506	* Oiler nipples 23-827
23508	Trip lever housing locating peg
23510	Turret-shaft locating peg

Order No.	Description
23512	Indexing plunger spring peg
23515	Worm actuating pin
23517	Locking pin
23519	Handle pivot pin
23521	Trip lever pivot pin
23523	* Gear securing pin 24-533
23524	* Turret gear securing pin 24-534
23525	* Ratchet securing pin 24-535
23528	* Locking-lever stop pin 24-541
23533	Handwheel pinion (standard)
23534	Handwheel pinion (extended)
23538	Base plate
23543	Clamp plates (2)
23545	Casting core plug
23547	Handle plunger
23548	Indexing plunger
23552	Rack
23554	Connecting-shaft ratchet
23556	Indexing-worm ratchet
23559	Gib adjusting screw
23561	* Capstan clamping screws (2) 48-249
23562	* Set-over screws (4) 61-376
23564	* Trip shaft locating screw 67-419
23565	* Worm-actuating pin locating screw 46-211
23566	* Handwheel retaining screw 53-305
23567	* Bearing-cap securing screw 73-534

Order No.	Description
23568	* Rack securing screws (3) 45-202
23569	* Pinion sleeve securing screw 59-351
23570	Stop screws
23577	Connecting shaft
23578	Trip-shaft assembly
23579	Turret shaft
23581	Handwheel extension sleeve (see 23534)
23582	Handwheel pinion sleeve
23585	Capstan bottom slide
23588	Capstan top-slide
23591	* Handle spring 82-063
23593	Trip lever spring
23595	* Indexing-plunger spring 82-846
23597	* Connecting-shaft spring 82-807
23601	Handle stem
23602	Cam-lock studs (standard)
23604	Cam-lock studs (metric)
23608	Turret c/w bushes (standard)
23611	Turret c/w bushes (metric)
23614	* Washers for hollow bolts (2) 85-699
23615	Handwheel retaining washer
23616	* Pin-locating screw washer 85-691
23617	Cam-lock stud washers
23618	Bush withdrawal washers
23622	Indexing worm

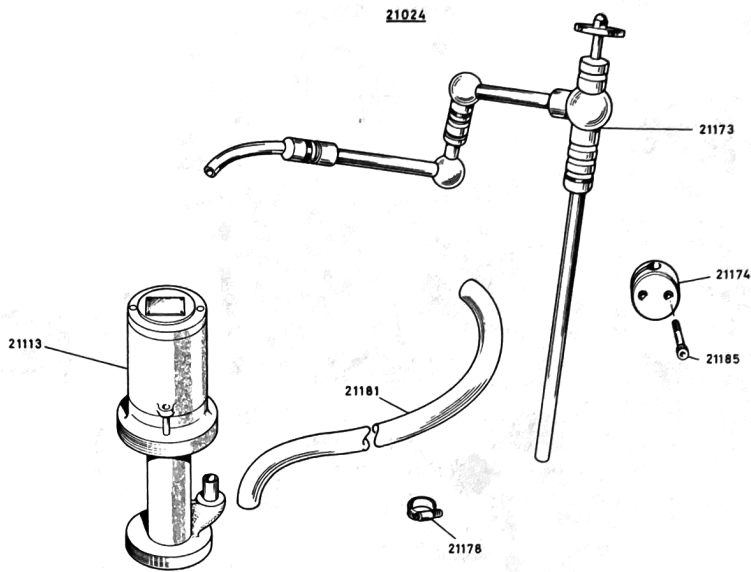


**THIRD-ROD CONTROL UNIT**

Order No.	Description	Order No.	Description	Order No.	Description
20679 *	Cam locating ball 01-788	20749	Operating lever sleeve	20843	Main phase fuse 1019
20681	Switch box, tail-end	20752 *	Operating-lever spring 82-132	20844	Control-circuit fuse 1018
20684	Operating lever bracket	20754 *	Cam locating spring 82-795	20849	Isolator switch knob 1008
20689 *	Eye-bolt bush 10-920	20758	Operating lever spring stop washer	20851	Selector switch knob 1009
20691	Cam locating-spring bush	20773	Control panel box	20855	Isolator switch adjusting nut 1051
20693	Third rod support bush	20775	Control panel top cover	20857	Switch adjusting nut locknut 1054
20697	Switch operating cam	20777	Control panel front cover	20859	Coupling locknut 1038
20699 *	Operating lever-spring clip 11-753	20781	Female conduit adapter 1034	20864	Terminal end-plate 1027
20701	Third rod tail-end collar	20782	Male conduit adapter 1037	20932	Screw washers 1055
20703	Switch box cover	20784	Pump conduit adapter 1035	20933	Rail-screw washers 1057
20707	Eyebolt	20788	Terminal barrier 1026	20934	Spring washers 1056
20710	Operating lever sleeve key	20789	Inch-contact block 1031	20935	Rail-screw spring washers 1058
20712 *	Operating lever knob 18-145	20790	Switch mounting-plate bracket		
20717	Operating lever assembly	20792	Inch-switch bracket		
20720 *	Eyebolt locknut 20-652	20794	Inch-button 1011		
20724	Operating lever swivel pins (2)	20799	Inch-button cap 1010		
20727	Third rod (short) ) 6½" & 13"	20802	Cable conduit 1040		
20729	Third rod (long) ) lathes	20804	Cable conduit, flexible 1039		
20731	Third rod (short) ) 7½" & 15"	20806	Inch-button retaining collar 1013		
20733	Third rod (long) ) lathes	20808	Star-point contactor 1022		
20737 *	Tail-end collar lock screw 59-350	20810	Forward/Reverse contactor 1020		
20738 *	Swivel-pin lock screws 58-343	20812	No-volt contactor 1023		
20739 *	Switch-box securing screws 46-213	20817	Male-conduit adapter coupling 1033		
20740 *	Bracket securing screws 46-213	20819	Three-way female coupling 1036		
20741 *	Eye-bolt bush securing screw 59-350	20821	Female coupling 1041		
20742 *	Cam securing screw 46-217	20822	Male coupling 1042		
20743 *	Limit-switch securing screws 45-208	20827	Switch-spindle extension 1004		
20744 *	Switch-box jacking screws 59-354	20830	Main fuse unit 1015		
		20832	Control-circuit fuse unit 1016		
		20834	Fuse holder 1017		

**UNIT IDENTIFICATION**

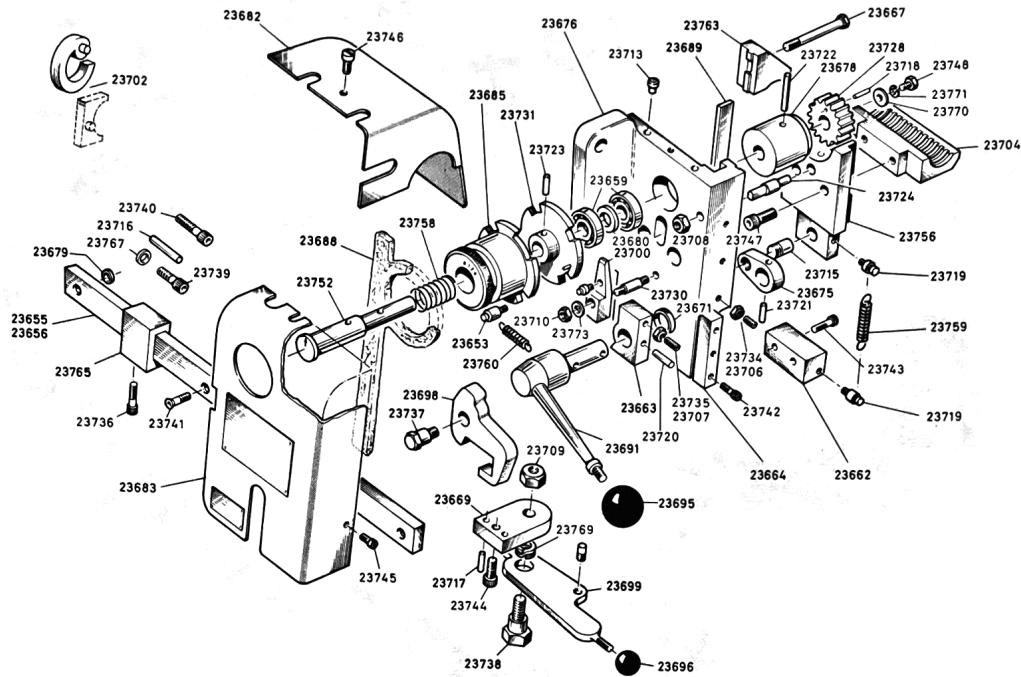
A	Forward contactor
B	Reverse contactor
C	Star point contactor
D	No-volt contactor
E	Main isolator switch
F	Forward speed selector
G	Reverse speed selector
H	Motor brake selector
I	Coolant pump selector
J	Inch button
K	Control transformer
L	Low-speed overload
M	High speed overload
N	Main phase fuse
O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



ACC-ST-P110-65

**COOLANT UNIT**

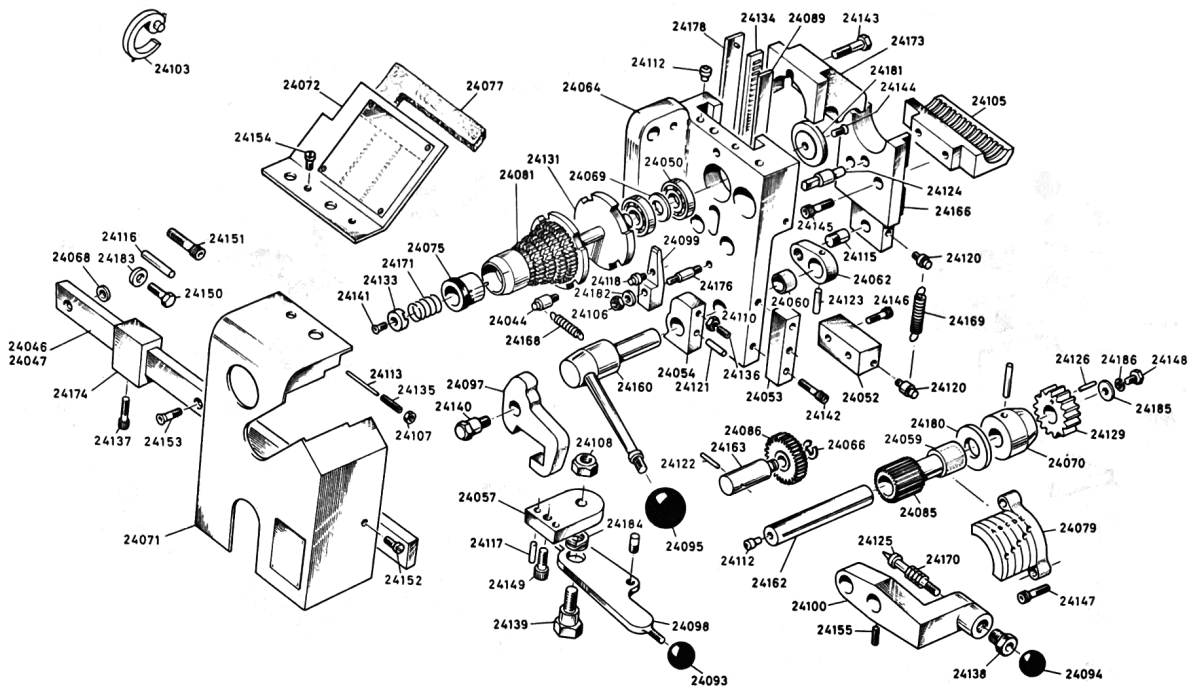
<u>Order No.</u>	<u>Description</u>	<u>Order No.</u>	<u>Description</u>
21024	Coolant unit c/w fittings (state electric supply)	21174	Feedpipe bracket
21113	Coolant pump (state details on existing pump)	21178	Hose clips (2)
21173	Feedpipe assembly, c/w bracket	21181	Flexible hose
		21185	* Pipe-bracket screws (2) 45-206



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**RAPID THREADER : English**

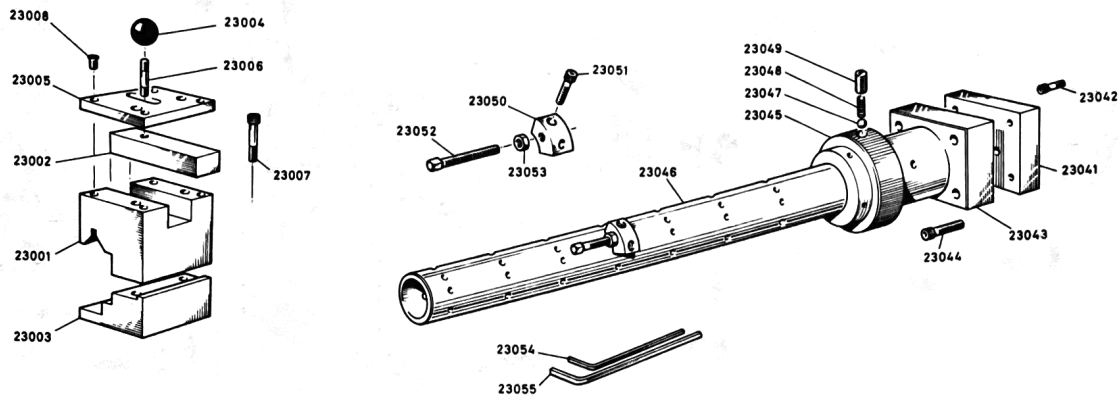
Order No.	Description	Order No.	Description	Order No.	Description
23653	Locking-lever spring anchor	23704	Half-nut (threader unit)	23737	Dis-engaging-lever pivot screw
23655	Stop bar (26 in.)	23706	* Nuts for gib adjusting screws 22-690	23738	Knock-off lever pivot screw
23656	Stop bar (46 in.)	23707	* Nut for locking-lever adjusting screw 22-689	23739	* Attachment securing screw (short) 47-227
23659	* Dial shaft bearings (2) 02-890	23708	* Nut for top-steady screw 22-689	23740	* Attachment securing screws (long) 47-228
23662	Spring anchor-block	23709	* Knock-off lever securing nut 22-691	23741	* Stop-bar securing screws 73-520
23663	Handle-shaft block	23710	* Locking-lever securing nut 22-689	23742	* Spacing-block securing screws 46-214
23664	Cover spacing-block	23713	* Oiler nipples 23-124	23743	* Anchor-block securing screws 73-197
23667	Top steady bolt	23715	* Slide driving pin	23744	* Bracket securing screw 73-199
23669	Knock-off lever bracket	23716	* Attachment location pin 14-131	23745	* Front-cover securing screws 73-472
23671	* Handle-shaft bush 10-006	23717	Lever-bracket locating pins	23746	* Back cover securing screws 73-472
23675	Handle-shaft cam	23718	* Pinion locating pin 24-046	23747	* Half nut securing screws (2) 73-196
23676	Threader main casting	23719	Main spring retaining pins (2)	23748	* Pinion securing screw 73-198
23678	Pinion driving collar	23720	* Shaft-block securing pin 24-543	23752	Dial shaft
23679	Stop-bar spacers	23721	* Shaft-cam securing pin 24-543	23756	Slide
23680	Dial-shaft bearing spacer	23722	* Pinion driving-collar pin 25-608	23758	Dial spring
23682	Back cover	23723	* Dial plate securing pin 24-543	23759	Main spring
23683	Front cover	23724	Selector pin	23760	Locking-lever spring
23685	Setting dial assembly	23728	Pinion	23763	Top steady
23688	Cover gasket (felt)	23730	Locking-lever pivot	23765	Adjustable stop
23689	Slide gib	23731	Dial plate	23767	* Securing screw washer 85-692
23691	Handle	23734	* Slide-gib adjusting screws (3) 73-195	23769	* Knock-off lever spring-washer 87-714
23695	Handle knob	23735	* Locking-lever adjusting screw 73-473	23770	* Pinion securing-screw washer 85-720
23696	Knock-off lever knob	23736	* Adjustable-stop locking screw 73-489	23771	* Pinion-screw spring washer 84-701
23698	Dis-engaging lever			23773	* Locking-lever securing nut washer 85-691
23699	Knock-off lever & pin				
23700	Locking-lever & pin				
23702	Half-nut lever lock (G-type) for lathe				



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**RAPID THREADER : Metric**

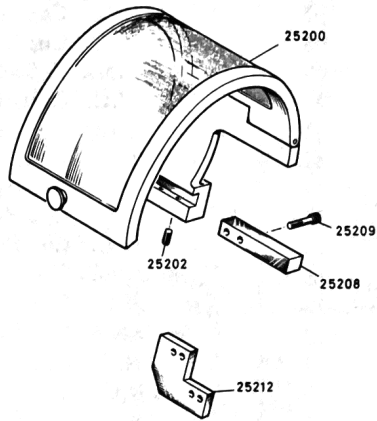
<u>Order No.</u>	<u>Description</u>	<u>Order No.</u>	<u>Description</u>	<u>Order No.</u>	<u>Description</u>
24044	Locking-lever spring anchor	24107	* Gib-screw nuts (3) 22-690	24144	* Setting-dial & cone gear screw
24046	Stop bar (26 in.)	24108	* Knock-off lever nut 22-691		73-195
24047	Stop bar (46 in.)	24109	* Driving gear shaft oiler	24145	* Half-nut securing screws (2)
24050	* Cone-gear bearings (2) 02-890		23-691		73-196
24052	Spring anchor block	24110	* Locking-lever screw nut 22-690	24146	* Anchor-block securing screws
24053	Cover spacing block	24112	* Slide oiler 23-124		73-197
24054	Handle-shaft block	24113	Gib-screw extension pin	24147	* Selector gate securing screws
24057	Knock-off lever bracket	24115	Slide-driving pin		73-197
24059	* Driving gear bush 10-009	24116	* Attachment locating pin 14-668	24148	* Pinion retaining screw 73-198
24060	* Handle-shaft bush 10-007	24117	Bracket locating pins (2)	24149	* Bracket securing screw 73-199
24062	Handle-shaft cam	24118	Locking-lever pin	24150	* Attachment screw (short) 47-227
24064	Main casting	24119	* Pinion driving-collar pin	24151	* Attachment screw (long) 08-052
24066	* Idler-gear retaining clip		25-608	24152	* Cover securing screws 73-472
		24120	Spring retaining pins (2)	24153	* Stop-bar securing screw 73-520
24068	Stop bar spacers	24121	* Handle-shaft block pin 24-542	24154	* Back cover screw 73-472
24069	Bearing spacer	24122	* Idler-gear shaft pin 24-046	24155	* Gear selector-lever securing screw
24070	Pinion driving collar	24123	* Handle-shaft cam pin 24-542	24160	Handle shaft assembly
24071	Front cover	24124	Selector pin	24162	Driving-gear shaft
24072	Back cover	24125	Gear-selector pin	24163	Idler-gear shaft
24075	Setting dial	24126	Pinion locating pin	24166	Slide
24077	Cover gasket (felt)	24129	Pinion	24168	Locking-lever spring
24079	Gear selector gate	24131	Cone-gear plate	24169	Main spring
24081	Cone gear assembly	24133	Dial spring retainer	24170	Gear selector-pin spring
24085	Driving gear	24134	Slide flat-cage roller	24171	Setting-dial spring
24086	Idler gear	24135	* Gib-adjusting screws (3) 73-195	24173	Leadscrew steady
24089	Slide gib	24136	* Locking-lever adjusting screw	24174	Adjustable stop
24093	Knock-off lever knob		73-473	24176	Locking-lever pivot stud
24094	Gear selector knob	24137	* Adjustable-stop locking screw	24178	Slide-roller track
24095	Handle knob		73-489	24180	Driving-gear washer
24097	Disengaging lever	24138	Gear-selector pin guide	24181	Dial-assembly retaining washer
24098	Knock-off lever & pin	24139	Knock-off lever pivot	24182	* Locking-lever washer 85-691
24099	Locking-lever	24140	Disengaging-lever pivot	24183	* Securing screw washer 85-692
24100	Gear selector lever	24141	Dial-spring retaining screw	24184	* Lever spring-washer 84-714
24103	Half-nut lever lock (C-type)	24142	* Cover spacing-block screws	24185	Pinion retaining washer
24105	Half-nut		46-214	24186	* Screw spring-washer 84-701
24106	* Locking lever nut 22-689	24143	* Steady securing screw 73-194		



ACC-ST - P113-6609

**BED STOP : long type**

<u>Order No.</u>	<u>Description</u>	<u>Order No.</u>	<u>Description</u>
23001	Bedstop body	23045	Indexing barrel
23002	Latch bar	23046	Stop tube
23003	Clamping piece	23047	Stop tube locating-ball
23004	Latch bar knob	23048	Locating-ball spring
23005	Body top-plate	23049	Spring-tension screw
23006	Latch bar stud	23050	Turret stop
23007	Clamp piece screws (2)	23051 *	Stop securing screws (2) 45-205
23008	Top-plate screws (4)	23052	Stop screws
23041	Auxiliary plate	23053	Stop screw locknut
23042 *	Auxiliary plate screws (3) 46-216	23054 *	Allen key 81-159
23043	Mounting block	23055 *	Allen key 81-160
23044 *	Mounting block screws (4) 46-216		



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**CHUCK · CHIP GUARD**

<u>Order No.</u>	<u>Description</u>	<u>Order No.</u>	<u>Description</u>
25200	Chuck/chip guard		
25202	* Guard-to-bed securing screws 59-354	25209	* Mounting bar securing screws 46-217
25208	Mounting bar	25212	Profilor clearance bracket



Appendix 1  
STANDARD PARTS REFERENCE LIST

Description	Section	Description	Section
Balls	01	10 x 24 t.p.i. Cap Screws – Hex Socket Head	45
Bearings – Ball Journal	02	1/4 in. U.N.C. Cap Screws – Hex Socket Head	46
Bearings – Roller	03	5/16 in. U.N.C. Cap Screws – Hex Socket Head	47
Bearings – Thrust	04	3/8 in. U.N.C. Cap Screws – Hex Socket Head	48
Belts – Flat	05	7/16 in. U.N.C. Cap Screws – Hex Socket Head	49
Belts – Timing	06	1/2 in. U.N.C. Cap Screws – Hex Socket Head	50
Belts – Vee	07	5/8 in. U.N.C. Cap Screws – Hex Socket Head	51
Bolts – Hex Head	08	3/4 in. U.N.C. Cap Screws – Hex Socket Head	52
Brake Shoes	09	10 x 24 t.p.i. C/Sunk Screws – Hex Socket Head	53
Bushes	10	1/4 in. U.N.C. C/Sunk Screws – Hex Socket Head	54
Circlips External	11	5/16 in. U.N.C. C/Sunk Screws – Hex Socket Head	55
Circlips Internal	12	3/8 in. U.N.C. C/Sunk Screws – Hex Socket Head	56
Circlips Special	13	1/2 in. U.N.C. C/Sunk Screws – Hex Socket Head	57
Spring Dowels	14	10 x 24 t.p.i. Cup Point Screws – Hex Socket Head	58
Electrical – Miscellaneous	15	1/4 in. U.N.C. Cup Point Screws – Hex Socket Head	59
Handles	16	5/16 in. U.N.C. Cup Point Screws – Hex Socket Head	60
Keys	17	3/8 in. U.N.C. Cup Point Screws – Hex Socket Head	61
Knobs	18	7/16 in. U.N.C. Cup Point Screws – Hex Socket Head	62
Motors	19	1/2 in. U.N.C. Cup Point Screws – Hex Socket Head	63
Nuts	20	5/8 in. U.N.C. Cup Point Screws – Hex Socket Head	64
Lock Nuts	21	3/4 in. U.N.C. Cup Point Screws – Hex Socket Head	65
Nuts – Miscellaneous	22	10 x 24 t.p.i. 1/2 Dog Screws – Hex Socket Head	66
Oilers	23	1/4 in. U.N.C. 1/2 Dog Screws – Hex Socket Head	67
Mills Pins	24	5/16 in. U.N.C. 1/2 Dog Screws – Hex Socket Head	68
Pins – Miscellaneous	25	3/8 in. U.N.C. 1/2 Dog Screws – Hex Socket Head	69
Oil Rings	26	1/2 in. U.N.C. 1/2 Dog Screws – Hex Socket Head	70
Oil Rings – Miscellaneous	27	5/8 in. U.N.C. 1/2 Dog Screws – Hex Socket Head	71
Rivets	28	3 B.A. B.A. Screws – Hex Socket Head	72
	29	Special Screws	73
	30		74
	31		75
	32		76
	33		77
	34		78
	35	Oil Seals	79
	36	Oil Sights	80
	37	Spanners & Wrenches	81
	38	Springs	82
	39	Switches	83
	40	Locking Washers	84
	41	Standard Washers	85
	42	Washers Miscellaneous	86
	43	Thread Inserts	87
	44	Miscellaneous	88
		Third-shaft control assembly	1000

**Section 01**  
**Balls**

Part Ref.	
01.185	1/8 Dia. Steel Ball.
01.786	5/32 Dia. Steel Ball.
01.787	3/16 Dia. Steel Ball.
01.788	1/4 Dia. Steel Ball.
01.789	5/16 Dia. Steel Ball.
01.790	3/8 Dia. Steel Ball.
01.791	9/16 Dia. Steel Ball.
01.792	5/8 Dia. Steel Ball.
01.793	1/4 Dia. Phosphor Bronze.
01.794	7/32 Dia. Steel Ball.
01.795	9/32 Dia. Steel Ball.
01.796	11/32 Dia. Steel Ball.
01.797	13/32 Dia. Steel Ball.
01.798	7/16 Dia. Steel Ball.
01.799	15/32 Dia. Steel Ball.
01.800	1/2 Dia. Steel Ball.
01.801	17/32 Dia. Steel Ball.
01.802	19/32 Dia. Steel Ball.

**Section 02**  
**Bearings - Ball Journal**

Part Ref.	
02.032	2 1/4 Dia. Hoffmann. XLS.
02.033	2 1/2 Dia. Hoffmann. XLS.
02.061	2 in. Dia. Hoffmann. XLS.
02.180	2 1/8 x 1 1/8 x 3/8 Hoffmann. S11.
02.872	10 m/m x 28 m/m x 8 m/m. Hoffmann. A10.
02.873	13 m/m x 30 m/m x 7 m/m. Hoffman. A13.
02.874	15 m/m x 35 m/m x 8 m/m. Hoffmann. A15.
02.875	3/4 i.d. x 1 7/8 o.d. Hoffmann LS.8.
02.876	7/8 i.d. x 1 7/8 o.d. x 3/8 wide Hoffmann. S9V2.
02.877	1 in. i.d. x 2 in. o.d. x 3/8 wide Hoffmann. S10V2.
02.878	50 m/m x 80 m/m x 16 m/m Hoffmann.
02.879	2 in. i.d. x 3 5/16 o.d. Hoffmann. XLS.2.

**Section 03**  
**Bearings - Roller**

Part Ref.	
03.038	181/118/181190 XH Gamet.
03.039	131095/131152 X Gamet.
03.079	HK1512 Ina Needle Roller.
03.183	1 1/8 x 7/8 x 3/4 Ina SC1412 Needle Roller.
03.184	1 in. x 1 1/4 x 1/2 Ina SC128 Needle Roller.
03.187	1 1/2 x 1 1/4 x 1 Ina SC2016 Needle Roller.
03.189	1 1/2 x 1 1/4 x 3/4 Ina SC2012 Needle Roller.
03.191	1 3/8 x 1 1/8 x 3/4 Ina SC1812 Needle Roller.
03.886	21 m/m x 15 m/m x 16 m/m HIHK.1516 Ina Needle.
03.887	1 in. x 3/4 x 3/4 Ina SC1212 Needle Roller.
03.888	7/8 x 1 1/16 x 3/4 Ina SC1112 Needle Roller.
03.889	35 m/m x 28 m/m x 20 m/m HK.2820 Ina Needle.
03.890	3/8 bore x 9/16 o.d. x 1/2 in. long Ina SC68 Needle Roller.
03.891	9/16 bore x 3/4 o.d. x 1/2 in. long Ina SC98 Needle Roller.

**Section 03 continued**

Part Ref.	
03.892	17 m/m x 40 m/m x 13 m/m KGSTaper roller KE30203
03.893	17 m/m bore Gamet taper roller 4 micron series plain.
03.894	1 1/16 bore x 7/8 o.d. x 1/2 in. long Ina SC118 Needle Roller.
03.895	20 m/m bore Gamet taper roller 4 micron series collar.
03.896	25 m/m x 52 m/m x 16 m/m KGS taper roller KE30205
03.897	1 in. x 1/4 x 3/4 Ina SC1612 Needle Roller.
03.898	1 1/8 x 1 3/8 x 1/2 Ina SC188 Needle Roller.
03.899	50 m/m x 90 m/m x 29 m/m Gamet taper roller.
03.900	2 3/8 bore x 4 o.d. x 1 in. long type 113060/113101 XH Gamet.
03.901	140085/140140 H. Gamet.
03.902	120063/1200110 H. Gamet.
03.910	111,050/111,090 Gamet.
03.911	131,095/131,152 X Gamet.
03.912	111,050/111,090 C Gamet.
03.913	112,045/112,085 C Gamet.
03.914	L181,118/181,190 XH Gamet.
03.916	SC1816 Ina Needle Roller.

**Section 04**  
**Bearings - Thrust**

Part Ref.	
04.081	A & K 1528 R & M.
04.882	WSP 5/8 in. Hoffmann.
04.883	HR 7/8 in. Hoffmann.
04.884	W 1 1/8 in. Hoffmann.
04.885	W 1 1/4 in. Hoffmann.
04.886	SCT 5/8 in. R & M.
04.887	SHT 7/8 in.
04.888	LT 1 1/4 in. R & M.

**Section 05**  
**Belts - Flat**

Part Ref.	
05.953	55 in. x 1 1/2 x 3 m/m Thk. 271-21 FW.
05.954	58 in. x 1 1/2 x 3 m/m Thk. 271-21 FW.
05.955	71 in. x 1 1/2 x 3 m/m Thk. 271-21 FW.
05.956	79 in. x 1 1/2 x 3 m/m Thk. 271-21 FW.
05.957	80 in. x 1 1/2 x 3 m/m Thk. 271-21 FW.
05.958	82 in. x 1 1/2 x 3 m/m Thk. 271-21 FW.
05.959	83 in. x 1 1/2 x 3 m/m Thk. 271-21 FW.
05.960	73 in. Lewis & Tyler.
05.961	75 in. Lewis & Tyler.
05.962	76 in. x 1 1/2 x 3 m/m Thk. 271-21 FW.
05.963	78 in. x 1 1/2 x 3 m/m Thk. 271-21 FW.
05.964	80 in. Lewis & Tyler.
05.965	81 in. Lewis & Tyler.
05.966	81 in. x 1 1/2 x 3 m/m Thk. 271-21 FW.

**Section 06**  
**Belts - Timing**

Part Ref.	
06.950	150L x 1/2 in. wide 40T.
06.951	187L x 1/2 in. wide 50T.
06.952	210L x 1/2 in. wide 56T.
06.953	225L x 1/2 in. wide 60T.
06.954	240L x 1/2 in. wide 64T.
06.955	255L x 1/2 in. wide 68T.
06.956	270L x 1/2 in. wide 72T.
06.957	285L x 1/2 in. wide 76T.
06.958	300L x 1/2 in. wide 80T.
06.959	322L x 1/2 in. wide 86T.
06.960	210L x 1 1/2 in. wide.
06.961	345L x 1/2 in. wide 92T.
06.962	360L x 1 1/2 in. wide.
06.963	367L x 1/2 in. wide 98T.
06.964	390L x 1/2 in. wide 104T.
06.965	420L x 1/2 in. wide 112T.
06.966	450L x 1/2 in. wide 120T.
06.967	480L x 1/2 in. wide 128T.
06.968	240H x 1 1/2 in. wide 48T.
06.969	270H x 1 1/2 in. wide 54T.
06.970	300H x 1 1/2 in. wide 60T.
06.971	330H x 1 1/2 in. wide 66T.
06.972	360H x 1 1/2 in. wide 72T.
06.973	390H x 1 1/2 in. wide 78T.
06.974	420H x 1 1/2 in. wide 84T.
06.975	450H x 1 1/2 in. wide 90T.
06.976	480H x 1 1/2 in. wide 96T.
06.977	510H x 1 1/2 in. wide 102T.
06.978	540H x 1 1/2 in. wide 108T.

**Section 07**  
**Belts - Vee**

Part Ref.	
07.142	A34 x 1/2 in. wide x 5/16 Thk.
07.929	A30 x 1/2 in. wide x 5/16 Thk.
07.930	A31 x 1/2 in. wide x 5/16 Thk.
07.931	A32 x 1/2 in. wide x 5/16 Thk.
07.932	A33 x 1/2 in. wide x 5/16 Thk.
07.934	A35 x 1/2 in. wide x 5/16 Thk.
07.935	A36 x 1/2 in. wide x 5/16 Thk.
07.936	A37 x 1/2 in. wide x 5/16 Thk.
07.937	A38 x 1/2 in. wide x 5/16 Thk.
07.938	A39 x 1/2 in. wide x 5/16 Thk.
07.939	A40 x 1/2 in. wide x 5/16 Thk.
07.940	A41 x 1/2 in. wide x 5/16 Thk.
07.941	A42 x 1/2 in. wide x 5/16 Thk.
07.942	A43 x 1/2 in. wide x 5/16 Thk.
07.943	A44 x 1/2 in. wide x 5/16 Thk.
07.944	A45 x 1/2 in. wide x 5/16 Thk.
07.945	A46 x 1/2 in. wide x 5/16 Thk.
07.946	A47 x 1/2 in. wide x 5/16 Thk.
07.947	A48 x 1/2 in. wide x 5/16 Thk.
07.948	A49 x 1/2 in. wide x 5/16 Thk.
07.949	A53 x 1/2 in. wide x 5/16 Thk.
07.950	A71 x 1/2 in. wide x 5/16 Thk.
07.951	A78 x 1/2 in. wide x 5/16 Thk.
07.952	A79 x 1/2 in. wide x 5/16 Thk.
07.953	A80 x 1/2 in. wide x 5/16 Thk.
07.954	A82 x 1/2 in. wide x 5/16 Thk.
07.955	A50 x 1/2 in. wide x 5/16 Thk.
07.956	A51 x 1/2 in. wide x 5/16 Thk.
07.957	A52 x 1/2 in. wide x 5/16 Thk.
07.958	A54 x 1/2 in. wide x 5/16 Thk.
07.959	A55 x 1/2 in. wide x 5/16 Thk.
07.960	A56 x 1/2 in. wide x 5/16 Thk.
07.961	A57 x 1/2 in. wide x 5/16 Thk.
07.962	A58 x 1/2 in. wide x 5/16 Thk.
07.963	A60 x 1/2 in. wide x 5/16 Thk.
07.964	A61 x 1/2 in. wide x 5/16 Thk.
07.965	A62 x 1/2 in. wide x 5/16 Thk.
07.966	A63 x 1/2 in. wide x 5/16 Thk.
07.967	A64 x 1/2 in. wide x 5/16 Thk.
07.968	A65 x 1/2 in. wide x 5/16 Thk.

Section 07 continued

Part Ref.

07.969	A66 x 1/2 in. wide x 5/16 Thk.
07.970	A68 x 1/2 in. wide x 5/16 Thk.
07.971	A70 x 1/2 in. wide x 5/16 Thk.
07.972	A72 x 1/2 in. wide x 5/16 Thk.
07.973	A74 x 1/2 in. wide x 5/16 Thk.
07.974	A75 x 1/2 in. wide x 5/16 Thk.
07.975	A76 x 1/2 in. wide x 5/16 Thk.
07.976	A81 x 1/2 in. wide x 5/16 Thk.
07.977	A84 x 1/2 in. wide x 5/16 Thk.
07.978	A85 x 1/2 in. wide x 5/16 Thk.
07.979	A87 x 1/2 in. wide x 5/16 Thk.
07.980	A90 x 1/2 in. wide x 5/16 Thk.
07.981	A92 x 1/2 in. wide x 5/16 Thk.
07.982	A93 x 1/2 in. wide x 5/16 Thk.
07.983	A94 x 1/2 in. wide x 5/16 Thk.
07.984	A96 x 1/2 in. wide x 5/16 Thk.
07.985	A97 x 1/2 in. wide x 5/16 Thk.

Section 08

Bolts - Hex Head

Part Ref.

08.002	10 x 24 t.p.i. x 1/2 in. long.
08.003	10 x 24 t.p.i. x 5/8 in. long.
08.004	10 x 24 t.p.i. x 3/4 in. long.
08.005	10 x 24 t.p.i. x 7/8 in. long.
08.006	10 x 24 t.p.i. x 1 in. long.
08.007	10 x 24 t.p.i. x 1 1/8 in. long.
08.008	10 x 24 t.p.i. x 1 1/4 in. long.
08.009	10 x 24 t.p.i. x 1 3/8 in. long.
08.010	10 x 24 t.p.i. x 1 1/2 in. long.
08.011	3/8 U.N.C. x 1 1/4 in. long.
08.012	3/8 U.N.C. x 2 in. long.
08.013	1/2 U.N.C. x 1 1/4 in. long.
08.014	1/2 U.N.C. x 1 1/2 in. long.
08.015	1/2 U.N.C. x 1 3/4 in. long.
08.016	1/2 U.N.C. x 2 in. long.
08.017	3/4 U.N.C. x 3 1/2 in. long.
08.018	3/8 U.N.C. x 1 1/2 in. long.
08.019	3/8 U.N.C. x 3 in. long.
08.020	1/2 U.N.C. x 2 1/4 in. long.
08.021	3/8 U.N.C. x 4 in. long.
08.022	1/2 U.N.C. x 3 1/2 in. long.
08.023	10 x 24 t.p.i. x 1 5/8 in. long.
08.024	10 x 24 t.p.i. x 1 3/4 in. long.
08.025	10 x 24 t.p.i. x 1 7/8 in. long.
08.026	10 x 24 t.p.i. x 2 in. long.
08.027	10 x 24 t.p.i. x 2 1/8 in. long.
08.028	10 x 24 t.p.i. x 2 1/4 in. long.
08.029	10 x 24 t.p.i. x 2 3/8 in. long.
08.030	10 x 24 t.p.i. x 2 1/2 in. long.
08.031	1/4 U.N.C. x 1/2 in. long.
08.032	1/4 U.N.C. x 3/8 in. long.
08.033	1/4 U.N.C. x 3/4 in. long.
08.034	1/4 U.N.C. x 7/8 in. long.
08.035	1/4 U.N.C. x 1 in. long.
08.036	1/4 U.N.C. x 1 1/8 in. long.
08.037	1/4 U.N.C. x 1 1/4 in. long.
08.038	1/4 U.N.C. x 1 1/2 in. long.
08.039	1/4 U.N.C. x 1 3/4 in. long.
08.040	1/4 U.N.C. x 1 7/8 in. long.
08.041	1/4 U.N.C. x 1 3/4 in. long.
08.042	1/4 U.N.C. x 1 7/8 in. long.
08.043	1/4 U.N.C. x 2 in. long.
08.044	1/4 U.N.C. x 2 1/8 in. long.
08.045	1/4 U.N.C. x 2 1/4 in. long.
08.046	1/4 U.N.C. x 2 3/8 in. long.
08.047	1/4 U.N.C. x 2 1/2 in. long.
08.048	5/16 U.N.C. x 3/4 in. long.
08.049	5/16 U.N.C. x 7/8 in. long.
08.050	5/16 U.N.C. x 1 in. long.
08.051	5/16 U.N.C. x 1 1/8 in. long.
08.052	5/16 U.N.C. x 1 1/4 in. long.
08.053	5/16 U.N.C. x 1 3/8 in. long.
08.054	5/16 U.N.C. x 1 1/2 in. long.
08.055	5/16 U.N.C. x 1 5/8 in. long.

Section 08 continued

Part Ref.

08.056	5/16 U.N.C. x 1 1/4 in. long.
08.057	5/16 U.N.C. x 1 1/2 in. long.
08.058	5/16 U.N.C. x 2 in. long.
08.059	5/16 U.N.C. x 2 1/8 in. long.
08.060	5/16 U.N.C. x 2 1/4 in. long.
08.061	5/16 U.N.C. x 2 3/8 in. long.
08.062	5/16 U.N.C. x 2 1/2 in. long.
08.063	5/16 U.N.C. x 2 5/8 in. long.
08.064	5/16 U.N.C. x 2 3/4 in. long.
08.065	5/16 U.N.C. x 2 7/8 in. long.
08.066	5/16 U.N.C. x 3 in. long.
08.067	3/8 U.N.C. x 3/4 in. long.
08.068	3/8 U.N.C. x 7/8 in. long.
08.069	3/8 U.N.C. x 1 in. long.
08.070	3/8 U.N.C. x 1 1/8 in. long.
08.071	3/8 U.N.C. x 1 3/8 in. long.
08.072	3/8 U.N.C. x 1 5/8 in. long.
08.073	3/8 U.N.C. x 1 3/4 in. long.
08.074	3/8 U.N.C. x 1 7/8 in. long.
08.075	3/8 U.N.C. x 2 1/8 in. long.
08.076	3/8 U.N.C. x 2 in. long.
08.077	3/8 U.N.C. x 2 3/8 in. long.
08.078	3/8 U.N.C. x 2 1/2 in. long.
08.079	3/8 U.N.C. x 2 5/8 in. long.
08.080	3/8 U.N.C. x 2 3/4 in. long.
08.081	3/8 U.N.C. x 2 7/8 in. long.
08.082	3/8 U.N.C. x 3 in. long.
08.083	3/8 U.N.C. x 3 1/8 in. long.
08.084	3/8 U.N.C. x 3 1/2 in. long.
08.085	3/8 U.N.C. x 3 3/4 in. long.
08.086	1/2 U.N.C. x 3/4 in. long.
08.087	1/2 U.N.C. x 7/8 in. long.
08.088	1/2 U.N.C. x 1 in. long.
08.089	1/2 U.N.C. x 1 1/8 in. long.
08.090	1/2 U.N.C. x 1 3/8 in. long.
08.091	1/2 U.N.C. x 1 5/8 in. long.
08.092	1/2 U.N.C. x 1 7/8 in. long.
08.093	1/2 U.N.C. x 2 in. long.
08.094	1/2 U.N.C. x 2 1/8 in. long.
08.095	1/2 U.N.C. x 2 1/2 in. long.
08.096	1/2 U.N.C. x 2 3/4 in. long.
08.097	1/2 U.N.C. x 2 5/8 in. long.
08.098	1/2 U.N.C. x 2 3/4 in. long.
08.099	1/2 U.N.C. x 3 in. long.
08.100	1/2 U.N.C. x 3 1/4 in. long.
08.101	1/2 U.N.C. x 3 3/4 in. long.
08.102	1/2 U.N.C. x 4 in. long.
08.103	1/2 U.N.C. x 4 1/4 in. long.
08.104	1/2 U.N.C. x 4 1/2 in. long.
08.105	1/2 U.N.C. x 4 3/4 in. long.
08.106	1/2 U.N.C. x 5 in. long.
08.107	1/2 U.N.C. x 5 1/4 in. long.
08.108	1/2 U.N.C. x 5 1/2 in. long.
08.109	1/2 U.N.C. x 5 3/4 in. long.
08.110	1/2 U.N.C. x 6 in. long.
08.111	5/8 U.N.C. x 1 in. long.
08.112	5/8 U.N.C. x 1 1/4 in. long.
08.113	5/8 U.N.C. x 1 1/2 in. long.
08.114	5/8 U.N.C. x 1 3/4 in. long.
08.115	5/8 U.N.C. x 2 1/4 in. long.
08.116	5/8 U.N.C. x 2 1/2 in. long.
08.117	5/8 U.N.C. x 2 3/4 in. long.
08.118	5/8 U.N.C. x 2 5/8 in. long.
08.119	5/8 U.N.C. x 3 1/4 in. long.
08.120	5/8 U.N.C. x 3 3/4 in. long.
08.121	5/8 U.N.C. x 4 in. long.
08.122	5/8 U.N.C. x 4 1/4 in. long.
08.123	5/8 U.N.C. x 4 1/2 in. long.
08.124	5/8 U.N.C. x 4 3/4 in. long.
08.125	5/8 U.N.C. x 5 in. long.
08.126	5/8 U.N.C. x 5 1/4 in. long.
08.127	5/8 U.N.C. x 5 1/2 in. long.
08.128	5/8 U.N.C. x 5 3/4 in. long.
08.129	5/8 U.N.C. x 6 in. long.
08.130	3/4 U.N.C. x 1 in. long.
08.131	3/4 U.N.C. x 1 1/4 in. long.
08.132	3/4 U.N.C. x 1 1/2 in. long.

Section 08 continued

Part ref.

08.133	3/4 U.N.C. x 1 3/4 in. long.
08.134	3/4 U.N.C. x 2 in. long.
08.135	3/4 U.N.C. x 2 1/4 in. long.
08.136	3/4 U.N.C. x 2 1/2 in. long.
08.137	3/4 U.N.C. x 2 3/4 in. long.
08.138	3/4 U.N.C. x 3 in. long.
08.139	3/4 U.N.C. x 3 1/4 in. long.
08.140	3/4 U.N.C. x 3 1/2 in. long.
08.141	3/4 U.N.C. x 3 3/4 in. long.
08.142	3/4 U.N.C. x 4 in. long.
08.143	3/4 U.N.C. x 4 1/4 in. long.
08.144	3/4 U.N.C. x 4 1/2 in. long.
08.145	3/4 U.N.C. x 4 3/4 in. long.
08.146	3/4 U.N.C. x 5 in. long.
08.147	3/4 U.N.C. x 5 1/4 in. long.
08.148	3/4 U.N.C. x 5 1/2 in. long.
08.149	3/4 U.N.C. x 5 3/4 in. long.
08.150	3/4 U.N.C. x 6 in. long.
08.151	7/8 U.N.C. x 1 1/2 in. long.
08.152	7/8 U.N.C. x 1 3/4 in. long.
08.153	7/8 U.N.C. x 2 in. long.
08.154	7/8 U.N.C. x 2 1/4 in. long.
08.155	7/8 U.N.C. x 2 1/2 in. long.
08.156	7/8 U.N.C. x 2 3/4 in. long.
08.157	7/8 U.N.C. x 3 in. long.
08.158	7/8 U.N.C. x 3 1/4 in. long.
08.159	7/8 U.N.C. x 3 1/2 in. long.
08.160	7/8 U.N.C. x 3 3/4 in. long.
08.161	7/8 U.N.C. x 4 in. long.
08.162	7/8 U.N.C. x 4 1/4 in. long.
08.163	7/8 U.N.C. x 4 1/2 in. long.
08.164	7/8 U.N.C. x 4 3/4 in. long.
08.165	7/8 U.N.C. x 5 in. long.
08.166	7/8 U.N.C. x 5 1/4 in. long.
08.167	7/8 U.N.C. x 5 1/2 in. long.
08.168	7/8 U.N.C. x 5 3/4 in. long.
08.169	7/8 U.N.C. x 6 in. long.

Section 09

Brake Shoes

Part Ref.

09.997	4 in. dia. for 6 in. lathe.
09.998	5 in. dia. for 7 1/2 in. lathe.
09.999	6 in. dia. for 8 1/2 in. lathe.

Section 10

Bushes

Part Ref.

10.035	GH38 x 2 in. long.
10.909	FCT 211 x 5/8 in. long.
10.910	CT51 x 7/8 in. long.
10.911	CT10 x 3/4 in. long.
10.912	CT174 x 1/2 in. long.
10.913	CT174 x 5/8 in. long.
10.914	BS2 x 1 1/2 in. long.
10.915	CT174 x 3/4 in. long.
10.916	CT56 x 3/4 in. long.
10.917	CT174 x 1 in. long.
10.918	CT175 x 3/4 in. long.
10.919	CT175 x 1 1/4 in. long.
10.920	CT18 x 5/8 in. long.
10.921	CT15 x 5/8 in. long.
10.922	CT15 x 1 1/16 in. long.
10.960	CT18 x 3/4 in. long.
10.924	CT15 x 1 3/16 in. long.
10.925	CT15 x 1 5/16 in. long.
10.926	CT18 x 1 1/8 in. long.
10.927	CT15 x 1 1/4 in. long.
10.928	CT30 x 1 1/4 in. long.
10.929	BS15 x 1 in. long.
10.930	BS69 x 3/4 in. long.
10.931	BS69 x 1 5/16 in. long.
10.932	BS69 x 1 in. long.

## Section 10 continued

Part Ref.	
10.933	BS69 x $1\frac{3}{16}$ in. long.
10.934	BS68 x $7/16$ in. long.
10.935	BS69 x $9/16$ in. long.
10.936	BS68 x $3/4$ in. long.
10.937	BS68 x $1\frac{1}{4}$ in. long.
10.938	BS69 x $7/8$ in. long.
10.939	BS68 x $1\frac{3}{8}$ in. long.
10.940	BS68 x $1\frac{3}{4}$ in. long.
10.941	BS2 x $5/8$ in. long.
10.942	FBS78 x $1\frac{3}{8}$ in. long.
10.943	BS2 x $1\frac{7}{16}$ in. long.
10.944	BS51 x 2 in. long.
10.945	BS2 x $7/8$ in. long.
10.946	GH6 x $7/8$ in. long.
10.947	BS68 x 2 in. long.
10.948	BS92 x $3/4$ in. long.
10.949	BS92 x 1 in. long.
10.950	BS92 x $1\frac{3}{16}$ in. long.
10.951	BS105 x $1\frac{9}{16}$ in. long.
10.952	CT15 x $3/4$ in. long.
10.953	CT15 x 1 in. long.
10.954	CT18 x 1 in. long.
10.955	CT18 x $1\frac{1}{4}$ in. long.
10.956	CT18 x $1\frac{3}{8}$ in. long.
10.957	CT40 x $7/8$ in. long.
10.958	CT40 x $1\frac{1}{4}$ in. long.
10.959	CT172 x $3/8$ in. long.
10.923	CT176 x $3/8$ in. long.
10.961	CT272 x $3/4$ in. long.
10.962	FBS233 x $3/8$ in. long.
10.963	FBS295 x $1\frac{1}{8}$ in. long.
10.964	FCT29 x $9/16$ in. long.
10.965	FCT60 x $1/2$ in. long.
10.966	FCT73 x $7/8$ in. long.
10.967	FCT103 x $3/4$ in. long.
10.968	FCTSA x $3/8$ in. long.
10.969	FGH40A x $1\frac{3}{8}$ in. long.
10.970	FGH40A x $1\frac{1}{4}$ in. long.
10.971	GH6 x $1\frac{1}{8}$ in. long.
10.973	GH53 x $1\frac{1}{2}$ in. long.
10.974	FCT201 x $7/8$ in. long.
10.975	BS2 x $1\frac{9}{16}$ in. long.

Section 11  
Circlips - External

Part ref.	
11.172	72 m/m (2.834) Anderton type 1400.
11.727	$1/8$ dia. Anderton type 1400.
11.728	$3/16$ dia. Anderton type 1400.
11.729	$1/4$ dia. Anderton type 1400.
11.730	$5/16$ dia. Anderton type 1400.
11.731	$3/8$ dia. Anderton type 1500 E303.
11.732	$1\frac{1}{4}$ dia. Anderton type 1400.
11.733	$1\frac{5}{16}$ dia. Anderton type 1400.
11.734	$7/16$ dia. Anderton type 1400.
11.735	$1\frac{5}{32}$ dia. Anderton type 1500. E 380.
11.736	$1/2$ dia. Anderton type 1400.
11.737	$1/2$ dia. Anderton type 1500. E396.
11.738	$3/8$ dia. Anderton type 1400.
11.739	$1\frac{1}{8}$ dia. Anderton type 1400.
11.740	$1/2$ dia. Seeger.
11.741	$9/16$ dia. Anderton type 1400.
11.742	$1\frac{7}{16}$ dia. Anderton type 1400.
11.743	$5/8$ in. dia. Anderton type 1400.
11.744	$1\frac{1}{16}$ dia. Anderton type 1400.
11.745	$3/4$ dia. Anderton type 1400.
11.746	$1\frac{1}{2}$ dia. Anderton type 1400.
11.747	$3/4$ dia. Seeger.
11.748	$1\frac{3}{16}$ dia. Anderton type 1400.

## Section 11 continued

Part ref.	
11.749	$7/8$ dia. Anderton type 1400.
11.750	$1\frac{1}{16}$ dia. Anderton type 1400.
11.751	$1\frac{5}{16}$ dia. Anderton type 1400.
11.752	$1\frac{3}{16}$ dia. Anderton type 1400.
11.753	1 dia. Anderton type 1400.
11.754	$1\frac{1}{8}$ dia. Anderton type 1400.
11.755	$1\frac{1}{8}$ dia. Seeger.
11.756	$1\frac{1}{4}$ dia. Seeger.
11.757	2 dia. Anderton type 1400.
11.758	58 m/m (2.283) Anderton type 1400.
11.759	$1\frac{3}{8}$ dia. Anderton type 1400.
11.760	$1\frac{31}{32}$ dia. Anderton type 1400.
11.761	$2\frac{1}{16}$ dia. Anderton type 1400.
11.762	$2\frac{1}{8}$ dia. Anderton type 1400.
11.763	$2\frac{3}{16}$ dia. Anderton type 1400.
11.764	$2\frac{1}{4}$ dia. Anderton type 1400.
11.765	$2\frac{5}{16}$ dia. Anderton type 1400.
11.766	$2\frac{3}{8}$ dia. Anderton type 1400.
11.767	$2\frac{7}{16}$ dia. Anderton type 1400.
11.768	$2\frac{1}{2}$ dia. Anderton type 1400.
11.769	$2\frac{9}{16}$ dia. Anderton type 1400.
11.770	$2\frac{3}{8}$ dia. Anderton type 1400.
11.771	$2\frac{1}{4}$ dia. Anderton type 1400.
11.772	$2\frac{7}{8}$ dia. Anderton type 1400.
11.773	$2\frac{15}{16}$ dia. Anderton type 1400.
11.774	3 dia. Anderton type 1400.
11.775	$1\frac{9}{16}$ dia. Anderton type 1400.
11.776	$5/8$ dia. Anderton type 1500. E485.
11.777	$3/4$ dia. Anderton type 1500. E580.
11.778	$5\frac{1}{16}$ dia. Anderton type 1500. E250.
11.779	$1\frac{11}{16}$ dia. Anderton type 1400.
11.780	$1\frac{3}{4}$ dia. Anderton type 1400.
11.781	$1\frac{13}{16}$ dia. Anderton type 1400.
11.782	$1/4$ dia. Anderton type 1500. E210.
11.783	$1\frac{1}{8}$ dia. Anderton type 1400.
11.784	$3\frac{1}{16}$ dia. Anderton type 1400.
11.785	$3\frac{3}{8}$ dia. Anderton type 1400.
11.786	$2\frac{3}{16}$ Dia. Anderton type 1400.
11.787	$3\frac{1}{4}$ dia. Anderton type 1400.
11.788	$3\frac{3}{8}$ dia. Anderton type 1400.
11.789	$3\frac{7}{16}$ dia. Anderton type 1400.
11.790	$3\frac{1}{2}$ dia. Anderton type 1400.
11.791	$3\frac{9}{16}$ dia. Anderton type 1400.
11.792	$3\frac{5}{8}$ dia. Anderton type 1400.
11.793	$3\frac{3}{4}$ dia. Anderton type 1400.
11.794	$3\frac{13}{16}$ dia. Anderton type 1400.
11.795	$3\frac{7}{8}$ dia. Anderton type 1400.
11.796	$3\frac{15}{16}$ dia. Anderton type 1400.
11.797	4 dia. Anderton type 1400.
11.798	4 $\frac{1}{8}$ dia. Anderton type 1400.
11.799	4 $\frac{1}{4}$ dia. Anderton type 1400.
11.800	4 $\frac{3}{8}$ dia. Anderton type 1400.
11.801	4 $\frac{1}{2}$ dia. Anderton type 1400.
11.802	4 $\frac{3}{4}$ dia. Anderton type 1400.
11.803	4 $\frac{3}{4}$ dia. Anderton type 1400.
11.804	4 $\frac{3}{4}$ dia. Anderton type 1400.
11.805	5 dia. Anderton type 1400.
11.806	5 $\frac{1}{8}$ dia. Anderton type 1400.
11.807	5 $\frac{1}{4}$ dia. Anderton type 1400.

## Section 11 continued

Part ref.	
11.808	5 $\frac{3}{8}$ dia. Anderton type 1400.
11.809	5 $\frac{1}{2}$ dia. Anderton type 1400.
11.810	5 $\frac{5}{8}$ dia. Anderton type 1400.
11.811	5 $\frac{3}{4}$ dia. Anderton type 1400.
11.812	5 $\frac{7}{8}$ dia. Anderton type 1400.
11.813	6 dia. Anderton type 1400.
11.814	6 $\frac{1}{8}$ dia. Anderton type 1400.
11.815	6 $\frac{1}{4}$ dia. Anderton type 1400.
11.816	6 $\frac{3}{8}$ dia. Anderton type 1400.
11.817	6 $\frac{1}{2}$ dia. Anderton type 1400.
11.818	6 $\frac{5}{8}$ dia. Anderton type 1400.
11.819	6 $\frac{3}{4}$ dia. Anderton type 1400.
11.820	6 $\frac{7}{8}$ dia. Anderton type 1400.
11.821	7 dia. Anderton type 1400.
11.822	7 $\frac{1}{8}$ dia. Anderton type 1400.
11.823	7 $\frac{1}{4}$ dia. Anderton type 1400.
11.824	7 $\frac{5}{16}$ dia. Anderton type 1400.
11.825	7 $\frac{3}{8}$ dia. Anderton type 1400.
11.826	7 $\frac{1}{2}$ dia. Anderton type 1400.
11.827	7 $\frac{3}{4}$ dia. Anderton type 1400.
11.828	7 $\frac{7}{8}$ dia. Anderton type 1400.
11.829	8 dia. Anderton type 1400.
11.830	$1\frac{1}{16}$ dia. Anderton type 1500 E.52.
11.831	$3\frac{3}{32}$ dia. Anderton type 1500
11.832	$3\frac{1}{32}$ dia. Anderton type 1500 E74A.
11.833	$7\frac{1}{64}$ dia. Anderton type 1500 E79.
11.834	$7\frac{1}{64}$ dia. Anderton type 1500 E79A.
11.835	$1/8$ dia. Anderton type 1500 E95.
11.836	$1/8$ dia. Anderton type 1500 E95A.
11.837	$9\frac{1}{64}$ dia. Anderton type 1500 E102.
11.838	$9\frac{1}{64}$ dia. Anderton type 1500 E102A.
11.839	$9\frac{1}{64}$ dia. Anderton type 1500 E105.
11.840	$9\frac{1}{64}$ dia. Anderton type 1500 E110.
11.841	$5\frac{3}{32}$ dia. Anderton type 1500 E116.
11.842	$5\frac{3}{32}$ dia. Anderton type 1500 E116A.
11.843	$11\frac{1}{64}$ dia. Anderton type 1500 E125.
11.844	$11\frac{1}{64}$ dia. Anderton type 1500 E125A.
11.845	$3\frac{1}{16}$ dia. Anderton type 1500 E125X.
11.846	$3\frac{1}{16}$ dia. Anderton type 1500 E125XA.
11.847	$3\frac{1}{16}$ dia. Anderton type 1500 E125XB.
11.848	$3\frac{1}{16}$ dia. Anderton type 1500 E147.
11.849	$3\frac{1}{16}$ dia. Anderton type 1500 E147A.
11.850	$3\frac{1}{16}$ dia. Anderton type 1500 E147B.
11.851	$7\frac{3}{32}$ dia. Anderton type 1500 E188.
11.852	$1/4$ dia. Anderton type 1500 E120A.
11.853	$5\frac{1}{16}$ dia. Anderton type 1500 E250A.
11.854	$21\frac{1}{64}$ dia. Anderton type 1500 E273.
11.855	$7\frac{1}{16}$ dia. Anderton type 1500 E343.
11.856	1 dia. Anderton type 1500 E743
11.858	15 m/m (0.590) Anderton type 1400.

**Section 12**  
**Circlips - Internal**

Part Ref.	Description
12.170	72 m/m (2.834) Seeger.
12.753	1/4 dia. Anderton type 1300.
12.754	5/16 dia. Anderton type 1300.
12.755	3/8 dia. Anderton type 1300.
12.756	7/16 dia. Anderton type 1300.
12.757	1/2 dia. Anderton type 1300.
12.758	9/16 dia. Anderton type 1300.
12.759	5/8 dia. Anderton type 1300.
12.760	11/16 dia. Anderton type 1300.
12.761	3/4 dia. Anderton type 1300.
12.762	13/16 dia. Anderton type 1300.
12.763	7/8 dia. Anderton type 1300.
12.764	15/16 dia. Anderton type 1300.
12.765	1 dia. Anderton type 1300.
12.766	28 m/m (1.102) Anderton type 1300.
12.767	40 m/m (1.574) Anderton type 1300.
12.768	1 1/8 Dia. Anderton type 1300.
12.769	52 m/m (2.047) Anderton type 1300.
12.770	80 m/m (3.150) Anderton type 1300.
12.771	83 m/m (3.267) Seeger.
12.772	4 dia. Anderton type 1300.
12.773	3.464 dia. Anderton type 1300.
12.774	2 1/2 dia. Anderton type 1300.
12.775	1 1/2 dia. Anderton type 1300.
12.776	1 1/4 dia. Anderton type 1300.
12.777	1 1/8 dia. Anderton type 1300.
12.778	1 1/4 dia. Anderton type 1300.
12.779	1 5/16 dia. Anderton type 1300.
12.780	1 3/8 dia. Anderton type 1300.
12.781	1 7/16 dia. Anderton type 1300.
12.782	1 1/2 dia. Anderton type 1300.
12.783	1 9/16 dia. Anderton type 1300.
12.784	1 5/8 dia. Anderton type 1300.
12.785	1 11/16 dia. Anderton type 1300.
12.786	1 3/4 dia. Anderton type 1300.
12.787	1 13/16 dia. Anderton type 1300.
12.788	1 15/16 dia. Anderton type 1300.
12.789	2 dia. Anderton type 1300.
12.790	2 1/16 dia. Anderton type 1300.
12.791	2 3/16 dia. Anderton type 1300.
12.792	2 1/4 dia. Anderton type 1300.
12.793	2 5/16 dia. Anderton type 1300.
12.794	2 3/8 dia. Anderton type 1300.
12.795	2 7/16 dia. Anderton type 1300.
12.796	2 1/2 dia. Anderton type 1300.
12.797	2 9/16 dia. Anderton type 1300.
12.798	2 5/8 dia. Anderton type 1300.
12.799	2 11/16 dia. Anderton type 1300.
12.800	2 3/4 dia. Anderton type 1300.
12.801	2 13/16 dia. Anderton type 1300.
12.802	2 7/8 dia. Anderton type 1300.
12.803	2 15/16 dia. Anderton type 1300.
12.804	3 dia. Anderton type 1300.

**Section 12 continued**

Part Ref.	Description
12.805	3 1/16 dia. Anderton type 1300.
12.806	3 1/8 dia. Anderton type 1300.
12.807	3 3/16 dia. Anderton type 1300.
12.808	3 1/4 dia. Anderton type 1300.
12.809	3 3/8 dia. Anderton type 1300.
12.810	3 7/16 dia. Anderton type 1300.
12.811	3 1/2 dia. Anderton type 1300.
12.812	3 9/16 dia. Anderton type 1300.
12.813	3 5/8 dia. Anderton type 1300.
12.814	3 3/4 dia. Anderton type 1300.
12.815	3 13/16 dia. Anderton type 1300.
12.816	3 7/8 dia. Anderton type 1300.
12.817	3 15/16 dia. Anderton type 1300.
12.818	4 dia. Anderton type 1300.
12.819	4 1/4 dia. Anderton type 1300.
12.820	4 1/2 dia. Anderton type 1300.
12.821	4 1/2 dia. Anderton type 1300.
12.822	4 3/4 dia. Anderton type 1300.
12.823	4 1/2 dia. Anderton type 1300.
12.824	4 3/4 dia. Anderton type 1300.
12.825	5 dia. Anderton type 1300.
12.826	5 1/8 dia. Anderton type 1300.
12.827	5 1/4 dia. Anderton type 1300.
12.828	5 3/8 dia. Anderton type 1300.
12.829	5 1/2 dia. Anderton type 1300.
12.830	5 5/8 dia. Anderton type 1300.
12.831	5 3/4 dia. Anderton type 1300.
12.832	5 7/8 dia. Anderton type 1300.
12.833	6 dia. Anderton type 1300.

**Section 13**  
**Circlips - Miscellaneous**

Part Ref.	Description
13.190	Anderton Ref. E389.
13.732	7/8 dia. Anderton type 700/37A. Ext.
13.733	3/4 dia. Anderton type 500/37. Ext.
13.734	Anderton Ref. E468.
13.736	RS62. (Spiralox).
13.739	Salter Bowed Ext. type 5101/60.
13.742	9/16 dia. Salter Bowed Ext. type 5101/56.
13.746	Anderton type 1500/E520 Ext.
13.779	No.62 Anderton type 10000 Ext.
13.780	5/8 dia. Anderton type 700 62A Ext.
13.781	5/8 dia. Salter Crescent 5103-62 Ext.
13.783	.437 dia. Anderton type 1400.
13.784	Anderton 1500 E 468 'E' type.
13.785	2 1/16 dia. Salter Bevelled type 5002/206 Int.
13.786	Anderton type 1200 Size 8 Int.
13.787	Salter 15/16 Ext type 5100/93.

**Section 14**  
**Spring Dowels**

Part Ref.	Description
14.104	1/8 dia. x 3/4 in. long
14.125	1/4 dia. x 1 1/2 in. long.
14.131	1/4 dia. x 1 in. long.
14.135	1/8 dia. x 1/2 in. long.

**Section 14 continued**

Part ref.	Description
14.144	3/16 dia. x 1 1/4 in. long.
14.599	5/16 dia. x 1 3/8 in. long.
14.600	3/32 dia. x 5/16 in. long.
14.601	3/32 dia. x 5/8 in. long.
14.602	5/32 dia. x 3/8 in. long.
14.603	5/32 dia. x 1/2 in. long.
14.604	3/16 dia. x 1/2 in. long.
14.605	3/16 dia. x 3/4 in. long.
14.606	3/16 dia. x 7/8 in. long.
14.607	3/16 dia. x 1 5/16 in. long.
14.608	1/4 dia. x 2 5/8 in. long.
14.609	1/4 dia. x 1 3/4 in. long.
14.610	3/32 dia. x 1/4 in. long.
14.611	3/32 dia. x 3/8 in. long.
14.612	3/32 dia. x 7/16 in. long.
14.613	3/32 dia. x 1/2 in. long.
14.614	3/32 dia. x 9/16 in. long.
14.615	3/32 dia. x 1 1/16 in. long.
14.616	3/32 dia. x 3/4 in. long.
14.617	3/32 dia. x 13/16 in. long.
14.618	3/32 dia. x 7/8 in. long.
14.619	3/32 dia. x 1 5/16 in. long.
14.620	3/32 dia. x 1 in. long.
14.621	1/8 dia. x 3/8 in. long.
14.622	1/8 dia. x 7/16 in. long.
14.624	1/8 dia. x 9/16 in. long.
14.625	1/8 dia. x 5/8 in. long.
14.626	1/8 dia. x 1 1/16 in. long.
14.628	1/8 dia. x 1 3/16 in. long.
14.629	1/8 dia. x 7/8 in. long.
14.630	1/8 dia. x 1 5/16 in. long.
14.631	1/8 dia. x 1 in. long.
14.632	1/8 dia. x 1 1/8 in. long.
14.633	1/8 dia. x 1 1/4 in. long.
14.634	1/8 dia. x 1 3/8 in. long.
14.635	1/8 dia. x 1 1/2 in. long.
14.636	5/32 dia. x 9/16 in. long.
14.637	5/32 dia. x 5/8 in. long.
14.638	5/32 dia. x 1 1/16 in. long.
14.639	5/32 dia. x 3/4 in. long.
14.640	5/32 dia. x 13/16 in. long.
14.641	5/32 dia. x 7/8 in. long.
14.642	5/32 dia. x 1 5/16 in. long.
14.643	5/32 dia. x 1 in. long.
14.644	5/32 dia. x 1 1/8 in. long.
14.645	5/32 dia. x 1 1/4 in. long.
14.646	5/32 dia. x 1 3/8 in. long.
14.647	5/32 dia. x 1 1/2 in. long.
14.648	3/16 dia. x 9/16 in. long.
14.649	3/16 dia. x 5/8 in. long.
14.650	3/16 dia. x 1 1/16 in. long.
14.651	3/16 dia. x 1 3/16 in. long.
14.652	3/16 dia. x 1 in. long.
14.653	3/16 dia. x 1 1/8 in. long.
14.655	3/16 dia. x 1 3/8 in. long.
14.656	3/16 dia. x 1 1/2 in. long.
14.657	7/32 dia. x 3/4 in. long.
14.658	7/32 dia. x 7/8 in. long.
14.659	7/32 dia. x 1 in. long.
14.660	7/32 dia. x 1 1/8 in. long.
14.661	7/32 dia. x 1 1/4 in. long.
14.662	7/32 dia. x 1 3/8 in. long.
14.663	7/32 dia. x 1 1/2 in. long.
14.664	1/4 dia. x 3/4 in. long.
14.665	1/4 dia. x 7/8 in. long.
14.667	1/4 dia. x 1 1/8 in. long.
14.668	1/4 dia. x 1 1/4 in. long.
14.669	1/4 dia. x 1 3/8 in. long.
14.671	1/4 dia. x 1 5/8 in. long.
14.672	1/4 dia. x 1 7/8 in. long.
14.673	1/4 dia. x 2 in. long.
14.674	1/4 dia. x 2 1/8 in. long.
14.675	1/4 dia. x 2 1/4 in. long.
14.676	1/4 dia. x 2 3/8 in. long.
14.677	1/4 dia. x 2 1/2 in. long.
14.678	1/4 dia. x 2 3/4 in. long.
14.679	5/16 dia. x 3/4 in. long.

### Section 14 continued

Part Ref.	Description
14.680	$\frac{5}{16}$ dia. x $\frac{7}{8}$ in. long.
14.681	$\frac{5}{16}$ dia. x 1 in. long.
14.682	$\frac{5}{16}$ dia. x $1\frac{1}{8}$ in. long.
14.683	$\frac{5}{16}$ dia. x $1\frac{1}{4}$ in. long.
14.684	$\frac{5}{16}$ dia. x $1\frac{1}{2}$ in. long.
14.685	$\frac{5}{16}$ dia. x $1\frac{5}{8}$ in. long.
14.686	$\frac{5}{16}$ dia. x $1\frac{3}{4}$ in. long.
14.687	$\frac{5}{16}$ dia. x 2 in. long.
14.688	$\frac{5}{16}$ dia. x $2\frac{1}{8}$ in. long.
14.689	$\frac{5}{16}$ dia. x $2\frac{1}{4}$ in. long.
14.690	$\frac{5}{16}$ dia. x $2\frac{1}{2}$ in. long.
14.691	$\frac{3}{8}$ dia. x $\frac{3}{4}$ in. long.
14.692	$\frac{3}{8}$ dia. x $\frac{7}{8}$ in. long.
14.693	$\frac{3}{8}$ dia. x 1 in. long.
14.694	$\frac{3}{8}$ dia. x $1\frac{1}{8}$ in. long.
14.695	$\frac{3}{8}$ dia. x $1\frac{1}{4}$ in. long.
14.696	$\frac{3}{8}$ dia. x $1\frac{3}{8}$ in. long.
14.697	$\frac{3}{8}$ dia. x $1\frac{1}{2}$ in. long.
14.698	$\frac{3}{8}$ dia. x $1\frac{5}{8}$ in. long.
14.699	$\frac{3}{8}$ dia. x $1\frac{3}{4}$ in. long.
14.700	$\frac{3}{8}$ dia. x $1\frac{7}{8}$ in. long.
14.701	$\frac{3}{8}$ dia. x 2 in. long.
14.702	$\frac{3}{8}$ dia. x $2\frac{1}{4}$ in. long.
14.703	$\frac{3}{8}$ dia. x $2\frac{1}{2}$ in. long.

### Section 15

#### Electrical - Miscellaneous

Part Ref.	Description
15.084	5 amp Slydlok fuse & holder.
15.090	9 v $1\frac{1}{2}$ amp screw type bulb.
15.091	1-1 Bulgin. LES Mod. lamp-holder.
15.101	Low volt plug socket.
15.149	A.E.I. 'T' junction $\frac{3}{4}$ in. conduit thrd. type.

### Section 16

#### Handles - Plastic

Part Ref.	Description
16.841	$\frac{3}{8}$ bore x $2\frac{1}{2}$ in. long.
16.842	$\frac{3}{8}$ bore x 3 in. long. cream.
16.843	$1\frac{1}{4}$ dia. x $1\frac{11}{16}$ cream.
16.844	$\frac{3}{8}$ bore x 3 in. long black.
16.845	$\frac{1}{2}$ bore x $1\frac{1}{4}$ in. long cream.
16.846	$\frac{1}{2}$ bore x $1\frac{3}{4}$ in. long black.
16.847	$1\frac{11}{16}$ bore x 4 in. long.
16.848	$1\frac{3}{4}$ dia. x 4 in. long.
16.849	$1\frac{3}{4}$ dia. x $1\frac{11}{16}$ long black.

### Section 17

#### Keys

Part Ref.	Description
17.001	No.3 Woodruff.
17.002	No.9 Woodruff.
17.003	No.15 Woodruff.
17.004	No.21 Woodruff.
17.005	Letter 'B' Woodruff.
17.006	$\frac{1}{4}$ x $\frac{1}{4}$ x 1 in. long Feather Key.
17.007	$\frac{1}{4}$ sq. x $1\frac{1}{4}$ in. long sq. Key.
17.008	Letter 'D' Woodruff.
17.009	$\frac{1}{4}$ x $\frac{1}{4}$ x $1\frac{1}{4}$ in. long.
17.010	No.5 Woodruff.
17.011	No.7 Woodruff.
17.012	No.11 Woodruff.
17.013	No.18 Woodruff.
17.014	No.22 Woodruff.
17.015	No.24 Woodruff.
17.016	No.155 Woodruff.
17.017	Letter 'A' Woodruff.
17.018	Letter 'C' Woodruff.
17.019	Letter 'E' Woodruff.
17.020	Letter 'F' Woodruff.
17.021	Letter 'G' Woodruff.

### Section 17 continued

Part Ref.	Description
17.023	$\frac{3}{16}$ x $\frac{3}{16}$ x $1\frac{1}{4}$ plain.
17.024	$\frac{1}{4}$ x $\frac{1}{4}$ x $2\frac{1}{2}$ plain.
17.025	$\frac{5}{16}$ x $\frac{5}{16}$ x 3 plain.
17.026	$\frac{5}{16}$ x $\frac{3}{8}$ x $3\frac{1}{4}$ in. plain
17.027	$\frac{3}{8}$ x $\frac{1}{4}$ x $3\frac{1}{4}$ plain.
17.028	$\frac{7}{16}$ x $\frac{3}{8}$ x $3\frac{1}{2}$ plain.
17.029	$\frac{3}{16}$ x $\frac{7}{16}$ x $\frac{3}{4}$ round end.
17.030	$\frac{1}{4}$ x $\frac{5}{16}$ x $1\frac{1}{2}$ round end.
17.031	$\frac{3}{4}$ x .283 x 1.885 Woodruff.
17.032	$\frac{3}{16}$ x $\frac{1}{2}$ Special.
17.033	$1\frac{1}{4}$ x $\frac{3}{8}$ x $1\frac{1}{4}$ Special.
17.059	$\frac{3}{16}$ x $\frac{3}{16}$ x $1\frac{1}{4}$ in. long. Feather Key.

### Section 18

#### Knobs - Plastic

Part Ref.	Description
18.145	$1\frac{1}{4}$ dia. x $\frac{3}{8}$ U.N.C. Red.
18.830	$1\frac{1}{2}$ dia. x $\frac{7}{16}$ U.N.C. Black.
18.831	$1\frac{1}{2}$ dia. x $\frac{7}{16}$ U.N.C. Red.
18.832	$1\frac{1}{2}$ x dia. x $\frac{3}{8}$ U.N.C. Red.
18.833	$1\frac{1}{2}$ dia. x $\frac{5}{16}$ U.N.C. Red.
18.834	$1\frac{1}{4}$ dia. x $\frac{7}{16}$ U.N.C. Red.
18.835	$1\frac{1}{4}$ dia. x $\frac{7}{16}$ U.N.C. Black.
18.836	$1\frac{1}{4}$ dia. x $\frac{3}{8}$ U.N.C. Black.
18.837	$1\frac{1}{4}$ dia. x $\frac{3}{8}$ U.N.C. Cream.
18.838	1 dia. x $\frac{3}{8}$ U.N.C. Black.
18.839	1 dia. x $\frac{3}{8}$ U.N.C. Cream.
18.840	$\frac{3}{4}$ dia. x $\frac{1}{4}$ U.N.C. Black.
18.841	Reverse and two speed switch knob.
18.843	$1\frac{1}{4}$ dia. x $\frac{7}{16}$ U.N.C. Transparent.
18.844	$1\frac{1}{2}$ dia. x $\frac{1}{2}$ U.N.C. Transparent.
18.845	$1\frac{3}{4}$ dia. x $\frac{3}{8}$ U.N.C. Red.

### Section 19

#### Motors

Part Ref.	Description
19.001	A.E.I. 1hp 190/210/346/380/3/50. BK.2410c. Speed 1400-1730.
19.003	A.E.I. 1hp 220/240/380/440/3/50. BK.2410c. Speed 1400-1730.
19.004	A.E.I. 1hp 220/240/50 BC. 3014. Speed 1400-1730.
19.005	A.E.I. 1hp 290/320/500/550/3/50/60. BK.2410c.
19.006	A.E.I. 1hp 500/550/3/50/60. BK.3210c. Speed 1400-1730.
19.007	L.D.C. $1\frac{1}{2}$ hp 200/220/1/50. R3K4. Speed 1400.
19.008	L.D.C. $1\frac{1}{2}$ hp 230/250/1/50. R3K4. Speed 1420.
19.009	L.D.C. 2hp 200/220/1/50. DP3R3K. Speed 1400.
19.010	L.D.C. 2hp 230/250/1/50. DP3R3K. Speed 1400.
19.011	L.D.C. 2hp 230/250/1/50. DP3R3J. Speed 1400-1730.
19.012	L.D.C. 3hp 190/220/3/50/60. Frame AC184.
19.013	L.D.C. 3hp 200/220/346/380/3/50. Frame A2W. Speed 1400.
19.014	L.D.C. 3hp 208/220/3/60. Frame AC184. Speed 1730.
19.015	L.D.C. 3hp 220/3/60 Frame AC184. NEMA.
19.016	L.D.C. 3hp 220/346/380/3/60. Frame AC184.

### Section 19 continued

Part Ref.	Description
19.017	Brook 3hp 220/440/3/60. Frame 225-4R. Speed 1800.
19.018	L.D.C. 3hp 230/250/400/440/3/50. Frame A2W. Speed 1400.
19.019	L.D.C. 3hp 230/250/400/400/3/50/60- Frame AC 184.
19.020	L.D.C. 3hp 260/280/3/50. Frame A2W. Speed 1400.
19.021	L.D.C. 3hp 400/3/60. Frame AC184. CSA.
19.022	L.D.C. 3hp 500/550/3/50. Frame A2W.
19.023	L.D.C. 3hp 550/3/50. Frame AC184.
19.024	L.D.C. 3hp 550/3/60. Frame AA215. Speed 1720.
19.025	L.D.C. 3hp 550/3/60. Frame AC184. CSA.
19.026	L.D.C. 3hp 550/3/60. Frame A3K. Speed 1720.
19.027	L.D.C. 5hp 200/220/346/380/3/50. Frame AC184. Speed 1400.
19.028	Brook 5hp 220/440/3/60. Frame 215-4R. Speed 1800.
19.029	L.D.C. 5hp 230/250/400/440/3/50. Frame AC184. Speed 1440.
19.030	L.D.C. 5hp 500/550/3/50. Frame AC184/5. Speed 1420.
19.031	L.D.C. 5hp 550/3/60. Frame HA215 Speed 1730.
19.032	Brook 5hp Speed 950.
19.033	L.D.C. $7\frac{1}{2}$ hp 200/220/346/380/3/50. Frame HH215 Speed 1440.
19.034	Brook $7\frac{1}{2}$ hp 220/440/3/60. Frame 254U. Speed 1800.
19.035	L.D.C. $7\frac{1}{2}$ hp 230/250/400/440/3/50. Frame AA215. Speed 1400.
19.036	L.D.C. $7\frac{1}{2}$ hp 500/550/3/50. Frame AA.215
19.037	L.D.C. $7\frac{1}{2}$ hp 550/3/60. Frame EA8K. Speed 1720.
19.038	A.E.I. 2/1hp 200/220/50/60. KNX.C164. Speed 2880-1440.
19.039	A.E.I. 2/1hp 346/50/60. KNX.C164. Speed 2880-1440.
19.040	A.E.I. 2/1hp 380/420/3/50/60. KNX.C164. Speed 2880/1440.
19.041	A.E.I. 2/1hp 500/550/50/60. KNX.C164. Speed 2880/1440.
19.042	Brook 3/1/2hp 190/220/3/50. Frame C184. Speed 3000-1500.
19.043	Brook 3/1/2hp 190/220/3/60. Frame C213. Speed 1800-900.
19.044	Brook 3/1/2hp 190/220/3/60. Frame C184. Speed 3600-1800.
19.045	Brook 3/1/2hp 190/220/3/50. Frame C213. Speed 1800-900.
19.046	Brook 3/1/2hp 220/50. Frame C213. Speed 1500-750.

## Section 19 continued

Part Ref.	
19.047	Newman 3/1½ hp 220/3/60. Frame 215.
19.048	Brook 3/1½ hp 380/3/50. Frame C215. Speed 1500-750.
19.049	L.D.C. 3/1½ hp 380/3/50. Frame C184. Speed 3000-1500.
19.050	Brook 3/1½ hp 400/440/3/50. Frame C213. Speed 1500-750.
19.051	L.D.C. 3/1½ hp 400/440/3/50. Frame C184. Speed 3000-1500.
19.052	Brook 3/1½ hp 440/3/60. Frame C215. Speed 1800-900.
19.053	Brook 3/1½ hp 550/3/60. Frame C213. Speed 1800-900.
19.054	Brook 3/1½ hp 500/550/50. Frame C213. Speed 1500-750.
19.055	L.D.C. 3/1½ hp 500/550/3/50. Frame C184. Speed 3000-1500.
19.056	Brook 5/2½ hp 190/220/3/50. Frame C213. Speed 3000-1500.
19.057	Brook 5/2½ hp 190/220/3/50. Frame C215. Speed 1500-750.
19.058	L.D.C. 5/2½ hp 190/220/3/60. Frame C213. Speed 3600-1800
19.059	Brook 5/2½ hp 190/220/3/60. Frame C215. Speed 1800-900.
19.060	Brook 5/2½ hp 220/50. Frame C215. Speed 1500-750.
19.061	L.D.C. 5/2½ hp 220/3/50. Frame C213. Speed 3000-1500.
19.062	Brook 5/2½ hp 220/3/60. Frame C254. Speed 1800-900.
19.063	Brook 5/2½ hp 380/3/50. Frame C215. Speed 1500-750.
19.064	L.D.C. 5/2½ hp 380/3/50. Frame C213. Speed 3000-1500.
19.065	L.D.C. 5/2½ hp 380/3/50. Frame C213. Speed 3000-1500.
19.066	L.D.C. 5/2½ hp 400/440/3/50. Frame C213. Speed 3000-1500.
19.067	Brook 5/2½ hp 400/440/3/50. Frame C215. Speed 1500-750.
19.068	Brook 5/2½ hp 440/3/60. Frame 254. Speed 1800-900.
19.069	Brook 5/2½ hp 500/550/50. Frame C215. Speed 1500-750.
19.070	Brook 5/2½ hp 500/550/3/50. Speed 3000-1500
19.071	Brook 5/2½ hp 500/550/3/50. Frame C184. Speed 3000-1500.
19.072	Brook 5/2½ hp 550/3/60. Frame 254. Speed 1800-900.

## Section 19 continued

Part Ref.	
19.073	L.D.C. 8/4 hp 190/220/3/50. Frame C254. Speed 1500-750.
19.074	Brook 8/4 hp 190/220/3/60. Frame C254. Speed 1800-900.
19.075	Brook 8/4 hp 220/50. Frame C254. Speed 1500-750.
19.076	Brook 8/4 hp 220/3/60. Frame 284. Speed 1800-900.
19.077	Brook 8/4 hp 380/50. Frame C254. Speed 1500-750.
19.078	Brook 8/4 hp 440/50. Frame 254C. Speed 1500-750.
19.079	Brook 8/4 hp 440/3/60. Frame 284. Speed 1800-900.
19.080	Newman 8/4 hp 550/3/60. Frame 284. Speed 1800-900.
19.081	Brook 8/4 hp 500/550/3/50. Frame 254. Speed 1500-750.
19.082	A.E.I. 8/4 hp 220/440/1/60. BC.3014.
19.165	A.E.I. 1 hp 200/240/380/440. BK2410c. Speed 1400-1730.
19.166	A.E.I. 2/1 hp 380/420/3/50/60. Frame KNX.C164.

Section 20  
Nuts

Part Ref.	
20.609	10 x 24 T.P.I. Deep Nut.
20.610	¼ U.N.C. Deep Nut.
20.611	5/16 U.N.C. Deep Nut.
20.612	3/8 U.N.C. Deep Nut.
20.613	7/16 U.N.C. Deep Nut.
20.614	½ U.N.C. Deep Nut.
20.615	9/16 U.N.C. Deep Nut.
20.616	5/8 U.N.C. Deep Nut.
20.617	¾ U.N.C. Deep Nut.
20.618	10 x 32 T.P.I. Std.Nut.
20.619	¼ U.N.F. Std.Nut.
20.620	½ U.N.C. Std.Nut.
20.621	5/16 U.N.C. Std.Nut.
20.622	3/8 U.N.C. Std.Nut.
20.623	7/16 U.N.C. Std.Nut.
20.624	½ U.N.C. Std.Nut.
20.625	9/16 U.N.C. Std.Nut.
20.626	5/8 U.N.C. Std.Nut.
20.627	¾ U.N.C. Std.Nut.
20.628	5/16 U.N.F. Std.Nut.
20.629	½ U.N.F. Std.Nut.
20.630	5/8 U.N.F. Std.Nut.
20.631	¾ U.N.F. Std.Nut.
20.632	10 x 24 T.P.I. Std.Nut.
20.633	7/16 U.N.F. Std.Nut.
20.634	9/16 U.N.F. Std.Nut.
20.635	¼ U.N.C. Thin Nut.
20.636	5/16 U.N.C. Thin Nut.
20.637	3/8 U.N.C. Thin Nut.
20.638	7/16 U.N.C. Thin Nut.
20.639	½ U.N.C. Thin Nut.
20.640	9/16 U.N.C. Thin Nut.
20.641	5/8 U.N.C. Thin Nut.
20.642	¾ U.N.C. Thin Nut.
20.643	¾ U.N.F. Std.Nut.
20.644	½ U.N.F. Thin Nut.
20.645	10 x 24 T.P.I. Thin Nut.

## Section 20 continued

Part Ref.	
20.646	10 x 32 T.P.I. Thin Nut.
20.647	¼ U.N.F. Thin Nut.
20.648	5/16 U.N.C. Thin Nut.
20.649	3/8 U.N.F. Thin Nut.
20.650	7/16 U.N.F. Thin Nut.
20.651	9/16 U.N.F. Thin Nut.
20.652	5/8 U.N.F. Thin Nut.
20.653	¾ U.N.F. Thin Nut.

Section 21  
Lock Nuts

Part Ref.	
21.648	¼ U.N.F. Std. Lock Nut.
21.649	5/16 U.N.F. Std. Lock Nut.
21.650	3/8 U.N.F. Std. Lock Nut.
21.651	7/16 U.N.F. Std. Lock Nut.
21.652	½ U.N.F. Std. Lock Nut.
21.653	9/16 U.N.F. Std. Lock Nut.
21.654	5/8 U.N.F. Std. Lock Nut. (Nyloc).
21.655	¾ U.N.F. Std. Lock Nut. (Nyloc).
21.656	7/8 U.N.F. Std Lock Nut. (Simmonds Nyloc NP/D 286).
21.657	¼ U.N.F. Thin Nut 'T'.
21.658	½ U.N.C. Std. Lock Nut.
21.659	5/16 U.N.C. Std. Lock Nut. (Simmonds Aero).
21.660	3/8 U.N.C. Std. Lock Nut. (Simmonds Aero).
21.661	7/16 U.N.C. Std. Lock Nut. (Nyloc).
21.662	½ U.N.C. Std. Lock Nut. (Nyloc NT/N1166).
21.663	7/8 U.N.F. Thin Nut 'T'.
21.664	9/16 U.N.C. Std. Lock Nut.
21.665	5/8 U.N.C. Std. Lock Nut.
21.666	¾ U.N.C. Std. Lock Nut.
21.667	7/8 U.N.C. Std. Lock Nut. ('T' NT/N282).
21.670	5/16 U.N.F. Thin Nut 'T'.
21.671	3/8 U.N.F. Thin Nut 'T'.
21.672	7/16 U.N.F. Thin Nut 'T' (Simmonds type NT/D 1146).
21.673	½ U.N.F. Thin Nut 'T' (Simmonds type NT/D166)
21.674	9/16 U.N.F. Thin Nut 'T'.
21.675	5/8 U.N.F. Thin Nut 'T' (Simmonds type NT).
21.676	¾ U.N.F. Thin Nut 'T'.
21.677	¼ U.N.C. Thin Nut 'T'.
21.678	5/16 U.N.C. Thin Nut 'T' (Simmonds type NT/N106).
21.680	3/8 U.N.C. Thin Nut 'T'. (Philidas J.U.C.J).
21.682	7/16 U.N.C. Thin Nut 'T'. (Simmonds NT/N126).
21.683	½ U.N.C. Thin Nut 'T'. (Simmonds NT/N166).
21.684	9/16 U.N.C. Thin Nut 'T'. (Simmonds NT/N166).
21.685	5/8 U.N.C. Thin Nut 'T'. (Simmonds NT/N206).
21.686	¾ U.N.C. Thin Nut 'T'.
21.687	½ U.N.F. Lock Nut. (Philidas c/w cap).

**Section 22**  
**Nuts Miscellaneous**

Part Ref.	
22.146	¼ B.S.F. Nyloc (Simmonds Type 'T').
22.634	3 B.A. Std. Nut.
22.656	⅝ U.N.F. Philidas c/w plastic cap QUFP/1.
22.663	½ U.N.C. Wedglok.
22.668	⅜ U.N.C. Nyloc.
22.681	⅝ U.N.C. Hex Slotted nut.
22.687	Spire Clip Nut. (Type SNU. 0530).
22.688	Vislok Nut. (Type Pat. 1319).
22.689	¼ B.S.W. Stiff Nut.
22.690	2 B.A. Thin Nut.
22.691	⅜ B.S.F. Nut (Thin).

**Section 23**  
**Oilers**

Part Ref.	
23.124	¼ Dia. Springwell oil cup.
23.826	¼ B.S.F. Grease Nipple.
23.827	¼ Dia. Garland diaphragm oiler.
23.828	⅝ Dia. Winkley oiler.
23.830	⅜ Dia. Winkley oiler.
23.831	¼ Dia. Bennet oiler.

**Section 24**  
**Mills Pins**

Part Ref.	
24.491	⅜ Dia. x ⅜ in. long G.P.1.
24.492	⅜ Dia. x ¼ in. long G.P.1.
24.493	⅜ Dia. x ⅝ in. long G.P.1.
24.494	⅜ Dia. x ⅜ in. long G.P.1.
24.495	⅜ Dia. x ⅞ in. long G.P.1.
24.496	⅜ Dia. x ½ in. long G.P.1.
24.497	⅜ Dia. x ⅑ in. long G.P.1.
24.498	⅜ Dia. x ⅒ in. long G.P.1.
24.499	⅜ Dia. x ⅓ in. long G.P.1.
24.500	⅜ Dia. x ⅔ in. long G.P.1.
24.501	⅜ Dia. x ⅕ in. long G.P.1.
24.502	⅜ Dia. x ⅖ in. long G.P.1.
24.503	⅜ Dia. x ⅗ in. long G.P.1.
24.504	⅜ Dia. x 1 in. long G.P.1.
24.505	⅜ Dia. x ⅝ in. long G.P.1.
24.506	⅜ Dia. x ⅞ in. long G.P.1.
24.507	⅜ Dia. x ⅞ in. long G.P.1.
24.508	⅜ Dia. x ½ in. long G.P.1.
24.509	⅜ Dia. x ⅑ in. long G.P.1.
24.510	⅜ Dia. x ⅒ in. long G.P.1.
24.511	⅜ Dia. x ⅓ in. long G.P.1.
24.512	⅜ Dia. x ⅔ in. long G.P.1.
24.513	⅜ Dia. x ⅕ in. long G.P.1.
24.514	⅜ Dia. x ⅖ in. long G.P.1.
24.515	⅜ Dia. x ⅗ in. long G.P.1.
24.516	⅜ Dia. x 1 in. long G.P.1.
24.517	⅜ Dia. x ⅝ in. long G.P.1.
24.518	⅜ Dia. x ⅞ in. long G.P.1.
24.519	⅜ Dia. x ⅞ in. long G.P.1.
24.520	⅜ Dia. x ½ in. long G.P.1.
24.521	⅜ Dia. x ⅓ in. long G.P.1.
24.522	⅜ Dia. x ⅔ in. long G.P.1.
24.523	⅜ Dia. x 1 in. long G.P.3.
24.524	⅜ Dia. x ½ in. long G.P.2.
24.525	⅜ Dia. x ⅑ in. long G.P.3.
24.526	⅜ Dia. x ⅒ in. long G.P.3.
24.527	⅜ Dia. x ⅓ in. long G.P.4.
24.528	⅜ Dia. x ⅔ in. long G.P.4.
24.529	⅜ Dia. x ⅕ in. long G.P.3.
24.530	⅜ Dia. x ⅖ in. long G.P.3.
24.531	⅜ Dia. x ⅗ in. long G.P.3.
24.532	⅜ Dia. x ⅘ in. long G.P.3.
24.533	⅜ Dia. x ⅙ in. long G.P.3.
24.534	⅜ Dia. x 1 in. long G.P.3.

**Section 24 continued**

Part Ref.	
24.535	⅜ Dia. x 1¼ in. long G.P.3.
24.536	⅜ Dia. x ½ in. long G.P.1.
24.537	⅜ Dia. x 1 in. long G.P.1.
24.538	⅜ Dia. x 1⅛ in. long G.P.1.
24.539	⅜ Dia. x ½ in. long G.P.3.
24.540	⅜ Dia. x ⅑ in. long G.P.3.
24.541	⅜ Dia. x ⅒ in. long G.P.3.
24.542	⅜ Dia. x ⅓ in. long G.P.3.
24.543	⅜ Dia. x ⅔ in. long G.P.3.
24.544	⅜ Dia. x 1 in. long G.P.3.
24.545	⅜ Dia. x 1¼ in. long G.P.3.
24.546	⅜ Dia. x 1½ in. long G.P.3.
24.547	⅜ Dia. x ⅝ in. long G.P.4.
24.548	⅜ Dia. x ⅞ in. long G.P.2.
24.549	⅜ Dia. x 1¾ in. long G.P.3.
24.550	⅜ Dia. x ⅜ in. long G.P.3.
24.551	¼ Dia. x ½ in. long G.P.2.
24.552	¼ Dia. x ⅝ in. long G.P.2.
24.553	¼ Dia. x 1 in. long G.P.2.
24.554	¼ Dia. x 1⅛ in. long G.P.2.
24.555	¼ Dia. x 1½ in. long G.P.2.
24.556	¼ Dia. x 1¾ in. long G.P.2.
24.557	¼ Dia. x ⅞ in. long G.P.3.
24.558	¼ Dia. x ⅝ in. long G.P.3.
24.559	¼ Dia. x 1⅞ in. long G.P.3.
24.560	¼ Dia. x ⅔ in. long G.P.4.
24.561	⅜ Dia. x ⅑ in. long G.P.1.
24.562	⅜ Dia. x ⅒ in. long G.P.1.
24.563	⅜ Dia. x ⅓ in. long G.P.1.
24.564	⅜ Dia. x ⅔ in. long G.P.1.
24.565	⅜ Dia. x 1 in. long G.P.2.
24.566	⅜ Dia. x ⅞ in. long G.P.1.
24.567	⅜ Dia. x 1⅝ in. long G.P.1.
24.568	⅜ Dia. x 1 in. long G.P.1.
24.569	⅜ Dia. x ⅝ in. long G.P.3.
24.570	⅜ Dia. x ⅔ in. long G.P.3.
24.571	⅜ Dia. x ⅞ in. long G.P.3.
24.572	⅜ Dia. x 1 in. long G.P.3.
24.573	⅜ Dia. x 1¼ in. long G.P.3.
24.574	⅜ Dia. x 1½ in. long G.P.3.
24.575	⅜ Dia. x 1¾ in. long G.P.3.
24.576	⅜ Dia. x 2 in. long G.P.3.
24.577	⅜ Dia. x 1 in. long G.P.4.
24.578	⅜ Dia. x 1¼ in. long G.P.4.
24.579	⅜ Dia. x ⅝ in. long G.P.3.
24.580	⅜ Dia. x ⅔ in. long G.P.1.
24.581	⅜ Dia. x 1⅞ in. long G.P.1.
24.582	⅜ Dia. x 1¼ in. long G.P.1.
24.583	⅜ Dia. x ⅓ in. long G.P.1.
24.584	⅜ Dia. x ⅝ in. long G.P.3.
24.585	⅜ Dia. x ⅔ in. long G.P.3.
24.586	⅜ Dia. x ⅞ in. long G.P.3.
24.587	⅜ Dia. x 1 in. long G.P.3.
24.588	⅜ Dia. x 1¼ in. long G.P.3.
24.589	⅜ Dia. x 1½ in. long G.P.3.
24.590	⅜ Dia. x 1¾ in. long G.P.3.
24.591	⅜ Dia. x 1 in. long G.P.4.
24.592	⅜ Dia. x 1½ in. long G.P.4.
24.593	⅜ Dia. x 1½ in. long G.P.1.
24.594	⅜ Dia. x ⅞ in. long G.P.1.
24.595	⅜ Dia. x 1½ in. long G.P.2.
24.596	⅜ Dia. x ½ in. long G.P.1.
24.597	⅜ Dia. x ⅑ in. long G.P.1.
24.598	⅜ Dia. x ⅒ in. long G.P.1.
24.599	⅜ Dia. x ⅓ in. long G.P.1.
24.600	⅜ Dia. x ⅔ in. long G.P.1.
24.601	⅜ Dia. x ⅕ in. long G.P.1.
24.602	⅜ Dia. x ⅖ in. long G.P.1.
24.603	⅜ Dia. x ⅗ in. long G.P.1.
24.604	⅜ Dia. x 1 in. long G.P.1.
24.605	⅜ Dia. x 1⅞ in. long G.P.1.
24.606	⅜ Dia. x 1¼ in. long G.P.1.
24.607	⅜ Dia. x 1½ in. long G.P.1.
24.608	⅜ Dia. x 1½ in. long G.P.1.
24.609	⅜ Dia. x 1¾ in. long G.P.1.
24.610	⅜ Dia. x 1¾ in. long G.P.1.
24.611	⅜ Dia. x 1¾ in. long G.P.1.

**Section 24 continued**

Part Ref.	
24.612	⅜ Dia. x 2 in. long G.P.1.
24.613	⅜ Dia. x ⅞ in. long G.P.1.
24.614	⅜ Dia. x ⅑ in. long G.P.1.
24.615	⅜ Dia. x ⅒ in. long G.P.1.
24.616	⅜ Dia. x ⅓ in. long G.P.1.
24.617	⅜ Dia. x ⅔ in. long G.P.1.
24.618	⅜ Dia. x ⅕ in. long G.P.1.
24.619	⅜ Dia. x ⅖ in. long G.P.1.
24.620	⅜ Dia. x ⅗ in. long G.P.1.
24.621	⅜ Dia. x 1¼ in. long G.P.1.
24.622	⅜ Dia. x 1⅝ in. long G.P.1.
24.623	⅜ Dia. x 1½ in. long G.P.1.
24.624	⅜ Dia. x 1⅞ in. long G.P.1.
24.625	⅜ Dia. x 1¾ in. long G.P.1.
24.626	⅜ Dia. x 1⅞ in. long G.P.1.
24.627	⅜ Dia. x 2 in. long G.P.1.
24.628	⅜ Dia. x 2¼ in. long G.P.1.
24.629	⅜ Dia. x 2½ in. long G.P.1.
24.630	⅜ Dia. x 2¾ in. long G.P.1.
24.631	⅜ Dia. x 3 in. long G.P.1.
24.632	⅜ Dia. x ⅞ in. long G.P.1.
24.633	⅜ Dia. x ⅑ in. long G.P.1.
24.634	⅜ Dia. x ⅒ in. long G.P.1.
24.635	⅜ Dia. x ⅓ in. long G.P.1.
24.636	⅜ Dia. x ⅔ in. long G.P.1.
24.637	⅜ Dia. x ⅕ in. long G.P.1.
24.638	⅜ Dia. x ⅖ in. long G.P.1.
24.639	⅜ Dia. x ⅗ in. long G.P.1.
24.640	⅜ Dia. x 1⅝ in. long G.P.1.
24.641	⅜ Dia. x 1 in. long G.P.1.
24.642	⅜ Dia. x 1⅞ in. long G.P.1.
24.643	⅜ Dia. x 1¼ in. long G.P.1.
24.644	⅜ Dia. x 1⅝ in. long G.P.1.
24.645	⅜ Dia. x 1½ in. long G.P.1.
24.646	⅜ Dia. x 1⅞ in. long G.P.1.
24.647	⅜ Dia. x 1¾ in. long G.P.1.
24.648	⅜ Dia. x 1⅞ in. long G.P.1.
24.649	⅜ Dia. x 2 in. long G.P.1.
24.650	⅜ Dia. x 2¼ in. long G.P.1.
24.651	⅜ Dia. x 2½ in. long G.P.1.
24.652	⅜ Dia. x 2¾ in. long G.P.1.
24.653	⅜ Dia. x 3 in. long G.P.1.
24.654	⅜ Dia. x ⅞ in. long G.P.1.
24.655	⅜ Dia. x ⅑ in. long G.P.1.
24.656	⅜ Dia. x ⅒ in. long G.P.1.
24.657	⅜ Dia. x ⅓ in. long G.P.1.
24.658	⅜ Dia. x ⅔ in. long G.P.1.
24.659	⅜ Dia. x ⅕ in. long G.P.1.
24.660	⅜ Dia. x ⅖ in. long G.P.1.
24.661	⅜ Dia. x ⅗ in. long G.P.1.
24.662	⅜ Dia. x 1⅝ in. long G.P.1.
24.663	⅜ Dia. x 1 in. long G.P.1.
24.664	⅜ Dia. x 1⅞ in. long G.P.1.
24.665	⅜ Dia. x 1¼ in. long G.P.1.
24.666	⅜ Dia. x 1⅞ in. long G.P.1.
24.667	⅜ Dia. x 1½ in. long G.P.1.
24.668	⅜ Dia. x 1⅞ in. long G.P.1.
24.669	⅜ Dia. x 1¾ in. long G.P.1.
24.670	⅜ Dia. x 1⅞ in. long G.P.1.
24.671	⅜ Dia. x 2 in. long G.P.1.
24.672	⅜ Dia. x 2¼ in. long G.P.1.
24.673	⅜ Dia. x 2½ in. long G.P.1.
24.674	⅜ Dia. x 2¾ in. long G.P.1.
24.675	⅜ Dia. x 3 in. long G.P.1.
24.676	⅜ Dia. x 3¼ in. long G.P.1.
24.677	⅜ Dia. x 3½ in. long G.P.1.
24.678	⅜ Dia. x 3¾ in. long G.P.1.
24.679	⅜ Dia. x 4 in. long G.P.1.
24.680	⅜ Dia. x ½ in. long G.P.1.
24.681	⅜ Dia. x ⅞ in. long G.P.1.
24.682	⅜ Dia. x ⅑ in. long G.P.1.
24.683	⅜ Dia. x ⅒ in. long G.P.1.
24.684	⅜ Dia. x ⅓ in. long G.P.1.
24.685	⅜ Dia. x ⅔ in. long G.P.1.
24.686	⅜ Dia. x ⅕ in. long G.P.1.
24.687	⅜ Dia. x ⅖ in. long G.P.1.
24.688	⅜ Dia. x 1 in. long G.P.1.









## Section 24 continued

Part Ref.	
24.371	$\frac{9}{32}$ Dia. x $3\frac{1}{2}$ in. long G.P.4.
24.372	$\frac{9}{32}$ Dia. x $3\frac{3}{4}$ in. long G.P.4.
24.373	$\frac{9}{32}$ Dia. x 4 in. long G.P.4.
24.374	$\frac{9}{32}$ Dia. x $4\frac{1}{4}$ in. long G.P.4.
24.375	$\frac{9}{32}$ Dia. x $4\frac{1}{2}$ in. long G.P.4.
24.376	$\frac{9}{32}$ Dia. x $4\frac{3}{4}$ in. long G.P.4.
24.377	$\frac{9}{32}$ Dia. x 5 in. long G.P.4.
24.378	$\frac{5}{16}$ Dia. x $1\frac{1}{4}$ in. long G.P.4.
24.379	$\frac{5}{16}$ Dia. x $\frac{3}{4}$ in. long G.P.4.
24.380	$\frac{5}{16}$ Dia. x $1\frac{3}{16}$ in. long G.P.4.
24.381	$\frac{5}{16}$ Dia. x $\frac{1}{2}$ in. long G.P.4.
24.382	$\frac{5}{16}$ Dia. x $1\frac{5}{16}$ in. long G.P.4.
24.383	$\frac{5}{16}$ Dia. x $1\frac{1}{8}$ in. long G.P.4.
24.384	$\frac{5}{16}$ Dia. x $1\frac{1}{2}$ in. long G.P.4.
24.385	$\frac{5}{16}$ Dia. x $1\frac{1}{4}$ in. long G.P.4.
24.386	$\frac{5}{16}$ Dia. x $1\frac{5}{8}$ in. long G.P.4.
24.387	$\frac{5}{16}$ Dia. x $1\frac{3}{4}$ in. long G.P.4.
24.388	$\frac{5}{16}$ Dia. x $1\frac{7}{8}$ in. long G.P.4.
24.389	$\frac{5}{16}$ Dia. x 2 in. long G.P.4.
24.390	$\frac{5}{16}$ Dia. x $2\frac{1}{4}$ in. long G.P.4.
24.391	$\frac{5}{16}$ Dia. x $2\frac{1}{2}$ in. long G.P.4.
24.392	$\frac{5}{16}$ Dia. x $2\frac{3}{4}$ in. long G.P.4.
24.393	$\frac{5}{16}$ Dia. x 3 in. long G.P.4.
24.394	$\frac{5}{16}$ Dia. x $3\frac{1}{4}$ in. long G.P.4.
24.395	$\frac{5}{16}$ Dia. x $3\frac{1}{2}$ in. long G.P.4.
24.396	$\frac{5}{16}$ Dia. x $3\frac{3}{4}$ in. long G.P.4.
24.397	$\frac{5}{16}$ Dia. x 4 in. long G.P.4.
24.398	$\frac{5}{16}$ Dia. x $4\frac{1}{4}$ in. long G.P.4.
24.399	$\frac{5}{16}$ Dia. x $4\frac{1}{2}$ in. long G.P.4.
24.400	$\frac{5}{16}$ Dia. x $4\frac{3}{4}$ in. long G.P.4.
24.401	$\frac{5}{16}$ Dia. x 5 in. long G.P.4.
24.402	$\frac{5}{16}$ Dia. x $5\frac{1}{2}$ in. long G.P.4.
24.403	$\frac{5}{16}$ Dia. x 6 in. long G.P.4.
24.404	$\frac{5}{16}$ Dia. x $6\frac{1}{2}$ in. long G.P.4.
24.405	$\frac{5}{16}$ Dia. x 7 in. long G.P.4.
24.406	$\frac{11}{32}$ Dia. x $1\frac{1}{4}$ in. long G.P.4.
24.407	$\frac{11}{32}$ Dia. x $\frac{3}{4}$ in. long G.P.4.
24.408	$\frac{11}{32}$ Dia. x $1\frac{3}{16}$ in. long G.P.4.
24.409	$\frac{11}{32}$ Dia. x $\frac{7}{8}$ in. long G.P.4.
24.410	$\frac{11}{32}$ Dia. x $1\frac{5}{16}$ in. long G.P.4.
24.411	$\frac{11}{32}$ Dia. x 1 in. long G.P.4.
24.412	$\frac{11}{32}$ Dia. x $1\frac{1}{8}$ in. long G.P.4.
24.413	$\frac{11}{32}$ Dia. x $1\frac{1}{4}$ in. long G.P.4.
24.414	$\frac{11}{32}$ Dia. x $1\frac{3}{8}$ in. long G.P.4.
24.415	$\frac{11}{32}$ Dia. x $1\frac{1}{2}$ in. long G.P.4.
24.416	$\frac{11}{32}$ Dia. x $1\frac{5}{8}$ in. long G.P.4.
24.417	$\frac{11}{32}$ Dia. x $1\frac{3}{4}$ in. long G.P.4.
24.418	$\frac{11}{32}$ Dia. x $1\frac{7}{8}$ in. long G.P.4.
24.419	$\frac{11}{32}$ Dia. x 2 in. long G.P.4.
24.420	$\frac{11}{32}$ Dia. x $2\frac{1}{4}$ in. long G.P.4.
24.421	$\frac{11}{32}$ Dia. x $2\frac{1}{2}$ in. long G.P.4.
24.422	$\frac{11}{32}$ Dia. x $2\frac{3}{4}$ in. long G.P.4.
24.423	$\frac{11}{32}$ Dia. x 3 in. long G.P.4.
24.424	$\frac{11}{32}$ Dia. x $3\frac{1}{4}$ in. long G.P.4.
24.425	$\frac{11}{32}$ Dia. x $3\frac{1}{2}$ in. long G.P.4.
24.426	$\frac{11}{32}$ Dia. x $3\frac{3}{4}$ in. long G.P.4.
24.427	$\frac{11}{32}$ Dia. x 4 in. long G.P.4.
24.428	$\frac{11}{32}$ Dia. x $4\frac{1}{4}$ in. long G.P.4.
24.429	$\frac{11}{32}$ Dia. x $4\frac{1}{2}$ in. long G.P.4.
24.430	$\frac{11}{32}$ Dia. x $4\frac{3}{4}$ in. long G.P.4.
24.431	$\frac{11}{32}$ Dia. x 5 in. long G.P.4.
24.432	$\frac{11}{32}$ Dia. x $5\frac{1}{2}$ in. long G.P.4.
24.433	$\frac{11}{32}$ Dia. x 6 in. long G.P.4.
24.434	$\frac{11}{32}$ Dia. x $6\frac{1}{2}$ in. long G.P.4.
24.435	$\frac{11}{32}$ Dia. x 7 in. long G.P.4.
24.436	$\frac{3}{8}$ Dia. x $1\frac{3}{16}$ in. long G.P.4.
24.437	$\frac{3}{8}$ Dia. x $\frac{1}{2}$ in. long G.P.4.
24.438	$\frac{3}{8}$ Dia. x $1\frac{5}{16}$ in. long G.P.4.
24.439	$\frac{3}{8}$ Dia. x $1\frac{1}{4}$ in. long G.P.4.
24.440	$\frac{3}{8}$ Dia. x $1\frac{1}{2}$ in. long G.P.4.
24.441	$\frac{3}{8}$ Dia. x $1\frac{3}{4}$ in. long G.P.4.
24.442	$\frac{3}{8}$ Dia. x $1\frac{5}{8}$ in. long G.P.4.
24.443	$\frac{3}{8}$ Dia. x $1\frac{3}{4}$ in. long G.P.4.
24.444	$\frac{3}{8}$ Dia. x $1\frac{7}{8}$ in. long G.P.4.

## Section 24 continued

Part Ref.	
24.445	$\frac{3}{8}$ Dia. x 2 in. long G.P.4.
24.446	$\frac{3}{8}$ Dia. x $2\frac{1}{4}$ in. long G.P.4.
24.447	$\frac{3}{8}$ Dia. x $2\frac{1}{2}$ in. long G.P.4.
24.448	$\frac{3}{8}$ Dia. x $2\frac{3}{4}$ in. long G.P.4.
24.449	$\frac{3}{8}$ Dia. x 3 in. long G.P.4.
24.450	$\frac{3}{8}$ Dia. x $3\frac{1}{4}$ in. long G.P.4.
24.451	$\frac{3}{8}$ Dia. x $3\frac{1}{2}$ in. long G.P.4.
24.452	$\frac{3}{8}$ Dia. x $3\frac{3}{4}$ in. long G.P.4.
24.453	$\frac{3}{8}$ Dia. x 4 in. long G.P.4.
24.454	$\frac{3}{8}$ Dia. x $4\frac{1}{4}$ in. long G.P.4.
24.455	$\frac{3}{8}$ Dia. x $4\frac{1}{2}$ in. long G.P.4.
24.456	$\frac{3}{8}$ Dia. x $4\frac{3}{4}$ in. long G.P.4.
24.457	$\frac{3}{8}$ Dia. x 5 in. long G.P.4.
24.458	$\frac{3}{8}$ Dia. x $5\frac{1}{2}$ in. long G.P.4.
24.459	$\frac{3}{8}$ Dia. x 6 in. long G.P.4.
24.460	$\frac{3}{8}$ Dia. x $6\frac{1}{2}$ in. long G.P.4.
24.461	$\frac{3}{8}$ Dia. x 7 in. long G.P.4.

## Section 25

## Pins Miscellaneous

Part Ref.	
25.042	$\frac{3}{32}$ Dia. x $\frac{3}{4}$ in. long Split Pin.
25.561	$\frac{1}{4}$ Dia. x $\frac{3}{4}$ in. long G.P.5.
25.562	$\frac{1}{4}$ Dia. x $1\frac{1}{8}$ in. long G.P.5.
25.566	$\frac{5}{16}$ Dia. x $\frac{1}{4}$ in. long G.P.3.
25.567	$\frac{5}{16}$ Dia. x $\frac{3}{8}$ in. long G.P.3.
25.568	$\frac{5}{16}$ Dia. x $\frac{1}{2}$ in. long G.P.3.
25.581	$\frac{3}{8}$ Dia. x $\frac{1}{4}$ in. long G.P.3.
25.582	$\frac{3}{8}$ Dia. x $\frac{3}{8}$ in. long G.P.3.
25.583	$\frac{3}{8}$ Dia. x $\frac{1}{2}$ in. long G.P.3.
25.584	$\frac{3}{8}$ Dia. x $\frac{1}{4}$ in. long G.P.3.
25.585	$\frac{3}{32}$ Dia. x 2 in. long Split Pin.
25.586	$\frac{3}{32}$ Dia. x $2\frac{1}{4}$ in. long Split Pin.

## Section 26

## Oil Rings

Part Ref.	
26.034	3 in. Dia. x .210 Thk. Pioneer. PO/33730021.
26.841	$\frac{1}{8}$ Dia. x .070 Thk. Pioneer. PO/02501207.
26.842	$\frac{3}{16}$ Dia. x .070 Thk. Pioneer. PO/03101807.
26.843	$\frac{1}{4}$ Dia. x .070 Thk. Pioneer. PO/03702507.
26.844	$\frac{5}{16}$ Dia. x .070 Thk. Pioneer. PO/04303107.
26.845	$\frac{3}{8}$ Dia. x .070 Thk. Pioneer. PO/05003707.
26.846	$\frac{7}{16}$ Dia. x .070 Thk. Pioneer. PO/05604307.
26.847	$\frac{9}{16}$ Dia. x .103 Thk. Pioneer. PO/07505610.
26.848	$\frac{11}{16}$ Dia. x .103 Thk. Pioneer. PO/08706810.
26.849	$\frac{13}{16}$ Dia. x .103 Thk. Pioneer. PO/10008110.
26.850	$\frac{1}{2}$ Dia. x .103 Thk. Pioneer. PO/06805010.
26.851	1 Dia. x .139 Thk. Pioneer. PO/12510013.
26.852	$1\frac{1}{2}$ Dia. x .139 Thk. Pioneer. PO/17515013.
26.853	$1\frac{5}{8}$ Dia. x .139 Thk. Pioneer. PO/18716213.
26.854	$1\frac{3}{4}$ Dia. x .139 Thk. Pioneer. PO/20618113.
26.855	$\frac{3}{8}$ Dia. x .103 Thk. Pioneer. PO/08106210.
26.856	2 Dia. x .139 Thk. Pioneer. PO/22520013.
26.857	$\frac{3}{4}$ Dia. x .103 Thk. Pioneer. PO/09307510.

## Section 26 continued

Part Ref.	
26.858	$\frac{7}{8}$ Dia. x .103 Thk. Pioneer. PO/10608710.
26.859	$\frac{1}{2}$ i.d. x $\frac{5}{8}$ o/d Dowty No.2.
26.860	$\frac{15}{16}$ Dia. x .103 Thk. Pioneer. PO/11209310.
26.861	$1\frac{1}{16}$ Dia. x .139 Thk. Pioneer. PO/13110613.
26.862	$1\frac{1}{8}$ Dia. x .139 Thk. Pioneer. PO/13711213.
26.863	$1\frac{3}{16}$ Dia. x .139 Thk. Pioneer. PO/14311813.
26.864	$1\frac{1}{4}$ Dia. x .139 Thk. Pioneer. PO/15012513.
26.865	$1\frac{5}{16}$ Dia. x .139 Thk. Pioneer. PO/15613113.
26.866	$1\frac{3}{8}$ Dia. x .139 Thk. Pioneer. PO/16213713.
26.867	$1\frac{7}{16}$ Dia. x .139 Thk. Pioneer. PO/16814313.
26.868	$1\frac{9}{16}$ Dia. x .139 Thk. Pioneer. PO/18115613.
26.869	$1\frac{11}{16}$ Dia. x .139 Thk. Pioneer. PO/19316813.
26.870	$1\frac{3}{4}$ Dia. x .139 Thk. Pioneer. PO/20017513.
26.871	$1\frac{7}{8}$ Dia. x .139 Thk. Pioneer. PO/21218713.
26.872	$1\frac{5}{8}$ Dia. x .139 Thk. Pioneer. PO/21819313.
26.873	$2\frac{1}{16}$ Dia. x .139 Thk. Pioneer. PO/23120613.
26.874	$2\frac{3}{8}$ Dia. x .139 Thk. Pioneer. PO/23721213.
26.875	$2\frac{5}{16}$ Dia. x .139 Thk. Pioneer. PO/24321813.
26.876	$2\frac{1}{4}$ Dia. x .139 Thk. Pioneer. PO/25022513.
26.877	$2\frac{3}{4}$ Dia. x .139 Thk. Pioneer. PO/25623113.
26.878	$2\frac{5}{8}$ Dia. x .139 Thk. Pioneer. PO/26223713.
26.879	$2\frac{7}{16}$ Dia. x .139 Thk. Pioneer. PO/26824313.
26.880	$2\frac{1}{2}$ Dia. x .139 Thk. Pioneer. PO/27525013.
26.881	$2\frac{9}{16}$ Dia. x .139 Thk. Pioneer. PO/28125613.
26.882	$2\frac{5}{8}$ Dia. x .139 Thk. Pioneer. PO/28726213.
26.883	$2\frac{11}{16}$ Dia. x .139 Thk. Pioneer. PO/29326813.
26.884	$2\frac{3}{4}$ Dia. x .139 Thk. Pioneer. PO/30027513.
26.885	$2\frac{13}{16}$ Dia. x .139 Thk. Pioneer. PO/30628113.
26.886	$2\frac{7}{8}$ Dia. x .139 Thk. Pioneer. PO/31228713.
26.887	$2\frac{15}{16}$ Dia. x .139 Thk. Pioneer. PO/31829313.
26.889	$3\frac{1}{8}$ Dia. x .210 Thk. Pioneer. PO/35031221.
26.890	$3\frac{1}{4}$ Dia. x .210 Thk. Pioneer. PO/36232521.
26.891	$3\frac{3}{8}$ Dia. x .210 Thk. Pioneer. PO/37533721.
26.892	$3\frac{1}{2}$ Dia. x .210 Thk. Pioneer. PO/38735021.
26.893	$3\frac{5}{8}$ Dia. x .210 Thk. Pioneer. PO/40036221.
26.894	$3\frac{3}{4}$ Dia. x .210 Thk. Pioneer. PO/41237521.
26.895	$3\frac{7}{8}$ Dia. x .210 Thk. Pioneer. PO/42538721.
26.896	4 in. Dia. x .210 Thk. Pioneer. PO/43740021.
26.897	$4\frac{1}{8}$ Dia. x .210 Thk. Pioneer. PO/45041221.

Section 26 continued

Part Ref.	
26.898	4¼ Dia. x 210 Thk. Pioneer. PO/46242521.
26.899	4¾ Dia. x 210 Thk. Pioneer. PO/47543721.
26.900	4½ Dia. x 210 Thk. Pioneer. PO/48745021.
26.901	4¾ Dia. x 210 Thk. Pioneer. PO/50046221.
26.902	4¾ Dia. x 210 Thk. Pioneer. PO/51247521.
26.903	4¾ Dia. x 210 Thk. Pioneer. PO/52548721.
26.904	5 in. Dia. x 210 Thk. Pioneer. PO/53750021.
26.905	5¾ Dia. x 210 Thk. Pioneer. PO/55051221.
26.906	5¼ Dia. x 210 Thk. Pioneer. PO/56252521.
26.907	5¾ Dia. x 210 Thk. Pioneer. PO/57553721.
26.908	5½ Dia. x 210 Thk. Pioneer. PO/58755021.
26.909	5¾ Dia. x 210 Thk. Pioneer. PO/60056221.
26.910	5¾ Dia. x 210 Thk. Pioneer. PO/61257521.
26.911	5¾ Dia. x 210 Thk. Pioneer. PO/62558721.
26.912	6 in. Dia. x .275 Thk. Pioneer. PO/65060027.
26.913	6¾ Dia. x .275 Thk. Pioneer. PO/66261227.
26.914	6¼ Dia. x .275 Thk. Pioneer. PO/67562527.
26.915	6¾ Dia. x .275 Thk. Pioneer. PO/68763727.
26.916	6½ Dia. x .275 Thk. Pioneer. PO/70065027.
26.917	6¾ Dia. x .275 Thk. Pioneer. PO/71266227.
26.918	6¾ Dia. x .275 Thk. Pioneer. PO/72567527.
26.919	6¾ Dia. x .275 Thk. Pioneer. PO/73768727.
26.920	7 in. Dia. x .275 Thk. Pioneer. PO/75070027.
26.921	7¾ Dia. x .275 Thk. Pioneer. PO/76271227.
26.922	7¼ Dia. x .275 Thk. Pioneer. PO/77572527.
26.923	7¾ Dia. x .275 Thk. Pioneer. PO/78773727.
26.924	7½ Dia. x .275 Thk. Pioneer. PO/80075027.
26.925	7¾ Dia. x .275 Thk. Pioneer. PO/81276227.
26.926	7¾ Dia. x .275 Thk. Pioneer. PO/82577527.
26.927	7¾ Dia. x .275 Thk. Pioneer. PO/83778727.
26.928	8 in. Dia. x .275 Thk. Pioneer. PO/85080027.
26.929	7¼ i.d. x 9/16 o.d. Dowty No.1.
26.930	9/16 i.d. x 11/16 o.d. Dowty No.3.
26.931	¾ i.d. x ¾ o.d. Dowty No.4.
26.932	11/16 i.d. x 13/16 o.d. Dowty No.5.
26.933	¾ i.d. x ¾ o.d. Dowty No.6.
26.934	13/16 i.d. x 15/16 o.d. Dowty No.7.
26.935	¾ i.d. x 1 o.d. Dowty No.8.

Section 26 continued

Part Ref.	
26.936	15/16 i.d. x 1 1/16 o.d. Dowty No.9.
26.937	1 in. i.d. x 1 1/8 o.d. Dowty No.10.
26.938	1 1/16 i.d. x 1 3/16 o.d. Dowty No.11.
26.939	1 1/8 i.d. x 1 1/4 o.d. Dowty No.12.
26.940	1 3/16 i.d. x 1 5/16 o.d. Dowty No.13.
26.941	1 1/4 i.d. x 1 3/8 o.d. Dowty No.14.
26.942	1 5/16 i.d. x 1 7/16 o.d. Dowty No.15.
26.943	1 3/8 i.d. x 1 1/2 o.d. Dowty No.16.
26.944	1 7/16 i.d. x 1 9/16 o.d. Dowty No.17.
26.945	1 1/2 i.d. x 1 5/8 o.d. Dowty No.18.
26.946	1 9/16 i.d. x 1 11/16 o.d. Dowty No.19.
26.947	1 5/8 i.d. x 1 3/4 o.d. Dowty No.20.
26.948	1 3/4 i.d. x 1 7/8 o.d. Dowty No.21.
26.949	1 1/8 i.d. x 2 in. o.d. Dowty No.22.
26.950	2 in. i.d. x 2 1/8 o.d. Dowty No.23.
26.951	2 1/8 i.d. x 2 1/4 o.d. Dowty No.24.
26.952	2 1/4 i.d. x 2 3/8 o.d. Dowty No.25.
26.953	2 3/8 i.d. x 2 1/2 o.d. Dowty No.26.
26.954	2 1/2 i.d. x 2 5/8 o.d. Dowty No.27.
26.955	2 3/8 i.d. x 2 3/4 o.d. Dowty No.28.
26.956	2 1/4 i.d. x 2 3/8 o.d. Dowty No.29.
26.957	2 1/8 i.d. x 3 in. o.d. Dowty No.30.

Section 27

Oil Rings Miscellaneous

Part Ref.	
27.026	Pioneer POS/2504/MP/658
27.027	Pioneer SH/96/332. 1 1/8 i.d.
27.028	1.734 i.d. x .139 Thk. Pioneer. PO/20017513,
27.040	Pioneer POS/2508/MP/658
27.047	Superfect SH/96/45
27.048	Superfect SH/96/34
27.060	1/2 i.d. B4/1115.
27.137	Dowty Mk7 list 4 pp 73c.
27.138	Dowty Mk24 list 5 pp 49c.
27.141	Superfect SH/96/16.
27.192	Dowty Mk.7 list 1 pp 49c.
27.846	.424 i.d. x .070 Thk. Pioneer. PO/06204310.
27.850	.859 i.d. x .139 Thk. Pioneer. PO/11208713.
27.855	Pioneer PO/23720021.
27.856	POS/2507/MP/658.
27.857	2.100 i.d. x .070 Thk. Pioneer. PO/25021221.
27.858	POS/2506/MP/658.
27.859	SH/96/44 Superfect.
27.860	PP73C Dowty.
27.861	5-004/MP/701.
27.862	SH/96/11 Superfect.
27.025	Pioneer POS/505/MH/658
27.148	Dowty list 5 Mk26 pp 49c.
27.182	Dowty 5 Mk 10 pp 49c.
27.193	Dowty pp 49c/18 list 5.

Section 28  
Rivets

Part Ref.	
28.902	3/32 Dia. x 1/2 in. long R.H. Steel.
28.903	1/8 Dia. x 1/4 in. long Copper Round Head.
28.904	1/8 Dia. x 3/4 in. long Copper Hollow.
28.905	1/8 Dia. x 7/16 in. long Copper c/sunk Head.
28.906	5/32 Dia. Copper, c/sunk- Head.
28.907	1/4 Dia. x 7/16 in. long Copper c/sunk Head.
28.908	1/2 Dia. x 1/2 in. long x 3/16 Dia. Hd. Hollow Copper.
28.909	1/8 Dia. x 3/8 in. long c/sunk Steel.
28.910	3/16 Dia. x 3/8 in. long R.H. Steel.
28.911	No.4 x 3/16 Pan Head.
28.912	No.4 x 1/2 Pan Head.
28.913	3/32 Dia. x 3/8 in. long R.H. Steel.

**Section 45**  
**Cap Screws – Hex Socket Head**  
**10 x 24 t.p.i.**

Part Ref.	
45.200	10 x 24 t.p.i. x $\frac{1}{4}$ in. long.
45.201	10 x 24 t.p.i. x $\frac{3}{8}$ in. long.
45.202	10 x 24 t.p.i. x $\frac{1}{2}$ in. long.
45.203	10 x 24 t.p.i. x $\frac{5}{8}$ in. long.
45.204	10 x 24 t.p.i. x $\frac{3}{4}$ in. long.
45.205	10 x 24 t.p.i. x $\frac{7}{8}$ in. long.
45.206	10 x 24 t.p.i. x 1 in. long.
45.207	10 x 24 t.p.i. x $1\frac{1}{4}$ in. long.
45.208	10 x 24 t.p.i. x $1\frac{1}{2}$ in. long.
45.209	10 x 24 t.p.i. x $1\frac{3}{4}$ in. long.
45.210	10 x 24 t.p.i. x 2 in. long.

**Section 46**  
**Cap Screws – Hex Socket Head**  
 **$\frac{1}{4}$  in. U.N.C.**

Part Ref.	
46.211	$\frac{1}{4}$ U.N.C. x $\frac{3}{8}$ in. long.
46.212	$\frac{1}{4}$ U.N.C. x $\frac{1}{2}$ in. long.
46.213	$\frac{1}{4}$ U.N.C. x $\frac{5}{8}$ in. long.
46.214	$\frac{1}{4}$ U.N.C. x $\frac{3}{4}$ in. long.
46.215	$\frac{1}{4}$ U.N.C. x $\frac{7}{8}$ in. long.
46.216	$\frac{1}{4}$ U.N.C. x 1 in. long.
46.217	$\frac{1}{4}$ U.N.C. x $1\frac{1}{4}$ in. long.
46.218	$\frac{1}{4}$ U.N.C. x $1\frac{1}{2}$ in. long.
46.219	$\frac{1}{4}$ U.N.C. x $1\frac{3}{4}$ in. long.
46.220	$\frac{1}{4}$ U.N.C. x 2 in. long.
46.221	$\frac{1}{4}$ U.N.C. x $2\frac{1}{4}$ in. long.
46.222	$\frac{1}{4}$ U.N.C. x $2\frac{1}{2}$ in. long.

**Section 47**  
**Cap Screws – Hex Socket Head**  
 **$\frac{5}{16}$  in. U.N.C.**

Part Ref.	
47.223	$\frac{5}{16}$ U.N.C. x $\frac{1}{2}$ in. long.
47.224	$\frac{5}{16}$ U.N.C. x $\frac{5}{8}$ in. long.
47.225	$\frac{5}{16}$ U.N.C. x $\frac{3}{4}$ in. long.
47.226	$\frac{5}{16}$ U.N.C. x $\frac{7}{8}$ in. long.
47.227	$\frac{5}{16}$ U.N.C. x 1 in. long.
47.228	$\frac{5}{16}$ U.N.C. x $1\frac{1}{4}$ in. long.
47.229	$\frac{5}{16}$ U.N.C. x $1\frac{1}{2}$ in. long.
47.230	$\frac{5}{16}$ U.N.C. x $1\frac{3}{4}$ in. long.
47.231	$\frac{5}{16}$ U.N.C. x 2 in. long.
47.232	$\frac{5}{16}$ U.N.C. x $2\frac{1}{4}$ in. long.
47.233	$\frac{5}{16}$ U.N.C. x $2\frac{1}{2}$ in. long.
47.234	$\frac{5}{16}$ U.N.C. x 3 in. long.

**Section 48**  
**Cap Screws – Hex Socket Head**  
 **$\frac{3}{8}$  in. U.N.C.**

Part Ref.	
48.236	$\frac{3}{8}$ U.N.C. x $\frac{1}{2}$ in. long.
48.237	$\frac{3}{8}$ U.N.C. x $\frac{5}{8}$ in. long.
48.238	$\frac{3}{8}$ U.N.C. x $\frac{3}{4}$ in. long.
48.239	$\frac{3}{8}$ U.N.C. x $\frac{7}{8}$ in. long.
48.240	$\frac{3}{8}$ U.N.C. x 1 in. long.
48.241	$\frac{3}{8}$ U.N.C. x $1\frac{1}{4}$ in. long.
48.242	$\frac{3}{8}$ U.N.C. x $1\frac{1}{2}$ in. long.
48.243	$\frac{3}{8}$ U.N.C. x $1\frac{3}{4}$ in. long.
48.244	$\frac{3}{8}$ U.N.C. x 2 in. long.
48.245	$\frac{3}{8}$ U.N.C. x $2\frac{1}{4}$ in. long.
48.246	$\frac{3}{8}$ U.N.C. x $2\frac{1}{2}$ in. long.
48.247	$\frac{3}{8}$ U.N.C. x 3 in. long.
48.248	$\frac{3}{8}$ U.N.C. x $3\frac{1}{2}$ in. long.
48.249	$\frac{3}{8}$ U.N.C. x 4 in. long.

**Section 49**  
**Cap Screws – Hex Socket Head**  
 **$\frac{7}{16}$  in. U.N.C.**

Part Ref.	
49.250	$\frac{7}{16}$ U.N.C. x 1 in. long.
49.251	$\frac{7}{16}$ U.N.C. x $1\frac{1}{4}$ in. long.
49.252	$\frac{7}{16}$ U.N.C. x $1\frac{1}{2}$ in. long.
49.253	$\frac{7}{16}$ U.N.C. x 2 in. long.
49.254	$\frac{7}{16}$ U.N.C. x $2\frac{1}{4}$ in. long.
49.255	$\frac{7}{16}$ U.N.C. x $2\frac{1}{2}$ in. long.
49.256	$\frac{7}{16}$ U.N.C. x 3 in. long.

**Section 50**  
**Cap Screws – Hex Socket Head**  
 **$\frac{1}{2}$  in. U.N.C.**

Part Ref.	
50.257	$\frac{1}{2}$ U.N.C. x $\frac{3}{4}$ in. long.
50.258	$\frac{1}{2}$ U.N.C. x 1 in. long.
50.259	$\frac{1}{2}$ U.N.C. x $1\frac{1}{4}$ in. long.
50.260	$\frac{1}{2}$ U.N.C. x $1\frac{1}{2}$ in. long.
50.261	$\frac{1}{2}$ U.N.C. x 2 in. long.
50.262	$\frac{1}{2}$ U.N.C. x $2\frac{1}{2}$ in. long.
50.263	$\frac{1}{2}$ U.N.C. x 3 in. long.
50.264	$\frac{1}{2}$ U.N.C. x $3\frac{1}{2}$ in. long.
50.265	$\frac{1}{2}$ U.N.C. x 4 in. long.
50.266	$\frac{1}{2}$ U.N.C. x $4\frac{1}{2}$ in. long.
50.267	$\frac{1}{2}$ U.N.C. x 5 in. long.
50.268	$\frac{1}{2}$ U.N.C. x $1\frac{3}{4}$ in. long.
50.269	$\frac{1}{2}$ U.N.C. x $2\frac{1}{4}$ in. long.

**Section 51**  
**Cap Screws – Hex Socket Head**  
 **$\frac{5}{8}$  in. U.N.C.**

Part Ref.	
51.268	$\frac{5}{8}$ U.N.C. x $1\frac{1}{4}$ in. long.
51.269	$\frac{5}{8}$ U.N.C. x $1\frac{1}{2}$ in. long.
51.270	$\frac{5}{8}$ U.N.C. x $1\frac{3}{4}$ in. long.
51.271	$\frac{5}{8}$ U.N.C. x 2 in. long.
51.272	$\frac{5}{8}$ U.N.C. x $2\frac{1}{2}$ in. long.
51.273	$\frac{5}{8}$ U.N.C. x 3 in. long.
51.274	$\frac{5}{8}$ U.N.C. x $3\frac{1}{2}$ in. long.
51.275	$\frac{5}{8}$ U.N.C. x 4 in. long.
51.276	$\frac{5}{8}$ U.N.C. x $4\frac{1}{2}$ in. long.
51.277	$\frac{5}{8}$ U.N.C. x 5 in. long.
51.278	$\frac{5}{8}$ U.N.C. x $5\frac{1}{2}$ in. long.
51.279	$\frac{5}{8}$ U.N.C. x 6 in. long.

**Section 52**  
**Cap Screws – Hex Socket Head**  
 **$\frac{3}{4}$  in. U.N.C.**

Part Ref.	
52.280	$\frac{3}{4}$ U.N.C. x $1\frac{1}{2}$ in. long.
52.281	$\frac{3}{4}$ U.N.C. x 2 in. long.
52.282	$\frac{3}{4}$ U.N.C. x $2\frac{1}{2}$ in. long.
52.283	$\frac{3}{4}$ U.N.C. x 3 in. long.
52.284	$\frac{3}{4}$ U.N.C. x $3\frac{1}{2}$ in. long.
52.285	$\frac{3}{4}$ U.N.C. x 4 in. long.
52.286	$\frac{3}{4}$ U.N.C. x $4\frac{1}{2}$ in. long.
52.287	$\frac{3}{4}$ U.N.C. x 5 in. long.
52.288	$\frac{3}{4}$ U.N.C. x $5\frac{1}{2}$ in. long.
52.289	$\frac{3}{4}$ U.N.C. x 6 in. long.

**Section 53**  
**C/Sunk Screws – Hex Socket Head**  
**10 x 24 t.p.i.**

Part Ref.	
53.300	10 x 24 t.p.i. x $\frac{1}{4}$ in. long.
53.301	10 x 24 t.p.i. x $\frac{5}{16}$ in. long.
53.302	10 x 24 t.p.i. x $\frac{3}{8}$ in. long.
53.303	10 x 24 t.p.i. x $\frac{1}{2}$ in. long.
53.304	10 x 24 t.p.i. x $\frac{5}{8}$ in. long.
53.305	10 x 24 t.p.i. x $\frac{3}{4}$ in. long.
53.306	10 x 24 t.p.i. x 1 in. long.

**Section 54**  
**C/Sunk Screws – Hex Socket Head**  
 **$\frac{1}{4}$  in. U.N.C.**

Part Ref.	
54.307	$\frac{1}{4}$ U.N.C. x $\frac{3}{8}$ in. long.
54.308	$\frac{1}{4}$ U.N.C. x $\frac{1}{2}$ in. long.
54.309	$\frac{1}{4}$ U.N.C. x $\frac{5}{8}$ in. long.
54.310	$\frac{1}{4}$ U.N.C. x $\frac{3}{4}$ in. long.
54.311	$\frac{1}{4}$ U.N.C. x $\frac{7}{8}$ in. long.
54.312	$\frac{1}{4}$ U.N.C. x 1 in. long.
54.313	$\frac{1}{4}$ U.N.C. x $1\frac{1}{4}$ in. long.
54.314	$\frac{1}{4}$ U.N.C. x $1\frac{3}{8}$ in. long.
54.315	$\frac{1}{4}$ U.N.C. x $1\frac{1}{2}$ in. long.

**Section 55**  
**C/Sunk Screws – Hex Socket Head**  
 **$\frac{5}{16}$  in. U.N.C.**

Part Ref.	
55.316	$\frac{5}{16}$ U.N.C. x $\frac{1}{2}$ in. long.
55.317	$\frac{5}{16}$ U.N.C. x $\frac{5}{8}$ in. long.
55.318	$\frac{5}{16}$ U.N.C. x $\frac{3}{4}$ in. long.
55.319	$\frac{5}{16}$ U.N.C. x 1 in. long.
55.320	$\frac{5}{16}$ U.N.C. x $1\frac{1}{4}$ in. long.
55.321	$\frac{5}{16}$ U.N.C. x $1\frac{1}{2}$ in. long.

**Section 56**  
**C/Sunk Screws – Hex Socket Head**  
 **$\frac{3}{8}$  in. U.N.C.**

Part Ref.	
56.322	$\frac{3}{8}$ U.N.C. x $\frac{1}{2}$ in. long.
56.323	$\frac{3}{8}$ U.N.C. x $\frac{5}{8}$ in. long.
56.324	$\frac{3}{8}$ U.N.C. x $\frac{3}{4}$ in. long.
56.325	$\frac{3}{8}$ U.N.C. x 1 in. long.
56.326	$\frac{3}{8}$ U.N.C. x $1\frac{1}{2}$ in. long.
56.327	$\frac{3}{8}$ U.N.C. x $1\frac{3}{4}$ in. long.
56.328	$\frac{3}{8}$ U.N.C. x $1\frac{1}{4}$ in. long.

**Section 57**  
**C/Sunk Screws – Hex Socket Head**  
 **$\frac{1}{2}$  in. U.N.C.**

Part Ref.	
57.329	$\frac{1}{2}$ U.N.C. x $\frac{3}{4}$ in. long.
57.330	$\frac{1}{2}$ U.N.C. x 1 in. long.
57.331	$\frac{1}{2}$ U.N.C. x $1\frac{1}{4}$ in. long.
57.332	$\frac{1}{2}$ U.N.C. x $1\frac{1}{2}$ in. long.
57.333	$\frac{1}{2}$ U.N.C. x $1\frac{3}{4}$ in. long.
57.334	$\frac{1}{2}$ U.N.C. x 2 in. long.

**Section 58****Cup Point Screws – Hex Socket Set 10 x 24 t.p.i.**

Part Ref.	
58.342	10 x 24 t.p.i. x $\frac{3}{16}$ in. long.
58.343	10 x 24 t.p.i. x $\frac{1}{4}$ in. long.
58.344	10 x 24 t.p.i. x $\frac{5}{16}$ in. long.
58.345	10 x 24 t.p.i. x $\frac{3}{8}$ in. long.
58.346	10 x 24 t.p.i. x $\frac{7}{16}$ in. long.
58.347	10 x 24 t.p.i. x $\frac{1}{2}$ in. long.
58.348	10 x 24 t.p.i. x $\frac{5}{8}$ in. long.
58.349	10 x 24 t.p.i. x $\frac{3}{4}$ in. long.

**Section 59****Cup Point Screws – Hex Socket Set  $\frac{1}{4}$  in. U.N.C.**

Part Ref.	
59.350	$\frac{1}{4}$ U.N.C. x $\frac{1}{4}$ in. long.
59.351	$\frac{1}{4}$ U.N.C. x $\frac{5}{16}$ in. long.
59.352	$\frac{1}{4}$ U.N.C. x $\frac{3}{8}$ in. long.
59.353	$\frac{1}{4}$ U.N.C. x $\frac{7}{16}$ in. long.
59.354	$\frac{1}{4}$ U.N.C. x $\frac{1}{2}$ in. long.
59.355	$\frac{1}{4}$ U.N.C. x $\frac{5}{8}$ in. long.
59.356	$\frac{1}{4}$ U.N.C. x $\frac{3}{4}$ in. long.
59.357	$\frac{1}{4}$ U.N.C. x 1 in. long.
59.358	$\frac{1}{4}$ U.N.C. x $1\frac{1}{4}$ in. long.
59.359	$\frac{1}{4}$ U.N.C. x $1\frac{1}{2}$ in. long.

**Section 60****Cup Point Screws – Hex Socket Set  $\frac{5}{16}$  in. U.N.C.**

Part Ref.	
60.360	$\frac{5}{16}$ U.N.C. x $\frac{1}{4}$ in. long.
60.361	$\frac{5}{16}$ U.N.C. x $\frac{5}{16}$ in. long.
60.362	$\frac{5}{16}$ U.N.C. x $\frac{3}{8}$ in. long.
60.363	$\frac{5}{16}$ U.N.C. x $\frac{7}{16}$ in. long.
60.364	$\frac{5}{16}$ U.N.C. x $\frac{1}{2}$ in. long.
60.365	$\frac{5}{16}$ U.N.C. x $\frac{5}{8}$ in. long.
60.366	$\frac{5}{16}$ U.N.C. x $\frac{3}{4}$ in. long.
60.367	$\frac{5}{16}$ U.N.C. x 1 in. long.
60.368	$\frac{5}{16}$ U.N.C. x $1\frac{1}{4}$ in. long.
60.369	$\frac{5}{16}$ U.N.C. x $1\frac{1}{2}$ in. long.

**Section 61****Cup Point Screws – Hex Socket Set  $\frac{3}{8}$  in. U.N.C.**

Part Ref.	
61.370	$\frac{3}{8}$ U.N.C. x $\frac{3}{8}$ in. long.
61.371	$\frac{3}{8}$ U.N.C. x $\frac{1}{2}$ in. long.
61.372	$\frac{3}{8}$ U.N.C. x $\frac{5}{8}$ in. long.
61.373	$\frac{3}{8}$ U.N.C. x $\frac{3}{4}$ in. long.
61.374	$\frac{3}{8}$ U.N.C. x 1 in. long.
61.375	$\frac{3}{8}$ U.N.C. x $1\frac{1}{4}$ in. long.
61.376	$\frac{3}{8}$ U.N.C. x $1\frac{1}{2}$ in. long.
61.377	$\frac{3}{8}$ U.N.C. x $1\frac{3}{4}$ in. long.

**Section 62****Cup Point Screws – Hex Socket Set  $\frac{7}{16}$  in. U.N.C.**

Part Ref.	
62.378	$\frac{7}{16}$ U.N.C. x $\frac{7}{16}$ in. long.
62.379	$\frac{7}{16}$ U.N.C. x $\frac{1}{2}$ in. long.
62.380	$\frac{7}{16}$ U.N.C. x $\frac{5}{8}$ in. long.
62.381	$\frac{7}{16}$ U.N.C. x $\frac{3}{4}$ in. long.
62.382	$\frac{7}{16}$ U.N.C. x 1 in. long.
62.383	$\frac{7}{16}$ U.N.C. x $1\frac{1}{4}$ in. long.

**Section 63****Cup Point Screws – Hex Socket Set  $\frac{1}{2}$  in. U.N.C.**

Part Ref.	
63.384	$\frac{1}{2}$ U.N.C. x $\frac{1}{2}$ in. long.
63.385	$\frac{1}{2}$ U.N.C. x $\frac{5}{8}$ in. long.
63.386	$\frac{1}{2}$ U.N.C. x $\frac{3}{4}$ in. long.
63.387	$\frac{1}{2}$ U.N.C. x 1 in. long.
63.388	$\frac{1}{2}$ U.N.C. x $1\frac{1}{4}$ in. long.
63.389	$\frac{1}{2}$ U.N.C. x $1\frac{1}{2}$ in. long.
63.390	$\frac{1}{2}$ U.N.C. x 2 in. long.

**Section 64****Cup Point Screws – Hex Socket Set  $\frac{5}{8}$  in. U.N.C.**

Part Ref.	
64.391	$\frac{5}{8}$ U.N.C. x $\frac{5}{8}$ in. long.
64.392	$\frac{5}{8}$ U.N.C. x $\frac{3}{4}$ in. long.
64.393	$\frac{5}{8}$ U.N.C. x 1 in. long.
64.394	$\frac{5}{8}$ U.N.C. x $1\frac{1}{2}$ in. long.

**Section 65****Cup Point Screws – Hex Socket Set  $\frac{3}{4}$  in. U.N.C.**

Part Ref.	
65.395	$\frac{3}{4}$ U.N.C. x $\frac{3}{4}$ in. long.
65.396	$\frac{3}{4}$ U.N.C. x 1 in. long.
65.397	$\frac{3}{4}$ U.N.C. x $1\frac{1}{2}$ in. long.

**Section 66** **$\frac{1}{2}$  Dog Screws – Hex Socket Set 10 x 24 t.p.i.**

Part Ref.	
66.410	10 x 24 t.p.i. x $\frac{3}{16}$ in. long.
66.411	10 x 24 t.p.i. x $\frac{1}{4}$ in. long.
66.412	10 x 24 t.p.i. x $\frac{5}{16}$ in. long.
66.413	10 x 24 t.p.i. x $\frac{3}{8}$ in. long.
66.414	10 x 24 t.p.i. x $\frac{1}{2}$ in. long.
66.415	10 x 24 t.p.i. x $\frac{5}{8}$ in. long.
66.416	10 x 24 t.p.i. x $\frac{3}{4}$ in. long.

**Section 67** **$\frac{1}{2}$  Dog Screws – Hex Socket Set  $\frac{1}{4}$  in. U.N.C.**

Part Ref.	
67.417	$\frac{1}{4}$ U.N.C. x $\frac{1}{4}$ in. long.
67.418	$\frac{1}{4}$ U.N.C. x $\frac{5}{16}$ in. long.
67.419	$\frac{1}{4}$ U.N.C. x $\frac{3}{8}$ in. long.
67.420	$\frac{1}{4}$ U.N.C. x $\frac{7}{16}$ in. long.
67.421	$\frac{1}{4}$ U.N.C. x $\frac{1}{2}$ in. long.
67.422	$\frac{1}{4}$ U.N.C. x $\frac{9}{16}$ in. long.
67.423	$\frac{1}{4}$ U.N.C. x $\frac{5}{8}$ in. long.
67.424	$\frac{1}{4}$ U.N.C. x $\frac{3}{4}$ in. long.
67.425	$\frac{1}{4}$ U.N.C. x 1 in. long.
67.426	$\frac{1}{4}$ U.N.C. x $1\frac{1}{4}$ in. long.
67.427	$\frac{1}{4}$ U.N.C. x $1\frac{1}{2}$ in. long.

**Section 68** **$\frac{1}{2}$  Dog Screws – Hex Socket Set  $\frac{5}{16}$  in. U.N.C.**

Part Ref.	
68.428	$\frac{5}{16}$ U.N.C. x $\frac{5}{16}$ in. long.
68.429	$\frac{5}{16}$ U.N.C. x $\frac{3}{8}$ in. long.
68.430	$\frac{5}{16}$ U.N.C. x $\frac{7}{16}$ in. long.
68.431	$\frac{5}{16}$ U.N.C. x $\frac{1}{2}$ in. long.
68.432	$\frac{5}{16}$ U.N.C. x $\frac{5}{8}$ in. long.
68.433	$\frac{5}{16}$ U.N.C. x $\frac{3}{4}$ in. long.
68.434	$\frac{5}{16}$ U.N.C. x $\frac{7}{8}$ in. long.
68.435	$\frac{5}{16}$ U.N.C. x 1 in. long.
68.436	$\frac{5}{16}$ U.N.C. x $1\frac{1}{4}$ in. long.
68.437	$\frac{5}{16}$ U.N.C. x $1\frac{1}{2}$ in. long.

**Section 69** **$\frac{1}{2}$  Dog Screws – Hex Socket Set  $\frac{3}{8}$  in. U.N.C.**

Part Ref.	
69.438	$\frac{3}{8}$ U.N.C. x $\frac{3}{8}$ in. long.
69.439	$\frac{3}{8}$ U.N.C. x $\frac{1}{2}$ in. long.
69.440	$\frac{3}{8}$ U.N.C. x $\frac{5}{8}$ in. long.
69.441	$\frac{3}{8}$ U.N.C. x $\frac{3}{4}$ in. long.
69.442	$\frac{3}{8}$ U.N.C. x 1 in. long.
69.443	$\frac{3}{8}$ U.N.C. x $1\frac{1}{4}$ in. long.
69.444	$\frac{3}{8}$ U.N.C. x $1\frac{1}{2}$ in. long.
69.445	$\frac{3}{8}$ U.N.C. x 2 in. long.

**Section 70** **$\frac{1}{2}$  Dog Screws – Hex Socket Set  $\frac{1}{2}$  in. U.N.C.**

Part Ref.	
70.445	$\frac{1}{2}$ U.N.C. x $\frac{1}{2}$ in. long.
70.446	$\frac{1}{2}$ U.N.C. x $\frac{5}{8}$ in. long.
70.447	$\frac{1}{2}$ U.N.C. x $\frac{3}{4}$ in. long.
70.448	$\frac{1}{2}$ U.N.C. x 1 in. long.
70.449	$\frac{1}{2}$ U.N.C. x $1\frac{1}{4}$ in. long.
70.450	$\frac{1}{2}$ U.N.C. x $1\frac{1}{2}$ in. long.
70.451	$\frac{1}{2}$ U.N.C. x 2 in. long.

**Section 71** **$\frac{1}{2}$  Dog Screws – Hex Socket Set  $\frac{5}{8}$  in. U.N.C.**

Part Ref.	
71.452	$\frac{5}{8}$ U.N.C. x $\frac{3}{4}$ in. long.
71.453	$\frac{5}{8}$ U.N.C. x 1 in. long.
71.454	$\frac{5}{8}$ U.N.C. x $1\frac{1}{2}$ in. long.

**Section 72****B.A. Cap Screws – Hex Socket Head**

Part Ref.	
72.493	3 B.A. x $\frac{3}{8}$ in. long.
72.494	3 B.A. x $\frac{1}{2}$ in. long.
72.495	3 B.A. x $\frac{5}{8}$ in. long.
72.496	3 B.A. x $\frac{3}{4}$ in. long.
70.497	3 B.A. x $1\frac{1}{4}$ in. long.
72.498	3 B.A. x $\frac{1}{2}$ in. long.
72.499	3 B.A. x 1 in. long.

**Section 73****Special Screws**

Part Ref.	
73.106	No. 10 x 24 x $\frac{3}{4}$ in. long Socket cap domed head.
73.143	$\frac{1}{4}$ U.N.C. x $\frac{3}{8}$ in. long domed head.
73.169	10 x 24 t.p.i. x $\frac{1}{4}$ in. c/sunk screw (slotted).
73.194	$\frac{5}{16}$ in. BSW x $1\frac{1}{4}$ in. long Hex head. Set screw.
73.195	2 BA x $\frac{1}{2}$ in. long. Hollow socket set screw.
73.196	$\frac{1}{4}$ in. BSW x $\frac{5}{8}$ in. long S.H.C.S.
73.197	$\frac{1}{4}$ in. BSW x $\frac{7}{8}$ in. long S.H.C.S.
73.198	2 BA x $\frac{1}{2}$ in. long Hex head set screw.
73.199	$\frac{1}{4}$ in. BSW x $\frac{1}{2}$ in. long S.H.C.S.
73.235	$\frac{5}{16}$ U.N.C. x $3\frac{1}{2}$ in. long Cap screw hex socket head.
73.450	6 BA x $\frac{3}{8}$ in. long Cheese head.
73.471	4 BA x 1 in. long Cheese head.

Section 73 continued

Part Ref.	
73.474	4 BA x $\frac{3}{8}$ in. long Cheese head.
73.479	44 x $\frac{1}{4}$ in. Drive screws.
73.480	44 x $\frac{5}{16}$ in. Drive screws.
73.481	46 x $\frac{5}{16}$ in. Drive screws.
73.482	$\frac{1}{4}$ U.N.C. x $\frac{3}{8}$ in. long SKT. Hd. set screw full dog.
73.483	2 BA x $\frac{5}{8}$ in. long Cheese head.
73.485	2 BA x $\frac{3}{8}$ in. long Cheese head.
73.486	2 BA x $\frac{1}{2}$ in. long Cheese head.
73.487	$\frac{1}{4}$ U.N.C. x $\frac{3}{8}$ in. long Mushroom head.
73.493	No.8 x 32 U.N.C. x $\frac{3}{8}$ in. long cap screw.
73.494	$\frac{1}{4}$ U.N.C. x $\frac{3}{8}$ in. long cap screw series CX large head
73.507	3 BA x $\frac{3}{4}$ in. long set screw cup point.
73.510	$\frac{7}{16}$ U.N.F. x $\frac{7}{16}$ in. long set screw cup point.
73.511	$\frac{3}{16}$ U.N.C. x $\frac{3}{8}$ in. long Mushroom head.
73.512	$\frac{7}{64}$ Dia. c/sunk head self tapping.
73.513	No.4 x $\frac{5}{16}$ in. long 'U' self tapping.
73.514	$\frac{3}{8}$ U.N.C. x $\frac{3}{8}$ in. long brass round head.
73.515	$\frac{1}{2}$ U.N.F. x $\frac{1}{2}$ in. long socket set cup point.
73.516	$\frac{5}{16}$ U.N.F. x $\frac{3}{8}$ in. long socket set cup point.
73.517	2 BA x $\frac{7}{8}$ in. long SKT.Csk Hd. screw.
73.518	2 BA x $\frac{1}{2}$ in. long Csk Hd screw.
73.519	2 BA x $\frac{3}{4}$ in. long SKT.Csk Hd. screw.
73.472	2 BA x $\frac{1}{4}$ in. long Cheese head.
73.473	2 BA x 1 in. long socket set screw oval point.
73.489	$\frac{1}{4}$ B.S.F. x $\frac{5}{8}$ in. long S.H.C.S.
73.520	$\frac{1}{4}$ U.N.C. x 1 in. long flat head.
73.521	2 BA x $\frac{3}{8}$ round head brass.
73.522	$\frac{5}{16}$ U.N.C. x $\frac{3}{4}$ in. wedglok set screw.
73.523	$\frac{5}{16}$ U.N.C. x 1 in. wedglok set screw.
73.524	4 BA x $\frac{1}{2}$ in. long Cheese head.
73.525	6 BA x $\frac{5}{8}$ in. long Cheese head.
73.526	4 BA x $\frac{13}{16}$ in. long Cheese head.
73.527	4 BA x $\frac{1}{2}$ in. long Cheese head.



**Section 79  
Oil Seals**

Part Ref.	
79.036	Weston. W22515637.R4.
79.037	Weston. W23727550.R4.
79.062	Weston. W16211237.R.
79.069	Weston. W913708225.
79.071	Angus. MS012.
79.171	Weston. W15011225. R4.
79.181	Weston. WB.16911037 R21.
79.188	Burtonwood. 6303.
79.860	$\frac{7}{8}$ i.d. x $1\frac{1}{2}$ o.d. x $\frac{1}{4}$ wide Angus M15 014 W13708725 R4.
79.861	$\frac{15}{16}$ i.d. x $1\frac{3}{8}$ o.d. x $\frac{5}{16}$ wide. Burtonwood 9907.
79.862	$\frac{15}{16}$ i.d. x $1\frac{1}{2}$ o.d. x $\frac{13}{32}$ wide. W15009340.R4.
79.863	1 in. i.d. x $1\frac{5}{8}$ o.d. x $\frac{3}{8}$ wide. W16210037.R4.
79.864	1 in. i.d. x $1\frac{3}{4}$ o.d. x $\frac{1}{4}$ wide. W17510025.R4.
79.865	$\frac{11}{16}$ i.d. x $1\frac{5}{8}$ o.d. x $\frac{5}{16}$ wide. W16210631.R4.
79.866	$1\frac{1}{4}$ i.d. x $1\frac{1}{16}$ o.d. x $\frac{3}{8}$ wide. W16912537.R4.
79.867	$1\frac{3}{8}$ i.d. x $1\frac{7}{8}$ o.d. x $\frac{5}{16}$ wide. W18713731.R4.
79.868	$1\frac{5}{8}$ i.d. x $2\frac{3}{16}$ o.d. x $\frac{3}{8}$ wide. W21916237.R4.
79.869	Nylos grease ring 6205 JV 52 m/m o.d.
79.878	Burtonwood. W15711039R4.
79.779	Burtonwood. 137-1828-12.
79.880	Mis.012.Gaco. MOS/075-125 -8.
79.881	MOS/100-M5-024.
79.882	W16211231R4.

**Section 80  
Oil Sights**

Part Ref.	
80.870	Perspex oilsight.SK625.
80.871	$1\frac{1}{4}$ o.d. Tecalemit. IC4610.
80.873	$1\frac{1}{2}$ o.d. Tecalemit. IC4612.

**Section 81  
Spanners & Wrenches**

Part Ref.	
81.151	$\frac{15}{16}$ a/f x $\frac{3}{4}$ a/f open end spanner.
81.152	$\frac{9}{16}$ a/f x $\frac{11}{16}$ a/f open end spanner.
81.153	$\frac{7}{16}$ sq. x $\frac{1}{2}$ a/f combination spanner.
81.154	$\frac{15}{16}$ a/f x $\frac{11}{16}$ a/f box Spanner.
81.155	Tommy Bar.
81.156	$\frac{3}{8}$ a/f Allen hexagon key.
81.157	$\frac{5}{16}$ a/f Allen hexagon key.
81.158	$\frac{7}{32}$ a/f Allen hexagon key.
81.159	$\frac{3}{16}$ a/f Allen hexagon key.
81.161	$\frac{1}{8}$ a/f Allen hexagon key.
81.162	$\frac{3}{32}$ a/f Allen hexagon key.
81.163	$\frac{3}{8}$ x $\frac{7}{16}$ U.N.C. open end spanner.
81.164	$\frac{15}{16}$ x $1\frac{1}{8}$ a/f box spanner.
81.165	$\frac{1}{2}$ x $\frac{3}{4}$ a/f ring spanner.

**Section 82  
Springs**

Part Ref.	
82.063	Flexo.163208.
82.064	707.0040 0.240 Dia. x $\frac{9}{16}$ in. free length.
82.065	707.0035 0.312 Dia. x $1\frac{1}{16}$ in. free length.
82.066	.237, o/d x $1\frac{1}{8}$ in. free length.
82.068	707.0005 0.175 o/d x $\frac{3}{8}$ in. free length.
82.072	707.0036 0.562 Dia. x $2\frac{1}{2}$ in. free length.
82.076	707.0045 0.500 i.d. x 3 in. free length.
82.078	707.0028 0.237 Dia. x $1\frac{1}{8}$ in. free length.
82.082	Flexo 103108.
82.102	707.0030 0.625 Dia. x $1\frac{1}{2}$ in. free length.
82.103	707.0030 0.3125 Dia. x $1\frac{1}{4}$ in. free length.
82.105	Flexo 82504.
82.107	Flexo 62604.
82.108	$\frac{3}{8}$ D.P. x $\frac{7}{8}$ in. free length.
82.109	Flexo 136314.
82.110	707.0008 $\frac{5}{8}$ Dia. x 2 in. free length.
82.111	707.0024 0.350 Dia. x $1\frac{3}{4}$ in. free length.
82.112	707.0032 $\frac{13}{16}$ Dia. x $1\frac{5}{8}$ in. free length.
82.113	707.0027 $\frac{1}{2}$ Dia. x $\frac{1}{2}$ in. free length.
82.120	707.0046 $\frac{5}{16}$ Dia. x $\frac{5}{8}$ in. free length.
82.121	707.0043 $\frac{9}{16}$ Dia. x $1\frac{1}{8}$ in. free length.
82.122	707.0025 0.296 Dia. x $1\frac{9}{16}$ free length.
82.123	707.0020 0.885 Dia. x $1\frac{3}{4}$ in. free length.
82.132	707.0034 $1\frac{1}{4}$ Dia. x 1 in. free length.
82.175	Compression spring.
82.179	Tension spring.
82.794	707.0023 $\frac{1}{4}$ Dia. x $\frac{13}{16}$ in. free length.
82.795	707.0021 $\frac{1}{4}$ o/d x $\frac{1}{2}$ in. free length.
82.796	Flexo 82804.
82.797	$\frac{1}{4}$ o/d x $\frac{5}{8}$ in. free length.
82.798	Flexo 82806.
82.799	Flexo 82708.
82.800	Flexo 92910.
82.801	Flexo 93012.
82.802	Flexo 93107.
82.803	Flexo 103210.
82.804	Flexo 123106.
82.805	Flexo 143112.
82.806	Flexo 203512.
82.807	Flexo 223412.
82.808	Flexo 223612.
82.809	Flexo 243698.
82.810	Flexo 243724.
82.811	Flexo 323608.
82.812	707.0014 0.180 Dia. x $\frac{21}{32}$ in. free length.
82.813	Flexo 143008.
83.814	707.0031 $\frac{3}{8}$ Dia. x 14 SWG
82.815	707.0015 $\frac{5}{16}$ Dia. x $1\frac{1}{8}$ OA.
82.816	707.0022 $\frac{5}{16}$ Dia. x $2\frac{1}{8}$ OA.
82.817	707.0016 $\frac{1}{2}$ Dia. x $2\frac{3}{16}$ in. free length.
82.818	707.0033 0.240 Dia. x $\frac{5}{8}$ in. free length.
82.819	22.5 m/m x 11.2 m/m x 8 m/m Schnorr disc spring

**Section 82 continued**

Part Ref.	
82.820	$1\frac{1}{8}$ o/d x .453 i.d. x .040 Beleville No.7.
82.821	$\frac{5}{8}$ i.d. x $\frac{15}{32}$ o/d Crinkle washer spring.
82.822	LSE 8596. Crinkle washer spring.
82.823	Flexo 62704.
82.824	Flexo 103208.
82.825	Flexo 122908.
82.826	Flexo 82805.
82.827	Flexo 62502.
82.828	Flexo 237508.
82.829	Flexo AA3516.
82.830	Flexo 123306.
82.831	Flexo 122906.
82.832	Flexo 153212.
82.833	Flexo 62603.
82.834	Flexo 143008.
82.835	Flexo 163314.
82.836	Flexo 244012.
82.837	Flexo 112808.
82.838	Flexo 112807.
82.839	Flexo 112908.

**Section 83  
Switches**

Part Ref.	
83.985	Craig & Derricott CLS.
83.986	Klockner & Moeller. AT/ 11A/2/1.
83.987	Klockner & Moeller. AT-3- 1.
83.988	Klockner & Moeller. TW2- 3/21c.
83.989	Santon 128/AD55/TB.
83.990	Santon SR3212/BE/80/TB3.
83.991	Santon SR1311 PC.
83.992	Santon SS3311 PC.
83.993	Santon SR338/BF/49/TA3.
83.994	Santon SR326AY37/9/TA
83.995	Santon SR237.
83.996	Craig & Derricott RTL3049 AS.
83.996	Crabtree B15 16107/3.
83.998	Crabtree B15 starter 1-4 amp.
83.999	Crabtree B15 starter 1.5-3 amp.
83.001	Crabtree B15 skelton contact.
83.002	Crabtree B23 contactor.
83.003	Crabtree D6 starter 14101.
83.004	Crabtree D6 starter 14104.
83.005	Crabtree D6 starter 1.1-1.8 amp.
83.006	Siemens contactor K915- 1115-1A.
83.007	Santon ESX 1311 PC.
83.008	Santon ESR3314/AB/65.
83.009	Klockner & Moeller TW2 3/63e.
83.010	Klockner & Moeller T2-2-C
83.012	Klockner & Moeller TD2- 415-c.
83.013	Chilton S258AB766E.
83.014	Chilton C258AB424.
83.015	Chilton C25A292E.
83.017	MEM. 310 AX.
83.019	Santon ESR 3311 PC.

### Section 83 continued

Part Ref.	
83.049	Stop button Brooks type Z
83.050	Stop button Brooks type Z.
83.051	UC2 contactor.
83.052	Overload block.
83.053	Heater coil for overload block.
83.054	Moving contact for UC2 contactor.
83.055	Aux. contact for UC2 contactor.
83.056	Fixed contact for UC2 contactor.
83.057	Coil for UC2 contactor.
83.083	40 watt Stepdown transformer primary 220/440/550 V.
83.085	Starlight transformer GD Underwood input 250/500 V. 1½ amp.
83.086	Burgess Mk.3 BR 600 V 2A Mico switch.
83.087	Moving contact for Crabtree B15 starter 1600/13.
83.088	Fixed contact for Crabtree B15 starter 1600/11.
83.089	Crabtree cable clamp assy. 1600/19.
83.092	Overload release unit Crabtree type 16007 3.6 amp.
83.093	Magnet coil Crabtree type 1600/9/5 380-420 V.
83.094	Crabtree B15 starter interior type.
83.095	Crabtree B15 starter moving contact 28011.
83.096	Crabtree series 16021. Aux. contact.
83.100	Crabtree contactor magnet 16000/20.
83.126	Shunt block extension for B23 Crabtree starter.
83.127	Spacer for B23 Crabtree starter.
83.128	Cable clamp extension for B23 Crabtree starter.
83.129	Overload release unit for B23 Crabtree starter.
83.130	Starter bottom assy c/w baseplate Crabtree B23.
83.150	Crabtree starter type D6 0.75-1 2A.
83.163	Crabtree B15 D & C starter 16104/5.
83.164	Crabtree B15 D & C starter 16199.
83.167	MEM.1315 AX 15 A isolator
83.168	Klockner & Moeller T2-4/60-102/7.
83.174	Sliding contact & block.
83.176	Toggle contact complete.
83.177	L/H slipper contact.
83.178	R/H slipper contact.

### Section 84 Locking Washers

Part Ref.	
84.067	3¼ o/d x 2.260 i.d. x .169 tab washer.
84.077	Terry Belleville washer No.10.
84.097	43A tag washer.
84.098	¾ dia star washer.

### Section 84 continued

Part Ref.	
84.099	¾ bore tab washer.
84.701	¾ Dia. bore single coil.
84.702	¼ Dia. bore single coil.
84.703	5/16 Dia. bore single coil.
84.704	¾ Dia. bore single coil.
84.705	7/16 Dia. bore single coil.
84.706	½ Dia. bore single coil.
84.707	9/16 Dia. bore single coil.
84.708	5/8 Dia. bore single coil.
84.709	¾ Dia. bore single coil.
84.710	7/8 Dia. bore Grover lock spring washer.
84.711	¾ Dia. bore double coil.
84.712	¼ Dia. bore double coil.
84.713	5/16 Dia. bore double coil.
84.714	¾ Dia. bore double coil.
84.715	7/16 Dia. bore double coil.
84.716	½ Dia. bore double coil.
84.717	9/16 Dia. bore double coil.
84.718	5/8 Dia. bore double coil.
84.719	¾ Dia. bore double coil.
84.720	11/16 Dia. bore single coil.
84.721	2 BA Std. lock washer.
84.722	11/16 Dia. bore double coil.
84.723	7/8 Dia. bore double coil.
84.724	7/8 Dia. spring washer.
84.725	Schnorr disc spring washer. type K.620L.
84.726	Terry's std. Belleville No. 7.

### Section 85 Standard Washer

Part Ref.	
85.690	¾ Dia. bore.
85.691	¼ Dia. bore.
85.692	5/16 Dia. bore.
85.693	¾ Dia. bore.
85.694	7/16 Dia. bore.
85.695	½ Dia. bore x 1 o/d x .092 in. W.
85.696	½ Dia. bore x 1¾ o/d x .062 in. W.
85.697	9/16 Dia. bore.
85.698	5/8 Dia. bore.
85.699	¾ Dia. bore.
85.700	½ in. i.d. x 5/16 Thick.
85.701	11/16 Dia. bore.
85.702	7/8 Dia. bore.
85.720	2 BA Std. plain washer.
85.727	0.445 i.d. x 0.660 x 18 SWG plain.
85.728	1 o/d x ¾ i.d. x ¾ Thick.

### Section 86 Washers Miscellaneous

Part Ref.	
86.029	¾ Internal fan disc washer
86.030	7/8 Internal fan disc washer
86.043	1½ o/d x ¾ i.d. x 3/16 Thk. leather washer.
86.044	1¼ o/d x ¾ i.d. x 3/16 Thk. leather washer.
86.045	1½ o/d x 1½ i.d. x 3/16 Thk. leather washer.
86.058	¾ in. 5° taper washer.
86.080	AD 1528 Ina thrust washer
86.118	1¼ o/d x 7/8 i.d. x 1/8 SKT leather washer.
86.119	½ i.d. fan disc washer.
86.133	Dowty rubber washer GD1321-3.
86.722	11/32 o/d x 23/32 x ½ in. leather washer.
86.723	1¼ o/d x 23/32 x ½ in. leather washer.
86.730	3BA large plain washer BS.3910/1961.
86.731	Tab washer Ref HHI/AG.
86.732	5/16 HP washer.
86.733	Belleville washer 1383/10.
86.734	½ i.d. x 3/16 o/d fibre washer
86.735	Beryllium copper washer. Ref.LSE 8596.
86.738	¼ bore shakeproof.
86.740	Dubo No.105 washer.
86.741	¾ bore x 7/16 o/d x 1/16 Thk. rubber.

### Section 87 Thread Inserts

Part Ref.	
87.823	9/16 U.N.C. Helicoil.
87.824	¾ U.N.C. x 9/16 in. long. Helicoil.
87.825	½ U.N.C. Helicoil.

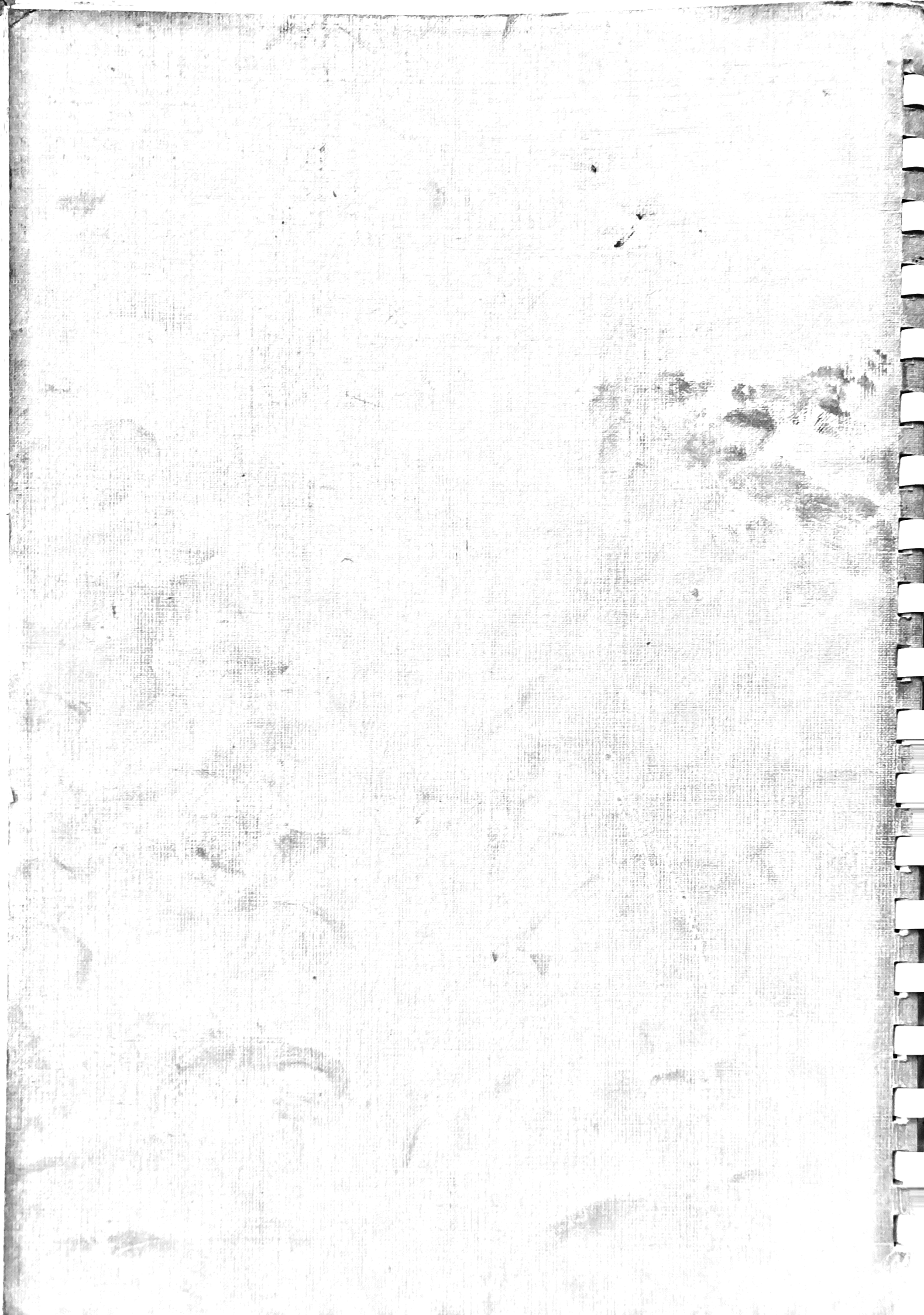
### Section 88 Miscellaneous

Part Ref.	
88.041	Brass pad 1/16 in. Thk. x 3/16 in. dia.
88.070	¾ in. solid gas plug.
88.073	Tecalmit 4336-2 90° M & F elbow.
88.074	Spire SRV 1590 (A) door latch.
88.075	Spire SBV 1691 door latch Stud.
88.076	1 in. solid gas plug.
88.046	½ in. U.N.C. x 2½ in. long stud.
88.147	¼ in. B.S.F. ball joint.

## Section 1000

Part Ref.

- 1001 Selector Switch Type T2-4/90-z Comprising of:
  - 1004 Switch Spindle Extension
  - 1005 Indicator Mounting Plate
  - 1006 Indicator Back Plate
  - 1007 Switch Indicator Plate - Motor fwd. Motor rev.
  - 1009 Thumb Grip Handle (Black)
- 1002 Selector Switch Type T26-2-z Comprising of:
  - 1004 Switch Spindle Extension
  - 1005 Indicator Mounting Plate
  - 1006 Indicator Back Plate
  - 1007 Switch Indicator Plate - Brake Release - Coolant Pump
  - 1009 Thumb Grip Handle (Black)
- 1003 Triple Pole Isolator Switch Type T26-3-v Comprising of:
  - 1004 Switch Spindle Extension
  - 1005 Indicator Mounting Plate
  - 1006 Indicator Back Plate
  - 1007 Switch Indicator Plate - Mains ON - OFF
  - 1008 Thumb Grip Handle (Red)
- 1010 Neoprene Inch Button Cap Type G - T
- 1011 Inch Button Type DT.r
- 1012 Retaining Ring - Integral Part of 1010
- 1013 Retaining Screwed Collar - Integral Part of 1011
- 1014 Isolator Shroud Type T2
- 1015 Triple Pole 25A Fuse Base Type S 25/3
- 1016 Single Pole 25A Fuse Base Type SH.25/1.1
- 1017 Fuse Holder Type K11(25A) or Type K111(25-60A)
- 1018 4A. Control Circuit Fuse Type TDZ.11.4.
- 1019 Main Phase Fuse 25A - Type TDZ.11.25  
                                   35A - Type TDZ.111.35  
                                   60A - Type TDZ.111.60
- 1020 Forward and Reverse Contactor Type DIL.2/57
- 1021 Control Transformer Type ET.200
- 1022 Star Point Contactor Type DIL.0-41/56
- 1023 No Volt Contactor Type DIL.00a-41/59
- 1024 Overload Relay Type Z.2
- 1025 Connecting Terminals Type RK.4(SAK.2.5)
- 1026 Terminal Barriers Type T.W. i/130.i
- 1027 Terminal End Plate Type AP.10/1179
- 1028 Terminal End Clamp Type EWK/1846
- 1029 Terminal Rail Type TS.32/120/1288
- 1030 Sleeves - Integral Part of 1020
- 1031 Inch Contact Black Type AK-44a
- 1032 Limit Switch Type AT.21-5-i
- 1033 Male Conduit Adapter Coupling
- 1034 Female Conduit Adapter Coupling
- 1035 Pump Conduit Adapter
- 1036 3 Way Female Coupling
- 1037 Male Conduit Adapter
- 1038 ½ in. B.S.P. Locknut
- 1039 ¾ in. Bore Flexible Conduit
- 1040 ½ in. Bore Copper Pipe
- 1041 Kingley Coupling Type 304 (Female)
- 1042 Kingley Coupling Type 304 (Male)
- 1043 3m x 12mm Round Head Screw
- 1044 4m x 8mm Cheese Head Screw
- 1045 4m x 12mm Cheese Head Screw
- 1046 4m x 15mm Cheese Head Screw
- 1047 4m x 20mm Cheese Head Screw
- 1048 4m x 35mm Cheese Head Screw
- 1049 4m x 105mm Cheese Head Screw
- 1050 5m x 9mm Cheese Head Screw
- 1051 BT.7871 Nut
- 1052 5m x 12mm Cheese Head Screw
- 1053 ¾ in. U.N.F. x ¾ Cheese Head Screw
- 1054 5mm Nut
- 1055 4mm Standard Washer
- 1056 4mm Shakeproof Washer
- 1057 5mm Standard Washer
- 1058 5mm Shakeproof Washer



# COLCHESTER QUICK-CHANGE TOOLPOST

## FITTING INSTRUCTIONS

Colchester quick-change toolposts, irrespective of size, require only single-bolt fixing to the top slide of Colchester lathes.

For those machines fitted with a slotted top slide, a tee-head bolt and stepped locating collar are supplied with the toolpost; the locating collar fitting into a recess in the base of the toolpost body with the machined boss of the collar engaged in the top slide slot. On the larger Colchester lathes (Triumph and Mascot models having solid-type top slides) the toolpost is fitted directly over a stud on the top slide. A plain locating collar is provided for the base of the toolpost.

If required, the knurled-head pin provided can be used to locate the toolpost at pre-set angles, e.g. in setting-up for screwcutting. In such cases; after positioning the body, drill and ream into the top slide to register with the locating pin. Depth of the holes so drilled into the top slide need not exceed 5/16".

The most useful position for setting up this toolpost, no matter what the top slide angle, is with the flat side of the body facing the operator.

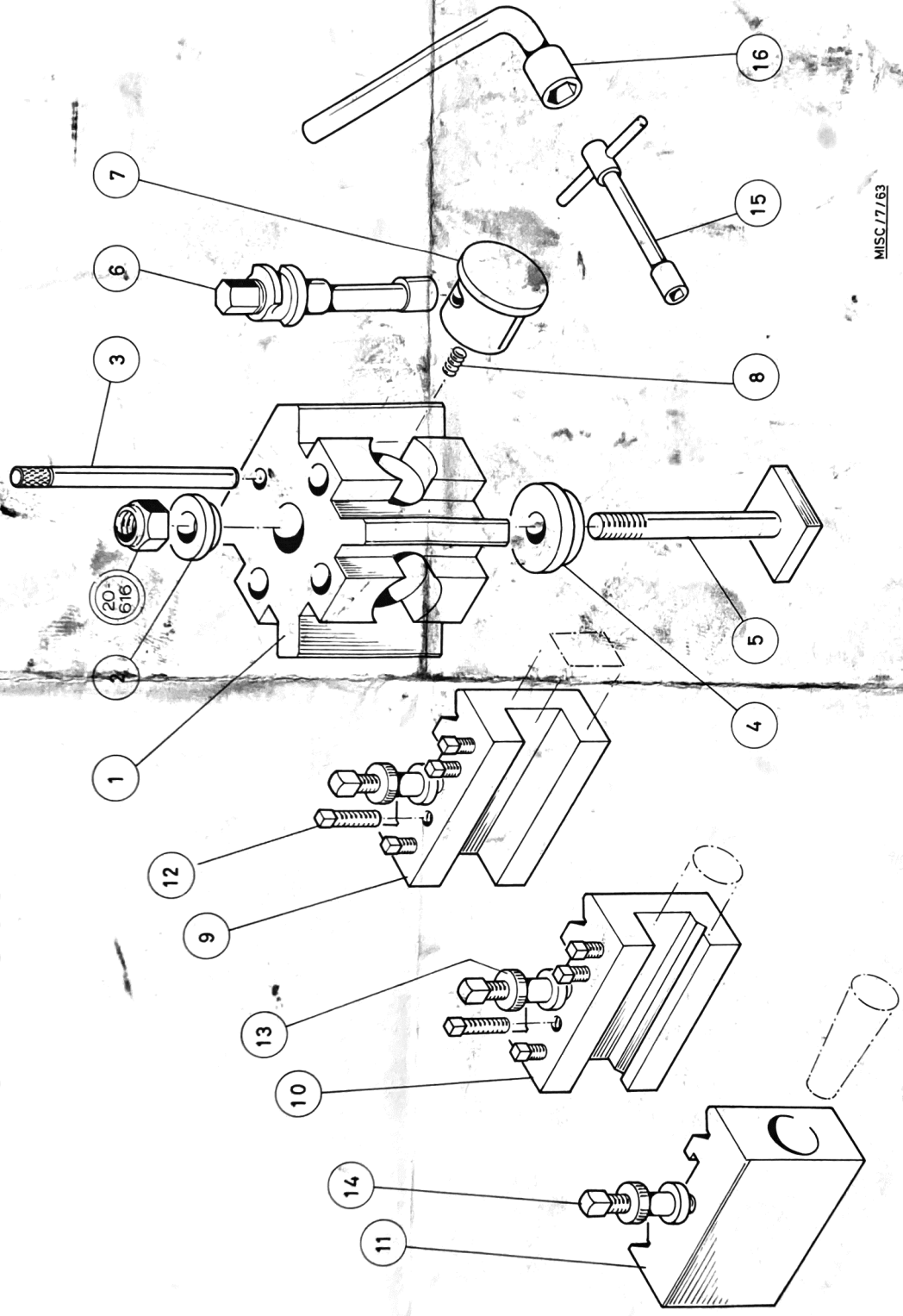
## COLCHESTER QUICK - CHANGE TOOLPOST

<u>Item No.</u>	<u>Description.</u>	<u>No. off.</u>
1	Toolpost body	1
2	Fixing bolt Flanged washer	1
3	Locating pin	1
4	Body Locating collar	1
5	Tee-head Fixing bolt (not supplied with larger sizes)	1
6	Toolholder Clamp bolt	3
7	Toolholder Clamp pad	3
8	Clamp Pad spring	3
9	Standard Toolholder	1
10	Boring Bar Toolholder	1
11	No. 2 Morse Taper Toolholder	1
12	Toolholder Clamping Screws	8
13	Height Adjusting Stop	3
14	Height Adjusting Screw	3
15	Square-socket Wrench	1
16	Hex-socket Wrench	1

### Standard Parts

20-616	Nut for Fixing bolt	1
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# COLCHESTER QUICK- CHANGE TOOLPOST



MISC 17/63



**COLCHESTER LATHE (DISTRIBUTORS) LIMITED**

HYPHE · COLCHESTER · ESSEX

0206

TELEPHONE: COLCHESTER 5161    TELEX: 18255    TELEGRAMS & CABLES: LATHES, TELEX, COLCHESTER

PLEASE ADDRESS ALL CORRESPONDENCE TO THE COMPANY AND NOT TO INDIVIDUALS

OUR REF.

LHC/ MP/SALES.

5th May, 1969

YOUR REF.



*Confirmation*

*Spares Dept  
The Hythe*

Apsley Grammar School,  
Rumballs Road,  
Hemel Hempstead,  
Herts.

Dear Sirs,

We thank you for returning Part 2 of the guaranteed card covering your Colchester lathe, and we enclose our official acknowledgment.

Whilst we are confident that you will obtain full satisfaction from Colchester products, we would assure you of our continued interest in any technical problems on which we may be of assistance to you with regard to your lathe.

Yours faithfully

*L. H. Carter*

L. H. CARTER  
Sales Office Manager





## CONDITIONS OF SALE

The Acceptance of any Order implies the acceptance by the Buyer of the following terms and conditions as part of the contract.

1. Inquiries herein are consistently being made as to the design of the products supplied by us, and for this reason the photographs and other illustrations or advertising matter are not necessarily representative of the goods to be supplied.

### 2. CONDITIONS AND WARRANTIES

While every care is exercised in selecting suitable goods and giving particulars of the capacities and performance of such goods, no conditions or warranties (except that for the design rights to be observed or to comply or otherwise as to which may have been expressed) shall apply to goods supplied by us, or to the fitness of such goods for any purpose, as to the construction of such goods, with the exception of those that may appear in our literature in acceptance of order and our liability in respect of any defect or of failure of the goods supplied or for any loss, injury, or damage attributable thereto is limited to the terms of the guarantee set out in Clause 4 of these conditions.

### 3. GENERAL

Drawings, dimensions, indications of performance and weights submitted may be taken as approximate only and do not form part of the Contract. The costs of all such alterations, additions, or any other work undertaken at the Buyer's request will be charged as an extra.

### 4. GUARANTEES

(a) We will replace or repair any goods which may prove defective through faulty material or workmanship within twelve months after despatch on the defective goods being returned to our Works carriage paid.

(b) This Guarantee will be invalidated by the Buyer making tampering or allowing any alterations or repairs to the goods without our consent and shall also be invalidated if the damage is due to negligence in proper handling or any other cause beyond our control.

(c) We shall not be liable for any consequential loss or damage of whatsoever nature of business arising, nor for any claim in respect of labour materials or other expenditures incurred in fitting replaced or repaired goods.

### 5. TERMS

Net cash with order unless otherwise agreed.

### 6. DAMAGE OR LOSS IN TRANSIT

No liability for damage or loss in transit can be accepted by us except for goods sold "delivered" when our responsibility shall be limited to replacing or repacking the damaged or missing goods, or at our option refunding the purchase price. Claims cannot be considered unless both the Carriers and ourselves are notified in writing within the following periods:—

#### (a) Goods by Rail

Within three days of receipt of goods, or, in the case of non-delivery, twenty-one days from the date of despatch as notified by us.

#### (b) Goods by Road Transport

Immediately on receipt of goods, or, in the case of non-delivery, within seven days from the date of despatch as notified by us.

### 7. PRICES

All orders are booked at the prices ruling at the time of acceptance by us, but will be subject to any fluctuations in costs of labour and materials which may occur in the course of manufacture and it is a condition of the contract that the goods shall be charged at the prices ruling at the date of despatch. Unless otherwise stated all prices will be for goods LOADED EX WORKS, packing and carriage costs will be charged as extras for Buyer's account.

### 8. DELIVERY

Delivery times where given will date from the confirmation by us of the order but will be approximate only, and we can accept no liability for delay from any cause whatever. Goods sold LOADED EX WORKS will be despatched according to Buyer's instructions at their risk. GOODS SOLD DELIVERED will be despatched by any means of transport at our option unless otherwise agreed in writing, and no unloading and damage charges will be for Buyer's account.

### 9. EXHIBITIONS

The Buyer shall not without our written consent exhibit the goods at any trade exhibition or permit photographs, models or literature relating thereto to be shown or used at any exhibition, but nothing in this clause shall prevent the Buyer's displaying the goods in their own premises.

10. Our Quotation and any contract arising therefrom is made subject to the foregoing conditions. If these conditions differ in any respect from conditions in the Buyer's order or confirmation, then the foregoing conditions shall prevail.