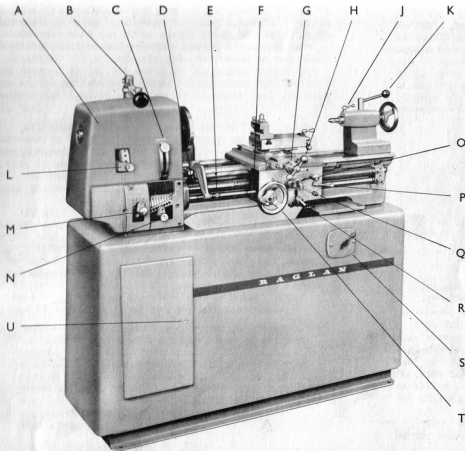


RAGLAN

5 in. Centre Lathe

Serial Number_____

**INSTRUCTIONAL
MANUAL
and
PARTS LIST**



- A Swinging Guard over Gear Train
- B Spindle speed Change Control Rod
- C Back Gear positioning Lever
- D Clutch to engage Lead Screw
- E Stop for automatic knock-off
- F Automatic Knock-off Rod
- G Socket screws clamping Swivel Slide
- H Cross Feed Handle and Micro Dial
- J Tailstock Barrel Lock
- K Tailstock Clamping Lever
- L Tumbler Gear Lever
- M Gearbox Tumbler Lever
- N Gearbox Sector Lever
- O Change lever, Longitudinal - Cross Feeds
- P Screwcutting engagement Lever
- Q Hand disengagement lever for power feeds
- R Traverse engagement lever
- S Reversing Switch
- T Longitudinal traverse handwheel & Micro Dial
- U Lock for Cupboard Door.

INSTALLATION.

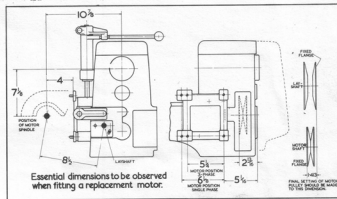
It is usually convenient to deliver the Raglan Lathe and the Cabinet Stand separately, the electrical and other connections being left ready for easy assembly. It is recommended that the Stand should first be placed in the required position and securely bolted down to its foundation. The Lathe can then be placed on the stand and secured to it, two bolts at the headstock end and one at the tailstock. These bolts should only be moderately tight to avoid as far as possible distorting the bed.

All Raglan lathes are tested in our Works for accuracy in the free standing position and the results then entered on the Lathe's Test Chart. If, therefore, a test is made after installation which does not agree with the Test Chart, some distortion has evidently taken place and which will, however, not be difficult to correct.

It will be noticed that the portion of the bed casting coming in contact with the surface of the Stand at the tailstock end is slightly convex to assist the bed to take up a free position. In line with the bolt hole in the stand two $\frac{3}{8}$ " set screws are positioned which when screwed up will impinge on the underneath of the bed foot. Access for screwing up these screws is from the inside of the stand at the rear. The method of correcting the distortion is as follows:

Select a short bar of round material, preferably brass, and insert in the 3-jaw Chuck to project approx. 6 inches. Take first a light cut and then a second lighter cut to avoid all chance of spring either in the work or the tool. If the result shows a taper, adjustment of either the front or rear set screw against the underneath of the casting will eventually remove the inaccuracy due to distortion.

The motor supplied with the machine should under no circumstances be substituted by any other not exactly similar to it without reference to us. Before dispatch from the Works it is correctly mounted in relation to the Variable Speed Drive and any alteration of position would seriously affect the satisfactory working of the drive. Should however the motor sent on the lathe be inadvertently not of the voltage required, a correct motor can be supplied by us and fitted by the customer providing the dimensions given on the illustration below are strictly adhered to.



Essential dimensions to be observed when fitting a replacement motor.

As far as possible, and particularly when the lathe is new, arrange to start the motor with the belt on the Variable Pulleys in the slow speed position. This considerably reduces the starting effort of the motor. If therefore the habit is formed of reducing the speed to the lowest before switching off, the life of the motor will be considerably prolonged.

The "Raglan" lathe can be fitted to order with a motor having any of the following voltages:

Single phase current: 200/210v 220/230v 240/250v

Alternating Current: 230/240v and 380/440v

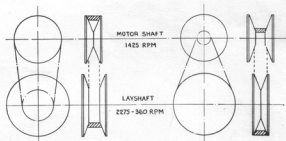
Direct Current: 110v and 220v

Voltages other than these are sometimes impracticable, due to the motor frame sizes being widely different. If a customer's electricity supply is such that our standard motor cannot be fitted, we can provide a single pulley drive attachment which can be driven by any motor placed in a convenient position not attached to the lathe.

VARIABLE SPEED DRIVE

The stepless speed variation is obtained by means of two sets of expanding and contracting Vee Pulleys, coupled by a Vee Belt specially made for, and obtained only from us. The expansion and contraction of these two pulleys is controlled so that the belt rises or falls on the inclined faces of the flanges, remaining at rest on those diameters giving the desired speed, and at the same time being of equal tension in all positions. The illustration below shows the theoretical application of the design.

Control of the opening and closing of the pulleys is by means of the horizontal lever over the top of the Headstock, very little effort being required to effect the required speed change. Movement should be fairly gentle, quick or jerky operation imposing an unnecessary strain on the mechanism. While the Control Lever might remain in the position in which it is placed, clamping it by giving a slight twist will prevent any tendency to "creep".



As the belt is of fixed length, it is obvious that the pulley flanges must be so adjusted axially that the full speed range can be obtained, i.e., when the belt is at the "top" of one pulley, it must be at the "bottom" of the other. Even so, this condition will not apply if the centre distance between the motor and the layshaft is not correct and therefore the motor position relative to the drive is important.

Only one flange of each pulley has axial movement, that on the motor being the left hand one and the right hand one on the Layshaft. Thus as one pulley "opens" the other "closes". The sliding movement of these flanges is controlled by forklifts secured to a sliding shaft, the thrust being taken on Ball Races. These Ball Races are mounted in housings which are prevented from revolving by a small headed stud set in the housing.

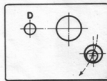
When adjustment is required, and this will be seldom, it can be made by slightly screwing forward the Grub Screws impinging on the Thrust Race Cover, bringing the pulley flanges slightly closer together. This adjustment is only needed to compensate for the slowly developing wear taking place on the sides of the belt. When making this adjustment care should be taken to ensure that the cover is strictly square with the axis of the motor spindle so that the faces of the Thrust Bearing are in contact all the way round. Any mal-adjustment is usually noticed by the bearing making a slight rattling noise.

BELTS

The stepless drive from the Motor to the Layshaft is by a belt made specially for us and obtained only from our Agents or ourselves. The Drive from the Layshaft to the Main Spindle is by two $\frac{3}{4}$ " Vee Belts. All three belts are reinforced by Rayon cords ensuring the minimum amount of stretch, in fact stretch can be said hardly to take place. When new, the sides of the belts have a thin coating of rubber, which quickly wears off, after which they settle down for prolonged use.

To compensate for wear or any slight stretch of the motor belt, a very small backward movement of the motor is all that is necessary.

To tighten the twin belts driving the main spindle, loosen the two set screws (which pass through $\frac{3}{8}$ " holes), depress the bracket by swinging about the position D until the slack is taken out. Tighten the screws again.



REMOVAL OF MAIN DRIVE MOTOR BELT.

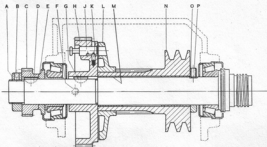
The machine should be stopped in the high speed position, that is when the belt is riding at the top of the motor pulley.

To remove the main drive belt, loosen the two forklifts, take out the pin and remove the $\frac{3}{4}$ " diameter operating shaft. This allows the loose flange of the motor pulley to be withdrawn; the belt is then free at this end. Loosen the layshaft housing plate and swing upwards on point D; this will loosen the twin 'vee' belts driving the main Spindle which should be removed from the layshaft pulley. The motor belt can then be pushed into the inside of the machine and by placing the hand through the rectangular opening at the top of the cupboard in the Cabinet Stand underneath the headstock, the belt can be drawn over the double vee pulley, worked round to the end of the layshaft, and so freed.

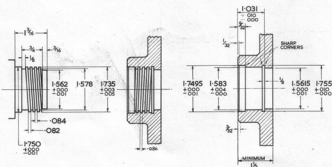
Replacement is by the reverse process and all parts should be secured before any attempt is made to put the belt on the motor pulley. Care should be taken that the forklifts are replaced in exactly the same position. The belt can then be sprung over the flange of the motor pulley.

MAIN SPINDLE

The main spindle, of high tensile steel, is machined to very close limits of accuracy and runs on two Timken Tapered Roller Bearings, both bearings being the same size. By adjustment of the rear Bearing, which is mounted on a phosphor bronze sleeve, all end-play can be taken up and the required amount of pre-load introduced to produce perfect finish at any spindle speed.



The Spindle nose has two bearing positions for accurately locating Backplates, Faceplates etc., the function of the square thread being merely for screwing these attachments on and off.



The above line drawing shows the dimensions of the spindle nose and also the recommended dimensions of any part that has to be screwed on to it.

To remove the spindle, necessary when the two Vee Belts require changing, the following sequence of operations should be undertaken

1. Unscrew Locknut A, first loosening Screw B.
2. Remove Gear C, Key D and Spacing Bush E.
3. Loosen Screw F.
4. Loosen Screw P.
5. Between the end of the V groove pulley and the main casting, clearing the Dust Cover, place two flat pieces of wood to act as a cushion and against which the Vee pulley can come to rest.
6. With another piece of wood against the L.H. end of the spindle tap the spindle lengthways until it has left the L.H. Timken Bearing. The spindle can then be freely withdrawn.

The Key G will pass through the bore of the V groove Pulley and therefore does not require to be removed.

To Disengage Back Gear.

The back gear lever will be at the bottom of the slot.

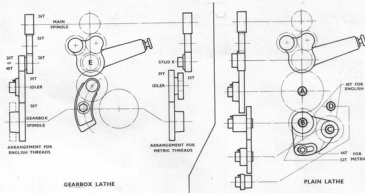
1. Swing open Guard over gear train.
2. Put back gear lever into the Top position of slot.
3. Turn Spindle until Plunger J on above illustration comes into view through opening in headstock, and with right thumb press firmly forward.
4. With left hand rotate motor pulley continuously until Plunger drops into corresponding hole in flange L.

To Engage Back Gear.

The Back lever will be at the top of the slot.

1. With the left hand rotate the motor pulley until Plunger J comes into view. Withdraw it. DO NOT USE FORCE.
2. Drop Back Gear lever into bottom position, if necessary rotating main spindle by hand to mesh gears, and secure.

GEAR TRAINS



GEARBOX LATHE

PLAIN LATHE

A range of Threads from 4 T.P.I to 30 T.P.I can be obtained without using Change-wheels. For these threads a 40T Gear is used on Stud E. a 50T Gear on the Gearbox Shaft extension (Stud D) and the 39T Gear used as an Idler.

For threads 32 T.P.I. to 60 T.P.I the lower Tumbler Gear with its 40T Gear is replaced by a combination Gear having a 20T Gear as an extension.

There are four Change-wheel positions, A.B.C. & D, three of which are fixed, C only being variable. Ratios between A and B are either 1:2, 1:1, or 2:1. B and C are permanently geared together (except for Metric or fractional threads.)

Gears for C and D are selected from the Screwcutting Chart for the thread required, in relation to those for A and B.

$$\text{FORMULA } \frac{B}{A} \times \frac{D}{C} \times 16 = \text{T.P.I.}$$

THREADS PER INCH ENGLISH										METRIC		SO	
A	B	C	D	E	F	G	H	I	J	K	L	M	N
50	56	52	48	44	40	36	32	28	24	20	18	16	14
50	56	52	48	44	40	36	32	28	24	20	18	16	14
15	14	13	12	11	10	9	8	7	6	5	4	3	2
15	14	13	12	11	10	9	8	7	6	5	4	3	2
7	7	6	5	4	3	2	1	1	1	1	1	1	1
7	7	6	5	4	3	2	1	1	1	1	1	1	1

GEARBOX SCREWCUTTING CHART

SCREWCUTTING CHART FOR PLAIN LATHE

RAGLAN SCREWCUTTING CHART									
STUDS					METRIC THREADS				
A	B	C	D	E	STUDS	STUDS	STUDS	STUDS	STUDS
50	56	52	48	44	50	56	52	48	44
50	56	52	48	44	50	56	52	48	44
15	14	13	12	11	15	14	13	12	11
15	14	13	12	11	15	14	13	12	11
7	7	6	5	4	7	7	6	5	4
7	7	6	5	4	7	7	6	5	4

DATA CHARTS are available for cutting threads/in: 3, 11, 19, 27. Also for B.A. Thds and Diametral pitch worms.

METRIC THREADS--

Plain Lathes

Metric Threads can be cut without special Changewheels. The two equal gears connecting Studs B & C used for the range of English threads are removable and, for Metric Threads, should be exchanged for a 52T on Stud B & 44T on Stud C. These two gears are specially drilled for this purpose and are not needed elsewhere. Selection of the requisite changewheels for the Metric Pitch required is then obtained by reference to the Chart under the heading "Metric Threads". A useful formula for calculating Metric Change wheels, which applies when the 52T and 44T gears are mounted in the train, is:-

$$\frac{A}{B} \times \frac{C}{D} \times \frac{16}{8} = \text{Pitch in millimetres.}$$

METRIC THREADS--

Gearbox Lathe.

The following sequence of operations should be made:-

1. On Stud E place the 26T Tumbler Gear with the plain extension.
2. Reverse the 50T Gear on the Gearbox shaft extension.
3. Remove the 39T Idler Gear and fit a 33T Gear on its extension, and remount with the 33T Gear on the inside, the 39T Gear meshing with the 50T Gear.
4. Refer to the Metric Screwcutting Chart inside the swinging Gear and select the appropriate Gear for Stud E shown opposite the thread to be cut. Mount this to the extension of the Tumbler Gear, Stud E.
5. Further reference to the Chart will give the positions of the Tumbler Lever (i.e. A, B or C) and of the Sector Lever (i.e. against the number shown in the bottom horizontal column of the Chart on the Gearbox itself).

