



INSTRUCTION & SPARE PARTS MANUAL

**CLAUSING**  
**COLCHESTER**

13" x 24" and 13" x 36"  
HEAVY DUTY GEARED HEAD  
PRECISION LATHES

CLAUSING DIVISION. ATLAS PRESS COMPANY. KALAMAZOO. MICH.. U.S.A.

Manufactured by  
THE COLCHESTER LATHE CO. LTD. COLCHESTER. ESSEX. ENGLAND

26 JAN 1966

# THIS MANUAL

applies to the Clausing-Colchester 13 in  $\times$  24 in and 13 in  $\times$  36 in heavy duty, geared-head precision lathes.

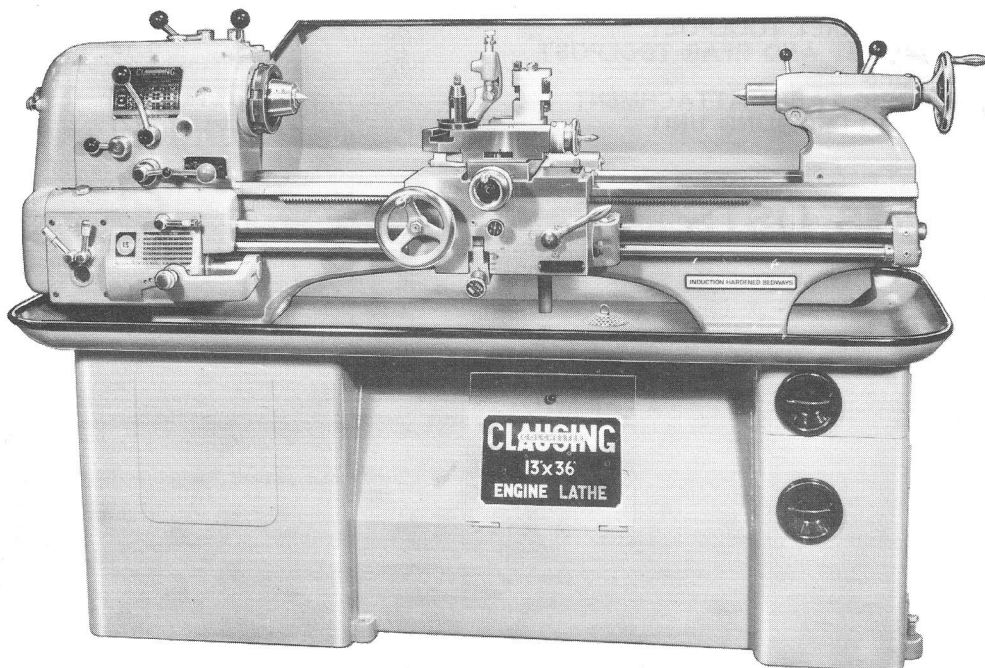
A full understanding of the contents will help you obtain the best results from the machine and achieve the standards of accuracy available.

Our Technical Service Department is always at your disposal to discuss any problems concerning the application of Clausing-Colchester lathes and their planned accessories or attachments. The aim is to ensure maximum satisfaction with your lathe.

The machine serial number is stamped at the tailstock end of the bed and **MUST** be quoted in all communications regarding your lathe.

Due to the Company policy of continuous improvement, designs may be modified or changed at any time without notice and this manual applies only to the machine with which it is issued.

THE SERIAL NUMBER OF YOUR MACHINE IS .....



ONE COPY OF THIS MANUAL IS SUPPLIED FREE WITH EACH NEW MACHINE



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## SPARES LISTS

# BRIEF SPECIFICATION

This specification applies to all four standard models of the Clausing-Colchester 13 in Swing lathes as follows:

6524 . 13 in × 24 in	Straight bed lathes
6525 . 13 in × 36 in	Straight bed lathes
6526 . 13 in × 24 in	Gap bed lathes
6527 . 13 in × 36 in	Gap bed lathes

## CAPACITIES

Height of centres	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	6½ in
Over bed...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	13 in
Over cross slide	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	8 in
Distance between centres	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	24/36 ins
Diameter of faceplate	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	12 in
Gap-bed Models																
Turning diameter in gap	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	18 in
Width in front of faceplate	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	4⅝ in
Capacity of travelling steady rest	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2 in
Overall length	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	61/77½ in
Overall width	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	30/33 in
Weight (approx)	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1372/1512 lb

## HEADSTOCK

Spindle bore (Max. bar diameter)	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1½ in
Spindle nose	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...A.S.A long taper LO
Taper in spindle nose bush	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	No. 3 Morse
Spindle speeds (two-speed motor)	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	16
Range of spindle speeds (two-speed motor)	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	40—1800 r.p.m.

## CARRIAGE

Total travel of cross slide	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	6¾ in
Total travel of top slide	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	3⅝ in
Height from top of top slide to centre line of spindle	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1⅞ in
Max. tool shank size (pillar type tool post)	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	⅝ × 1⅛ in

## THREADS AND FEEDS

Pitch of leadscrew	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	6 t.p.i.
Number of threads	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	45
Range	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	4—120 t.p.i.
Number of feeds	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	45
Range per rev. of spindle	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Longitudinal	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0.0025—0.068 in
Cross	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	0.0006—0.017 in

## TAILSTOCK

Spindle travel (No. 3 M.T. centre fitted)	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	5½ in
Spindle travel (Standard tang drill fitted)	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	3¾ in
Taper in spindle	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	No. 3 Morse

## DRIVE

Two-speed motor	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...3/1½ hp 60 c/s 1800/900 r.p.m.
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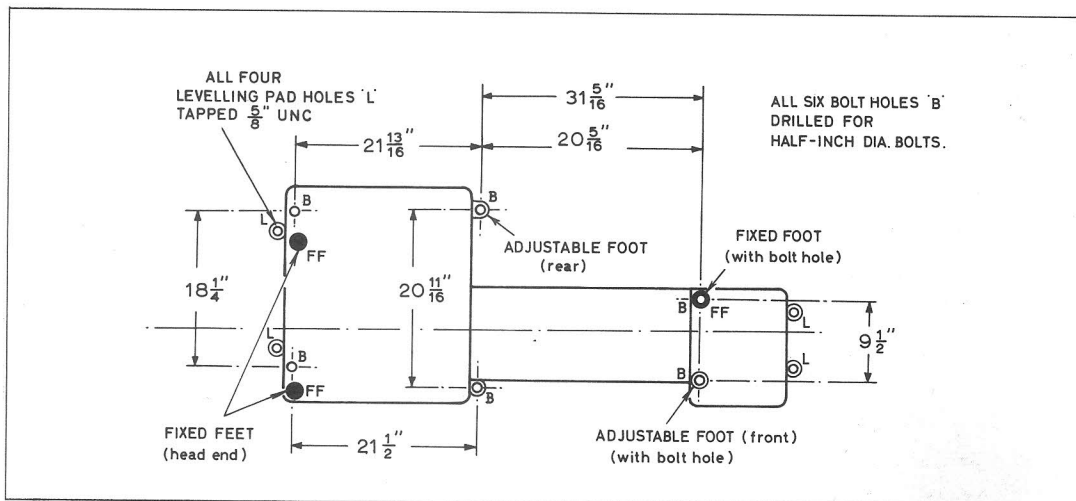
## STANDARD EQUIPMENT SUPPLIED WITH THE MACHINE

Full length splash guard  
Two No. 3 Morse taper centres  
One centre bush  
Wrenches etc.

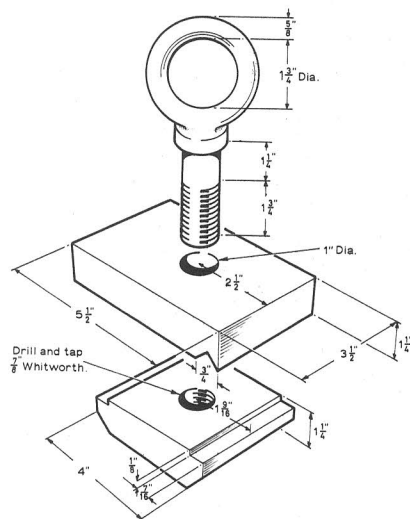
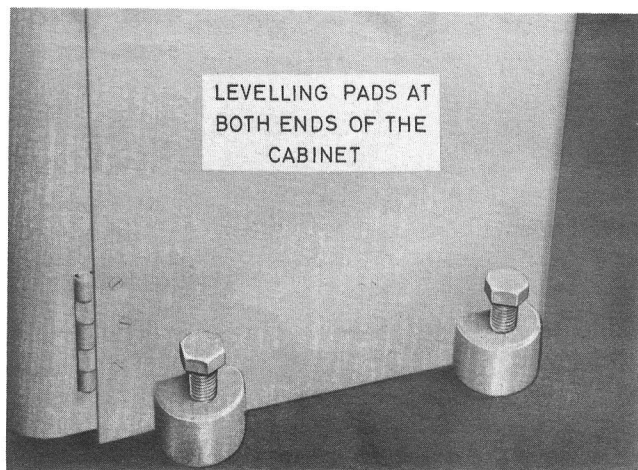
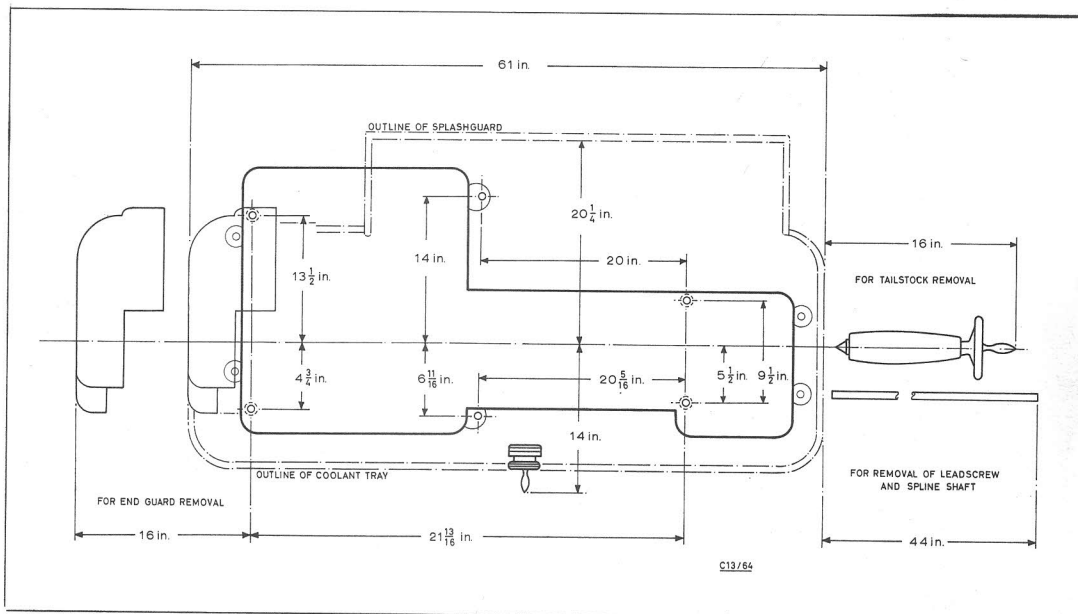
One 12" dia. faceplate  
One 6" dia. slotted driving plate  
Travelling steady rest

For details of additional equipment available, see Section ACCESSORIES

## INSTALLATION PLAN



## FOUNDATION PLAN



## LIFTING PLATE & BOLT



# INSTALLATION

## INTRODUCTION

Clausing-Colchester lathes are the result of half a century of concentration in manufacture of this type of machine tool. Whilst essentially precision tools intended for producing accurate workpieces, the design of robust construction and simplified controls makes these machines suitable for tooling in production work.

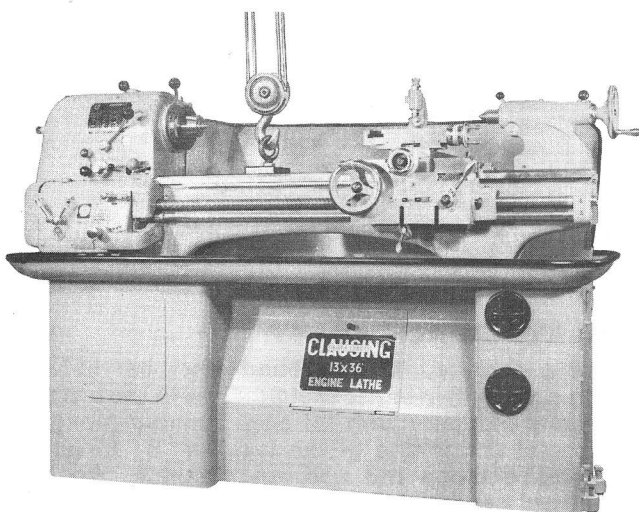
All castings are naturally aged for at least six months to avoid possible distortion. Jigs and special-purpose machines are used extensively in our manufacturing operations to ensure interchangeability of components. Care is taken in all processes of all departments to ensure your satisfaction with the machine.

The headstock is an all-g geared arrangement, totally enclosed within an oilbath and giving sixteen spindle speeds. The main spindle is precision finished from a heat-treated high tensile steel forging and is carried at the front end on Gamet high precision double row taper roller bearings of exceptional accuracy which are specially manufactured to our requirements. The rear end of the spindle is carried in a single-row taper roller bearing of similar design. All headstock spindles and shafts are carried in needle roller anti-friction bearings.

## LIFTING

The complete machine weighs approximately 1,550 lb and proper equipment must, therefore, be made available for handling this weight. All lifting and repositioning should be carried out with great care. It is recommended that a lifting bolt with clamp plates to the dimensions shown on the sketch should be used. Wind the saddle and slides towards the tail end of the lathe and fit the clamp plate securely at the point of balance of the machine.

Do not sling the machine from any other points. In case of difficulty, consult your local Clausing-Colchester agent.



## LIFTING THE LATHE

## CLEANING

Each lathe is delivered having all bright machined surfaces covered with a heavy protective coating. Before attempting to operate the machine remove all traces of the preservative using white spirit or kerosene.

**DO NOT USE CELLULOSE SOLVENTS FOR CLEANING—THESE WILL DAMAGE THE PAINT FINISH.**

When cleaning, pay particular attention to the slides and spindle nose. It is essential that the end guard be removed and the gear train carefully cleaned before operating the lathe.

All cleaned parts should then be dried using fluff-free cloth and the bright surfaces given a light coating of Shell Tellus 33 oil.

## WORKING AREA

When deciding upon the position for the lathe, remember that sufficient room must be allowed not only for ease of operation but to permit the end guard to be opened, for access to the motor compartment at the rear of the cabinet base and for the servicing operations recommended.

A foundation plan is included which gives the main installation dimensions and also the recommended minimum space required for efficient operation of the machine under all conditions of working.

## INSTALLING

In order to achieve the full standards of accuracy built in to your Clausing-Colchester lathe, it is essential that the machine be installed upon a solid concrete base which must be as level and free from vibration as possible. For most applications the machine will then perform perfectly satisfactorily whilst free-standing. When operating at high speed on out-of-balance work, however, it may become necessary to bolt the machine to the concrete foundation. Instructions for installation of the machine under both sets of conditions are given below.

Careful attention to siting and foundation will greatly add to the accuracy of the work produced and to the life of the machine. If the lathe must be installed above ground floor level, it is essential for best results to provide a concrete floor and to position the machine headstock as close as possible to a supporting wall or pillar. Wooden floors are not recommended because changes in atmospheric conditions which affect the floor will adversely affect the alignment of the machine. When wooden floor siting is unavoidable, a section of the floor should be taken up and a concrete base built up to the floor level.

It is not recommended that the machine is placed on felt or rubber mats no matter what type of foundation is provided.

**THE MACHINE SHOULD NOT BE GROUTED IN.**

## FREE STANDING MACHINES

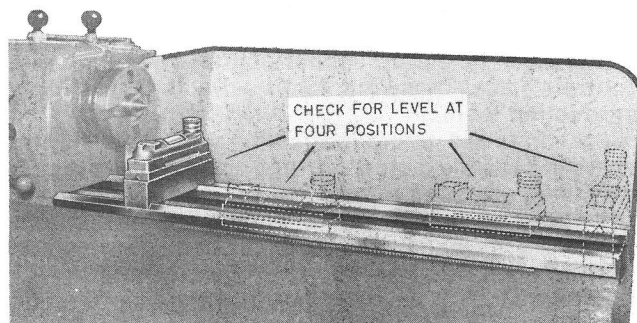
1. Position the lathe level upon the three fixed feet (shown in the installation plan).
2. Screw down the adjustable feet to each take its share of the load without losing ground contact at any other foot. Lock the adjustable feet.
3. Run the lathe. Any evident vibration will be due to incorrect setting of the adjustable feet; and this can be eliminated by slight alteration of the setting whilst the machine is running. Re-lock the adjustable feet.
4. For all normal operating requirements, the mounting as described will give all the support necessary.
5. It is essential that the machine is correctly levelled before using it in production and each time an adjustment is made to the foundation bolts or mounting feet. A precision engineers' level should be used and readings taken across headstock and tailstock ends and then in two positions on both front and rear bed shears in a longitudinal direction. Careful attention to levelling will greatly add to the accuracy of work produced and to efficient life of the machine. If the foundation is not accurate and level it may be necessary to adjust the levelling screws provided at the base of the cabinet.

## BOLTING DOWN

1. Position the lathe level upon the three fixed feet (shown in the installation plan as FF).
2. Screw down the adjustable feet to each to take its share of the load without losing ground contact with any other foot. Lock the adjustable feet.
3. Insert  $\frac{1}{2}$  in diameter foundation bolts through the bolt positions provided and into cleanly drilled holes in the concrete foundation. When inserted, they should be firmly secured within the foundation before attempting to tighten the holding-down nuts.
4. Secure the holding-down bolts firmly but avoid overtightening. Bolt tension should be just sufficient to retain the machine in position without disturbing the cross-wind alignment.
5. Run the machine. Any evident vibration will be due to incorrect setting of the adjustable feet which can be remedied by slackening the mounting bolts and altering the adjustment a little at a time. Care and attention given to obtain the correct setting at this stage will be well repaid. Re-lock the adjustable feet before tightening the mounting bolts.
6. It is essential that the machine is correctly levelled before using it in production and each time an adjustment is made to the foundation bolts or mounting feet. A precision engineers' level should be used and readings taken across headstock and tailstock ends and then in two positions on both front and rear bed shears in a longitudinal direction. Careful attention to levelling will greatly add to the accuracy of work produced and to efficient life of the machine. If the foundation is not accurate and level it may be necessary to adjust the levelling screws provided at the base of the cabinet.

## ALIGNMENT CHECKS

When the machine is installed initially, or after subsequent re-positioning, it is advisable to carefully check the alignment of the headstock and tailstock. All machines are accurately aligned before despatch from the Works, but transit shocks may render a further checking necessary or of benefit.

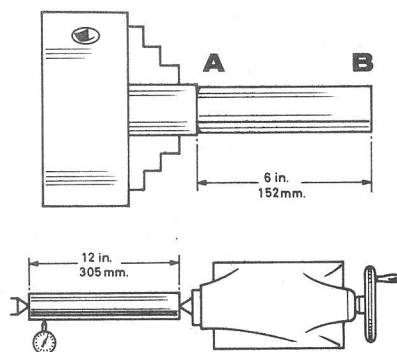


## HEADSTOCK ALIGNMENT

Grip a length of mild steel bar in the chuck and using keen tools take a light cut over the outside diameter for about 6 in of its length. Do not use the tailstock centre as a steady during this test.

Micrometer readings at the two ends of the turned ends of the turned diameter (at A and B in the sketch) should be precisely the same. If the readings differ, the headstock should be re-aligned as follows:—

1. Slacken the four socket-head headstock retaining screws until only finger tight. This will allow the headstock to pivot about the locating dowel.
2. Accurate adjustment for re-alignment can be made using the 'set-over' pad which is built into the underside of the headstock and rests between the bedway.
3. After alignment, tighten the locknut on each adjusting screw of the set-over pad and securely tighten headstock retaining screws.



## TAILSTOCK ALIGNMENT

Place a prepared 12 in ground steel bar between centres, as shown in the sketch. Then to the top slide fix a dial indicator with its anvil running along the horizontal centre-line of the test bar. By traversing the saddle along the bed, an accurate check on alignment can be made.

Any alignment errors may be rectified by adjustment to the two set-over screws provided one at each side of the tailstock base.

## INSTRUCTIONS and PARTS

# CLAUSING

COLCHESTER

DIVISION, ATLAS PRESS CO.  
KALAMAZOO, MICHIGAN

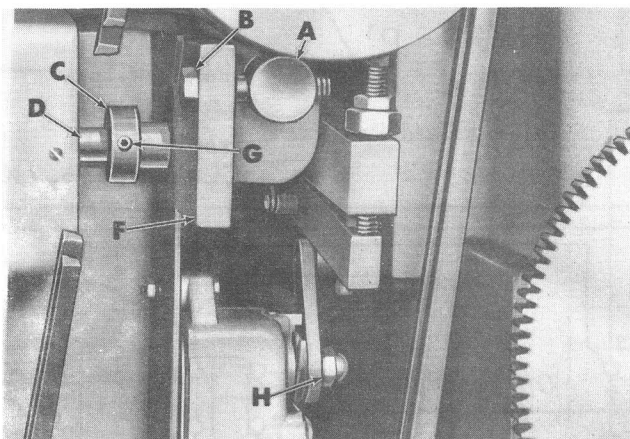


Figure 1

1. Before installing switch panel assembly turn the reversing switch shaft (D, fig. 1) clockwise as far as it will go, and then back two "clicks" — the switch is now in the off position.

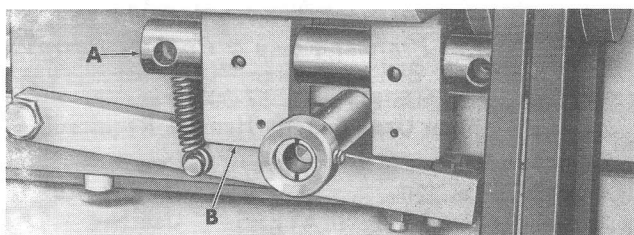


Figure 2

2. Slide switch panel mounting bar (A, fig. 2) in holes in back of headstock (B).
3. Slide drum switch shaft (D, fig. 1) with switch panel into coupling (C), then align mounting bar (A) with holes in mounting plate (F) and secure in place with two 3/8-16 x 2" screws (B). DO NOT TIGHTEN SECURELY.

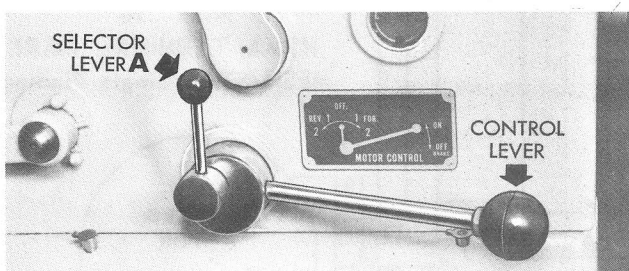


Figure 3

4. Make sure selector lever (A, fig. 3) rotates freely. If binding condition occurs, loosen mounting screws (B, fig. 1) and realign, then tighten screws securely.

## INSTALLING ELECTRIC CONTROL PANEL ASSEMBLY

ON

13" CLAUSING-COLCHESTER LATHES

FROM SERIAL NO.

TO

April 1964 FILE NO. 13"-CC ELEC-4

5. Hold the small reversing selector lever at the front of the lathe head stock in a vertical position and securely tighten set screw (G) in coupling collar (C) to clamp reversing switch shaft.

**IMPORTANT:** Be sure set screw (G) is at 90° to slots in coupling.

6. Connect the six numbered wires in the conduit from the reversing switch to the corresponding numbered motor leads. Use small screws and nuts, and tape connections.
7. Bring the main electric line into the magnetic starter through a knock out opening in the top of the box and connect the wires to the correct terminals as shown in the wiring diagram inside the switch cover.
8. Make sure red control lever is in "down" or "off" position.
9. Select the speed and direction of spindle rotation desired with the spindle selector lever.
10. Move the red control lever up to start the lathe and motor. To stop the lathe, push the lever down—continue to push the control lever down to operate the brake and quickly stop the spindle.
11. Before changing motor speed or direction of rotation, the control lever must be returned to the "off" position.

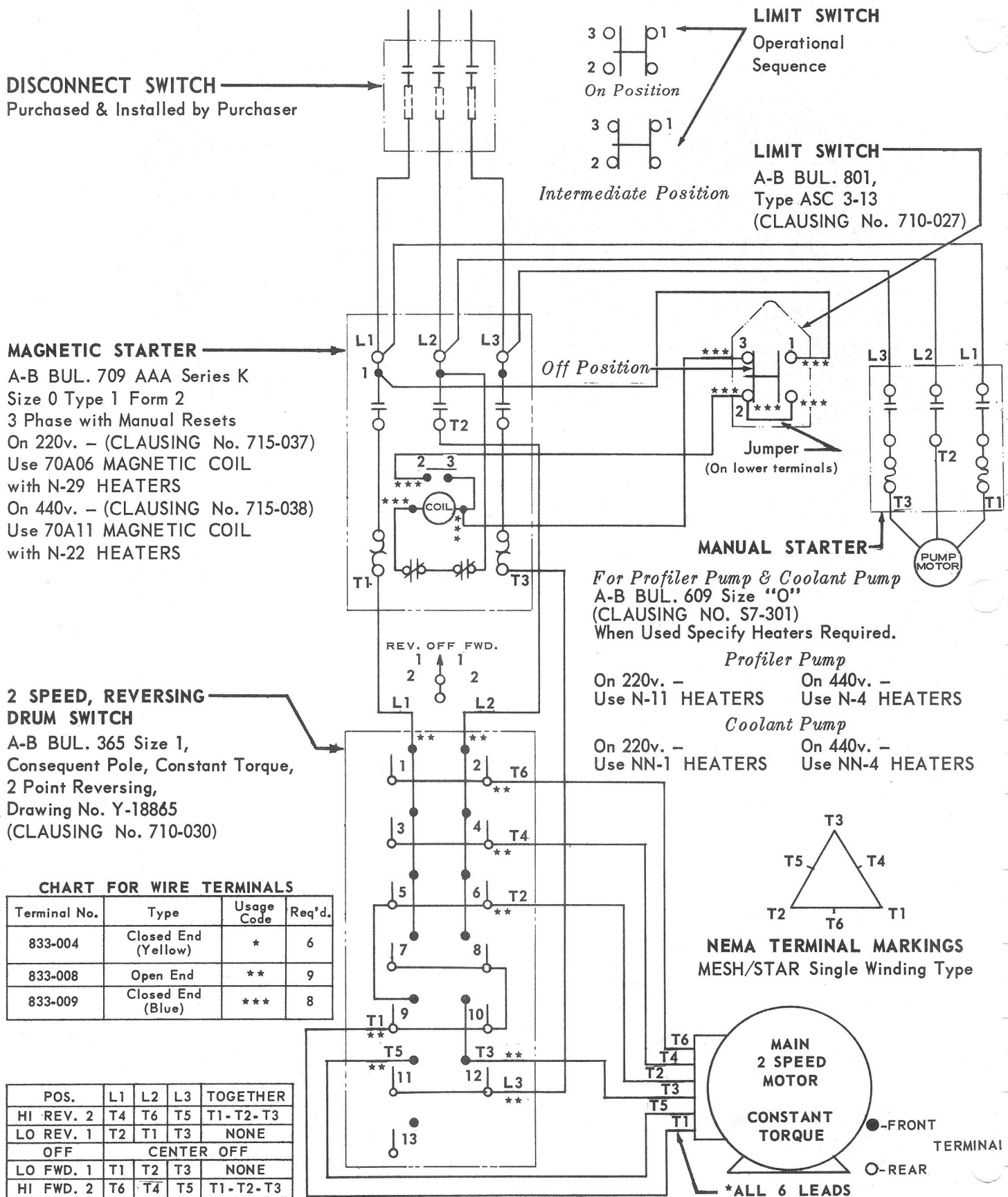
**NOTE:** The limit switch incorporates a safety feature to protect the machine and operator. In the event of an electrical power failure, the lathe cannot be accidentally restarted and will not restart by itself. It is necessary for the operator to return the control lever to the "off" position, and then move the lever to the "on" position to start the lathe.

12. If spindle rotation does not correspond to selector switch notation, interchange any two line leads. If the motor does not start when the control lever is in the "up" or "on" position, or stop in the "down" position, adjust the travel of the limit switch arm on the switch lever by loosening the adjusting nut (H, fig. 1). If the brake lever at the rear of the headstock jams on the threaded end of the brake link, adjust set screw in the bracket on the switch panel to limit travel of the switch lever.



# WIRING TO POWER SUPPLY

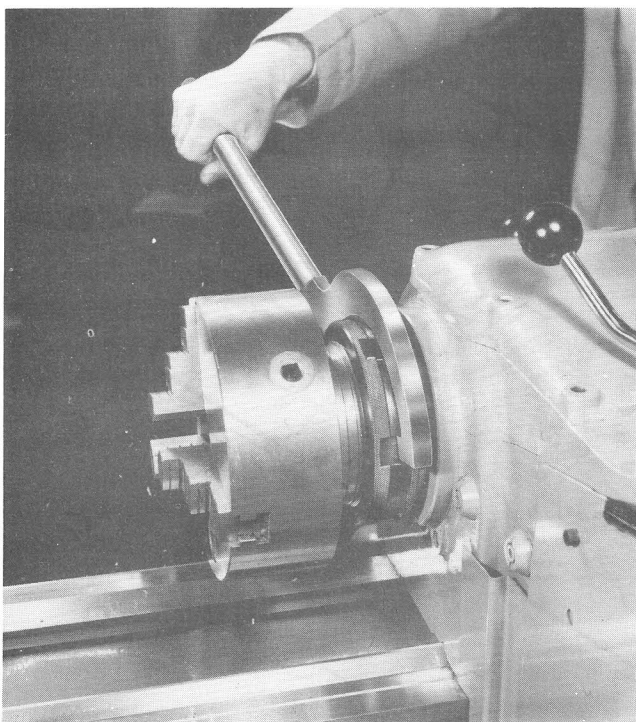
## APPLIES TO CLAUSING-COLCHESTER 13" LATHES FROM SERIAL NO. \_\_\_\_\_ TO \_\_\_\_\_



## CHUCK MOUNTING

The A.S.A. long-taper key drive spindle nose (to LO standard) is incorporated on this machine and has been selected in order to overcome the danger of chuck or faceplate detachment when the spindle is stopped or reversed rapidly.

Before fitting a chuck to the spindle nose, ensure that the centre and centre bush have been removed. Care should be taken to make sure that the taper and the key of the spindle nose, together with the internal tapered bore of the chuck, are scrupulously clean. Any dirt, swarf or burrs on these surfaces will upset the accuracy of the machine, may prevent the correct locking of the chuck on the spindle nose and can cause irremediable damage to the mating surfaces. The spindle nose drawnut engages with the thread on the back of the chuck; and when the drawnut has been screwed up by hand, without trouble, the special spanner wrench supplied with the machine should be used to tighten the drawnut fully. It is advisable to give the stock of the Spanner wrench one or two sharp blows with a mallet to ensure that the drawnut is quite tight. Do not, however, fit extension handles over the spanner wrench for tightening purposes.



### NOTE:

Should the chuck remain fitted for any length of time, the locking procedure should be repeated frequently. This is important when the machine is engaged on work which involves intermittent or heavy cutting. If the chuck is fitted with the spindle nose still warm from operating, it is essential that the drawnut is re-tightened before starting the machine again from a cold condition.

Releasing the drawnut will free the chuck or faceplate from the taper. Care must be taken whenever this is done, however, to ensure that the chuck does not slide off the spindle nose to damage the bed or saddle. It is advisable to obtain assistance each time the chuck is to be removed.

To avoid the possibility of moving the machine from its levelled position, final locking of the chuck or faceplate should be made with the spanner wrench horizontal.

## LUBRICATION

Accuracy of the work produced and long, efficient service from your lathe depend to a large extent upon the care and correct attention given to lubrication.

### Periodic attention

Before the new machine is put into service all oiling points should be properly lubricated, as indicated on the Lubrication Chart which shows the attention recommended daily, weekly and monthly. It cannot be stressed too highly that all the oiling points marked with a black dot (bedway, leadscrew and spline shaft) should be carefully cleaned and lubricated every working day in order to obtain efficient operation of the lathe.

Before starting work each day run the machine at high speed for a few minutes in order to thoroughly distribute lubricant throughout the gearing. This procedure is also advised when a period of work at slow speeds is anticipated.

### Lubricants

When the machine is despatched from the Works the headstock and gearbox are filled to the correct levels with the approved lubricant, as follows:—

Headstock — Shell Tellus Oil 27  
Gearbox — Shell Tellus Oil 33

Tellus oils may generally be obtained from Shell Oil Companies and agents throughout the world, but when difficulty is experienced in obtaining these recommended grades the following physical characteristics should be quoted in lubricant orders;

	Tellus Oil 27	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 INCORRECT GRADES OF OIL IN THE HEADSTOCK AND GEARBOX IS LIABLE TO CAUSE OVERHEATING AND RESULT IN POSSIBLE DAMAGE.**

### Oil levels

Oil levels in the headstock and gearbox should be checked every week. When checking the levels at the sight-glass, always stop the machine and allow a period of time for the oil to settle so that a true reading can be obtained. When this procedure is not followed there is a risk of overfilling which may result in the generation of excessive heat and cause oil loss through pressure leakage.

After an initial period of service of between 150 and 200 hours of running, both the headstock and gearbox of your new lathe should be drained, flushed with clean flushing oil and then refilled to the correct level with the recommended lubricant. Thereafter, repeat the draining and oil-change procedure every three months or 500 hours of operation—whichever is the shorter period.

### Motor attentions

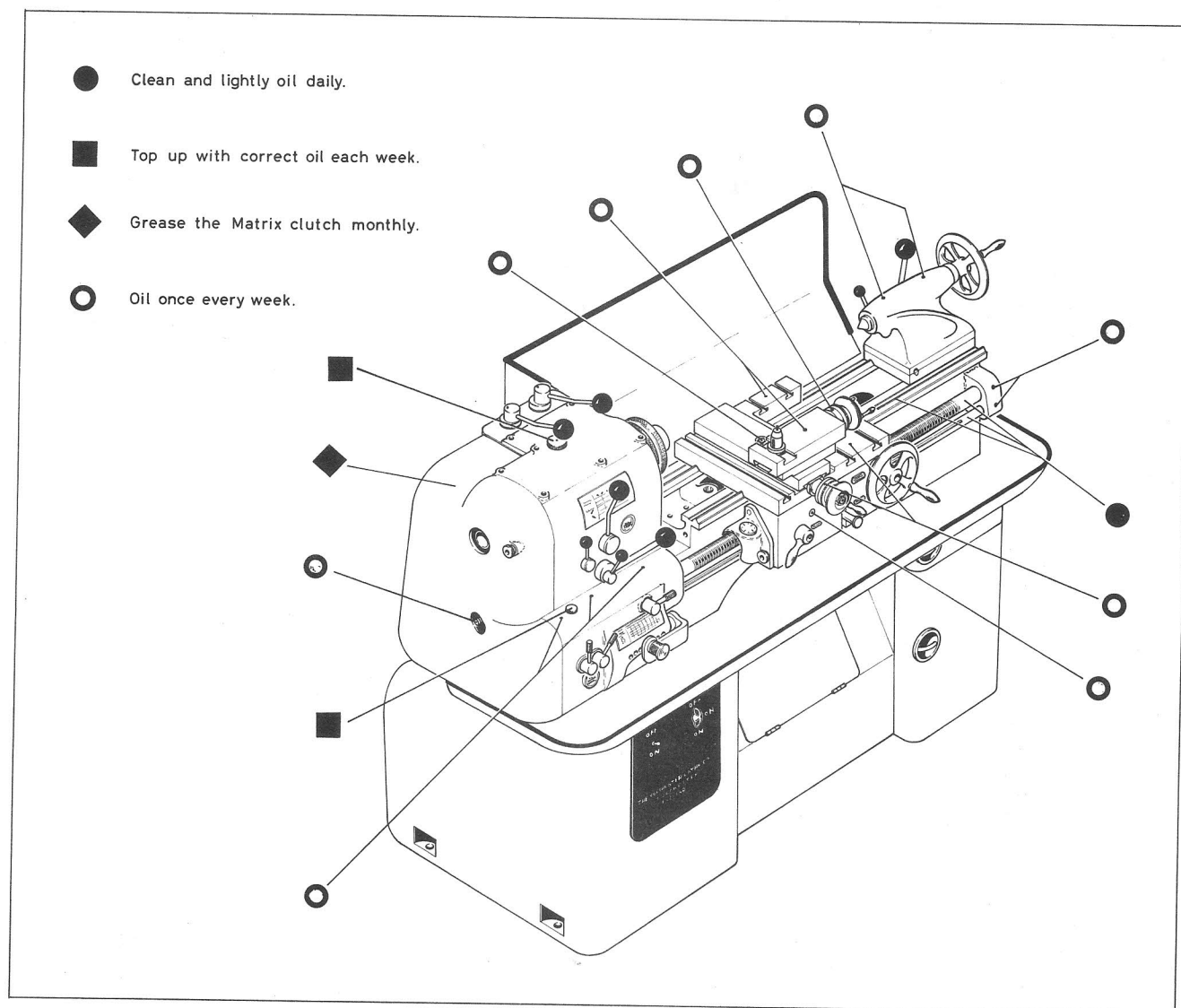
Motor bearings should be checked periodically as recommended by the manufacturer. Ensure an adequate supply of lubricant, whether oil or grease, but take care not to over-lubricate.

Bearings of the coolant pump motor should be lubricated as required with Shell Alvania 3 grease or an equivalent water repellent grease.

### Saddle and Slides

A one-shot lubrication system is fitted in the saddle. Before commencing work each day, depress the lubricator button to send a full supply of oil through the oil channels along the slideways.

An oil level sight glass is provided in the front face of the saddle. At least once every week check the oil reservoir and replenish as necessary with Shell Tullus Oil 33.





# OPERATION

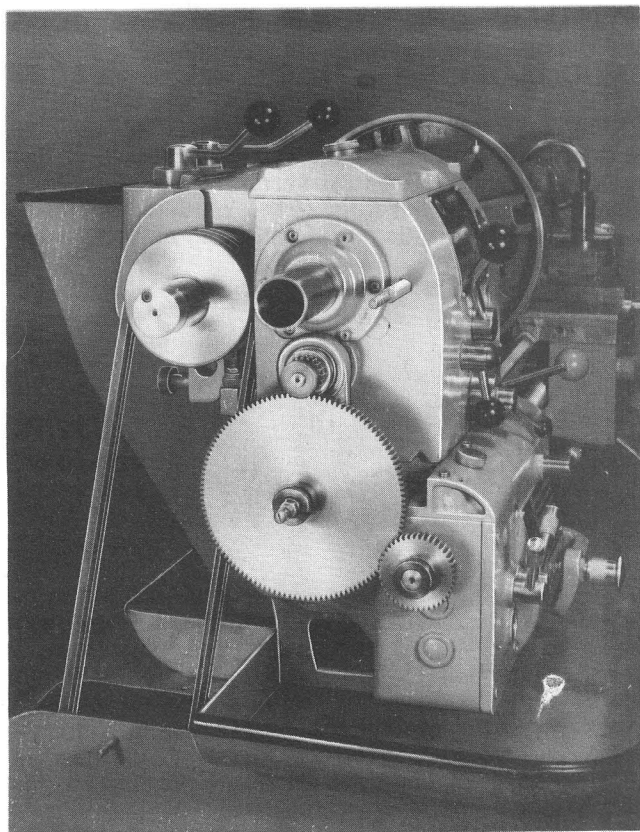
## DRIVE

The headstock gear train is driven from a two speed electric motor through standard double vee belts and pulley drives.

When correctly tensioned, belt can be deflected  $\frac{3}{4}$  in. when pressed at a point midlength between the motor and headstock pulleys.

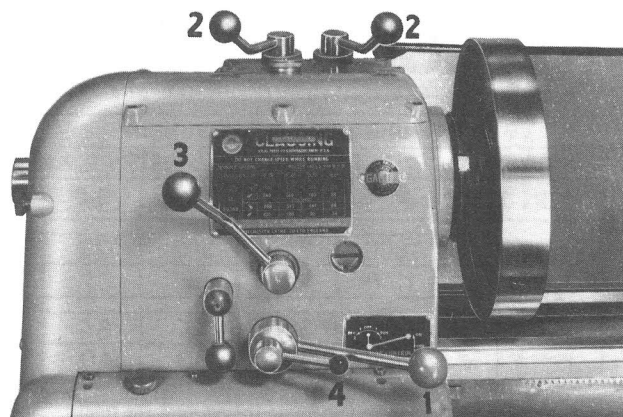
After an initial period of service (between 150 and 200 hours of operation) it may become necessary to re-adjust the tension of the driving belt to eliminate slap, vibration or slip due to belt stretch. Tension adjustment can be made any time by screwing down the two bolts retaining the front of the motor platform. Access to these two bolts is gained from the back of the motor compartment at the headstock end of the machine after removal of the louvred cover panel.

The drive is completely enclosed in an end guard to avoid the possibility of motor failure due to chips or coolant splashing. Removal of the end guard for motor or drive attention will automatically isolate the electric power supply.



**DRIVE END GEARS**

## STARTING



Rotation of the main spindle is controlled from the front of the headstock by means of the starting lever (1). Pull the starting lever upward. This action will start the motor through an air brake starter; the starting lever will remain in this position until it is moved downward to stop spindle rotation.

The starting mechanism incorporates a no-volt release. In the event of an electrical supply failure, the machine can only be restarted by first moving the control lever to the OFF position and then starting in the normal manner. Correct operation of the no-volt release should be checked from time to time, as described in Section ELECTRICAL WIRING.

## STOPPING

To stop the spindle, return the starting lever to the original or OFF position. On direct start machines, downward pressure on the starting lever operates a two-shoe Ferodo lined brake inside the driving pulley which causes the spindle to stop instantly. This brake cannot be fitted on lathes having the Matrix clutch.

## REVERSE

On machines supplied for operation on 3-phase A.C. supply (only) rotation of the main spindle is readily reversed by means of the finger-tip reversing switch (4) which is inset in the starting lever. Because of the use of the American long taper spindle nose there is no possibility of the chuck or faceplate running off when the spindle is rapidly reversed or stopped; providing, of course, that these have been correctly fitted.

## HEADSTOCK SPEED SELECTION

Speed selection is by means of two levers on the top of the headstock (2) and one lever on the front (3). Each lever has two positions, providing eight spindle speeds as shown on the data plate; but this range is increased to sixteen speeds by the use of a two-speed motor. The two-speed control switch for the motor is incorporated into the headstock controls. Lever positions and a chart of the speeds are shown in the illustration.

The small lever (G) is used in conjunction with gear-box controls for reversing the direction of feed. THE SPINDLE AND HEADSTOCK GEARING MUST ALWAYS BE STOPPED BEFORE MOVING ANY OF THE CHANGE LEVERS.









# COLCHESTER

ATLAS PRESS CO. KALAMAZOO, MICH. U.S.A.

**DO NOT CHANGE SPEED WHILE RUNNING**

**SPINDLE SPEEDS**

**PULLEY 2355 & 1175 R.P.M.**

LEVERS ON TOP					
LEVER AT FRONT	HIGH SPEED				
		1800	750	307	127
		1140	472	195	81
	LOW SPEED				
		900	375	153	64
		570	236	98	40

USE SHELL TELLUS OIL 27

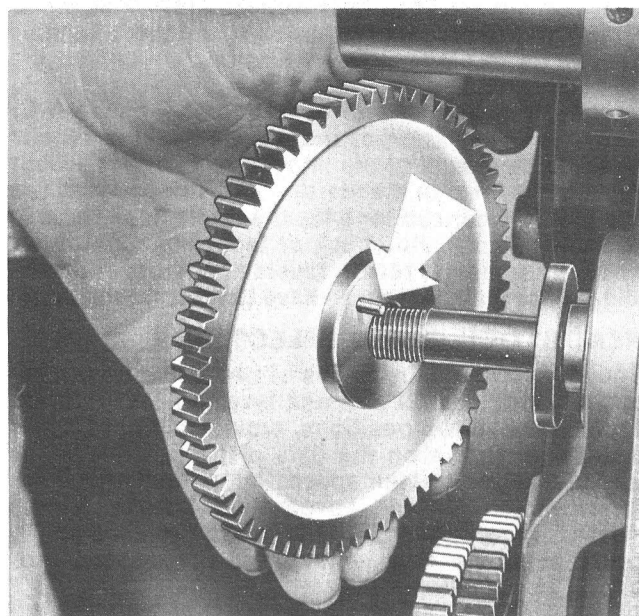
OBTAINABLE FROM SHELL OIL COMPANIES THROUGHOUT THE WORLD

**THE COLCHESTER LATHE CO LTD ENGLAND**

## SWING FRAME

The drive from headstock to gearbox is transmitted through the train of gears on the end of the headstock, enclosed by the end cover.

The gears are fitted to a swing frame assembly which is readily adjustable to accommodate the full range of change gears available for each particular machine (see also Section GEARBOX). At each of the gear spindles a knurled handnut is fitted to enable gear wheels to be rapidly interchanged when required. Be sure to tighten the handnuts after fitting each gear wheel.



A shear pin safety device is fitted as a measure to protect against overload when screwcutting. A shear pin can be replaced easily by removing the top gear in the train, then the splined sleeve which carries the gear. The broken portion of pin 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 will drop out through the slot. A new pin can then be inserted and the top gear and sleeve re-assembled. When the end guard is opened the electric supply is automatically isolated by a micro-switch in the headstock.

NOTE:—The leadscrew should never be allowed to revolve except when screwcutting; it should be cleaned and lightly oiled each time before use.

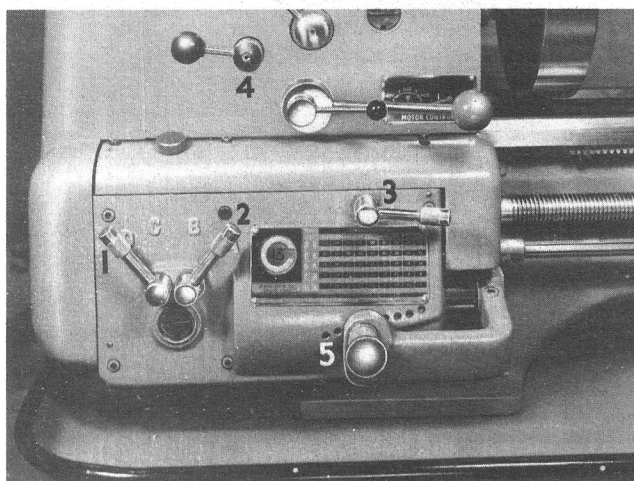
## GEARBOX

The standard gearbox covers a range of 45 feeds and threads (including  $11\frac{1}{2}$  and 23 t.p.i.) but does not provide metric threads. The full range of feeds and threads available are shown in the reproduction of the machine data plates.

Control of the gearbox is by means of four levers (1, 2, 3 and 4 in the illustration) and the tumbler shaft (5). The tumbler shaft is provided with a spring-loaded plunger which engages with holes in the front of the gearbox cover to provide positive positioning and locking. The two selector levers (1) and (2) at the left-hand end of the gearbox each have two positions (A or B) and (C or D) and by manipulating these two levers in conjunction with the tumbler arm a range of 36 feeds and threads can be obtained. The remaining 9 feeds and threads of the total 45 are obtainable by substituting a 42T change gear for the 21T gear on the top driver position and re-meshing the train. This 42T change gear is supplied stowed alongside the 35T change gear on the gearbox driving shaft.

**SPINDLE AND HEADSTOCK GEARING MUST BE STOPPED BEFORE ANY OF THE LEVERS CONTROLLING THE GEARBOX ARE MOVED.**

A third lever (3) disengages the leadscrew when this is not actually required for screwcutting. A lever (4) situated high on the front of the headstock controls direction of the feeds, reversing them as required.



## THREAD CUTTING

### 1. Threads available from the gearbox

The screwcutting dial on the apron has four numbered divisions and four sub-divisions marked on its surface, clearly visible from the operating position. The housing carrying this dial is located to the side of the apron and is retained in position by a knurled handscrew. When not required for use it may be swung out of contact with the leadscrew, since it is only employed when screwcutting is actually carried out.

To cut an even number of threads per inch (e.g. 12 t.p.i., 14 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 be engaged only on the numbered divisions. For 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.

The settings of gear box levers for the threads available from each gearbox are shown on the machine data plates which are reproduced in Section GEAR-BOX.

### 2. Threads not available from the gearbox

To cut special and multi-start threads which are not immediately available from the gearbox, it is necessary to use special change gears which are obtainable as extra equipment. For calculating the number of teeth in the required 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 selector levers on A C

2 with selector levers on A D

4 with selector levers on B C

8 with selector levers on B D

and T = Number of threads per inch to be cut

Values for X are as follows:—

0	0	0	0	0	0	0	0	0
28	26	24	23	22	20	19	18	16

Example

It is required to cut 27 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 so doing until a practicable result is obtained.

### Setting up gear train (27 t.p.i.)

1. Remove gear from headstock spindle.
2. Loosen swingframe (quadrant) locking nut located between swing frame and end of bed. Swing quadrant until 120T idler gear is out of mesh with gear on gearbox shaft.
3. Loosen idler gear stud nut located on inside of quadrant, slide 120T idler gear away from headstock spindle.
4. Select the proper gear for headstock spindle position (i.e. 28T as example). Place gear in position on spindle and secure in place.
5. Slide 120T idler gear up until properly meshed with gear on headstock spindle and secure in place. For correct mesh; place piece of heavy wrapping paper (.005 in. thick) between teeth of meshing gears, tighten gears in position and remove paper.
6. Check gear in position on gearbox spindle. For obtaining 27 t.p.i. it should be 35T gear.
7. Swing quadrant so 120T idler gear is in proper mesh with gear on gearbox shaft. Tighten in place.
8. Set gearbox levers properly, as shown on the data plate (left hand to C, right hand to B) and position tumbler to cut 36 t.p.i.
9. Check gear set-up by cutting 27 t.p.i. on scrap stock.

$$\text{In the case of 27 t.p.i.} = \frac{3 \times 18 \times 4}{10 \times 27} = \frac{28}{35} = \frac{\text{Driver}}{\text{Driven}}$$

LEVERS	THREADS PER INCH									
	SLIDING FEEDS IN INCHES- SURFACING $\frac{1}{2}$ SLIDING									
D B	112	104	96	92	88	80	76	72	64	
C B	56	52	48	46	44	40	38	36	32	
D A	28	26	24	23	22	20	19	18	16	
C A	14	13	12	11 $\frac{1}{2}$	11	10	9 $\frac{1}{2}$	9	8	
C A	7	6 $\frac{1}{2}$	6	5 $\frac{3}{4}$	5 $\frac{1}{2}$	5	4 $\frac{3}{4}$	4 $\frac{1}{2}$	4	

WHEN USING 42<sup>T</sup>  
DRIVER GEAR

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



## Metric Thread Cutting

Compounding of the quadrant idler gear is necessary for cutting all 21 available metric threads. For this machine replace the 120T idler with a compound 127T and 120T idlers on the quadrant.

1. Loosen quadrant locking nut located between quadrant and end of bed. Swing quadrant until 120T gear is out of mesh with gear on feedbox shaft.
2. Loosen idler gear stud nut located on inside of quadrant. Slide 120T gear away from gear on headstock shaft. Select proper gear for headstock shaft from chart, place gear in position and tighten knurled nut.
3. Remove 120T idler gear from brass sleeve. Place 127T gear on brass sleeve followed by 120T gear. Slide sleeve with compound 127T/120T gears on idler gear stud; be sure 127T gear is next to quadrant.
4. Slide 127T/120T gear up until 127T gear meshes with selected gear in position on headstock shaft. For correct mesh, place strip of heavy wrapping paper (.005 in. thick) between teeth of meshing gears. Paper should fit tight between gears. Lock gear stud in place and remove paper.
5. Place 21T gear in position on feedbox shaft next to feedbox. This gear is used as spacer only.
6. Select proper gear for this shaft position from chart. It will be 30T, 35T or 42T only. Place gear in position next to 21T gear spacer. Tighten in place.
7. Swing quadrant until 120T gear meshes with outer gear on feedbox shaft. Check gear mesh (step 4) and tighten quadrant locking nut.
8. Position feedbox levers as shown in chart. Check gear setup by cutting thread on scrap stock.

### NOTE:

When cutting metric threads, THE THREADING DIAL CANNOT BE USED. Close half-nut for first cut, then reverse lathe to return carriage for each succeeding pass until thread is completed.

M/M Pitch	DRIVER (Top)	DRIVEN (Bottom)	LEVER L.H.	POS. R.H.	TUMBLER
0.25*	21T	35T	D	B	3
0.35*	21T	30T	D	B	6
0.5	42T	35T	D	B	3
0.6	42T	35T	D	B	6
0.7	42T	30T	D	B	6
0.75	42T	35T	D	B	9
0.9	27T	30T	C	B	6
1.0	42T	35T	C	B	3
1.25†	42T	42T	C	B	9
1.5	42T	35T	C	B	9
1.75	42T	30T	C	B	9
2.0	42T	35T	D	A	3
2.5†	42T	42T	D	A	9
0.3	42T	35T	D	A	9
3.5	42T	30T	D	A	9
4.0	42T	35T	C	A	3
4.5	27T	30T	C	A	9
5.0†	42T	42T	C	A	9
5.5	33T	30T	C	A	9
6.0	42T	35T	C	A	9
7.0	42T	30T	C	A	9

### NOTE:

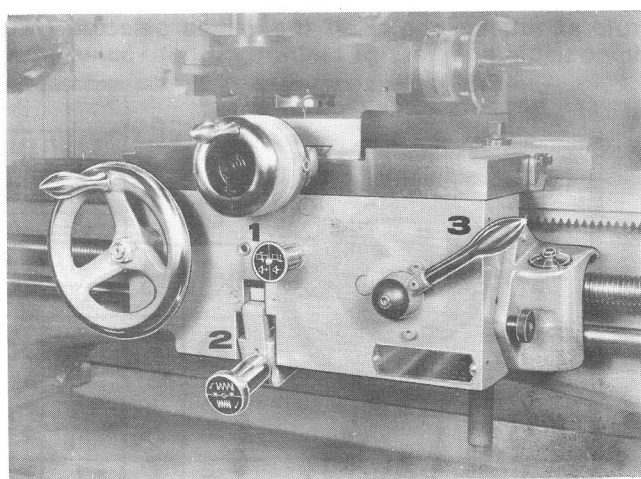
† For these threads an extra 42T gear is required.

\* For these threads a spacer No. M1-565 ( $\frac{1}{2}$ " wide x  $\frac{7}{8}$ " Bore) is required in place of 21T gear at bottom position.

## APRON

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.

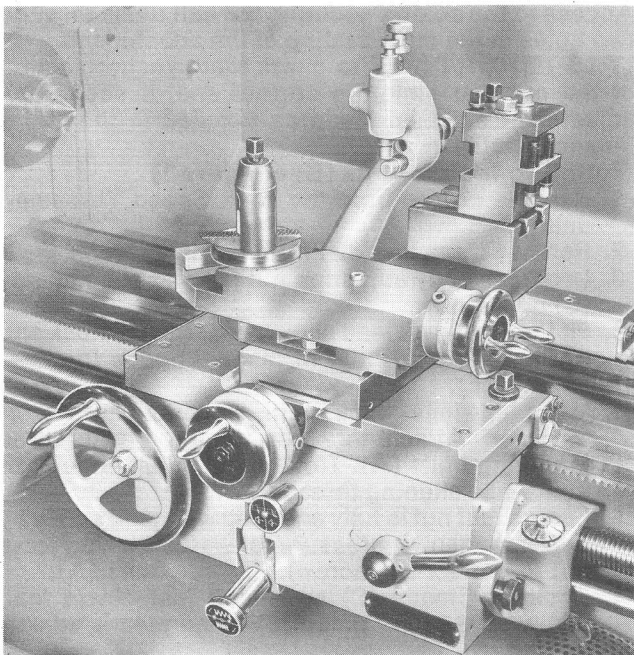
The feeds are engaged by lever (2) which incorporates a safety device to prevent overloading. This mechanism is pre-set at the Works to trip out at 400 lb end pressure. It should give long, trouble-free service,



## SADDLE AND SLIDES

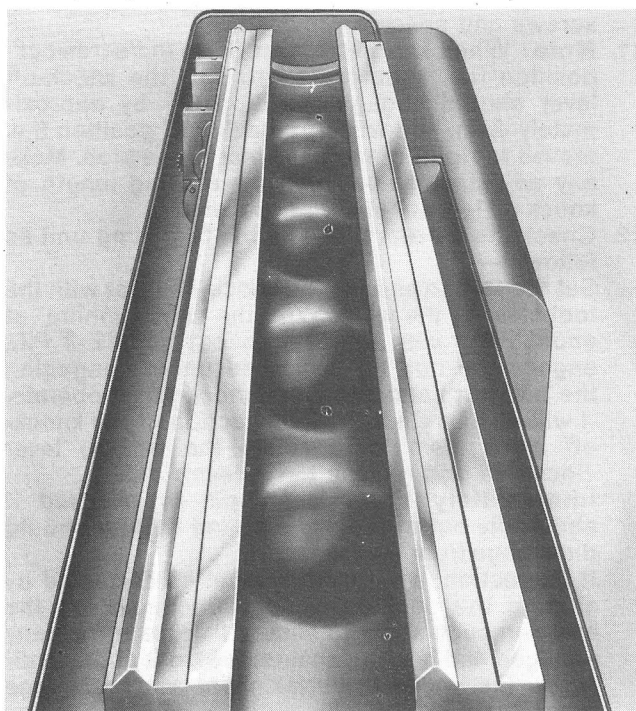
The saddle is of American winged type. It is secured to the bed by means of adjustable keep strips at front and rear and can be locked in any position on the bed by means of a locking clamp. The cross slide is graduated radially 90°-0-90° each side for accurate setting of the compound slide. Large diameter micrometer dials are graduated in 0.001 in. divisions on both the slides.

An American pillar-type toolpost is fitted as standard, intended for tools up to  $\frac{9}{16}$  in.  $\times$   $1\frac{1}{8}$  in.



## The Bed

All lathe beds are induction hardened and ground on working surfaces. To remove the detachable gap-piece on gap bed machines, simply unscrew the four cap-head screws. No dowels are fitted.

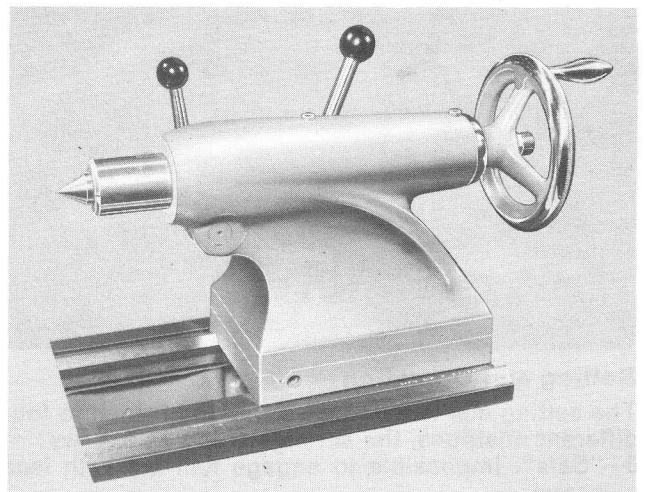


When refitting the gap-piece, first clean off the block and locating faces most thoroughly. Then fit the gap-piece in position and locate the four screws (two vertically from the top, two horizontally). Now bring up the saddle to give an approximate alignment and tighten the screws lightly. If the mating faces are properly clean the gap-piece may now be aligned exactly by a few taps in the required direction using a hide-faced mallet. Finally tighten the retaining screws securely.

The lathe bed should be cleaned down as often as possible to keep it free from chips. Use a brush for all cleaning; do not use an airblast which can drive chips under the sliding surfaces and may, also, blow away the protective oil film from working surfaces. After cleaning down, the bed should be coated with Shell Tellus Oil 33 to prevent formation of rust.

## TAILSTOCK

The barrel is graduated in inch divisions and induction-hardened in the 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 marked on the front face of the nose chamfer to assist in setting tools to correct centre height when a workpiece is set up between centres. There are two parts to the tailstock body 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 need for a special taper attachment; maximum set over is  $\frac{1}{4}$  in. each side of the centre line, a graduated scale is marked on the rear face of the tailstock casting. The tailstock is set over by first releasing the bedway clamping lever and then adjusting the two set-over screws fitted in the base (one at each side) for this purpose.



THE TWO SPRING-LOADED SHOULDER BOLTS HOLDING THE BASE TO THE BODY DO NOT REQUIRE SLACKENING AT ANY TIME.

Quick lever clamping is employed to lock the tailstock in position on the bedways. The tailstock barrel is locked at the required setting by a lever-operated clamp.

## HIGH SPEED THREADING UNIT

### Introduction

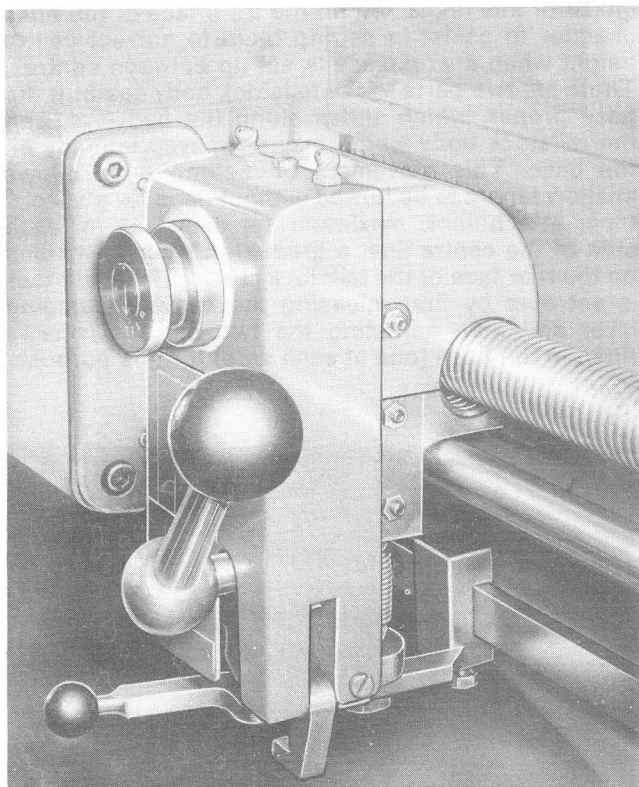
This attachment is designed to replace the existing screwcutting mechanism of the lathe. It is secured to the right hand side of the lathe apron by socket head screws and accurately positioned by dowels.

The attachment contains its own half-nut mechanism and obviates any possibility of the thread being picked up incorrectly. A threading dial is eliminated; the operator merely presses on the handle and the half-nut will engage at the correct point to pick up all American and English threads, including fractional threads per inch.

Once fully engaged, the half-nut is locked positively in mesh with the lead screw and always at precisely the same depth of engagement until disengaged automatically or manually.

When the knock-off lever encounters the stop which is fitted to the lathe bed, the half-nut is disengaged automatically, safely and with great accuracy.

As engagement of the half-nut is controlled and release is automatic, threads can safely be cut at high spindle speeds, the only limiting factors being considerations of tool life and the speed at which the carriage can be picked up without undue strain on the lathe mechanism.



### Setting and Operation

The setting dial can be pulled out and turned to four different positions, the settings being as follows:  
0—"Safe". Impossible to engage half-nut with lead screw

1—Odd-quarter threads per inch (e.g.  $4\frac{3}{4}$ )

2—Odd-half threads per inch (e.g.  $4\frac{1}{2}$ )

4—Whole numbers of threads per inch (e.g. 8 or 13)

Move the knock-off control to the "Screwcut" position and set the adjustable stop to engage the knock-off lever so the half-nut is disengaged at approximately the required position. Now, with the tool clear of the work and the lathe running, engage the half-nut and allow the knock-off to operate. Fine adjustment may then be made by using the compound slide.

Threads may be cut either by feeding the tool straight in or by using the top slide at half the thread angle. When using the latter method, however, allowance must be made for the fact that the tool will have moved forward by half the pitch when the thread is completed.

The tool may be allowed to form its own annular groove at the end of the cut, but should be withdrawn without delay to avoid rubbing.

It is important that the lead screw be clean and free from swarf for high speed screw cutting.

### INSTRUCTIONS FOR FITTING NEW HALF NUT

Access to the screws securing the half nut is through two holes in the main casting of the attachment.

**IT IS IMPORTANT** to check that synchronisation of the nut and pinion is correct and, if necessary, adjustment must be made as detailed in the Maintenance section.

#### Mounting Instructions (See Figure 1)

1. Remove covers from the High Speed Threading unit.
2. Remove threading dial from carriage apron.
3. Loosen steady adjusting nut (B) and slide steady (C) up slightly.
4. Fit threader over lead screw, near the tailstock end of the lathe and hold in place. Engage threader half nut (E).
5. Move carriage back until it contacts face of threader. Attach threader to apron with three mounting bolts (A). Tighten bolts just enough to hold while aligning threader.
6. Ensure half nut is fully engaged with lead screw by applying gentle pressure upwards (taking care not to deflect leadscrew). Tighten bolts (A).
7. Position Steady (C) so that it just clears lead screw (.003 in. maximum); tighten steady adjusting nut (B).
8. On 17 in. lathes only, adjust lower steady (located next to apron) to bear lightly on underside of leadscrew.
9. Position stop bar (H) below knock-off lever (F) (about  $\frac{1}{8}$  in. clearance) and parallel to feed rod. Locate mounting holes on lathe beddrill and tap  $\frac{1}{4}$  in. UNC for mounting screws.
10. Attach stop bar to bed using flat head machine screws and spacers provided.
11. **Note:** When knock-off lever (F) is in "screwcut" position (i.e. knob moved to left) the knock-off lever should engage the stop (K) by approximately  $\frac{5}{16}$  in. and when in the "lock" position (i.e. moved to right) it must be clear of the stop. Make any adjustment necessary by altering length of knock off lever or stop bar spacers.
12. Check the correct fitting of the threading unit as follows:—

Set the stop to engage the knock-off lever with the tool clear of the work. With the lathe running at about 300 r.p.m. and set to cut say 12 T.P.I., engage the nut, as described under "engaging the half-nut" and allow the knock-off to operate. It will be seen that the initial action of the knock-off mechanism is to rotate the locking lever clockwise and release the selector pin.

**Immediately** the selector pin is released it should fly out of the dial slot and the nut should disengage from the leadscrew.

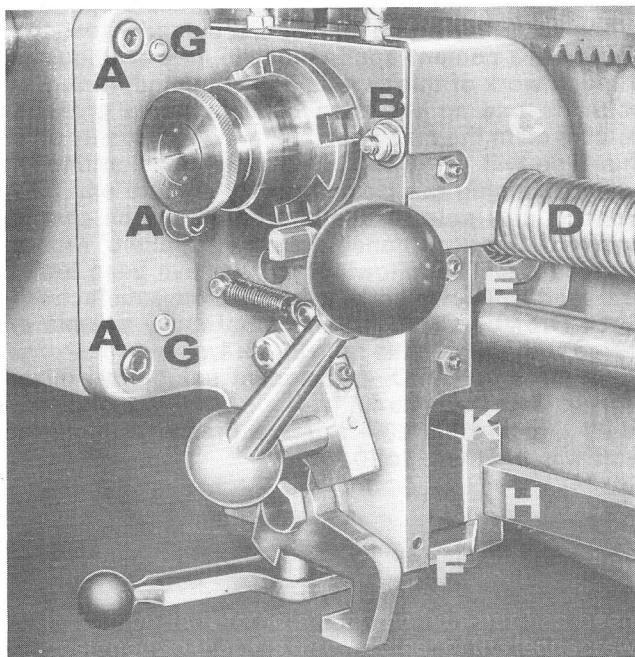
If this action is sluggish it must be corrected by altering the position of the attachment on the apron in such a way to ensure that the nut is fully engaged and bearing against the front of the lead-screw (i.e. move the attachment away from the operator).



It is important to note that the half-nut has been designed so that it is thrown clear of the leadscrew immediately the slide pin is released. If the attachment is fitted incorrectly and the nut is pressing against the back of the leadscrew (i.e. tending to bend the leadscrew towards the operator) the servo action will not operate and the release mechanism is liable to act sluggishly.

This fault can be easily discovered by observing the slide pin when the knock-off mechanism operates with an increased load applied to the carriage by applying slight hand pressure to the traversing hand wheel. If the slide pin flies out of the dial slot **immediately** it is released the action is satisfactory, but if there is a slight pause the servo action is not operating and the nut is being forced out of engagement with the leadscrew by the safety device incorporated in the attachment.

13. After any necessary adjustments have been made, and repeated trials show that the attachment is working satisfactorily, drill dowel holes in lathe apron through holes "G" in threader, ream to dowel size and fit dowels.
14. Replace the covers and the attachment is ready for operation.



### Engaging the Half-Nut

With the lathe running at required speed, hold down the handle with a steady pressure. Engagement will not be possible until the right moment, which is indicated by a movement of the handle. At this moment the handle should be depressed fully and released. If the half-nut is not properly locked in engagement, the handle will fly back and the procedure should be repeated.

The handle must be held down firmly and steadily until the half-nut engages; it should not be depressed intermittently or engagement will be delayed.

The handle *must* be released on engagement. Before screw cutting, it is recommended that the operator carry out a few runs with the tool clear of the work to get the "feel" of the mechanism.

### Manual Release

If it is required to cut a thread without using the automatic knock-off, the half-nut can be disengaged manually.

### Safety Lock

If it is required to advance the carriage beyond the stop, this may be done without interfering with the setting, by moving the knock-off control to the "lock" position. It will then be retained in a position which will allow the stop to be by-passed, at the same time locking the attachment so that it will not be possible to engage the half-nut until the knock-off control is returned to the "screw cut" position.

### Left Hand Threads

Left hand threads should be cut by reversing the lathe and inverting the tool. The lead screw can then be set to run in the normal direction of rotation and the automatic knock-off can be used. If a screw-on chuck is used, care must be taken, of course, to ensure that it does not unscrew while running.

### Lubrication

Medium lubricating oil, not grease, should be used at the points indicated.

The double ball bearing on the pinion shaft is packed with grease and will not require attention.

### Maintenance

Adjustment for wear in the half-nut slide is by three socket head screws with lock nuts operating on a gib on the right hand side of the attachment. It is essential, however, that this slide works freely over the full range of its travel.

Initially the attachment will either be fitted by a trained service engineer, or will be supplied with the mounting bracket drilled to correspond with existing locations on the lathe apron, but the following points should be noted:

1. When the half-nut mechanism is locked in engagement, the half-nut should be deeply meshed and the steady set to prevent the lead screw distorting upwards.
2. The half-nut should not bow the lead screw horizontally, a slight deflection away from the attachment is acceptable, but there must be no deflection towards the attachment.
3. With the cover of the attachment removed, it will be seen that a pin enters one of the slots in the control disc when the half-nut is engaged. With back lash taken up, this pin should be approximately central in the slot, with a slight bias towards the side of the slot nearest the mounting flange of the attachment. On no account must it bear against the side of the slot.

Should this fault develop through wear, it may be corrected by re-synchronizing the pinion as follows. Withdraw the pinion from the shaft after removing the retaining screw. The pinion is located on the driving collar by a pin which will engage any one of a series of holes arranged to give a vernier action. By moving the pinion round one hole at a time, the best position can easily be found by trial and error. A second pin, fitted to the reverse side of the pinion, may be used to give a further set of positions if necessary.

No other adjustment should be attempted without consulting the suppliers and the serial number of the attachment must always be quoted in case of difficulty or when ordering replacements.



# ACCESSORIES

A comprehensive range of accessories is available for the Clausing-Colchester lathe, specifically designed for the machine and engineered for robust service and reliability.

A brief list of these is given below and more detailed information on certain items is given in subsequent pages. All accessories listed can be fitted to the machine after it has left the Works.

<i>Description</i>	<i>Code</i>
3-jaw Universal scroll chuck—7½ in. . . . .	13-201
4-jaw Independent chuck—10 in. . . . .	13-202
18 in. Faceplate (gap bed lathes only) . . . . .	13-203
Coolant system . . . . .	13-208
Reversing switch . . . . .	13-212
Steady rest . . . . .	13-210
One-position carriage stop . . . . .	13-214
Five-position carriage stop . . . . .	13-216
Rear toolpost . . . . .	13-217
Chuck backplate . . . . .	13-218
Telescopic taper attachment . . . . .	13-213
High-speed threading unit . . . . .	13-227
Rotating centre . . . . .	13-215
Hex bed turret . . . . .	13-651
Micro carriage stop . . . . .	13-2000
Turret toolpost . . . . .	13-4½-S
Hydraulic profiling attachments	
(13 in x 24 in lathes) . . . . .	13-230
(13 in x 36 in lathes) . . . . .	13-231

## COOLANT SYSTEM

The cabinet base has a built-in storage tank with a pump fitting position already provided. A pipe in the centre of the tray returns coolant to the tank and a gauze strainer is fitted to the pipe at tray level to prevent swarf and chips from entering the sump.

The jointed piping supplied with this unit is fully universal and will feed coolant to any required position. Supply of coolant is easily controlled by a ball-type shut-off valve. The whole system has been designed to eliminate the leaks usually inherent in other coolant systems. Capacity of the unit is 5½ gallons. An electric pump of robust and reliable design is available and is wired into the main electrical panel at the main switch (see Wiring Diagram). The pump motor should never be run if the coolant sump is dry. The sump should be cleaned at frequent intervals and refilled with fresh coolant. Precautions should be taken when refilling to avoid splashing the coolant over the pump.

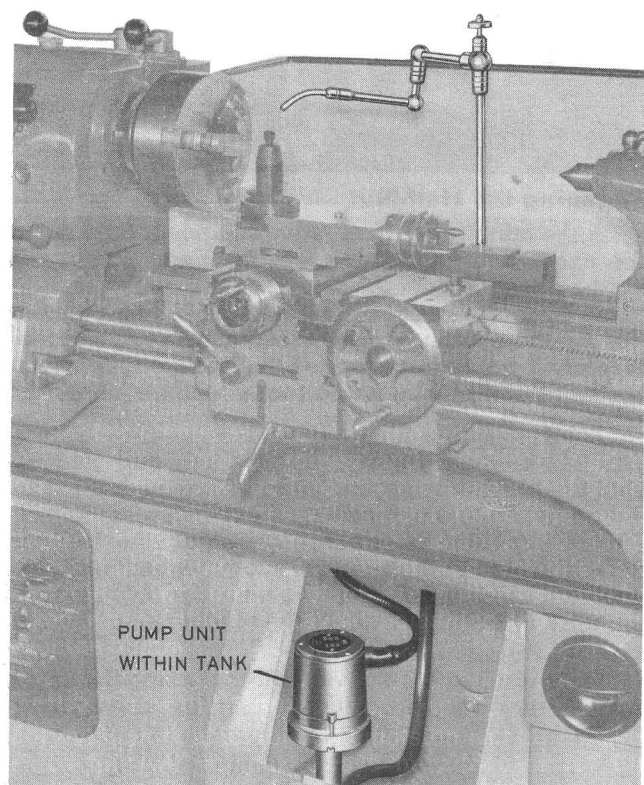
## Soluble oil emulsions

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

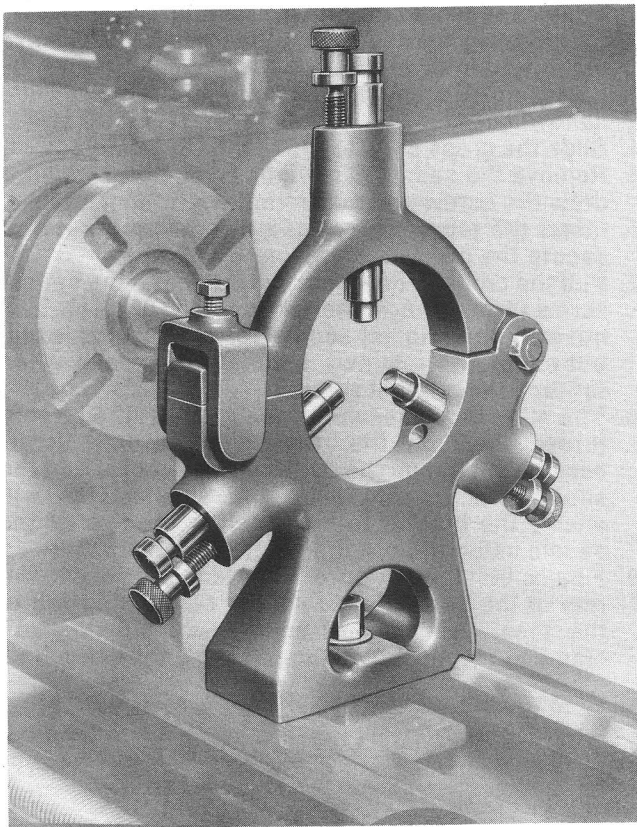
The tank should be emptied, cleaned out and re-filled with fresh soluble oil at regular intervals.

### STEADY REST

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

Inserts are of sintered bronze and 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

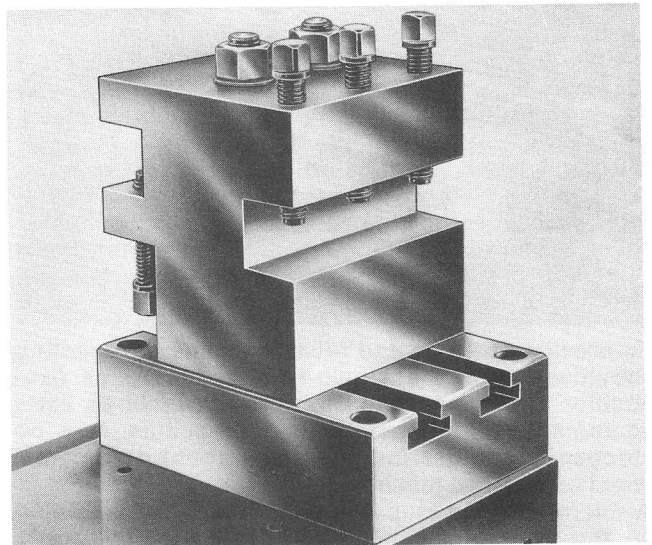
As an aid to production, a rear toolpost is available for fitting direct to the cross slide, which is drilled and tapped ready to receive it.

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

Using this tool post (with the tool fitted in conventional manner) left hand threads can be easily cut. Supplied complete with all necessary fixing screws, the only fitting required is the physical bolting of base pad to 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  $\frac{5}{8}$  in.

Standard wrenches and Allen keys supplied with the machine will fit all the nuts and screws in this assembly.

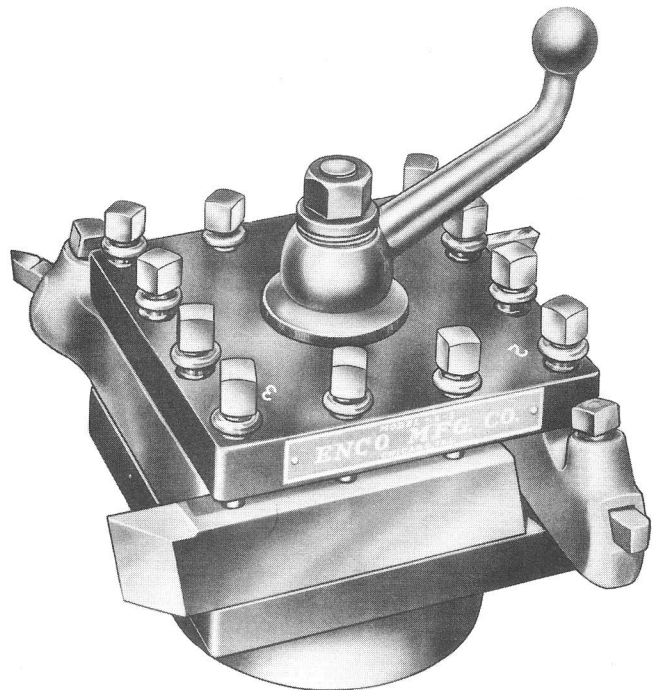


### SQUARE TURRET TOOLPOST

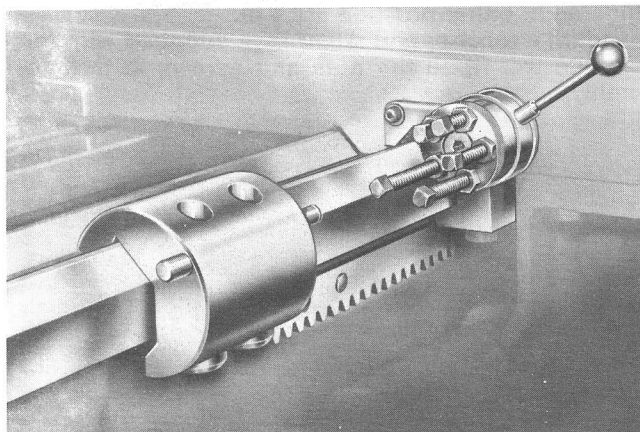
To index the toolpost into any of four operating positions, the central hand lever is moved in an anti-clockwise direction until distinct detents are felt. This indicates that the plunger mechanism has released the locating plunger and the indexing mechanism is engaged. When the central hand lever is 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 turret block to topslide.

Using the retracting plunger method of indexing, the turret block remains close on its bottom face whilst being indexed, which effectively prevents entry of chips between the locating faces. The turret block can also be swung into any position without use of the indexing mechanism.

The turret block will accommodate up to four tools or toolholders having a height up to  $\frac{3}{4}$  in.



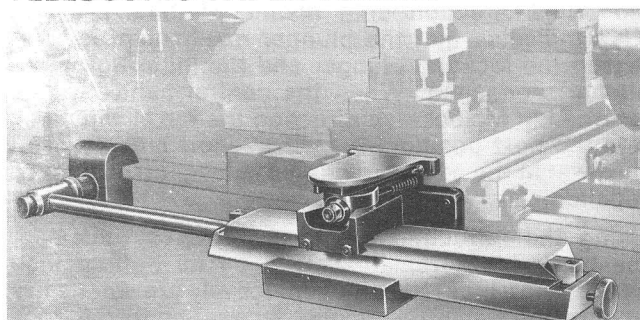
## BED STOPS



To provide accurate and reliable means of repeating shoulder lengths, a single-type bed stop or five-position turret type bed stop are available as extra equipment. With these units, the saddle may be stopped in any desired position without detrimental effect on the feed mechanism.

A micro carriage stop is also available, for clamping on the front of the bedway. Micrometer control is graduated in 0.001 divisions. Hardened stop locks securely in any position.

## TELESCOPIC TAPER TURNER



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

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

The swivel slide is graduated in  $\frac{1}{4}^\circ$  of arc and in  $\frac{1}{8}$  in. 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 10 in. 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 Caphead Allen 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 accomplished simply 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 re-adjusting 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. Slide the cross slide to the rear of the saddle.
5. Remove the saddle screw nut fixing bolt and withdraw the screw and nut from the rear end.
6. Insert the taper turner saddle screw and nut and secure the nut with the fixing bolt.
7. Pull the cross slide forward and engage the saddle screw in the handwheel pinion. (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. This 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. Fit the connecting rod to the taper turner slide and the connecting rod clamp to the machined face on the back of the bed.



# HYDRAULIC PROFILER

## COLCHESTER SERIES '300' HYDRAULIC PROFILING UNIT

Designed to permit faster and more accurate profiling, this unit can be fitted at any time to Colchester lathes without modification or alteration of the machine. The standard equipment unit comprises four basic sub-units; profile slide, tool box, the rear beam and tail-stock units (suitable for round or flat masters or models) and a free-standing hydraulic power unit complete with a set of hoses. Two further units are available as additional equipment; a turret stop assembly and a facing beam; both of which are described subsequently.

### Profile slide

Mounted directly on the rear of the lathe cross slide, this is an integral unit comprising the operating cylinder, cartridge-type servo valve, stylus lever mechanism and a swivelling Colchester Multi-type toolpost complete with one turning tool holder.

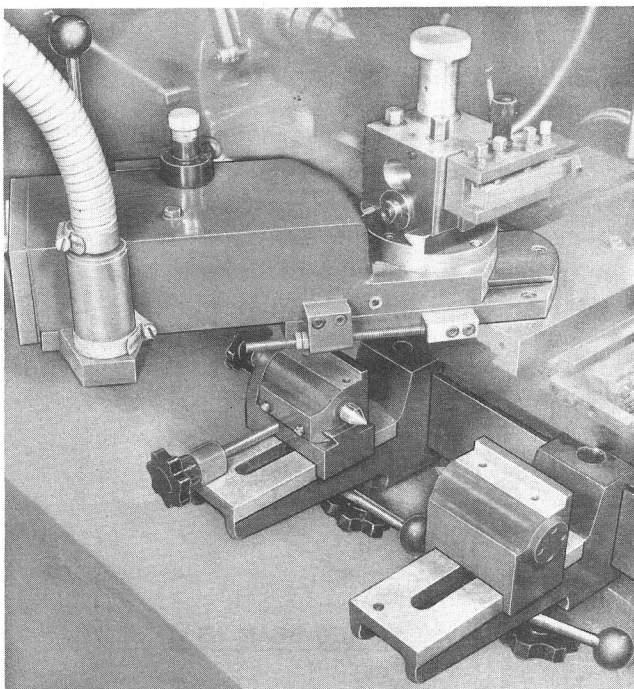
The complete unit can be fitted in four alternative positions; at 90°, 60°, 30° or parallel to the centre-line of the lathe. Maximum and minimum profiling angles obtainable for each of these positions are shown on the installation drawing overleaf. A copying accuracy of  $\pm 0.0005$  in. (0.01 mm) can be achieved; the change in copy diameter at 90° is  $5\frac{1}{2}$  in. (140 mm) and at 60° is 5 in. (127 mm).

The main control valve is a self-contained cartridge unit secured into the profile slide casting. The stylus is mounted on the lower end of the stylus lever shaft which is retained in the outer end of the stylus lever. Height and angle of the stylus in relation to the model master is easily adjusted by hand after releasing the clamp bolt. A combined ON/OFF lever and forward feed-velocity control is mounted on top of the slide assembly. The ram has a stroke of 3 in. (76 mm) and maximum approach/retraction speed of 110 in. (279 mm) per minute. The low stylus pressure of only 6 oz. (17 g) permits soft masters or models to be used, if necessary.

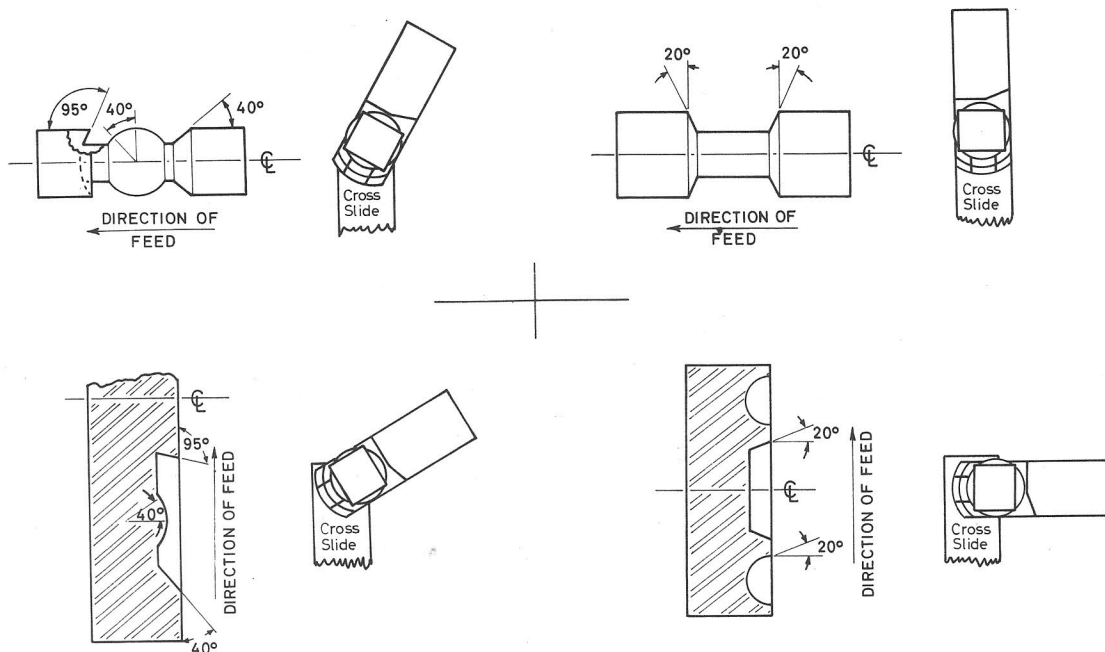
### Toolbox

A swivelling Colchester Multi-type toolpost allows all tooling to be pre-set and enables all such tool changes to be made rapidly without the necessity for re-setting the slide assembly. Sufficient height adjustment is provided to permit the tool to be set up for forward or reverse cutting. Tools are carried in interchangeable toolholders; and when each tool has once been set to centre height it may be removed and replaced any number of times without alteration of the setting.

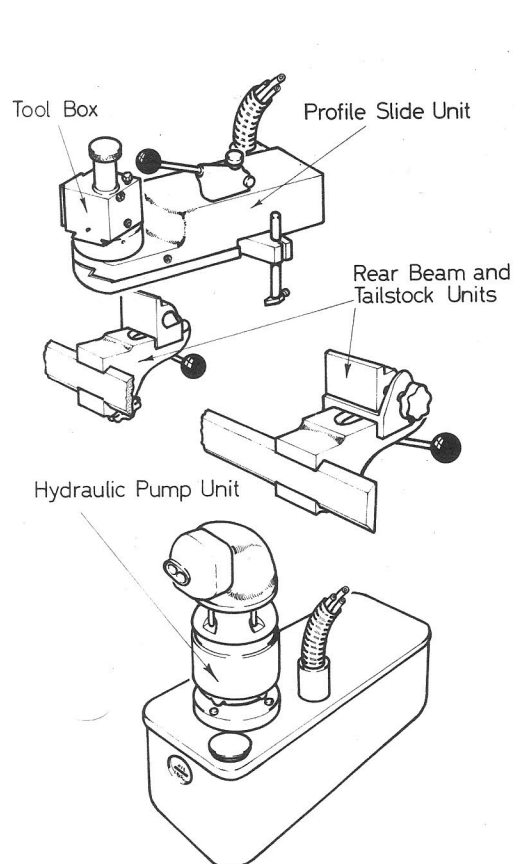
The toolbox is fitted on a base plate located at the front of the profile slide unit and can be mounted at four alternative positions, governed by the angle of the slide unit to the centre line of the machine. An adjusting handwheel is fitted which, through spiral gearing, provides micrometer control of the depth of cut up to  $\frac{1}{2}$  in. (13 mm) movement of the tool box along the base slide. Three alternative sizes of toolbox base slides are available, dependent upon the size of the machine to which the unit is fitted.



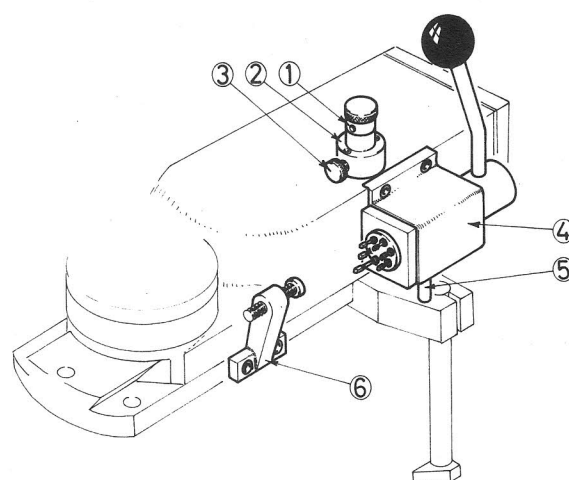




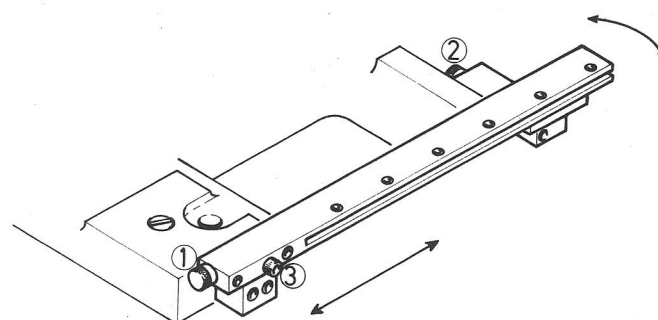
SLIDE POSITION CHART



HYDRAULIC PROFILING UNIT



TURRET STOP ASSY.



FACING BEAM ASSY.

### Rear beam assembly

The dovetail-section beam is fitted directly on the rear face of the lathe bed to provide a rigid datum surface for carrying the model (or master) parallel to the centre-line of the machine.

Two beam-brackets slide on the beam to provide the locating surface for two tailstock-type model carriers which can accommodate either round master profiles or flat templates. Both brackets are mounted and locked on the beam by means of knurled handwheels. The tailstock centre of the model carrier at the headstock end is spring-loaded, that at the tail-end is adjustable by a knurled handwheel to give up to  $2\frac{1}{2}$  in. (64 mm) of travel. Both model carriers are adjustable laterally relative to the machine centre-line and are locked by means of locking handles. Each tailstock housing is suitably drilled and tapped for attachment of flat profiling templates; short templates may be bolted on the tail-end housing only, longer templates should be supported at both housings. When the template is produced for support at both housings, the clamp-bolt holes should be made slightly elongated to permit of small transverse adjustments.

### Hydraulic power unit

This is a free-standing, combined tank and pump unit; designed to fit neatly at the back of the lathe. The motor unit is flange-mounted vertically upon the cover of the hydraulic tank. The electric pump works on  $\frac{1}{2}$  h.p. producing a working pressure of 300 lb/sq. in. A pressure gauge is fitted on all units. The pump and oil filters can be removed easily for inspection or servicing. Connection of the pump unit to the profile slide assembly is by means of three plastic hoses (two of large bore, one of small bore) all of which are sheathed in a single flexible conduit.

### ITEMS AVAILABLE AS EXTRA EQUIPMENT

#### Facing beam

To enable the profile slide unit to be used at  $30^\circ$  and parallel to the centre line of the machine, a facing beam is required. This consists of a slotted beam, or template carrier, which is mounted across the end of the saddle in the position shown in the sketch opposite. The template is fixed within the longitudinal slot and secured by the setscrews fitted along the edge of the beam. Final adjustment of the template position is made by setting the whole assembly over by means of the two micrometer adjusting screws (1 and 2). Screw No. 1 provides adjustment in a transverse plane whilst No. 2 varies the angle of the beam relative to the centre line of the machine. A pair of thumb-screws (3) are provided for locking the facing beam in the required position.

### Turret stop assembly

The turret stop provides a highly effective means of turning a workpiece having widely varying diameters. The stop screws may be set to give up to five roughing cuts whilst the sixth station is set to allow the stylus to traverse the full template form.

Operation of the profile slide is by means of the control lever fitted to the rear face of the turret stop unit and movement of the lever to the left (towards the profile slide) brings the next turret stop screw round to the contact position and advances the unit. Movement of the lever to the right, or away from the profile slide, retracts the slide unit. To convert the standard profile assembly to a turret stop unit, the pin retaining the feed control dial (1) is removed and the ON/OFF (retraction) lever assembly is then

removed complete. A replacement keep is provided in the conversion kit; and this one must be fitted in place of the cam beneath the lever housing. Use the same two securing screws, however. The dial nut should then be re-fitted and pinned in position. The knurled lock-screw from the old lever assembly should be fitted to the new keep, as shown in the sketch. The side cover plate should next be removed and in its place the turret stop assembly is fitted, using the same four fixing screws. Now with the turret stop control lever in the retracted position, insert a spring dowel pin (5) through the underside of the hole in the stylus lever until it projects through the base of the turret stop assembly by approximately  $\frac{3}{8}$  in. (10 mm.). The adjustable stop bracket (6) can now be fitted to the holes which are pre-drilled and tapped in the baseplate, using the screws provided in the conversion kit.

### ASSEMBLING HYDRAULIC PROFILING ATTACHMENT TO LATHE

By consulting the chart shown in the sketches, the most suitable position for the profile slide assembly to produce the required work may be readily ascertained.

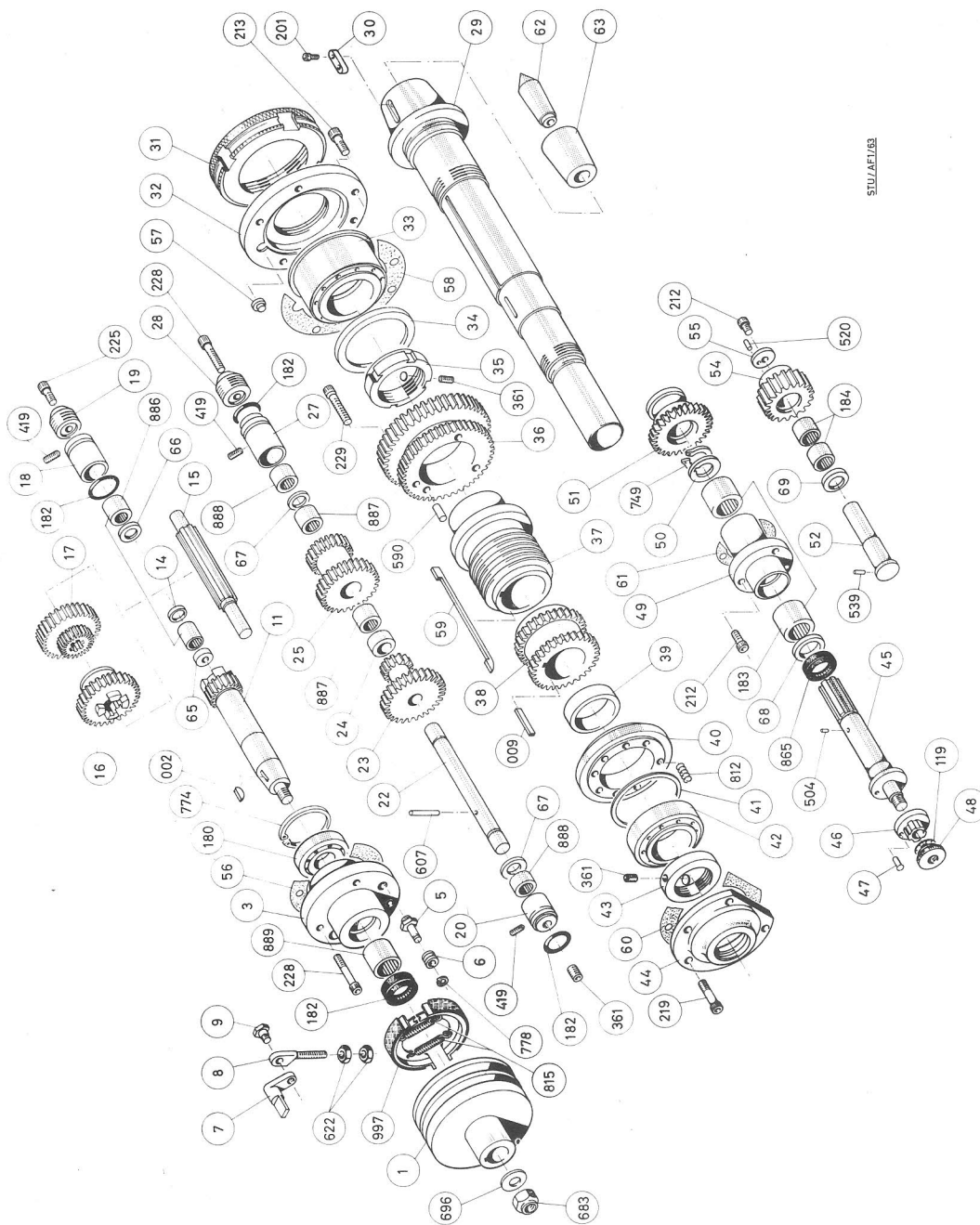
1. Clean out the pre-tapped holes at the rear of the cross slide and on the machined face at the rear of the bed. Mount the profile slide unit on the rear of the lathe cross slide and secure it in position with the four  $\frac{5}{16}$  in. UNC screws provided (three screws fitted from the top, one from underneath).
2. Mount the rear beam unit on the machined face at the back of the lathe bed and secure in position using the socket cap screws provided. Before finally tightening the screws ensure that the beam is positioned parallel to the bedways; this can be accomplished by mounting a dial indicator on the rear of the saddle and with the gauge anvil running along the top edge of the beam.
3. The free-standing pump and tank unit should be positioned at the back of the lathe, toward the tail-end. After inserting the hydraulic hoses into the flexible sheathing, connect up between the units. Take care to match the marks on the tank connections with similar markings on the profile slide unit. This applies only to the two hoses of equal diameter, the third (smaller) hose can be fitted only in one position. Clamp the flexible sheathing at both the pump unit and profile slide ends.
4. Fill the hydraulic tank with Shell Tellus 33 oil to the level shown on the oil-sight glass. Before use, the hydraulic system must be bled of all air and provision is made on the top and rear face of the profile slide unit for this. With the motor connected up (see below) switch on the pump, check that the control lever is at the OFF or retracted position, then partially unscrew the rear bleed plug. When all air and bubbly oil has been expelled through the bleed plug, screw it up tight. Set the control lever now in the ON or contact position and repeat the procedure to expel all air through the top bleeder plug.

# **SPARE PARTS SECTION**



When ordering spares for your Colchester Lathe, it is essential to quote the Serial Number, stamped on the bed at the tailstock end. This will ensure rapid service.

# HEADSTOCK SHAFT AND GEAR ASSEMBLIES



STU/AFT/63



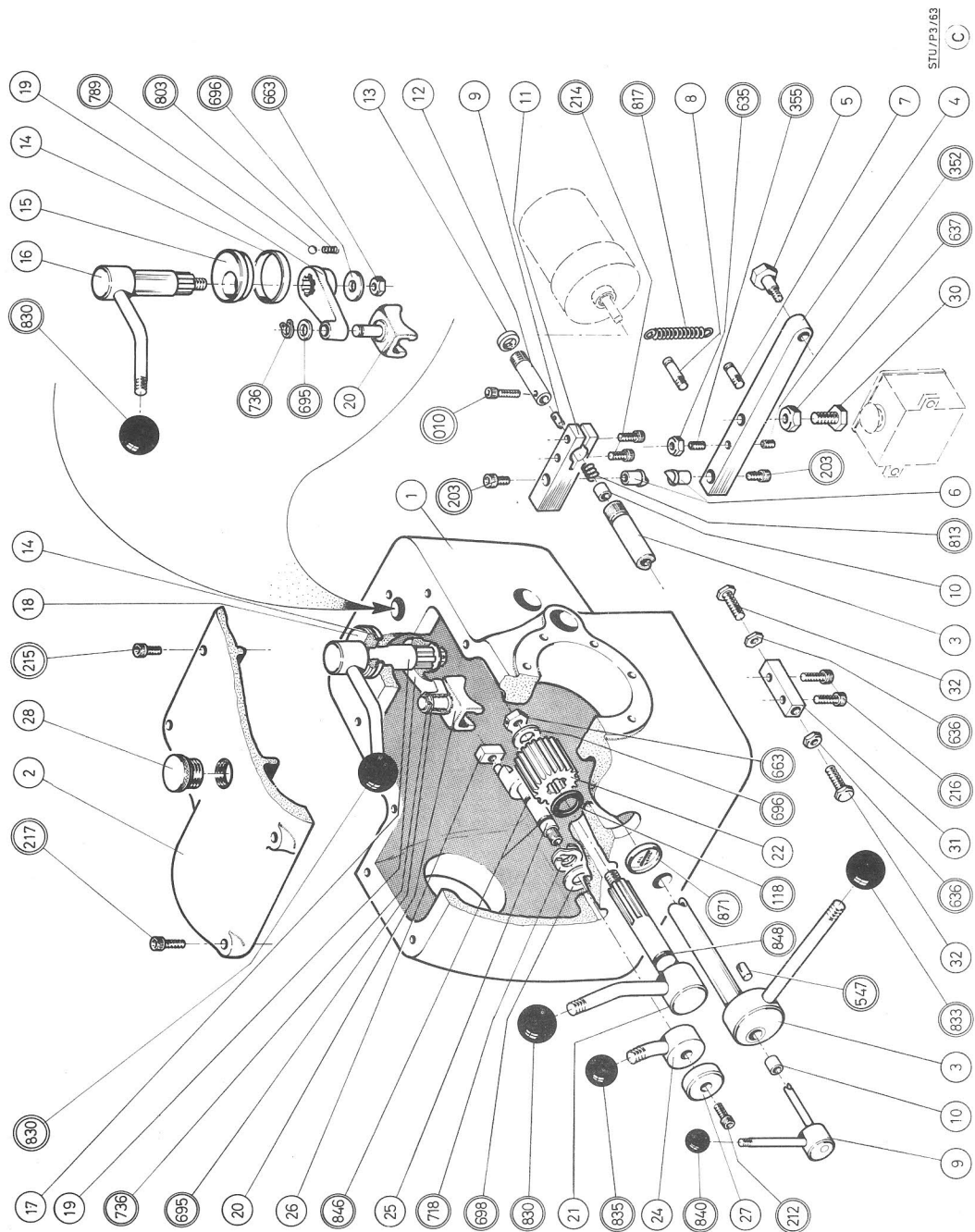
# HEADSTOCK - Shaft and Gear Assemblies

Ref. Dwg. STU/AFL/63

Item No.	Description	No.off.	Item No.	Description	No.off.	Item No.	Description	No.off.
<u>Driving Shaft</u>								
1	Driving pulley	1	59	Sliding sleeve key	1	774	Thrust bearing retaining clip	1
3	Flanged bearing - housing	1	38	Spindle reverse gear 30T/30T	1	778	Brake shoe fixing stud circlip	1
56	Bearing - housing gasket	1	39	Back bearing spacer collar	1	815	Brake shoe spring	2
5	Brake shoe fixing stud	1	40	Back bearing inside collar	1	886	Clutch driving shaft inner bearing	1
6	Brake shoe flanged bush	1	41	Back bearing thrust ring	1	886	Driving shaft bearing	1
7	Brake shoe expanding lever	1	42	Back bearing	1	889	Clutch driving shaft outer bearing	1
8	Expanding lever link	1	43	Screwed collar on spindle	1	997	Brake shoes - pair	1
9	Expanding lever bolt	1	60	Back bearing cover gasket	1	<u>Second Shaft</u>		
65	Bearing removal washer	1	44	Back bearing outside cover	1	182	Oilring for L/H bush	1
11	Clutch driving shaft 12T	1	62	Centre bush	1	182	Oilring for R/H bush	1
14	Driving shaft thrust collar	1	63	Centre bush	1	228	Screwed plug securing screw	1
15	Driving shaft	1	<u>Reverse Shaft</u>			361	Screw for L/H bush	1
16	Driving shaft gear 30T	1	45	Reverse shaft	1	419	Locking screw for L/H bush	1
17	Driving shaft gear 14T/24T	1	46	Shearpin sleeve	1	419	Locking screw for R/H bush	1
66	Driving shaft spacer collar	1	47	Shearpin	1	607	Gear retaining pin	1
18	Driving shaft bush	1	48	Knurled nut	1	887	Bearing for 28T/20T gear	2
19	Driving shaft bush screwed plug	1	49	Flanged bearing - housing	1	888	L/H bearing for second shaft	1
<u>Second Shaft</u>								
20	Second shaft bush - L/H	1	61	Bearing - housing gasket	1	888	R/H bearing for second shaft	1
67	Spacer collar - L/H	1	50	Reverse shaft collar	1	<u>Main Spindle</u>		
22	Second shaft	1	51	Reverse shaft gear 30T	1	009	Spindle reverse gear driving key	1
23	Second shaft gear 30T/13T	1	68	Reverse shaft spacer collar	1	201	Spindle nose key securing screw	2
24	Spacer collar - centre	1	<u>Inter Reverse Shaft</u>			213	Front bearing cover securing screw	3
25	Second shaft gear 28T/20T	1	52	Inter Reverse shaft	1	219	Rear bearing cover securing screw	3
70	Spacer collar - R/H	1	54	Inter reverse shaft gear 20T	1	229	Double gear securing screw	3
27	Second shaft bush - R/H	1	69	Reverse gear spacer collar	1	361	Adjusting collar locking screw	1
28	R/H bush screwed plug	1	55	Reverse gear stop washer	1	361	Screwed collar locking screw	1
<u>Main Spindle</u>								
29	Spindle	1	<u>Standard Parts</u>			590	Double gear locating pin	1
30	Spindle nose key	1	<u>Driving Shaft</u>			812	Back bearing pressure spring	15
31	Spindle nose draw nut	1	002	Clutch driving shaft key	1	<u>Reverse Shaft</u>		
32	Front bearing cover	1	180	Clutch driving shaft thrust bearing	1	119	Fan disc washer	1
58	Front bearing cover gasket	1	181	Flanged bearing - housing oilseal	1	183	Reverse shaft bearing	2
33	Front bearing	1	182	Driving shaft bush oilring	1	212	Bearing - housing securing screw	3
57	Front bearing locating peg	1	225	Screwed plug securing screw	1	504	Collar locating pin	1
34	Front bearing shield	1	228	Bearing - housing securing screw	1	749	Reverse shaft retaining clip	1
35	Front bearing adjusting collar	1	419	Driving shaft bush locking screw	1	865	Oilseal	1
36	Double gear on spindle 44T/51T	1	622	Expanding lever link lock nut	1	<u>Inter Reverse Shaft</u>		
37	Sliding sleeve	1	683	Pulley retaining nut	1	184	Bearing for 20T gear	2
			696	Pulley retaining washer	1	212	Stop washer securing screw	1
						520	Stop washer pin	1
						539	Shaft locking pin	1

SPECIFICATIONS OF STANDARD PARTS ARE GIVEN IN APPENDIX I AT THE END OF THIS SPARE PARTS SECTION

# **HEADSTOCK MAIN CASTINGS AND LEVER ASSEMBLIES**



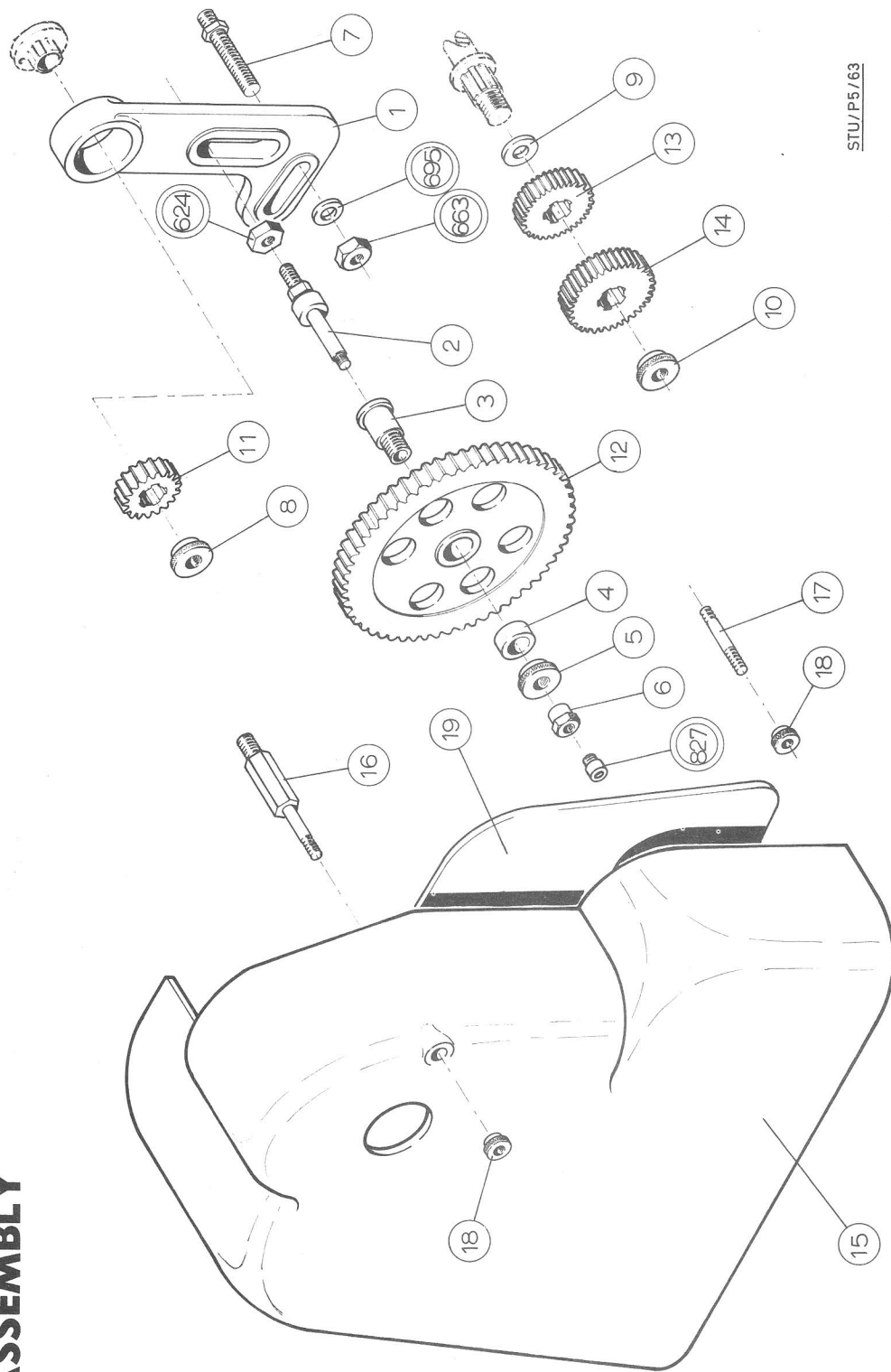
# HEADSTOCK - Main Castings and Lever Assemblies

Ref. Dwg. STU/P3/63

<u>Item No.</u>	<u>Description</u>	<u>No.off.</u>	<u>Item No.</u>	<u>Description</u>	<u>No.off.</u>
<u>Standard Parts</u>					
1	Main casting	1	010	Reverse switch coupling retaining screw	1
2	Top cover	1	118	Leather washer for Pt. 21	1
3	Operating lever assembly	1	203	Locking pawl securing screw	2
4	Limit switch operating lever	1	212	Retaining screw for Pt. 25	1
5	Pivot bolt for Pt. 4	1	214	Securing screws for Pt. 11	2
6	Locking pawl	2	215	Headstock cover screws	6
7	Return spring stud - short	1	216	Securing screws for Pt. 31	2
8	Return spring stud - long	1	217	Headstock cover screws	3
9	Reverse switch lever assembly	1	352	Lever lock screw	1
10	Reverse switch lever bush	1	355	Lever stop screw	1
11	Brake operating lever	1	547	Operating lever locking pin	1
12	Reverse switch coupling	1	635	Lever lock screw nut	1
13	Coupling cramp ring	1	636	Set over bolt lock nuts	2
14	Selector sleeve	2	637	Actuating bolt lock nut	1
15	Driving shaft gear selector - R/H	1	663	Lock nuts for Pts. 16, 17 & 21	3
16	Driving shaft gear shifter lever - R/H	1	695	Internal gear lever washer	2
17	Driving shaft gear shifter lever - L/H	1	696	Retaining washer for Pts. 16, 17 & 21	3
18	Driving shaft gear selector - L/H	1	698	Eccentric shaft retaining washer	1
19	Internal gear lever	2	718	Eccentric shaft spring washer	1
20	Gear shifter fork	2	736	Gear shifting fork circlip	2
21	Sliding sleeve shifting lever	1	789	Gear selector location ball	2
22	Sliding sleeve shifting pinion	1	803	Gear selector spring	2
24	Reverse gear shifting lever	1	813	Operating shaft spring	1
25	Reverse gear eccentric shaft	1	817	Return spring	1
26	Reverse gear shifting pad	1	830	Gear shift lever knob	3
27	Reverse gear shifting lever collar	1	833	Operating lever knob	1
28	Filler plug	1	835	Reverse gear lever knob	1
30	Switch actuating bolt	1	840	Reverse switch lever knob	1
31	Set over pad	1	846	Eccentric shaft oil ring	2
32	Set over bolt	2	848	Oil ring for Pt. 21	1
			871	Oil sight	1

SPECIFICATIONS OF STANDARD PARTS ARE GIVEN IN APPENDIX I AT THE END OF THIS SPARE PARTS SECTION

# **SWING FRAME ASSEMBLY**



STU/P5/63



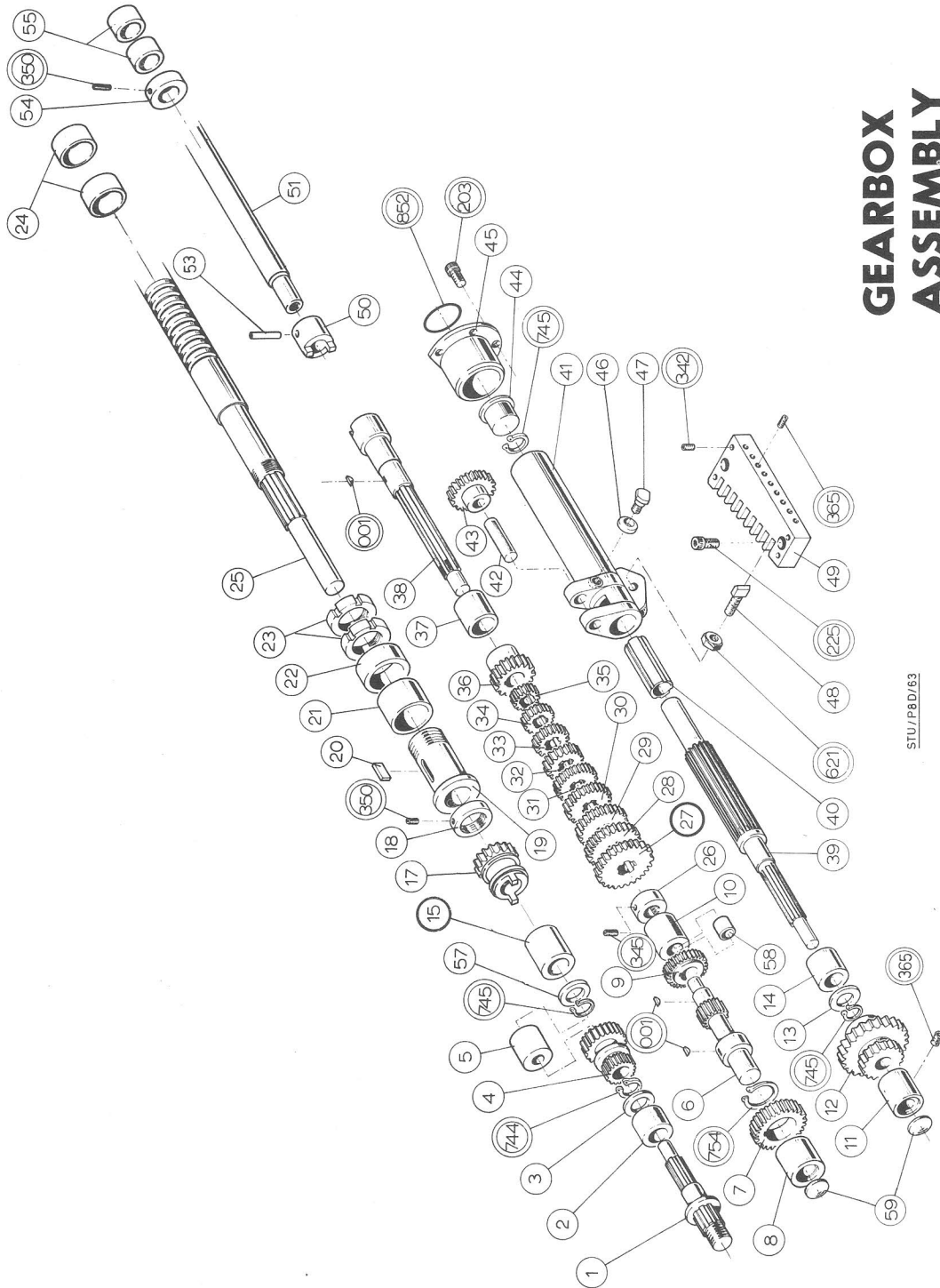
SWING FRAME ASSEMBLY

Ref. Dwg. STU/P5/63

<u>Item No.</u>	<u>Description</u>	<u>No.off.</u>	<u>Item No.</u>	<u>Description</u>	<u>No.off.</u>
1	Swing frame	1	<u>Standard Parts</u>		
2	Change gear sleeve stud	1	624	Change gear sleeve stud nut	1
3	Change gear sleeve	1	663	Swing frame fixing stud nut	2
4	Change gear sleeve spacer collar	1	695	Swing frame fixing stud washer	2
5	Change gear stud knurled nut	1	827	Change gear stud oiler	1
6	Oiler retaining nut	1			
7	Swing frame fixing stud	1			
8	Reverse shaft knurled nut	1			
9	Gearbox driving shaft washer	1			
10	G/B driving shaft knurled nut	1			
11	21T/16P Change gear	1			
12	120 T/16P Change gear	1			
13	35 T/16P Change gear	1			
14	42 T/16P Change gear	1			
15	Belt and Change gear guard	1			
16	Belt and Change gear guard stud (long)	1			
17	Belt and Change gear guard stud (short)	1			
18	Belt and Change gear guard knurled nut	2			
19	Inner belt guard	1			

SPECIFICATIONS OF STANDARD PARTS ARE GIVEN IN APPENDIX I AT THE END OF THIS SPARE PARTS SECTION

# **GEARBOX ASSEMBLY GEARS AND SHAFTS**

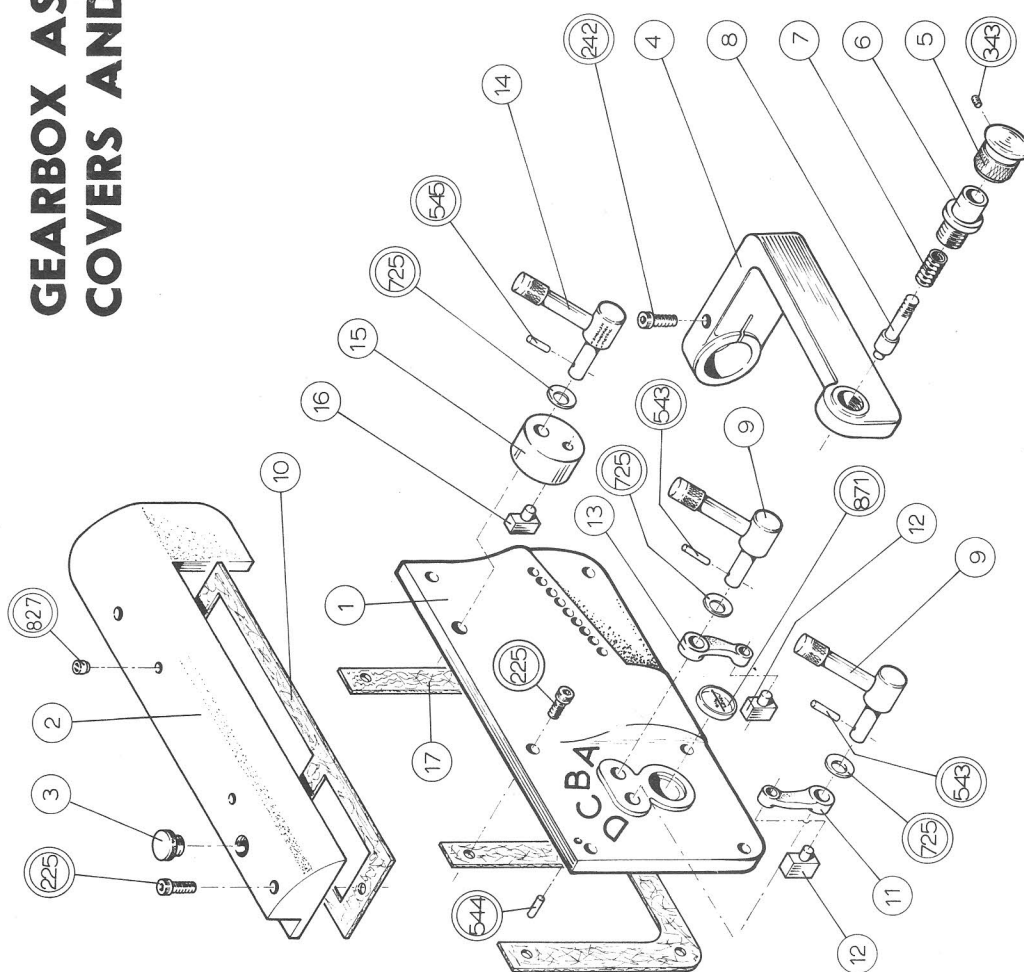


STU/P8D/63

Ref. Dwg. STU/P8D/63

SPECIFICATIONS OF STANDARD PARTS ARE GIVEN IN APPENDIX I AT THE END OF THIS SPARE PARTS SECTION

# **GEARBOX ASSEMBLY COVERS AND LEVERS**



STU/P10/63



# GEARBOX ASSEMBLY - Gears and Shafts

Ref. Dwg. STU/P8D/63

<u>Item No.</u>	<u>Description</u>	<u>No.off.</u>	<u>Item No.</u>	<u>Description</u>	<u>No.off.</u>
1	Driving shaft	1	37	Cone shaft bush - R/H	1
2	Driving shaft bush - L/H	1	38	Cone shaft	1
3	Driving shaft washer	1	39	Tumbler shaft 15T	1
4	Driving shaft gear 16T/24T	1	40	Tumbler shaft bush - R/H	1
5	Driving shaft bush - R/H	1	41	Tumbler bearing	1
6	Intermediate shaft 14T	1	42	Tumbler gear shaft	1
7	Intershaft gear 32T	1	43	Tumbler gear 27T	1
8	Intershaft bush	1	44	Tumbler bearing plug	1
9	Intershaft gear 24T	1	45	Tumbler bearing bush	1
10	Coneshaft bush - L/H	1	46	Tumbler roller	1
11	Tumbler shaft bush - L/H	1	47	Tumbler roller pin	1
12	Tumbler shaft gear 24T/42T	1	48	Tumbler locating pin	1
13	Tumbler shaft washer	1	49	Tumbler locating strip	1
14	Tumbler shaft bush - centre	1	50	Feed shaft coupling	1
15	Leadscrew spacer collar	1	51	Feed shaft	1
17	Leadscrew gear 24T	1	53	Driving pin	1
18	Leadscrew screwed collar	1	54	Feed shaft tailend collar	1
19	Leadscrew thrust sleeve	1	55	Feed shaft tailend bush	2
20	Leadscrew key	1	57	Leadscrew retaining washer	1
21	Leadscrew bush	1	58	Intershaft bush - R/H	1
22	Leadscrew thrust collar	1	59	Core plugs for Pts. 8 & 11	2
23	Leadscrew locknut	2			
24	Leadscrew tailend bush	2			
25	Leadscrew	1			
26	Cone shaft screwed collar	1			
27	28T Cone shaft gear	1			
28	26T Cone shaft gear	1			
29	24T Cone shaft gear	1			
30	23T Cone shaft gear	1			
31	22T Cone shaft gear	1			
32	20T Cone shaft gear	1			
33	19T Cone shaft gear	1			
34	18T Cone shaft gear	1			
35	16T Cone shaft gear	1			
36	Cone shaft pinion 24T	1			

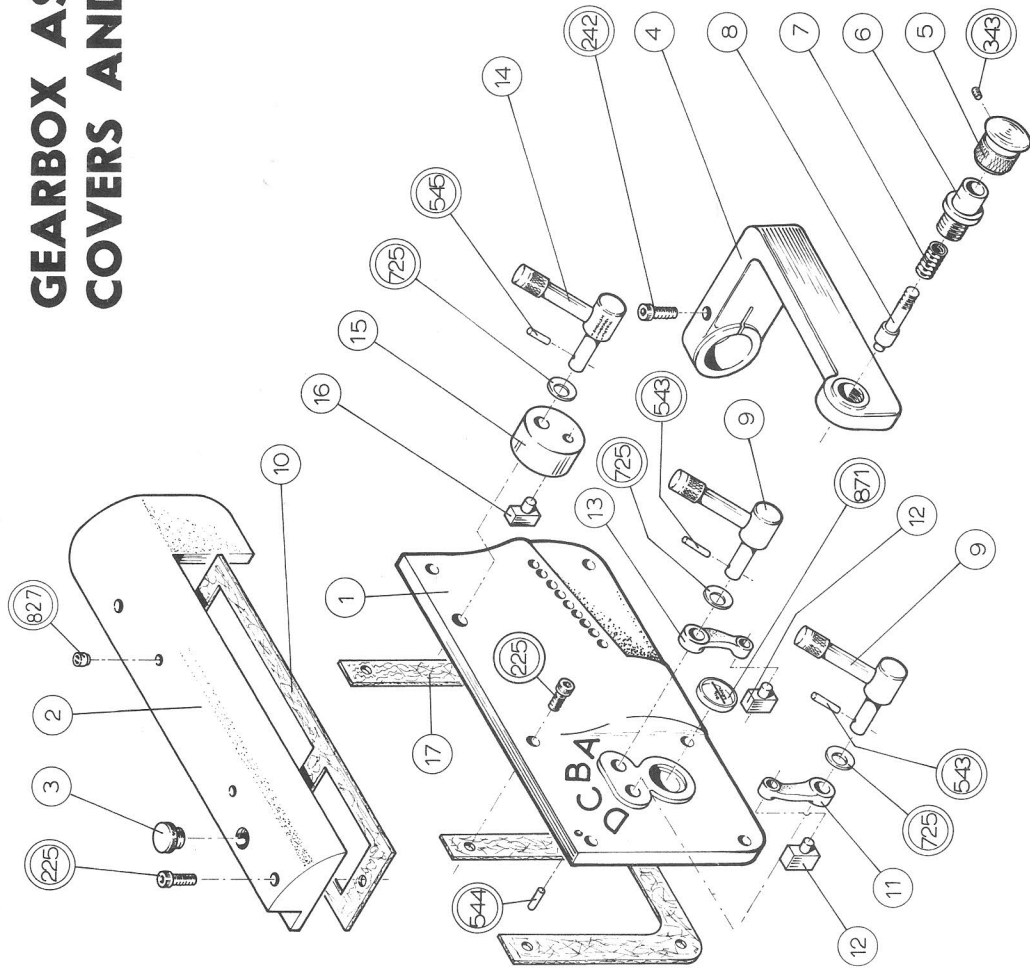
<u>Item No.</u>	<u>Description</u>	<u>No.off.</u>
001	Keys for Pts. 6 & 38	3
203	Tumbler bearing bush securing screws	3
225	Locating strip securing screws	2
342	Locating strip jacking screws	4
345	Collar locking screw for Pt. 26	1
350	Locking screw for Pts. 18 & 54	2
365	Locating strip adjusting screws	9
621	Locating pin locknut	1
744	Driving shaft circlip	1
745	Retaining circlips for Pts. 25, 39 & 40	3
754	Intershaft gear retaining circlip	1
852	Tumbler bearing bush oilring	1

## Standard Parts

001	Keys for Pts. 6 & 38	3
203	Tumbler bearing bush securing screws	3
225	Locating strip securing screws	2
342	Locating strip jacking screws	4
345	Collar locking screw for Pt. 26	1
350	Locking screw for Pts. 18 & 54	2
365	Locating strip adjusting screws	9
621	Locating pin locknut	1
744	Driving shaft circlip	1
745	Retaining circlips for Pts. 25, 39 & 40	3
754	Intershaft gear retaining circlip	1
852	Tumbler bearing bush oilring	1

SPECIFICATIONS OF STANDARD PARTS ARE GIVEN IN APPENDIX I AT THE END OF THIS SPARE PARTS SECTION

# GEARBOX ASSEMBLY COVERS AND LEVERS



STU/P10/63

# GEARBOX ASSEMBLY - Covers and Levers

Ref. Dwg. STU/P10/63

<u>Item No.</u>	<u>Description</u>	<u>No.off.</u>
1	Front cover	1
2	Top cover	1
3	Filler plug	1
4	Tumbler shifting arm	1
5	Tumbler handle	1
6	Tumbler Handle socket	1
7	Tumbler handle spring	1
8	Tumbler handle plunger	1
9	Gear shifting lever	2
10	Top cover gasket	1
11	Internal gear shifter lever L.H.	1
12	Gear shifter pad	2
13	Internal gear shifter lever R.H.	1
14	Leadscrew gear shifter lever	1
15	Eccentric gear shifting lever	1
16	Leadscrew gear shifter pad	1
17	Front cover gasket	1
<u>Standard Parts</u>		
225	Cover Securing screws	9
242	Tumbler arm clamping screw	1
343	Tumbler handle locking screw	1
543	Securing pins for Pt.Nos. 11 & 13	2
545	Securing pin for Pt.No. 15	1
725	Tensioning washers for Pt.Nos. 9 & 14	3
871	Oilsight	1
544	Front cover dowel pins	2
827	Oilers	2

SPECIFICATIONS OF STANDARD PARTS ARE GIVEN IN APPENDIX I AT THE END OF THIS SPARE PARTS SECTION

This diagram illustrates the exploded view of a mechanical assembly, likely a small motor or pump. The components are numbered as follows:

- 1**: Main housing or base plate.
- 2**: Small circular component, possibly a bearing or seal.
- 3**: Small circular component, possibly a bearing or seal.
- 4**: Small circular component, possibly a bearing or seal.
- 5**: Small circular component, possibly a bearing or seal.
- 6**: Small circular component, possibly a bearing or seal.
- 7**: Small circular component, possibly a bearing or seal.
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- 14**: Small circular component, possibly a bearing or seal.
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- 18**: Small circular component, possibly a bearing or seal.
- 19**: Small circular component, possibly a bearing or seal.
- 20**: Small circular component, possibly a bearing or seal.
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- 22**: Small circular component, possibly a bearing or seal.
- 23**: Small circular component, possibly a bearing or seal.
- 24**: Small circular component, possibly a bearing or seal.
- 25**: Small circular component, possibly a bearing or seal.
- 26**: Small circular component, possibly a bearing or seal.
- 27**: Small circular component, possibly a bearing or seal.
- 28**: Small circular component, possibly a bearing or seal.
- 29**: Small circular component, possibly a bearing or seal.
- 30**: Small circular component, possibly a bearing or seal.
- 31**: Small circular component, possibly a bearing or seal.

This diagram shows an exploded view of a mechanical assembly. The central component is a large, rectangular metal housing (35) with various mounting points and internal features. Surrounding it are numerous smaller parts, including:
 

- Fasteners:** Screws (e.g., 34, 36, 37, 38, 39, 40, 41, 42, 43, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100), bolts (e.g., 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 85

STU/P22/64



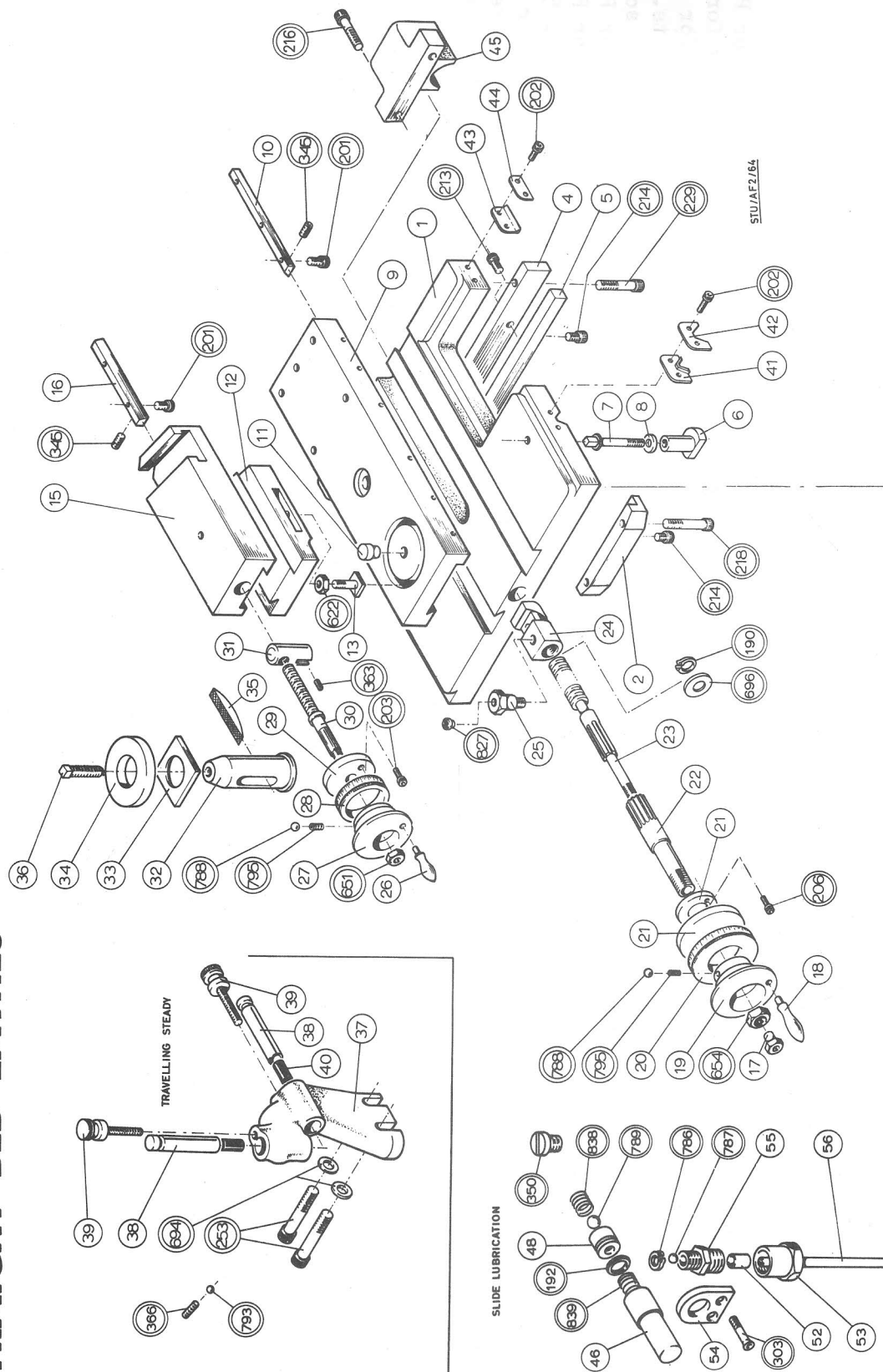
# APRON ASSEMBLY - Straight-Bed

Ref. Dwg. STU/P22/64-C.

<u>Item No.</u>	<u>Description</u>	<u>No.off.</u>	<u>Item No.</u>	<u>Description</u>	<u>No.off.</u>	<u>Item No.</u>	<u>Description</u>	<u>No.off.</u>
1	Apron main casting	1	28	Indicator gear	1	<u>Standard Parts</u>		
2	Leadscrew bush	2	29	Indicator guard pin	1			
3	Racking shaft 13T	1	30	Guard fixing pin	1	078	Detent spring for Pt. 16	1
4	Handwheel	1	31	Knurled nut	1	203	Retaining screw for Pts. 33 & 51	5
5	Handwheel handle	1	32	Wormbox main casting	1	204	Securing screw for Pts. 8 & 19	5
6	Rack pinion 12T	1	33	Wormbox support bush	2	212	Stop screw for Pts. 24 & 25	3
7	Rack pinion gear 42T	1	34	Spline shaft pinion	1	304	Latch bar fixing screw	2
8	Wormwheel	1	35	Worm and pinion shaft	1	347	Locking screw for Pt. 35	2
9	Pinion 25T	1	36	Wormbox bracket	1	350	Locking screw for Pt. 47	1
10	Pinion bush	1	37	Worm and pinion	1	361	Lockscrew for Pt. 51	2
11	Idler gear 33T	1	38	Spring support shaft	1	362	Securing screw for Pt. 7 and	
12	Idler gear bush	1	39	Knock-off pin	1		handle detent screw	2
13	Wormwheel shaft	1	40	Knock-off bush	1	364	Spring detent screw	1
14	Double gear 25T/32T	1	41	Wormbox latch bar	1	659	Gear retaining nut	1
15	Double gear bush	1	42	Wormbox latch	1	673	Handwheel retaining nut	1
16	Double gear shaft	1	43	Latch plunger	1	778	Circlip for Pt. 20	1
17	Double gear bush	1	46	Wormbox handle	1	784	Circlip for Pts. 14 & 18	2
18	Double gear 22T/38T	1	47	Wormbox latch shaft	1	788	Detent ball for Pts. 16 & 24	2
19	Inter-gear shaft	1	48	Latch bar bush	1	797	Handle detent spring	1
20	Inter-lock pivot bolt	1	49	Latch bar spring	1	822	Tension washer for Pt. 23	1
21	Inter-lock lever	1	50	Latch plunger spring	1	827	Oiler	2
22	Leadscrew halfnut	1	51	Spring adjuster screw	2	836	Wormbox spring	2
23	Leadscrew nut eccentric cam	1	52	Leaf spring	1	871	Oilsight	1
24	Leadscrew nut handle	1	53	Leaf spring plate	2	909	Worm and pinion bush	2
25	Handle retaining washer	1	54	Rubber stop for Pt. 32	2	543	Dowel for wormwheel and pinion	2
26	Dial Indicator guard	1	55	Spring collar	2		(not shown)	
27	Indicator dial	1	56	Latch washer (rubber)	2			
			57	Screw pad (brass)	2			

SPECIFICATIONS OF STANDARD PARTS ARE GIVEN IN APPENDIX 1 AT THE END OF THIS SPARE PARTS SECTION

# SADDLE AND SLIDES STRAIGHT BED LATHES



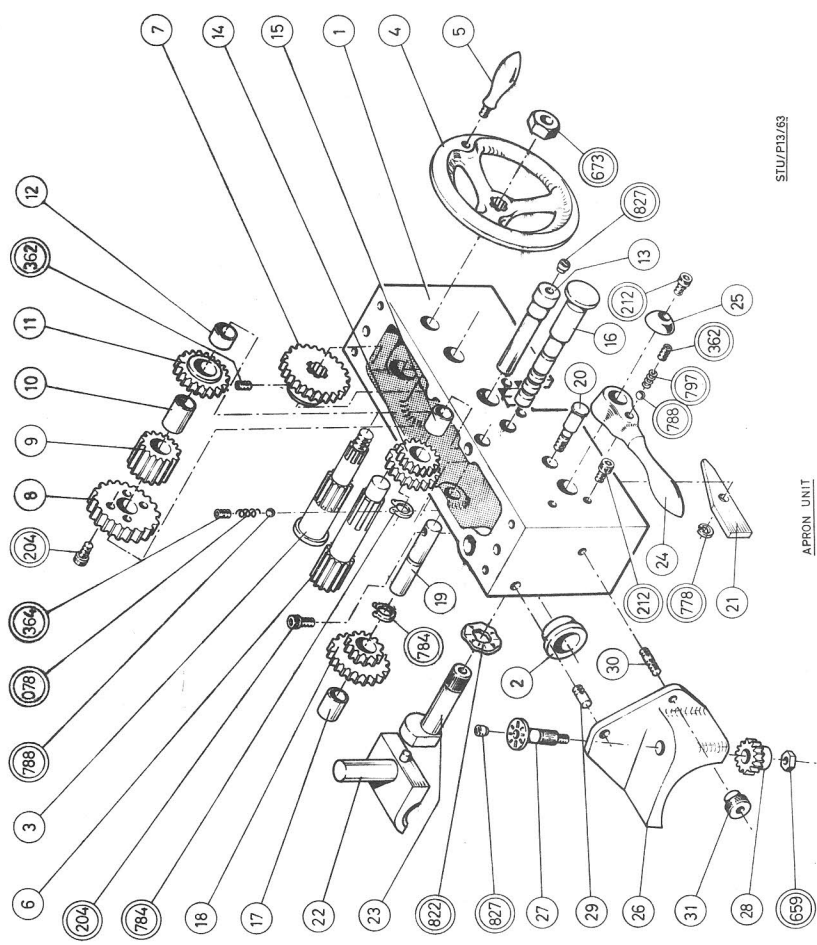
STU/AF2/64

# SADDLE AND SLIDES - Straight Bed Lathes

Ref. Dwg. STU/AF2/64

<u>Item No.</u>	<u>Description</u>	<u>No.off.</u>	<u>Item No.</u>	<u>Description</u>	<u>No.off.</u>	<u>Item No.</u>	<u>Description</u>	<u>No.off.</u>
1	Saddle main casting	1	33	Toolholder clamp plate	1	206	Crossslide keep retaining screws	2
2	Front strip	1	34	Toolholder collar	1	213	Securing screws for Pt. 5	2
4	Rear strip fixed plate	1	35	Toolholder swivel piece	1	214	Adjusting screws for saddle strips	4
5	Rear strip adjustable plate	1	36	Toolscrew	1			
6	Saddle clamp	1	37	Travelling steady main casting	1	216	Screw for Pt. 45	1
7	Saddle clamp bolt	1	38	Travelling steady fingers	2	218	Front strip securing screws	2
8	Saddle clamp bolt washer	1	39	Travelling steady adjusting screws	2	229	Rear strip securing screws	2
9	Crossslide	1	40	Travelling steady finger inserts	2	253	Travelling steady securing screws	2
10	Crossslide gib	2	41	Vee bed wiper	2	345	Adjusting screws for Pts. 10 & 16	10
11	Swivel slide pivot	1	42	Wiper shields for Pt. 41	2			
12	Swivel slide	1	43	Flat bed wiper	2	363	Topslide nut securing screw	1
13	Swivel slide bolt	2	44	Wiper shield for Pt. 43	2	366	Steady finger guide screws	2
15	Topslide	1	45	Crossslide screw end guard	1	622	Swivel slide bolt locking nut	2
16	Topslide gib	1	46	Lubricating plunger	1	651	Topslide handwheel retaining nut	1
17	Crossslide screw retaining nut	1	48	Valve bush	1			
18	Crossslide screw handwheel handle	1	50	Oil filler plug	1	654	Crossslide handwheel retaining nut	1
19	Crossslide screw handwheel	1	52	Union sleeve	1			
20	Crossslide screw index ring	1	53	Union nut	1	694	Steady fixing bolt washers	2
21	Crossslide screw keep	1	54	Plunger retaining plate	1	696	Crossslide screw nut retaining washer	1
22	Crossslide screw pinion	1	55	Connector	1			
23	Crossslide screw	1	56	Stand pipe	1	787	Connector ball	1
24	Crossslide screw nut	1				788	Index ring balls	1
25	Crossslide screw nut retaining bolt	1				789	Valve bush ball	6

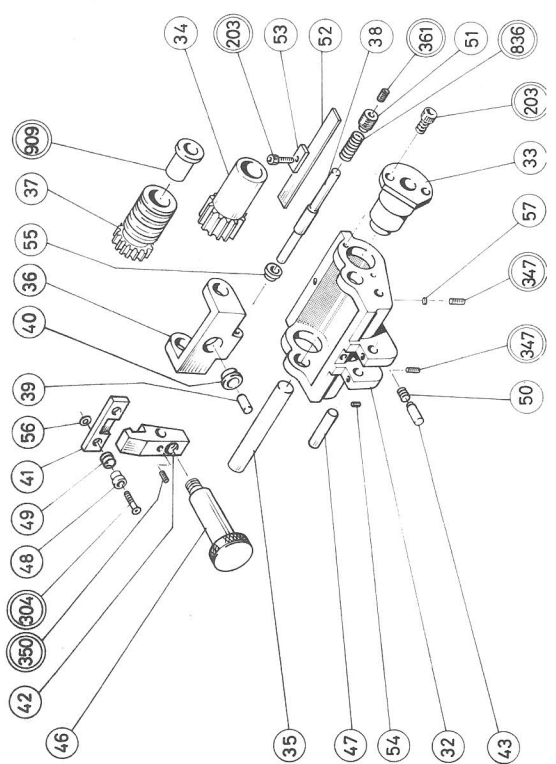
SPECIFICATIONS OF STANDARD PARTS ARE GIVEN IN APPENDIX 1 AT THE END OF THIS SPARE PARTS SECTION



STU/P13/63

APRON UNIT

WORM BOX ASSEMBLY



# APRON ASSEMBLY



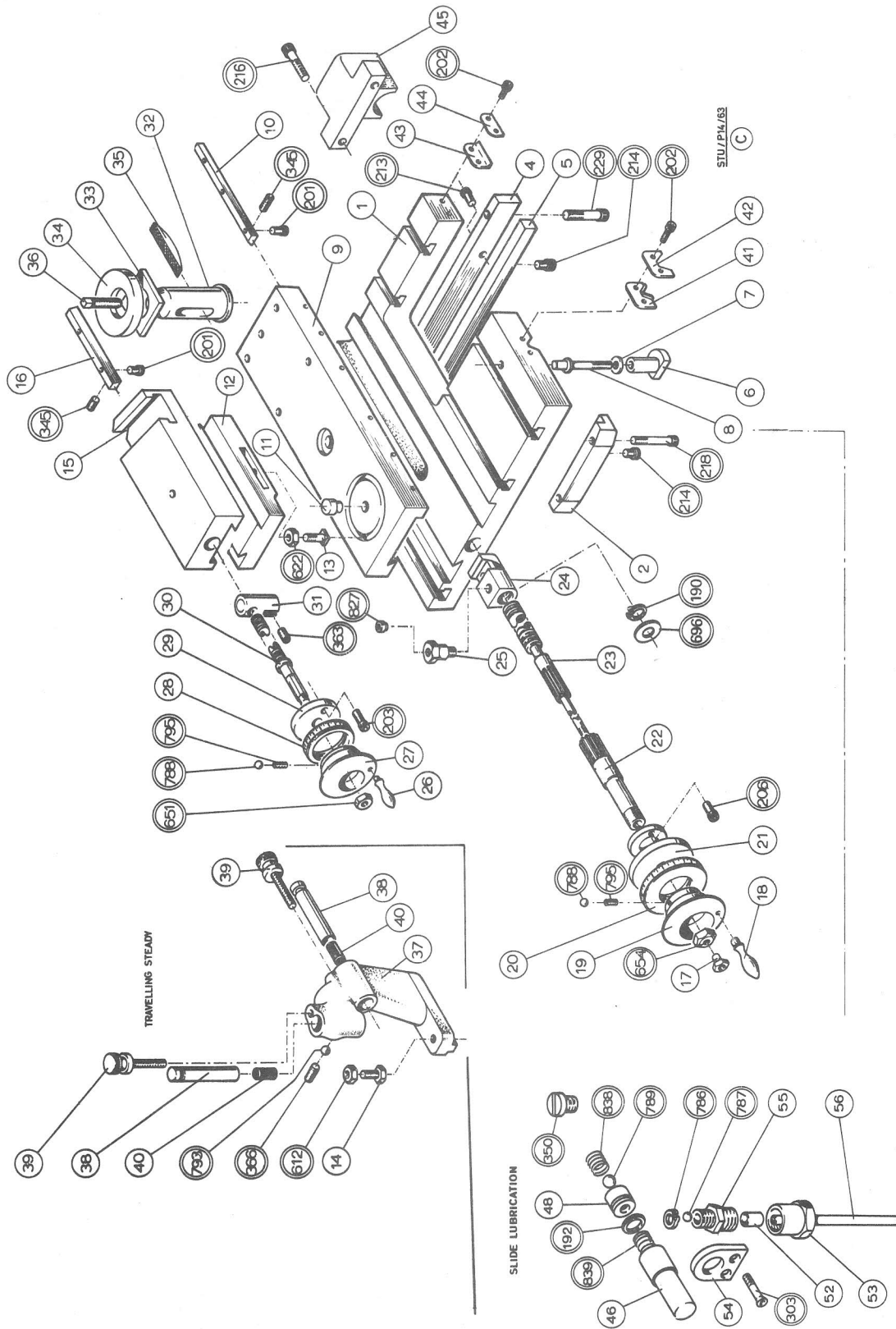
# APRON ASSEMBLY - Gap Bed Lathes

Ref. Dwg. STU/P13/63-C

<u>Item No.</u>	<u>Description</u>	<u>No.off.</u>	<u>Item No.</u>	<u>Description</u>	<u>No.off.</u>	<u>Item No.</u>	<u>Description</u>	<u>No.off.</u>
1	Apron main casting	1	28	Indicator gear	1	57	Screw pad (brass)	2
2	Leadscrew bush	2	29	Indicator guard pin	1			
3	Racking shaft 13T	1	30	Guard fixing pin	1		<u>Standard Parts</u>	
4	Handwheel	1	31	Knurled nut	1			
5	Handwheel handle	1	32	Wormbox main casting	1	078	Detent spring for Pt. 16	1
6	Rack pinion 12T	1	33	Wormbox support bush	2	203	Retaining screw for Pts. 33 & 51	5
7	Rack pinion gear 42T	1	34	Spline shaft pinion	1	204	Securing screw for Pt. 8 & 19	5
8	Wormwheel	1	35	Worm and pinion shaft	1	212	Stop screw for Pts. 24 & 25	3
9	Pinion 25T	1	36	Wormbox bracket	1	304	Latch bar fixing screw	2
10	Pinion bush	1	37	Worm and pinion	1	347	Locking screw for Pt. 35	2
11	Idler gear 33T	1	38	Spring support shaft	1	350	Locking screw for Pt. 47	1
12	Idler gear bush	1	39	Knock-off pin	1	361	Lockscrew for Pt. 51	2
13	Wormwheel shaft	1	40	Knock-off bush	1	362	Securing screw for Pts. 7 & handle detent screw	2
14	Double gear 25T/32T	1	41	Wormbox latch bar	1			
15	Double gear bush	1	42	Wormbox latch	1	364	Spring detent screw	1
16	Double gear shaft	1	43	Latch plunger	1	659	Gear retaining nut	1
17	Double gear bush	1	46	Wormbox handle	1	673	Handwheel retaining nut	1
18	Double gear 22T/38T	1	47	Wormbox latch shaft	1	778	Circlip for Pt. 20	1
19	Inter-gear shaft	1	48	Latch bar bush	1	784	Circlip for Pts. 14 & 18	2
20	Inter-lock pivot bolt	1	49	Latch bar spring	1	788	Detent ball for Pts. 16 & 24	2
21	Inter-lock lever	1	50	Latch plunger spring	1	797	Handle detent spring	1
22	Leadscrew halfnut	1	51	Spring adjuster screw	2	822	Tension washer for Pt. 23	1
23	Leadscrew nut eccentric cam	1	52	Leaf spring	1	827	Oiler	2
24	Leadscrew nut handle	1	53	Leaf spring plate	2	836	Wormbox spring	2
25	Handle retaining washer	1	54	Rubber stop for Pt. 32	2	871	Oilsight (not shown)	1
26	Dial indicator guard	1	55	Spring collar	2	909	Worm and pinion bush	2
27	Indicator dial	1	56	Latch washer (rubber)	2	543	Dowel for wormwheel and pinion (not shown)	2

SPECIFICATIONS OF STANDARD PARTS ARE GIVEN IN APPENDIX 1 AT THE END OF THIS SPARE PARTS SECTION

# SADDLE AND SLIDES GAP BED LATHES



# SADDLE AND SLIDES - Gap Bed Lathes

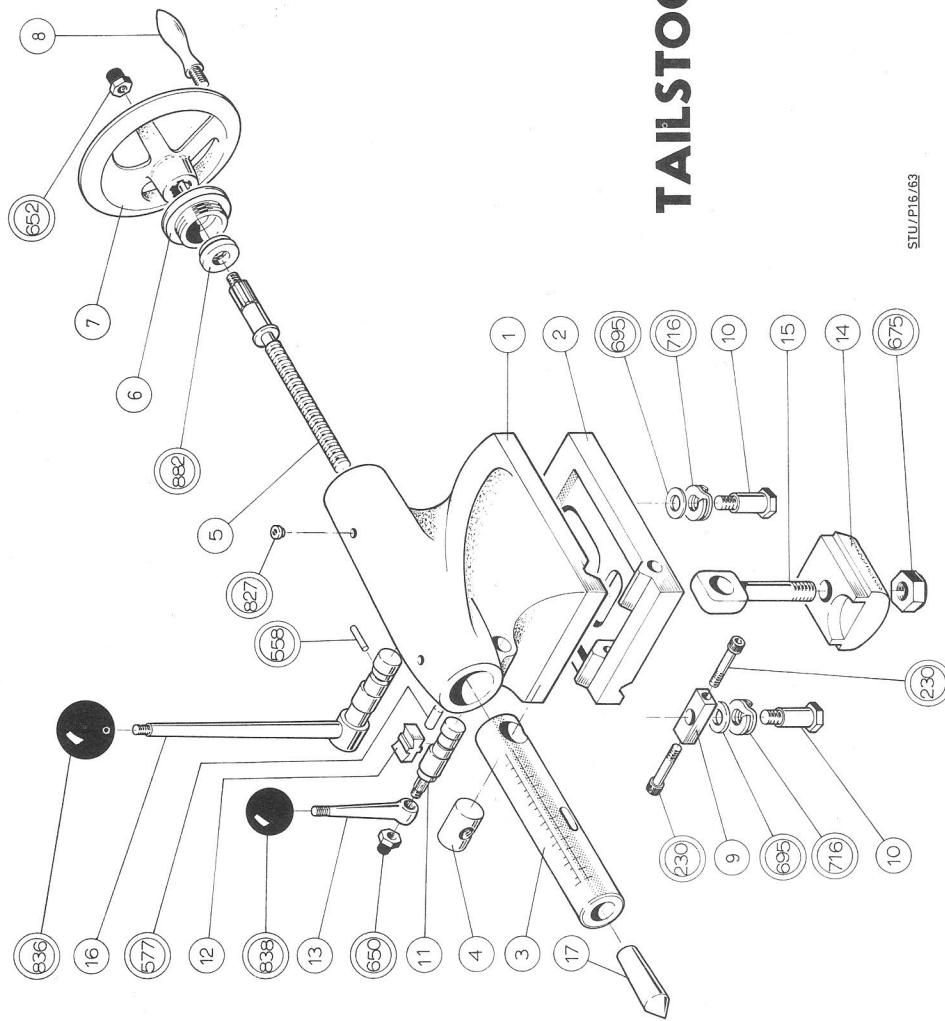
Ref. Dwg. STU/P14/63C

<u>Item No.</u>	<u>Description</u>	<u>No.off.</u>	<u>Item No.</u>	<u>Description</u>	<u>No.off.</u>	<u>Item No.</u>	<u>Description</u>	<u>No.off.</u>
1	Saddle main casting	1	32	Toolholder	1	213	Securing screws for Pt. 5	2
2	Front strip	1	33	Toolholder clamp plate	1	214	Adjusting screws for saddle strips	4
4	Rear strip fixed plate	1	34	Toolholder collar	1			
5	Rear strip adjustable plate	1	35	Toolholder swivel piece	1	216	Screw for Pt. 45	1
6	Saddle clamp	1	36	Toolscrew	1	218	Front strip securing screws	2
7	Saddle clamp bolt	1	37	Travelling steady main casting	1	229	Rear strip securing screws	2
8	Saddle clamp bolt washer	1	38	Travelling steady fingers	2	253	Travelling steady securing screws	2
9	Crossslide	1	39	Travelling steady adjusting screws	2	345	Adjusting screws for Pts. 10 & 16	10
10	Crossslide gib	2	40	Travelling steady finger inserts	2	363	Topslide nut securing screw	1
11	Swivel slide pivot	1	41	Vee bed wiper	2	366	Steady finger guide screws	2
12	Swivel slide	1	42	Wiper shields for Pt. 41	2	622	Swivel slide bolt locking nut	2
13	Swivel slide bolt	2	43	Flat bed wiper	2	651	Topslide handwheel retaining nut	1
15	Topslide	1	44	Wiper shield for Pt. 43	1	654	Crossslide handwheel retaining nut	1
16	Topslide gib	1	45	Crossslide screw end guard	1	694	Steady fixing bolt washers	2
17	Crossslide screw retaining nut	1	46	Lubricating plunger	1	696	Crossslide screw nut retaining washer	1
18	Crossslide screw handwheel handle	1	48	Valve bush	1	787	Connector ball	1
19	Crossslide screw handwheel	1	52	Union sleeve	1	788	Index ring balls	6
20	Crossslide screw index ring	1	53	Union nut	1	789	Valve bush ball	1
21	Crosslide screw keep	1	54	Plunger retaining plate	1	793	Steady finger guide balls	2
22	Crosslide screw pinion	1	55	Connector	1	795	Index ring springs	6
23	Crosslide screw	1	56	Stand pipe	1	827	Oilers	9
24	Crosslide screw nut	1	<u>Standard Parts</u>			839	Plunger spring	1
25	Crosslide screw nut retaining bolt	1	190	Crossslide screw nut retaining clip	1	838	Valve spring	1
26	Topslide screw handwheel handle	2	192	Valve bush 'O' ring	1	350	Oil filler plug	1
27	Topslide screw handwheel	1	201	Gib securing screws	10	786	Circlip	1
28	Topslide index ring	1	202	Bed wiper securing screws	8			
29	Topslide keep	1	203	Topslide keep retaining screws	2			
30	Topslide screw	1	206	Crossslide keep retaining screws	2			
31	Topslide screw nut	1						

SPECIFICATIONS OF STANDARD PARTS ARE GIVEN IN APPENDIX I AT THE END OF THIS SPARE PARTS SECTION

# TAILSTOCK ASSEMBLY

STU/P16/63





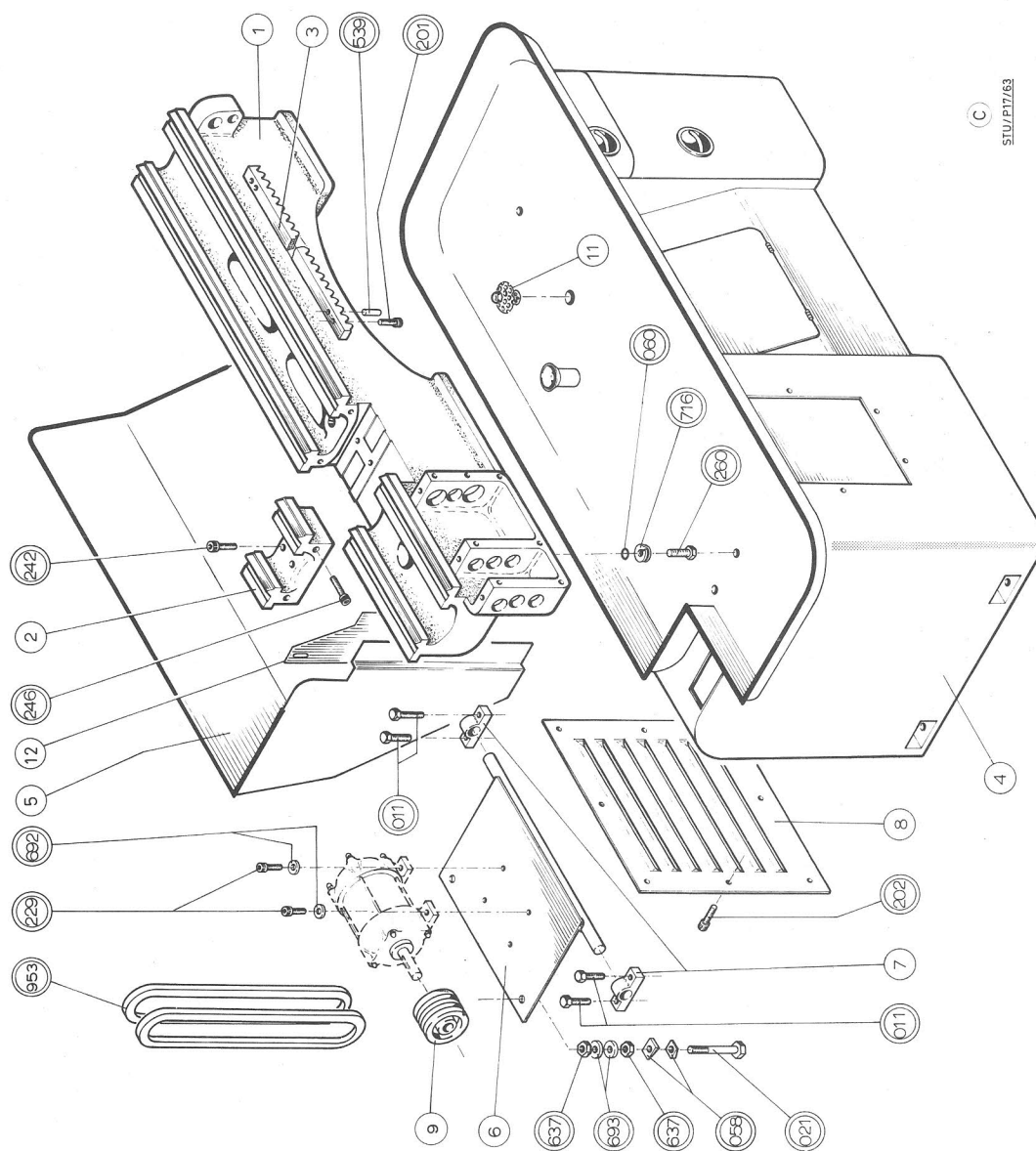
TAILSTOCK ASSEMBLY  
Ref. Dwg. STU/P16/63  
Description

<u>Item No.</u>		<u>No. off.</u>
1	Tailstock Main Casting	1
2	Tailstock base	1
3	Barrel	1
4	Barrel nut	1
5	Barrel screw	1
6	Screw keep	1
7	Handwheel	1
8	Handwheel handle	1
9	Set over block	1
10	Base retaining bolt	2
11	Barrel clamp cam	1
12	Barrel clamp pad	1
13	Barrel clamp lever	1
14	Clamp plate	1
15	Clamping eyebolt	1
16	Tailstock clamp C/W lever	1
17	Centre	1
<u>Standard Parts</u>		
230	Set over block adjusting screws	2
558	Clamping cam pin	1
577	Barrel clamp lever stop pin	1
650	Barrel clamp lever retaining nut	1
652	Handwheel retaining nut	1
675	Clamping nut	1
695	Washer for Pt. No. 10	2
716	Spring washer for Pt. No. 10	2
827	Oilers	2
836	Tailstock clamp lever knob	1
838	Barrel clamping lever knob	1
882	Thrust bearing	1

SPECIFICATIONS OF STANDARD PARTS ARE GIVEN IN APPENDIX I AT THE END OF THIS SPARE PARTS SECTION

# BED, CABINET AND TRANSMISSION ASSEMBLIES

C  
STU/P17/63



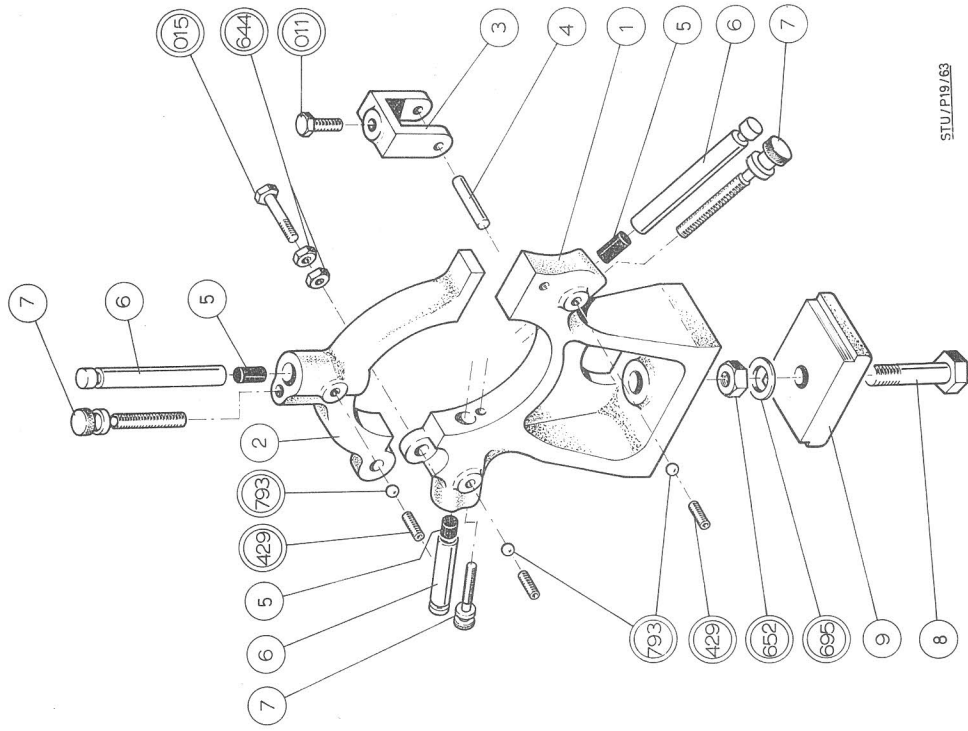
BED, CABINET AND TRANSMISSION ASSEMBLIES

Ref. Dwg. STU/P17/63

<u>Item No.</u>	<u>Description</u>	<u>No.off.</u>	<u>Item No.</u>	<u>Description</u>	<u>No.off.</u>
1	Bed	1	058	Support bolt washers	4
2	Gap piece	1	060	Bed securing bolt oilrings	3
3	Rack	1	201	Back securing screws	2
4	Cabinet	1	202	Louvre plate securing screws	7
5	Back splash guard	1	229	Motor securing bolts	4
6	Motor platform	1	242	Vertical securing screw for gap piece	2
7	Motor platform mounting brackets	2	246	Horizontal securing screw for gap piece	2
8	Motor Louvre plate	1	260	Bed securing screws	3
9	Motor Pulley	1	539	Rack dowel	3
11	Coolant filter	1	637	Support bolt nuts	4
<u>Standard Parts</u>			692	Motor securing bolt washers	4
011	Securing bolts for Pt. 7	4	693	Support bolt washers	4
021	Motor Platform support bolt	2	716	Bed securing bolt washers	3
			953	Driving Belt (Vee)	2

SPECIFICATIONS OF STANDARD PARTS ARE GIVEN IN APPENDIX 1 AT THE END OF THE SPARE PARTS SECTION.

# STEADY REST



STU/P19/63

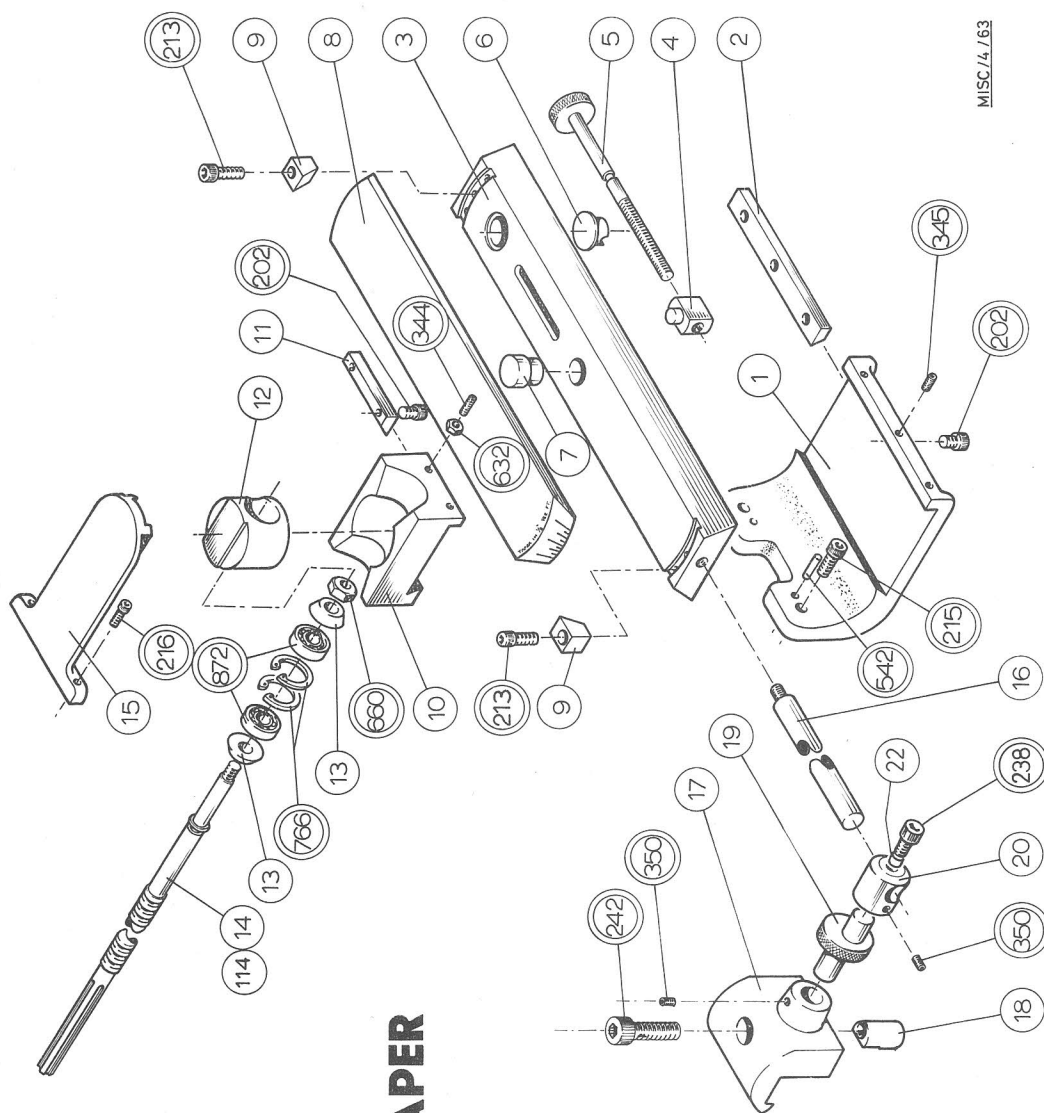
STEADY REST  
Ref. Dwg. STU/P19/63

<u>Item No.</u>	<u>Description</u>	<u>No. off.</u>
1	Steady main casting	1
2	Steady top casting	1
3	Clamp fork	1
4	Clamp hinge pin	1
5	Finger inserts	3
6	Steady finger	3
7	Finger adjusting screw	3
8	Steady clamp bolt	1
9	Clamp plate	1
	<u>Standard Parts</u>	
011	Clamp fork bolt	1
015	Pivot bolt	1
429	Finger locking screw	3
644	Pivot bolt nuts	2
652	Clamp bolt nut	1
695	Clamp bolt washer	1
793	Finger locking balls	3

SPECIFICATIONS OF STANDARD PARTS ARE GIVEN IN APPENDIX I AT THE END OF THIS SPARE PARTS SECTION



# **TELESCOPIC TAPER ATTACHMENT**



MISC/4/63

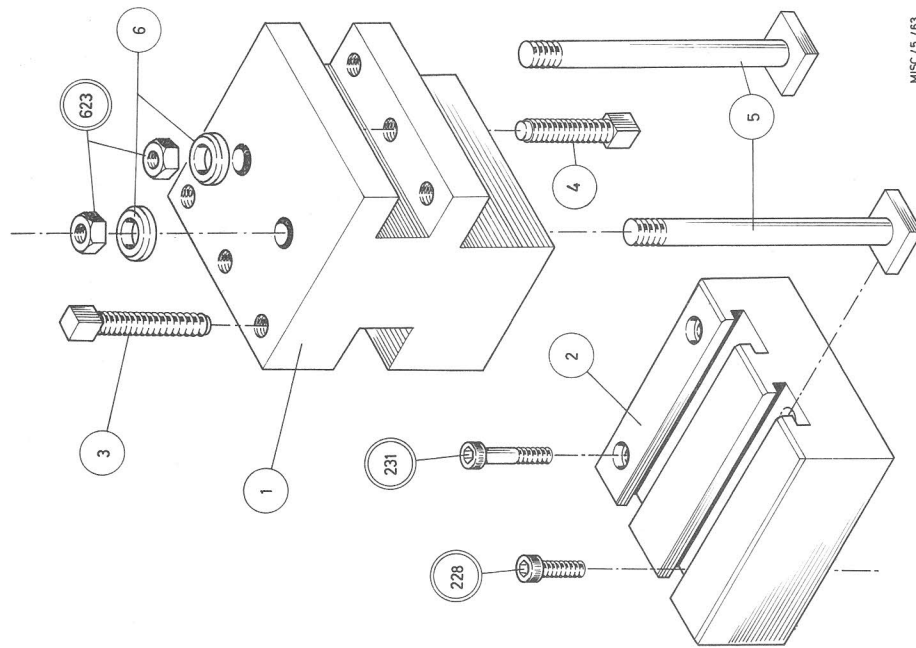
# TELESCOPIC TAPER ATTACHMENT

Ref. Dwg. MISC/4/63

<u>Item No.</u>	<u>Description</u>	<u>No.off.</u>	<u>Item No.</u>	<u>Description</u>	<u>No.off.</u>
1	Taper turner bracket	1	19	Eccentric pin	1
2	Bracket gib	1	20	Anchor bracket extension	1
3	Taper turner plate	1	21	Connecting rod locking screw	1
4	Swivel slide adjusting screw nut	1	<u>Standard Parts</u>		
5	Swivel slide adjusting screw	1	202	Gib securing screws	5
6	Adjusting screw keep	1	213	Slideway clamp screws	2
7	Swivel slide pivot	1	215	Bracket securing screws	2
8	Swivel slide	1	216	Securing screws for Pt. 15	2
9	Slideway clamp	2	238	Locking screw for Pt. 20	1
10	Slide block	1	242	Retaining screw for Pt. No. 18	1
11	Slide block gib	1	344	Adjusting screw for Pt. 11	2
12	Bearing housing	1	345	Adjusting screw for Pt. 2	3
13	Thrust washers	2	350	Locking screw for Pt. 20	4
14	Taper Turner saddle screw	1	542	Bracket locating dowel pins	2
15	Bottom slide extension	1	632	Adjusting screw locknut for Pt. 11	2
16	Connecting rod	1	660	Thrust bearing adjusting nut	1
17	Anchor bracket	1	766	Bearing retaining circlip	2
18	Anchor bracket clamping piece	1	872	Thrust bearings.	2

SPECIFICATIONS OF STANDARD PARTS ARE GIVEN IN APPENDIX 1 AT THE END OF THIS SPARE PARTS SECTION.

# REAR TOOLPOST



REAR TOOLPOST  
Ref. Dwg. MISC/5/63

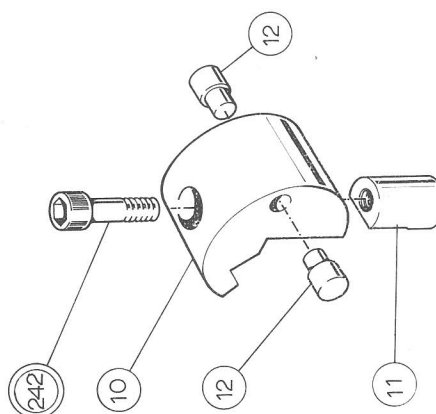
<u>Item No.</u>	<u>Description</u>	<u>No. off.</u>
1	Block	1
2	Base Plate	1
3	Tool Screws	3
4	Tool Screws	3
5	Toolblock Clamping Bolts	2
6	Toolblock Clamping Washers	2

Standard Parts

228	Base Plate Securing Screws	2
231	Base Plate Securing Screws	2
623	Toolblock Clamping Nuts	2

SPECIFICATIONS OF STANDARD PARTS ARE GIVEN IN APPENDIX I AT THE END OF THIS SPARE PARTS SECTION

STU / P21 / 63





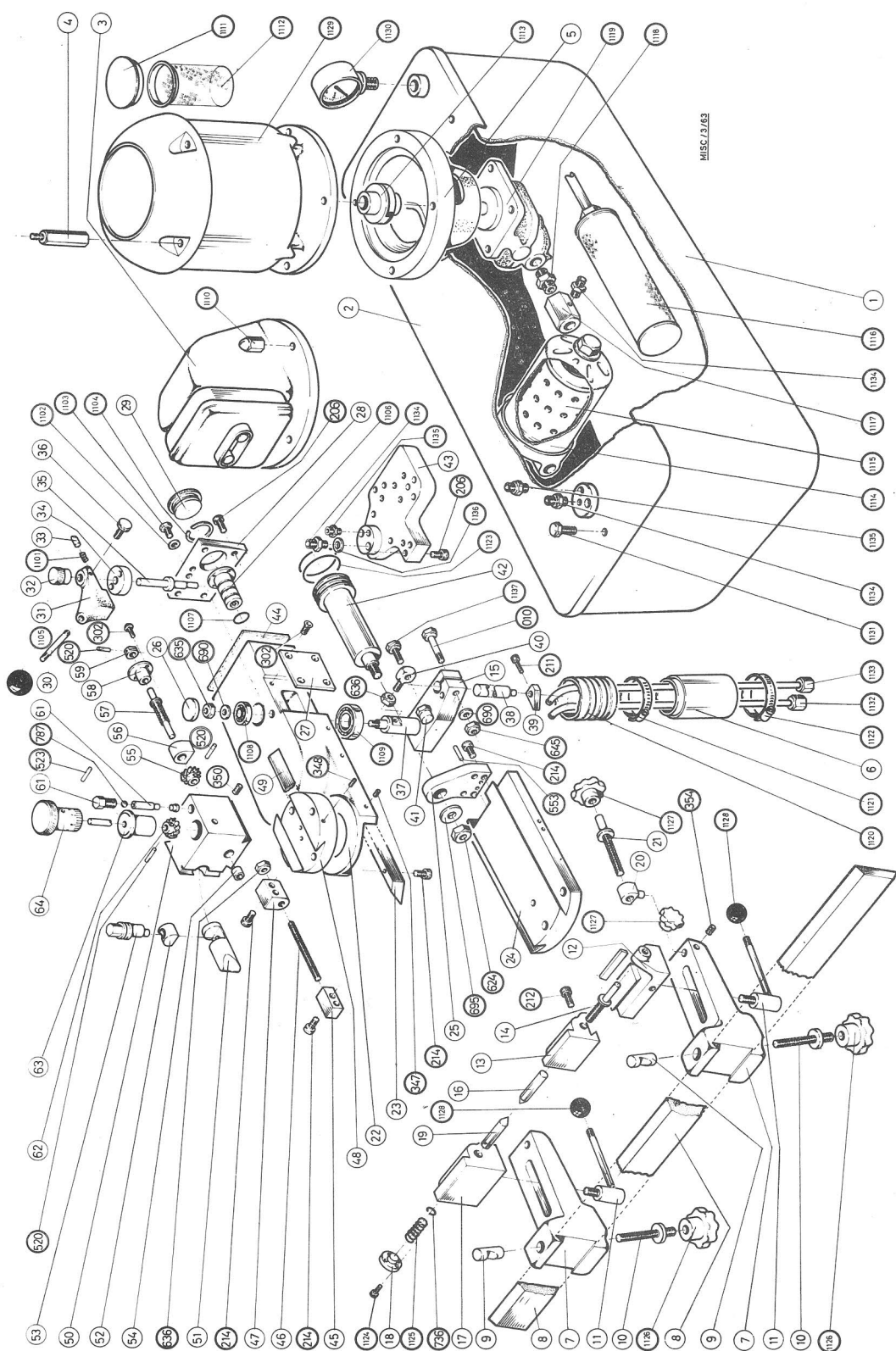
TURRET STOP AND BED STOP

Ref. Dwg. STU/P21/63

<u>Item</u>	<u>Description</u>	<u>No. off.</u>
1	Turret	1
2	Turret plate	1
3	Lever ring	1
4	Ratchet lever	1
5	Ratchet location pin	1
6	Stop screw 3" long	1
7	Stop screw 2.1/4" long	2
8	Stop screw 1.1/8" long	2
9	Turret spindle	1
10	Bed stop block	1
11	Clamping piece	1
12	Pad	1
	<u>Standard Parts</u>	
242	Clamping piece retaining screw	1
636	Stop screw lock nut	5
541	Turret plate locating pin	1
788	Turret location ball	1
840	Ratchet lever knob	1

SPECIFICATIONS OF STANDARD PARTS ARE GIVEN IN APPENDIX I AT THE END OF THIS SPARE PARTS SECTION

# SERIES 300 HYDRAULIC PROFILING UNIT

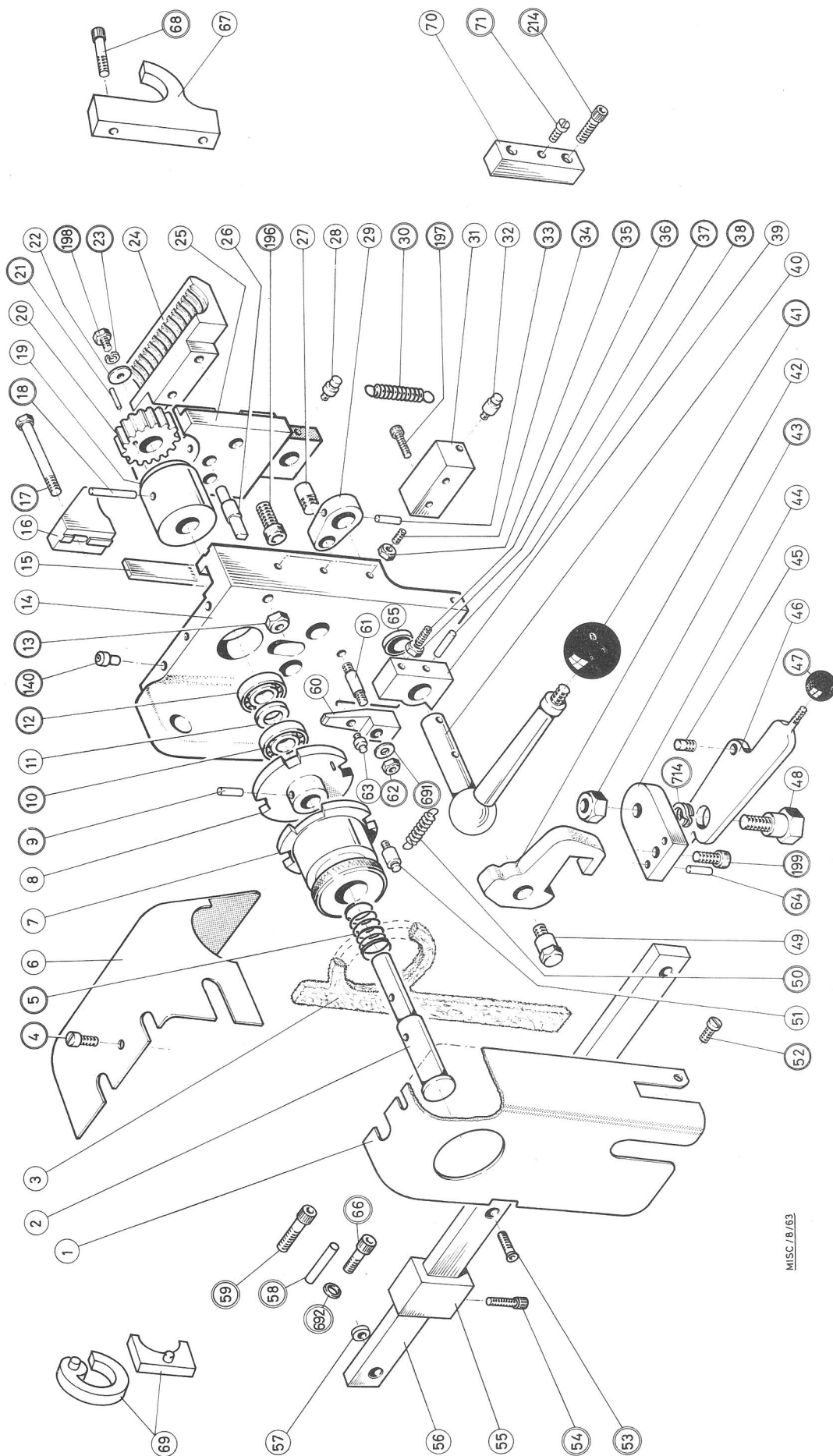


Ref. Dwg. MISC/3/63

33

SPECIFICATIONS OF STANDARD PARTS ARE GIVEN IN APPENDIX I AT THE END OF THIS SPARE PARTS SECTION

# RAPID-THREADER ATTACHMENT



MISC / 8 / 63

Ref. Dwg. MISC/8/63

35

SPECIFICATIONS OF STANDARD PARTS ARE GIVEN IN APPENDIX I AT THE END OF THIS SPARE PARTS SECTION



# APPENDIX 1

## SPECIFICATION OF STANDARD PARTS

### Item No.

001	Woodruff Key	No. 3.
002	" "	No. 9.
009	Feather Key	1/4" x 1/3" x 1".
011	Hex. Head Bolt	3/8" UNC x 1.1/4".
015	" " "	1/2" " x 1.3/4".
021	" " "	7/8" " x 4".
032	Ball Journal	Hofman XLS 2.1/4".
058	Taper Washer	3/8" I/D x 5".
060	Oilring Type B 4/115	1/2" I/D.
061	Ball Journal	Hofman XLS 2.
062	Oilseal - Weston W 16211237 R	1.1/8" I/D x 1.628 x 3/8".
180	Ball Journal.	Hofman 2 7/8" x 1 1/8" x 3".
181	Oilseal - Weston	WB 16911037 R21.
182	Washer Dowty	List 5MK 10PP 49C.
183	Needle Bearing Ina	SC 1412. 1 1/8" x 7/8" x 3".
184	" "	SC 128 1" x 3/4" x 1/2".
201	Socket Cap Head Screw	No. 10 - 24 t.p.i. x 3/8".
202	" " "	No. 10 - 24 " x 1/2".
203	" " "	No. 10 - 24 " x 5/8".
206	" " "	No. 10 - 24 " x 3/4".
207	" " "	No. 10 - 24 " x 5/8".
212	" " "	No. 10 - 24 " x 1".
213	" " "	1/4" UNC x 1/2".
214	" " "	1/4" " x 5/8".
215	" " "	1/4" " x 3/4".
216	" " "	1/4" " x 7/8".
217	" " "	1/4" " x 1".
218	" " "	1/4" " x 1.1/4".
219	" " "	1/4" " x 1.1/2".
223	" " "	1/4" " x 1.3/4".
225	" " "	5/16" " x 1.2".
228	" " "	5/16" " x 1.3/4".
229	" " "	5/16" " x 1.1/2".
230	" " "	5/16" " x 1.1/4".
231	" " "	5/16" " x 1.1/2".
242	" " "	5/16" " x 1.1/4".
246	" " "	5/16" " x 2.1/2".
253	" " "	3/8" " x 2.1/2".
260	" " "	7/16" " x 2".
300	Socket Countersunk Head Screw	1/2" " x 1.1/2".
314	" " "	No. 10 - 24 t.p.i x 1/4".
318	" " "	1/4" UNC x 1.3/8".
319	" " "	5/16" " x 3/4".
342	Socket Head Set Screw	5/16" " x 1".
343	" " "	No. 10 - 24 t.p.i x 3/16".
344	" " "	No. 10 - 24 " x 1/4".
345	" " "	No. 10 - 24 " x 5/16".
350	" " "	No. 10 - 24 " x 3/8".
351	" " "	1/4" UNC x 1/4".
355	" " "	1/4" " x 5/16".
361	" " "	1/4" " x 5/8".
362	" " "	5/16" " x 5/16".
		5/16" " x 3/8".

SPECIFICATION OF STANDARD PARTS (CONTINUED)

Item No.

363	Socket Head Set Screw	5/16" UNC x 7/16".
365	" " " "	5/16" " x 5/8".
366	" " " "	5/16" " x 3/4".
378	" " " "	7/16" " x 7/16".
419	Socket Head Set Screw 1/2 dog	1/4" UNC x 3/8".
429	" " " " " "	5/16" x 3/8".
485	Socket Countersunk Head Screw	2 BA x 3/8".
495	Socket Cap Head Screw	3 BA x 5/8".
497	" " " "	3 BA x 1.1/4".
520	Mills Pin GP 1	1/8" x 1/2".
539	" " GP 3	5/16" x 1/2".
541	" " GP 3	3/16" x 5/8".
542	" " GP 3	3/16" x 3/4".
543	" " GP 3	3/16" x 7/8".
544	" " GP 3	3/16" x 1".
545	" " GP 3	3/16" x 1.1/4".
546	" " GP 3	3/16" x 1.1/2".
547	" " GP 4	3/16" x 5/8".
558	" " GP 3	1/4" x 3/8".
559	" " GP 3	1/4" x 1.1/8".
563	" " GP 3	1/4" x 1.1/4".
577	" " GP 4	5/16" x 1".
579	" " GP 3	1/8" x 5/16".
590	" " GP 3	3/8" x 1.3/4".
607	Grover Spring Dowel Pin	3/16" x 15/16".
612	Deep Nut - Steel	3/8" UNC.
621	Standard Nut - Steel	5/16" "
622	" " "	3/8" "
623	" " "	7/16" "
624	" " "	1/2" "
632	" " "	No. 10-24 t.p.i.
636	" " "	3/8" UNC.
637		
644	Thin Locknut	1/2" "
650	Nyloc Nut	3/8" UNF.
651	" "	7/16" "
652	" "	1/2" "
654	" "	5/8" "
659	Simmonds Aero Nut	5/16" UNC.
660	Nyloc Nut	3/8" "
663	Wedglock Nut	1/2" "
675	Simmonds Nut Type T	5/8" UNF.
692	BS Steel Washer	5/16" I/D.
693	" " "	3/8" I/D.
694	" " "	7/16" I/D.
695	" " "	1.1/2" I/D.
698	" " "	5/8" I/D.
716	Double Coil Spring Washer - Light Series	1/2" I/D.
718	Double Coil Spring Washer - Light Series	5/8" I/D.
725	Schnoor Disc Spring Washer Type K	Size 6201.
736	External Circlip - Type 1400 - Anderton	1/2" Dia.

SPECIFICATION OF STANDARD PARTS (CONTINUED)

Item No.

743	External Circlip - Type 1400 - Anderton	5/8" Dia.
744	External Circlip - Type 5101/66 - Salter	11/16" Dia.
745	External Circlip - Type 5101/66 - Salter	3/4" Dia.
749	External Circlip - Type 5101/66 - Salter	7/8" "
754	External Circlip - Type 5101/66 - Salter	1.1/8" Dia.
766	External Circlip - Type 1300 - Anderton	28 mm Dia.
773	Internal Circlip - Type 1300 - Anderton	3.464" Dia.
774	Internal Circlip - Type 1300 - Anderton	2.1/8" Dia.
778	"E" Type Circlip - Type 1500 - Anderton	5/16" Dia.
782	"E" Type Circlip - Type E 210 - Anderton	1.1/4" Dia.
786	Steel ball.	5/32" "
788	" "	1/4" "
789	" "	5/16" "
790	" "	3/8" "
792	" "	5/8" "
793	Pho. Bronze Ball	1/4" "
795	Compression Spring	1/4" O/D x 1/2" FL. x 22 SWG.
803	Compression Spring	5/16" O/D x 1.1/4" FL.
813	" "	1.3/8" O/D x 1" FL.
815	Extension Spring	5/16" O/D x 1.7/8" OA.
817	Standard Extension Spring	1/2" O/D x .080" x 2.3/16" OA.
827	Garland Diaphragm Oiler	1/4" Dia.
828	Winkley Oiler	5/16" Dia.
830	Plastic Knob - Black	1.1/2" O/D x 7/16" UNC.
833	" " - Red	1.1/2" O/D x 5/16" "
835	" " - Black	1.1/4" O/D x 7/16" "
836	" " - "	1.1/2" O/D x 7/16" "
838	" " - "	1" O/D x 3/8" UNC.
840	" " - "	3/4" O/D x 1/4" UNC.
841		
846	Oilring-Pioneer	P.O. 06204310.
852	" -Dowty	1.484" I/D x .139".
855	" -Pioneer	P.O./23720021.
858	" - "	P.O.52506/MP/658.
863	Oilseal-Weston W 1620037	1" I/D x 1.5/8" O/D x 3/8".
865	" -Weston W 16912537	1.1/4" I/D x 1.11/16". O/D x 3/8".
871	Oilsight - Tecalemit I.C. 4610	1.1/4" O/D.
872	Thrust Bearing	Hoffman A 10.
882	Thrust Bearing	Hoffman 5/8" WSP.
885	Thrust Bearing	Hoffman W 1.1/4".
886	Needle Bearing Ina	HK. 1516 21mm x 15mm x 16mm.
887	" " "	SC 1212 1" x 3/4" x 3/4".
888	" " "	SC 1112 7/8" x 11/16" x 3/4".
889	" " "	HK 2820 35mm x 28mm x 20mm.
906	Countersunk Head Rivet	5/32" Dia.
908	Hollow Copper Rivet	5/32" Dia.
997	Brake Shoes	4" Dia. Ferodo.