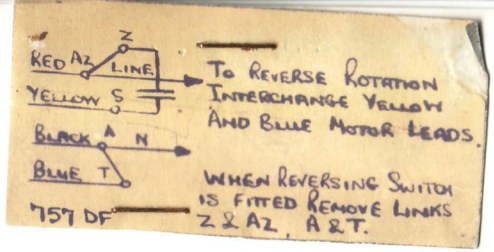


ML7-R LATHE

Illustrations not binding in detail

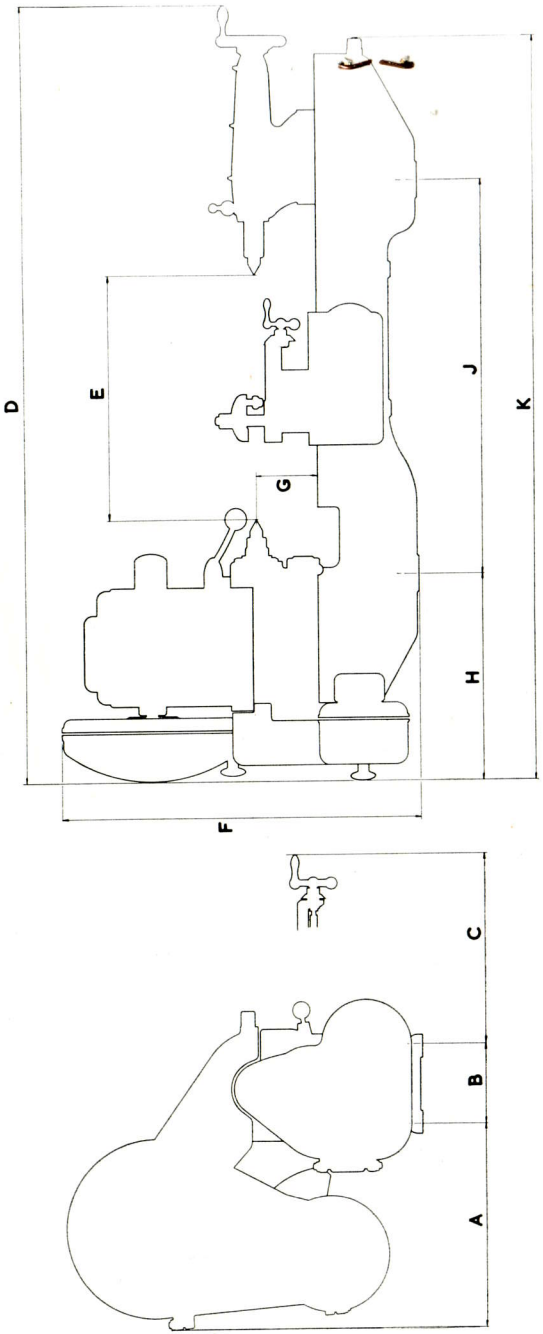


Fig. 1 Showing overall measurements for installation purposes

A	11½″	291 mm
B	4⅝″	117·5 mm
C	10¾″	273 mm
D	47″ or 59″	1195 or 1500 mm
E	19″ or 31″	483 or 787 mm
F	20½″	521 mm
G	3½″	88·9 mm
H	11¾″	300 mm
J	22¼″ or 31¼″	565 or 794 mm
K	41⅞″ or 53⅞″	1065 or 1370 mm

MYFORD ML7-R 3½″ CENTRE LATHE

MYFORD LATHES pass rigid inspection tests before shipment, and in order to maintain this built-in accuracy, they must be properly installed.

DO NOT OPERATE THE LATHE UNTIL . . . . . .

* **The machine has been correctly installed and levelled, and it has been thoroughly cleaned and lubricated.**
* **The instructions have been carefully read, and the controls and adjustments are understood.**

MACHINE SERIAL No.

In the event of queries, or orders for spares, please state the number of the machine, as shown on the front of the bed at the left hand end of the facing for the rack, Fig. 2.

KR 146444

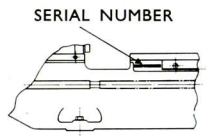


Fig. 2

We are always pleased to answer any technical question in connection with our Products. When writing to the Works be sure to state the Serial letter and number of your Lathe.

DO NOT MOVE ANY PART OF THE MACHINE UNTIL ALL SURFACES HAVE BEEN THOROUGHLY CLEANED AND OILED

INSTALLATION

Unpacking

Great care is taken in the packing of ML7-R Lathes to ensure that the user will receive the Lathe in perfect condition, and it is important that unpacking should be carried out with the same care in order to avoid possible damage.

Shortages

Check the standard equipment supplied with the machine, as listed, and illustrated below.

All loose packing material (such as wood wool) should be set aside and thoroughly searched in the case of apparent shortages. If the missing items do not come to light, report the shortages immediately to the supplier from whom the machine was purchased.

Cleaning

Myford machines are shipped with all parts protected by a rust preventative; all traces of this should be removed with either petrol or paraffin.

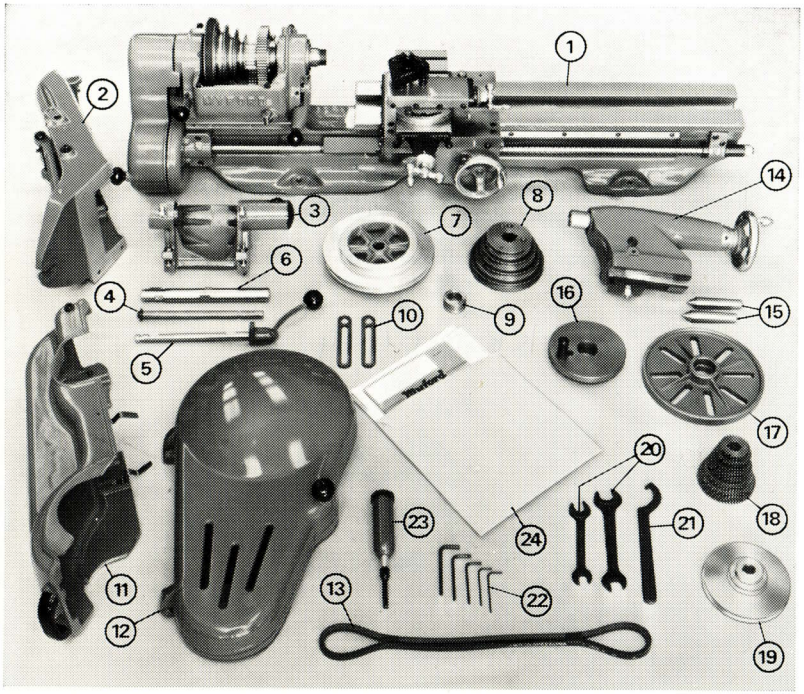


Fig. 3 Lathe with standard equipment dismantled for packing

Dismantled Equipment

1. Lathe partially dismantled for packing.
2. Countershaft arm with motor base
3. Swing head assembly.
4. Swing head pivot shaft.
5. Cam shaft and lever assembly.
6. Countershaft.
7. Countershaft two step pulley.
8. Countershaft cone pulley.
9. Countershaft collar.
10. Motor base tie bars.
11. Headstock belt guard.
12. Motor drive belt guard and backplate.
13. Motor drive vee belt.
14. Tailstock.

Standard Equipment (loose)

15. Soft and hard centres.
16. Catchplate with peg.
17. 6¾″ dia. faceplate.
18. 8 changewheels (to complete standard set of 14 – 6 are mounted on the machine). (Except ML7-RB quick-change lathes.)
19. Motor pulley.
20. 2 double ended spanners.
21. Cee spanner.
22. 5 hexagon keys.
23. Oil gun.
24. Descriptive matter, installation booklet, etc.

For checking only. Do not use these numbers for ordering.

ASSEMBLY OF MOTORISING EQUIPMENT
(Standard Machine — no clutch)

References are to illustration Fig. 3 or to parts list drawing section 'motorising assembly'.

a Remove motor base from countershaft arm (2) by releasing 2 B.A. cup point socket set screw (QR10) in motor base and ¼″ B.S.F. half dog point socket set screw (QR11) in countershaft arm and withdrawing pivot pin (QR9).

b Remove outer 7/16″ B.S.F. hexagon nut and washer (QR5 and QR4) from stud at back of bed. Screw second nut in as far as possible and check that second washer is in position on stud.

c Mount the countershaft arm (2) on to the back of the headstock (Fig. 4) securing it with the four (¼″ B.S.F.) hexagon head screws (QR2). At this stage these screws should be only lightly nipped.

d Insert the camshaft (5) into the lower hole in the countershaft arm (lever to the left when looking on the rear of the machine) and locate with the ¼″ B.S.F. half dog point socket set screw (QR19) ensuring that the screw is not overtightened till it prevents free rotation.

e Remove the hexagon head screw and washers from the swing head pivot shaft (4) and, looking on the rear of the machine, insert the tapped end of the shaft into the left hand bearing only of the countershaft arm. Place the swing head in position (long boss to the left) and push the pivot shaft through the left hand bearing. Place the tie bars (10) for the motor base on the shaft (Fig. 5). Push the shaft through the right hand bearings of the swing head and countershaft arm, at the same time, rotating the shaft so that the flat near the left hand end will line up with the ¼″ B.S.F. cup point socket set screw (QR30) in the left hand bearing of the countershaft arm. With the shaft projecting roughly ⅛″ (3 mm) at the right hand end, tighten the grub screw sufficiently to allow the shaft to slide but at the same time preventing rotation. Slide the shaft and the swing head so that the ¼″ B.S.F. half dog point socket set screw (QR11) in the left hand bearing of the swing head can be tightened into the groove in the pivot shaft sufficiently for location but without preventing free rotation of the swing head.

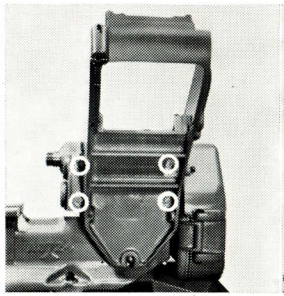


Fig. 4

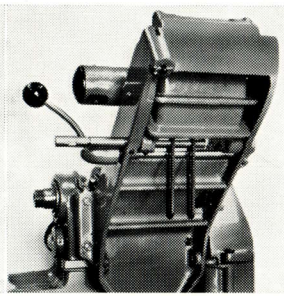


Fig. 5

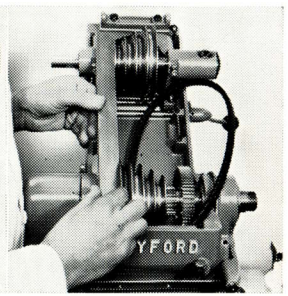


Fig. 6

f Remove both Woodruff keys from the countershaft (6). Looking on the front of the machine, insert the countershaft (full ⅞″ diameter leading) through the left hand bearing in the swing head. Mount the four step countershaft pulley (8) on to it (small diameter to the left) and push the shaft through till it is supported in the right hand bearing. Holding a 'straight edge' firmly against the left hand side of the headstock vee cone pulley (Fig. 6) push the countershaft pulley to the left against it and check that its face is true to the straight edge. If it is not, pivot the countershaft arm about its securing screws till the faces of the two pulleys are in one plane. The axes of the countershaft and headstock spindle will now be parallel one to another and the countershaft arm may be secured by finally tightening the four ¼″ B.S.F. hexagon head screws (QR2). Next tighten the inner 7/16″ B.S.F. hexagon nut (QR5) against the back of the countershaft arm. Tighten firmly but not sufficiently to cause distortion. Place the outer washer on to the stud, followed by the outer 7/16″ B.S.F. hexagon nut and lock the latter tight. Remove the countershaft and countershaft vee cone pulley.

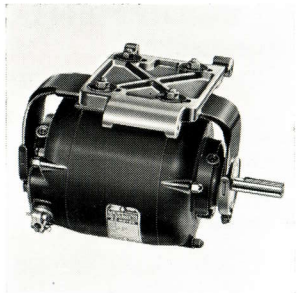


Fig. 7

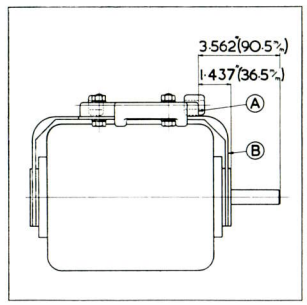


Fig. 8

g Release and remove hexagon nut and washer (QR16 and QR15) and withdraw clamp screw (QR13 and QR14) from motor base. Assemble the motor to the motor base ensuring that faces A and B are parallel and the dimensions given are not exceeded (Figs. 7 and 8).

h Insert the plain end of the motor base swing pin in to the left hand ⅜″ bore near the lower end of the countershaft arm. Hold the motor and base assembly in position, with the base plate uppermost and, rotating the swing pin so that the flat on it will line up with the 2 B.A. socket set screw in the motor base, pass it through both bearings of the motor base and into the right hand bearing in the countershaft arm. Position the swing pin so that the ¼″ B.S.F. half dog point socket set screw (QR11) in the left hand bearing of the countershaft arm can be inserted into the annular groove in the swing pin. Tighten the 2 B.A. cup point socket set screw (QR10) in the left hand bearing of the motor base to secure the latter to the swing pin. Check that the motor base and swing pin are free to rotate. Adjust the ¼″ B.S.F. peg end socket set screw if necessary.

i Still looking on the rear of the machine, fit the motor base clamp pin (QR13 and QR14), entering it from the right hand side, first through one of the tie bars, then through the motor base, finally through the second tie bar. Fit the washer and nut on the left hand end (Fig. 9).

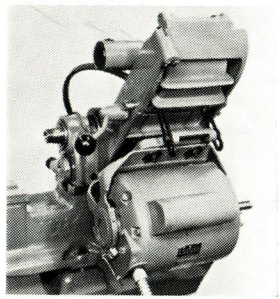


Fig. 9

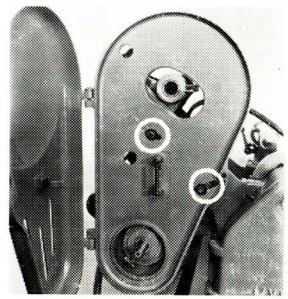


Fig. 10

j Mount the primary drive belt guard in position, attaching it by means of the ¼″ B.S.F. x 1¼″ cap screw and washer (QR41 and QR15) in the forward, lower slot. This screw is threaded into the hole provided in the countershaft arm. The ¼″ B.S.F. x ¾″ hexagon head screw (QR40) is used in the upper slot with one washer (QR15) *on each side* of the backplate. This screw is threaded into the end of the swing head pivot shaft (4) from which it was removed before the shaft was fitted. (See paragraph E.) Position the backplate so that the screws are about two thirds of the way along their slots, the backplate being near its forward position. Tighten the lower screw securely first. Now tighten the upper screw to draw the swing head pivot shaft through its bearings. Next, tighten the ¼″ B.S.F. cup point socket set screw in the countershaft arm to lock the pivot shaft. (Fig. 10.)

k Replace the Woodruff key in the ¾″ diameter portion of the countershaft (6) and mount the two step pulley (7) on to the shaft, the longer boss first. Press the pulley firmly against the shoulder on the shaft and lock the securing screw tight.

Enter the shaft through the left hand swing head bearing (looking on the front of the machine), place the collar (9) on to the shaft (socket set screw to the right hand end) and push the shaft through so that the four step vee cone pulley (8) can be mounted on it with the small step to the left. Push the pulley as far as it will go to the right and continue to feed the shaft through until the Woodruff key can be inserted into its keyway. Line up the key with the keyway in the pulley, push the pulley to the left and the shaft through the pulley. Place the vee belt in position over the shaft. Push the shaft through into the right hand bearing.

With the boss of the two step pulley (7) against the face of the swing head bearing position the collar so that the shaft has approximately 0·005″ (0·1 mm) end float and the socket set screw will bear on the flat on the shaft. Tighten the screw to lock the collar in position. Again holding the 'straight edge' firmly against the left hand side of the headstock vee cone pulley (Fig. 6) push the countershaft vee cone pulley up to it and lock in position with the socket set screw.

l Release the belt tension (lever upwards and forwards) and place the vee belt in matching steps of the cone pulleys. Push the lever backwards and downwards to tension the belt. Check the belt tension which, having been set at the factory, should be correct. If, however, any adjustment is required, adjust the tensioning screws (QR28) until the slack of the belt allows approximately ½″ total movement when lightly oscillated by the thumb and forefinger (Fig. 11). This will give an initial setting which can be increased if slip is experienced when the machine is operated.

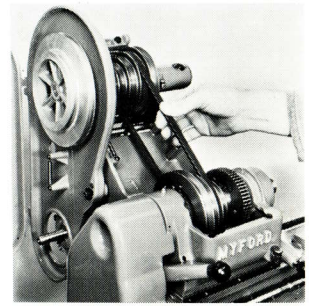


Fig. 11

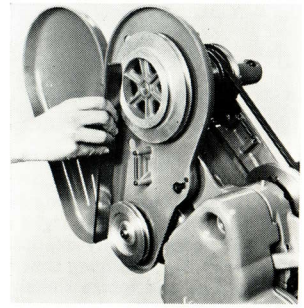


Fig. 12

m Place the motor pulley in position on the motor shaft with the larger diameter outwards, but do not secure. Holding a 'straightedge' firmly against the two step countershaft pulley, line up the motor pulley to it, checking that the face of the motor pulley is parallel to it. (Fig. 12.) If it is not, it will be necessary to reposition the motor on its base. When the pulleys are in line, lock the socket set screw to secure the motor pulley.

n Place the headstock belt guard (11) in position and adjust the pivot screws (QR58). Remove all traces of play but do not overtighten, as this would strain or even crack the guard. *N.B.* To obtain access to the left hand screw (looking on the front of the machine) through the hole provided in the motor drive guard backplate, the latter may have to be temporarily repositioned. Next, remove the split pin, which was inserted during packing, to release the roller and plunger assembly.

o Release the motor base clamp and the belt tension release and fit the motor drive vee belt. Push the belt tension release lever backwards and downwards to the stop. Tension the motor drive belt by allowing it to take almost the full weight of the motor and retighten the clamp.

p Check the position of the motor drive belt guard and adjust as necessary to give adequate clearance when the belt is in both the slow and fast countershaft speed position, also pulley clearance when the belt tension release lever is in the released position. *N.B.* When changing the motor drive vee belt from one step to the other, the belt tension lever should be in the released position.

q Slide the tailstock on to the bed from the end. The clamp plate should be guided into position between and below the shears. The clamp lever should be in the free position, that is, roughly horizontal, pointing towards the end of the bed.

ASSEMBLY OF MOTORISING EQUIPMENT
(Machine fitted countershaft clutch)

a Proceed as at a, b, c, d and e on page 5.
b Mount the primary drive belt guard as at j on page 6.
c Remove the tape from the end of the countershaft and check that the steel ball and push bar (Q116 and Q117) are in position, the ball in first and the push bar projecting. Insert the countershaft (shaft, primary drive pulley, clutch, assembly) into the left hand bearing of the swing head (looking from the FRONT of the machine). When the shaft is projecting through the bearing, place in position, first the three parts of the ball thrust bearing (Q99) then the collar (Q100). Spring open the cir-clip (Q101) and slip it over the shaft (Fig. 13).
d Place the pulley, with the vee belt in one of the grooves, on the shaft and push the shaft to the right (looking from the FRONT). Before easing the shaft into the right hand bearing, check that the Vee belt and Push Bar are both in place.

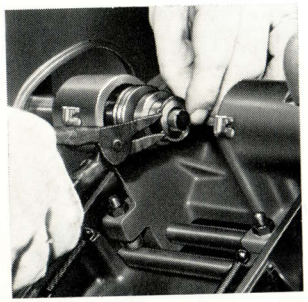


Fig. 13

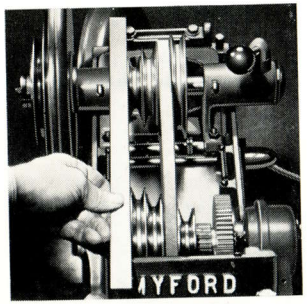


Fig. 14

With the clutch operating lever and knob (Q94) in the position shown in Fig. 14 and the pulley as far to the right as possible, push the shaft through. When the Keyway in the shaft becomes fully exposed rotate the pulley to line up the Keyways and insert the Woodruff key, ensuring that the cir-clip is to the left of it. Push the shaft through as far as it will go and locate the cir-clip in the groove provided. *N.B.* Any other position of the clutch operating lever will prevent the shaft from taking up its correct position, consequently the cir-clip will not enter its groove.
e To ensure the correct alignment of the countershaft and headstock spindle pulleys, place a straightedge across the face of the headstock pulley and adjust the position of the countershaft arm so that the headstock and countershaft cone pulleys are parallel. See Fig. 14. *N.B.* During this operation it may be necessary to adjust the position of the countershaft cone pulley, as well as the position of the countershaft arm to ensure correct alignment.

After setting, tighten the four hexagon head screws which secure the countershaft arm and the grub screw in the countershaft cone pulley.
f Before proceeding further with the assembly, check the clutch adjustment. See page 24.
g With the belt tension lever in the released position, adjust the position of the inner hexagon nut on the $\frac{7}{16}$" B.S.F. stud at the bottom of the countershaft arm, so that the washer is just trapped finger tight. Over tightening will cause straining so that misalignment of the headstock may ensue if the headstock is jolted at some future date. Replace the outer washer and the outer hexagon nut on this stud and lock tight.
h Position the headstock drive belt so that it is in matching grooves of the headstock and the countershaft vee cone pulley. Push the cam backwards and downwards against the stop so that the camshaft is in the full lift position. Check the belt tension which should be correct, having been set at the factory, but if any adjustment is required, adjust the tensioning screws (Q57) until the slack of the belt allows approximately $\frac{1}{2}$" total movement when lightly oscillated by the thumb and forefinger. See Fig. 11. This will provide an initial setting which can be increased if slip is experienced when the machine is operated.
i Assemble the motor to the motor base and these to the countershaft arm at the same time fitting the motor base clamp pin, as at g, h and i on page 6. See also Figs. 7, 8 and 9.
j Mount the motor pulley on to the motor shaft and line up; mount the headstock belt guard; adjust the primary drive belt tension; position the motor drive belt guard; slide the tailstock onto the end of the bed; all as paragraphs m, n, o, p and q on page 7.

FOUNDATION

It is essential that the Lathe be placed on a solid foundation. The floor material is an important consideration, concrete being the most satisfactory. If the floor is of flimsy construction, a possible solution is to cut a hole through the floor and build up a concrete foundation from the ground up to the floor level.

If the machine is to be located on an upper floor of timber construction, it should be placed directly over a beam or girder, near a wall, or at some other spot where displacement of the floor will be at a minimum.

Floor Stands

The MYFORD steel cabinet stand makes an ideal support for the Lathe. See Figs. 15, 16 and 17. Wooden benches are not recommended, as they are affected by moisture and atmospheric changes. Despite the rigidity of the Lathe a warping bench can upset the level of a Lathe in the space of a few days, and greatly impair its accuracy.

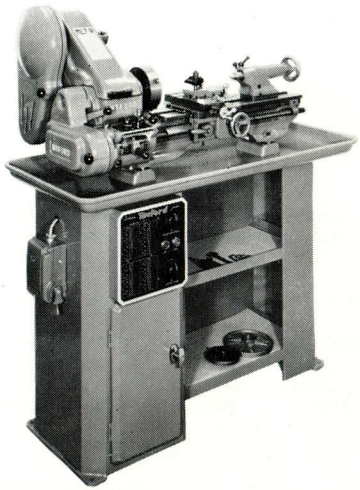


Fig. 15. Lathe mounted on Industrial Cabinet Stand with built-in coolant service.

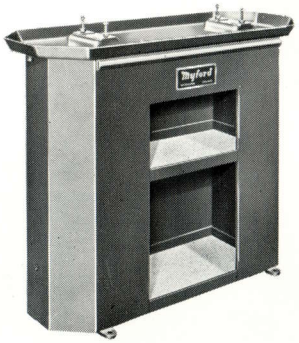


Fig. 16. Tray-top Cabinet with deep tray, raising blocks and terminal block only.

Fig. 17. Tray-top Cabinet as Fig. 16 but with drum type switch.

Myford Range of Lathe Cabinets

If the user is compelled to use a wooden bench, good dry timber must be used. The structure should be solidly built, well braced and should be securely bolted to the floor. A piece of steel sheet should be placed on the bench top to prevent the Lathe feet from sinking into the wood surface under the bolting down pressure. The MYFORD drip tray see Fig. 18, will serve very well for this purpose.

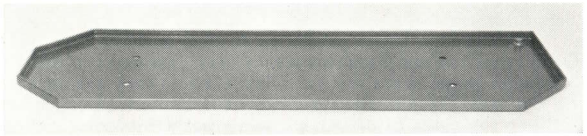


Fig. 18. Drip Tray.

Lathe Height

A bench height of 33-34 inches is suitable for the man of average height. Alternatively, a comfortable working height can be gauged by arranging the Lathe so that the upper surface of the topslide is at elbow height.

Before bolting down, the floor stand should be packed under the feet until the top surface is roughly level.

Levelling the Lathe

If the Lathe is not properly levelled, the Lathe bed may be twisted, resulting in misalignment of the headstock or tailstock with the ways, causing the lathe to turn and bore taper. ACCURATE WORK CANNOT BE EXPECTED IF THE LATHE IS NOT LEVEL.

The precision built into a Lathe can be completely nullified by faulty, uneven bolting on bench or floor stand.

Levelling should be carried out by placing shims of thin metal or asbestos sheet jointing under the Lathe feet, the amount of packing being determined with an Engineer's precision level. Where the Lathe is mounted on raising blocks having jackscrews, packing shims are not required. The level, which should be sufficiently sensitive to read to ·003″ per foot or better, should be placed across the bed at both the headstock end and the tailstock end. See Fig. 19. After bolting down re-check for level, and make any further necessary adjustments.

Do not try to level the Lathe by packing under the cabinet or bench.

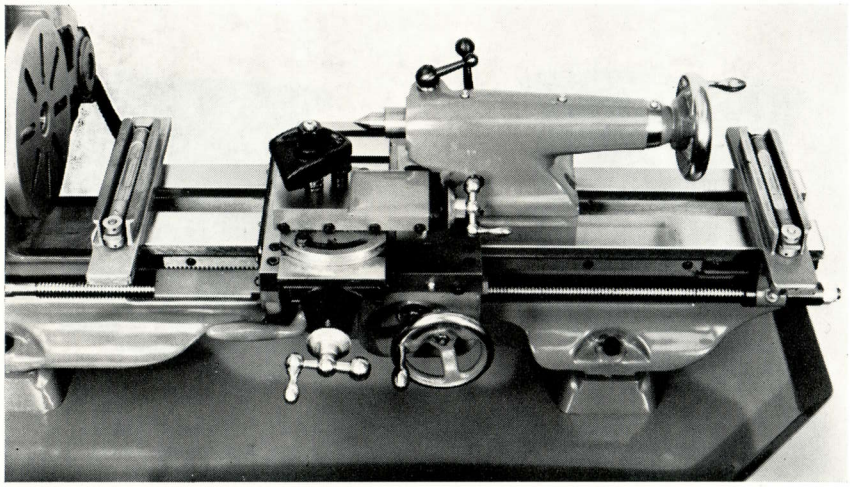


Fig. 19

Levelling with a Dial Test Indicator

If a precision level is not available, use a dial test indicator in the following manner, to ensure that no distortion of the lathe bed takes place when bolting down:—

Place the Lathe on the bench or floor stand with the holding down bolts loosely in position.

Grip a piece of 1″ diameter material in the chuck with approximately 8″ protruding, and clamp the dial indicator in the tool post with the plunger located at the extreme end of the test bar as shown in Fig. 20.

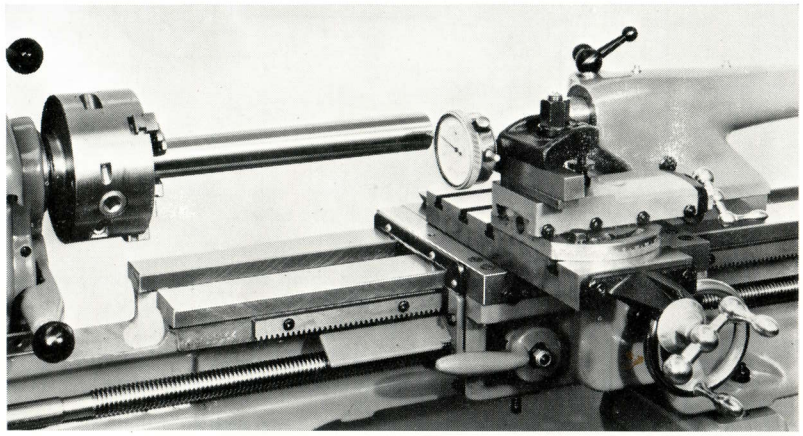


Fig. 20
Showing test piece in chuck and
dial indicator in tool clamp.

Rotate the headstock spindle by hand, and adjust the dial indicator, so that the zero mark lies midway between the extremes of the pointer movement.

So long as the lathe bed is not strained the dial indicator will continue to register zero but any distortion due to bolting down on to an uneven surface will be shown immediately by the dial indicator.

The lathe feet should be shimmed, so that, when the holding down bolts are finally tight, the dial indicator still reads zero.

Checking the Levelling

A final check of the levelling can be carried out by turning a test piece as shown in Fig. 21. The test piece should be approximately 1″ dia. by 4″ to 6″ long and should be relieved in the middle so as to leave about ½″ for test turning at each end.

Take a very light finishing cut (·002″) across both collars, without the use of the tailstock and without alteration of the tool setting. Measure the dia. of each collar with a micrometer. The collars should be the same dia., if not the same, a further adjustment of the packing is required.

If the dia. of the test piece is larger at the free end, packing should be increased under the FRONT of the foot at the tailstock end, or under the BACK of the foot if smaller.

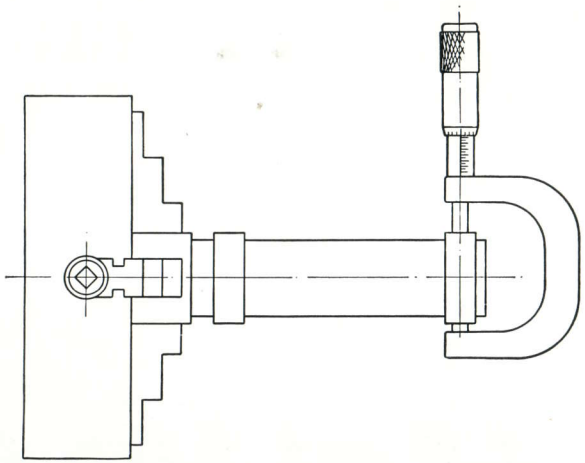


Fig. 21
Showing test piece with two collars.

Readjustment

It may be necessary to readjust the packing shims from time to time, especially if the lathe is mounted on a wooden floor or bench.

Electric Motors and Switch Wiring

ML7-R Lathes are designed for use with 1,420/1,450 r.p.m. full load speed electric motors of ½ h.p. 3 phase and certain single phase of ¾ h.p. Resilient mounted motors are recommended.

All single phase motors which are required for reversing duty will need to have four terminals for connection to the reversing switch. Should only two terminals be provided, it will not be possible to use the motor, unless the two wires which feed the motor starting windings can be brought out separately.

Switches

MYFORD cabinet stands are fitted with a reversing switch which is already connected to a terminal block at the back of the stand. See Figs. 22 and 23 .The Lathe motor and mains supply should be connected to the appropriate terminals as indicated in Figs. 26 and 27. NOTE THE EARTHING TERMINAL TO THE LEFT OF THE TERMINAL BLOCK.

Stands (20/039 and 20/040) fitted push button starters

On stands fitted with push button starters the electricity supply must not be connected to the terminal block at the back of the Lathe but direct into the push button starter (for single phase connect to L1 and L3).

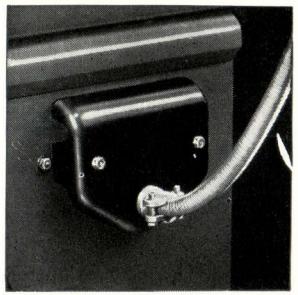


Fig. 22

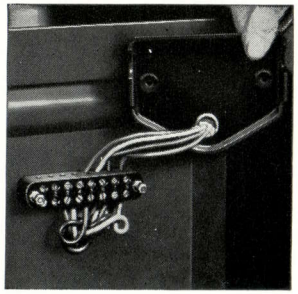


Fig. 23

Close-up of terminal Block with and without cover.

The DRUM TYPE reversing switch, see Figs. 24 and 25 is the most suitable type of switch for use with a bench mounted Lathe, being completely shrouded and easily mounted. A mounting bracket is available for the attachment of the drum type switch to the front of the Lathe in a convenient operating position. See Fig. 25. This bracket can be fitted to standard change gear machines only.

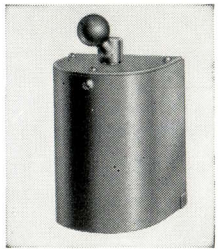


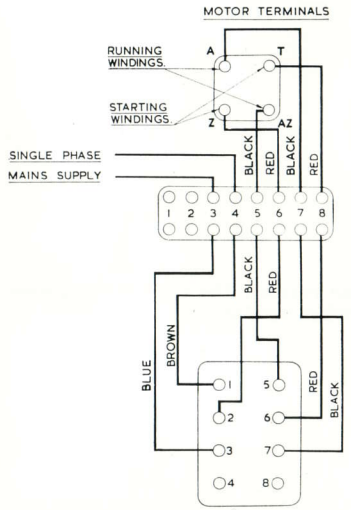
Fig. 24
Drum Type Switch

Fig. 25
Drum Type Switch Mounted on Switch Bracket

The connections for drum type reversing switches are shown in Figs. 26 and 27.

When single phase motors are supplied with Bench Lathes, but without switchgear, the terminals are 'bridged' at the MYFORD works for plain 'ON-OFF' starting. These bridge pieces must be removed before a reversing switch can be used. When a single phase motor is to be connected to a reversing switch **always check that there are no links** connecting the starting to the running windings.

Wiring diagrams for motors used in conjunction with Dewhurst drum type reversing switch.



For terminal markings for other makes of motor see page 14, Fig. 28.

Fig. 26. Single Phase.

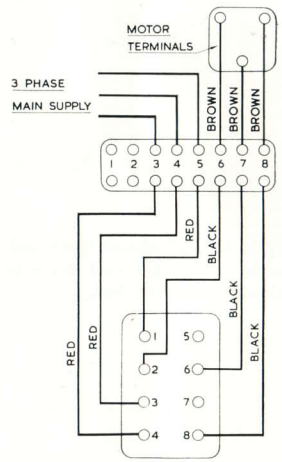


Fig. 27. Three Phase.

Earthing

It is important to make sure that the cabinet and the Lathe are electrically connected to a satisfactory earthing point. Should any difficulty be found in wiring and running the motor the advice of an electrician who is competent in motor wiring should be sought.

Connection Diagram—Santon Rotary Reversing Switch

MOTOR	STARTING WINDING	RUNNING WINDING	RUNNING WINDING	STARTING WINDING
CROMPTON	Z	A	A2	T
AEI	A1	T2	T3	A2
ENGLISH ELECTRIC	1	2	3	4
BROOK	Z1	A1	A2	Z2

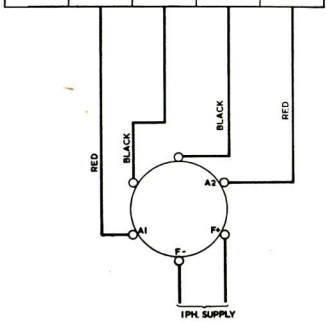
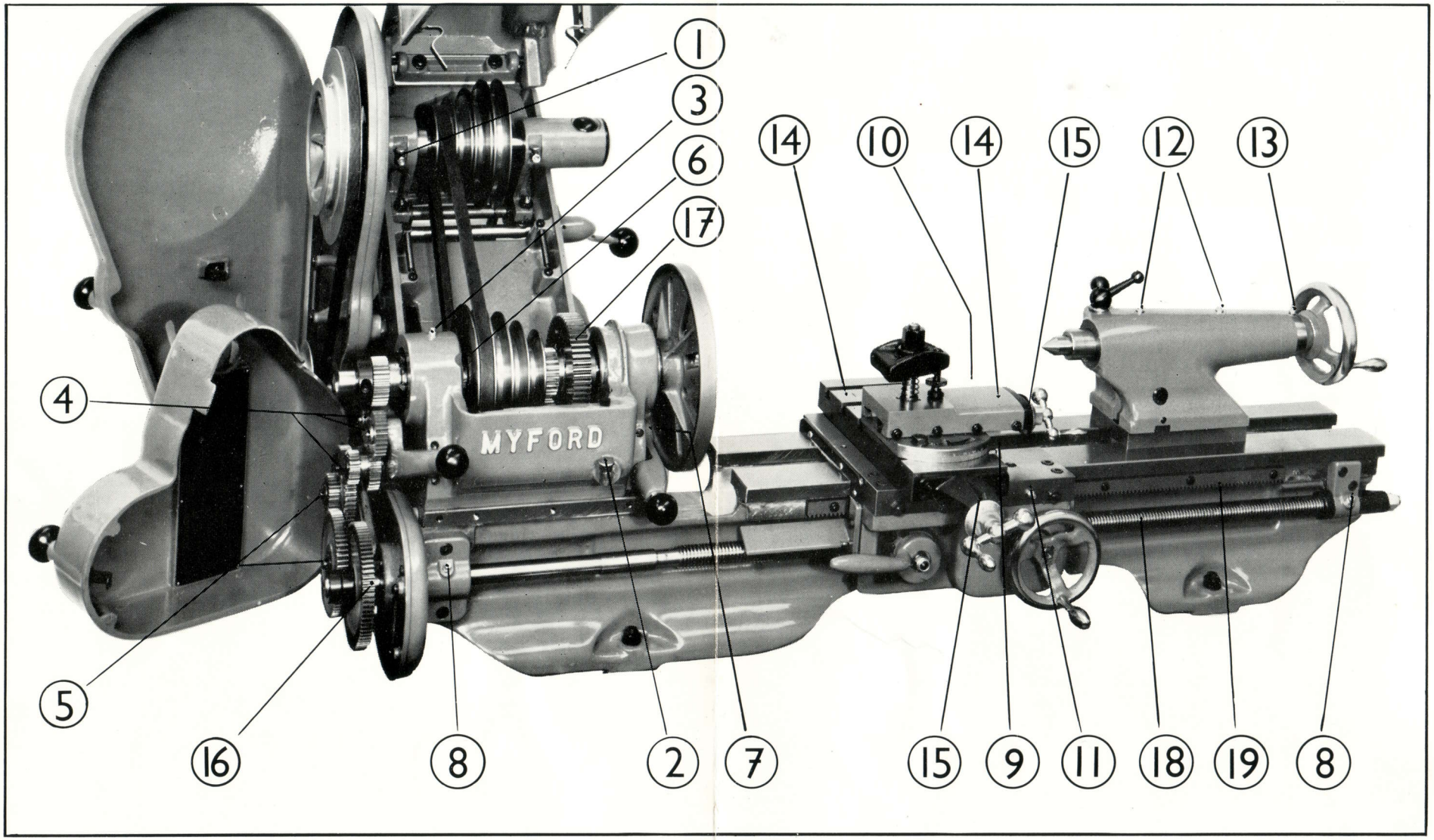


Fig. 28

N.B. Fig. 26 shows terminal markings for Crompton motors. The table above shows alternative terminal markings—equally applicable when connecting other motors to drum type switches.



LUBRICATION CHART — except where otherwise specified use Esso Nuto H32 (I.S.O. Specification 3448/1975(E) — formerly Nuto H44)

1. **Countershaft bearings.** Replenish the two oil cups daily.
2. **Headstock front bearing.** Replenish the oil cup twice daily.
3. **Headstock rear bearing.** Lubricate with the oil gun daily.
4. **Tumbler gear studs.** Lubricate with the oil gun twice daily.
5. **Changewheel studs.** Lubricate with the oil gun twice daily.
6. **Headstock pulley.** Lubricate with the oil gun twice daily whenever the reduction gear is in use.
7. **Backgear spindle.** Lubricate with the oil gun twice daily whenever the reduction gear is in use.

8. **Leadscrew brackets, L.H. & R.H.** Lubricate with the oil gun weekly.
9. **Saddle, front shear.** Lubricate with the oil gun daily.
10. **Saddle, rear shear.** Lubricate with the oil gun daily.
11. **Apron reservoir.** Replenish with the oil gun daily. This lubricates the handwheel and rack pinion shafts, also the reduction gear.
12. **Tailstock barrel.** Lubricate with the oil gun daily.
13. **Tailstock thrust.** Lubricate with the oil gun daily.
14. **Cross-slide and topslide ways.** Clean and apply an oil of viscosity S.A.E.30 weekly.

*15. **Cross-slide and topslide feedscrews.** Using oil of viscosity S.A.E.30 lubricate from underneath twice weekly.

*16. **Change gear teeth.** Lubricate with oil of viscosity S.A.E.30 daily.

*17. **Reduction gear teeth.** Lubricate with oil of viscosity S.A.E.30 daily whenever the reduction gear is in use.

*18. **Leadscrew.** Clean with a stiff brush and apply oil of viscosity S.A.E.30 weekly.

*19. **Rack.** Lubricate with oil of viscosity S.A.E.30 weekly.

NOTE: We supply and recommend Esso Nuto H32 (formerly Nuto H44) or equivalent for general lubrication. Where oil of viscosity S.A.E.30 is specified, any good motor oil of this number will be satisfactory.
For starred items, nos. 15, 16, 17, 18 and 19, Rocol MTS1000 grease should be used in those territories where it is available.

LUBRICATION

After installing the Lathe, refer to the lubrication chart on pages 15 and 16 and treat all points with the recommended lubricants. An oil gun is supplied for use with the pressure nipples fitted to each machine. Careful attention should be paid to the lubrication of the headstock bearings, particularly during the first few hours of running.

Headstock Spindle

The front bearing is lubricated from the oil cup mounted on the front of the bearing housing. The cup should be replenished twice daily. The rear bearings require lubrication only once daily. A nipple is provided on the top of the rear bearing housing.

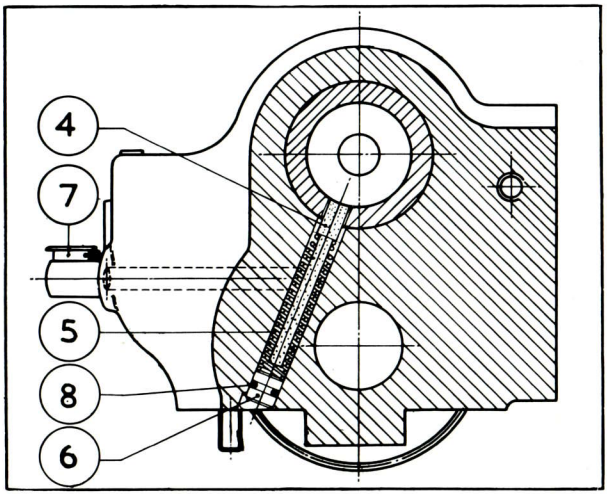


Fig. 29

Fig. 29 is a section through the headstock, showing No. 7 the Lubricator, No. 4 the Wick, No. 5 the Spring, No. 6 the Retaining Plug and No. 8 an 'O' Ring, all for the front bearing lubrication.

It will be observed that the end of the Wick is in contact with the spindle and it should be noted that the arrangement has been so designed that provided the oil cup is replenished twice daily adequate lubrication is provided right through the speed range.

Countershaft

The hardened steel countershaft runs in oil impregnated bronze bearings which are located in the swing head. Oil cups are provided for occasional lubrication. The countershaft clutch (if fitted) pulley is mounted on 'sealed for life' ball bearings which do not require any attention.

IMPORTANT: WHENEVER THE HEADSTOCK REDUCTION GEAR IS USED, ENSURE THAT THE HEADSTOCK PULLEY BEARING IS WELL LUBRICATED VIA THE OIL NIPPLE AT THE LARGE END OF THE PULLEY. Fig. 30.

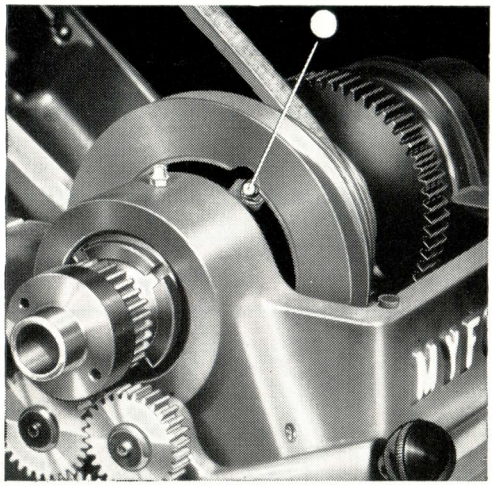


Fig. 30. Showing the oil nipple for headstock pulley bearing lubrication.

General

Daily cleaning and correct lubrication of the machine will greatly increase its working life. Excess oil should be wiped from oiling points, as oil and dirt form an abrasive compound which can easily damage precision bearing surfaces.

Wipe the bed and other sliding surfaces with a clean oily rag at frequent intervals. Use a brush to clean spindle nose threads, gear teeth, leadscrew threads etc.

At regular intervals, the leadscrew should be thoroughly cleaned with a stiff brush and paraffin, and oiled freely along its entire length.

Keep the Lathe completely covered between working periods. The MYFORD waterproof Lathe cover shown in Fig. 31 will provide excellent protection when the Lathe is not in use.

Fig. 31. Lathe cover.

CONTROLS & ADJUSTMENTS

DO NOT OPERATE THE LATHE until all the following instructions have been carefully read and the controls and adjustments are fully understood.

Headstock Spindle Drive

The vee cone pulleys on the motor, countershaft and headstock spindle in conjunction with the reduction gear, give a range of 14 speeds. Fig. 32.

The two fastest backgeared speeds are approximately the same as the two slowest ungeared speeds. They are not shown and should not be used.

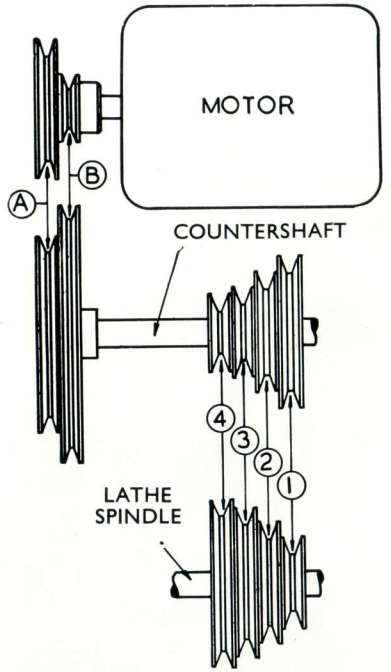


Fig. 32

Headstock Spindle Speeds
(1420/1450 R.P.M. Full Load Speed Motor)
Spindle Speeds with 1750 R.P.M. (60 Hz A.C.) Motor in Brackets

Motor Drive Belt Position	Headstock Drive Belt Position	Ungeared	Geared
A	1	2105 (2525)	—
A	2	1480 (1775)	—
A	3	1050 (1260)	135 (162)
A	4	740 (890)	95 (114)
B	1	600 (720)	77 (92)
B	2	420 (505)	54 (65)
B	3	300 (360)	39 (47)
B	4	210 (250)	27 (32)

Speed Changing

Access to the headstock belt for speed changing is attained by lifting up the front guard, as shown in Fig. 33 and the headstock belt tension is released by the operation of the belt tensioning lever.

DO NOT ATTEMPT TO CHANGE THE HEADSTOCK BELT POSITION WHILST THE LATHE IS RUNNING, NOR WITHOUT OPERATING THE BELT TENSIONING LEVER

The six lower speeds of the available range of 14 spindle speeds are achieved through the headstock reduction gears. As supplied, the machine is set for direct (or ungeared) drive, i.e. the headstock cone pulley is coupled to the 60T 'bull' gear which is in turn keyed to the spindle.

To engage the reduction gears release the pulley coupling by rotating the half circular key (fitted to the 60T 'bull' gear) through 180 degrees. The two positions of the key operating lever are positively determined by ball and spring.

Release the plunger which locates the reduction gear lever and reset in the upper position to engage the reduction gear cluster with the 60T 'bull' gear and the cone pulley sleeve gear.

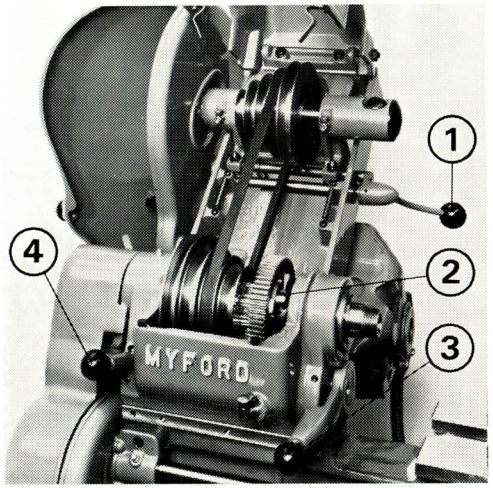


Fig. 33. Location of the Headstock Controls.

(1) BELT TENSION RELEASE LEVER

(2) LEVER FOR BACK GEAR KEY

(3) BACK GEAR LEVER

(4) TUMBLER REVERSE LEVER

DO NOT ATTEMPT TO ENGAGE THE REDUCTION GEARS WHILST THE SPINDLE IS REVOLVING

Adjustment of reduction gear cluster engagement

Release the headstock pulley coupling and engage the reduction gear cluster.

Place a wedge between the reduction gear cluster (1) and the inside of the headstock casting, as shown in Fig. 34. This will load the eccentric shaft (2) and so prevent movement.

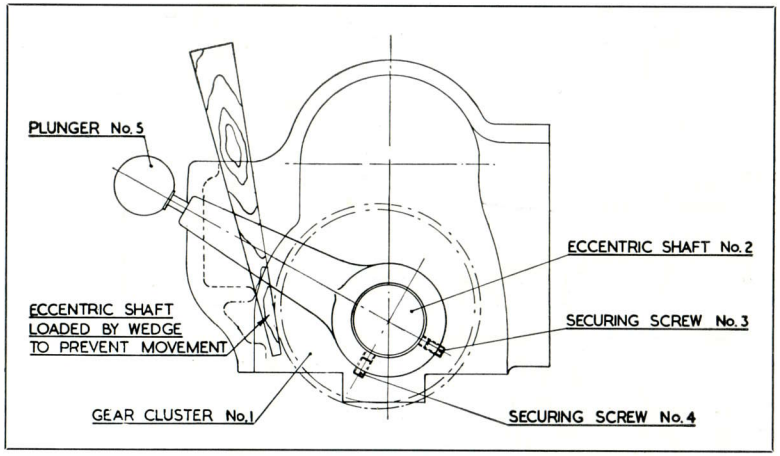


Fig. 34. Showing reduction gear adjustment.

Release the lever securing screws (3 and 4) and withdraw the lever plunger (5). Adjust the lever in relation to the eccentric shaft and tighten the securing screws. Remove the wedge, restore the lever plunger and check the backlash.

Replacement of reduction gear cluster

Remove circlip (parts list H77) which retains gear cluster. Release securing screws (Fig. 34, Nos. 3 and 4), withdraw plunger (5) and remove back gear lever. Withdraw 2 B.A. socket set screw (parts list H26) at front end of headstock, which was partially obscured by backgear lever, also the retaining screw (H71), which is inserted through the upper hole for the plunger for the back gear lever.

Withdraw eccentric (H78).

Headstock spindle bearings

IMPORTANT—The bearings are carefully adjusted at the works and should not be interfered with unless adjustment is necessary. Damage can be caused by faulty adjustment and the following notes and drawings should be carefully studied before attempting adjustment.

As shown in Fig. 35 the headstock bearing layout combines a tapered front journal with twin angular contact ball bearings at the rear. Front journal clearance is adjusted by axial movement of the spindle relative to the tapered bush.

In considering the ball bearings it will be noted that the outer races of each bearing are separated by a spacing washer, and that both outer races and spacer are therefore capable of, and intended to be, locked solid together by screwed rings, Nos. (1) and (2).

As the inner races have no spacer they can be loaded by end pressure arising from the adustment of collar (No. 4).

(**Note.** The spacing washer is cut away to permit oil to reach the ball bearings. Should the bearings be removed from the headstock care must be taken when replacing to ensure that this cut-away section is opposite the oil nipple.)

Examination of Fig. 35 will show that the ball bearings are held between the spindle thrust shoulder (5) and the adjusting collar (4), by the distance sleeve (6) and the sleeve gear (7) which act as spacers.

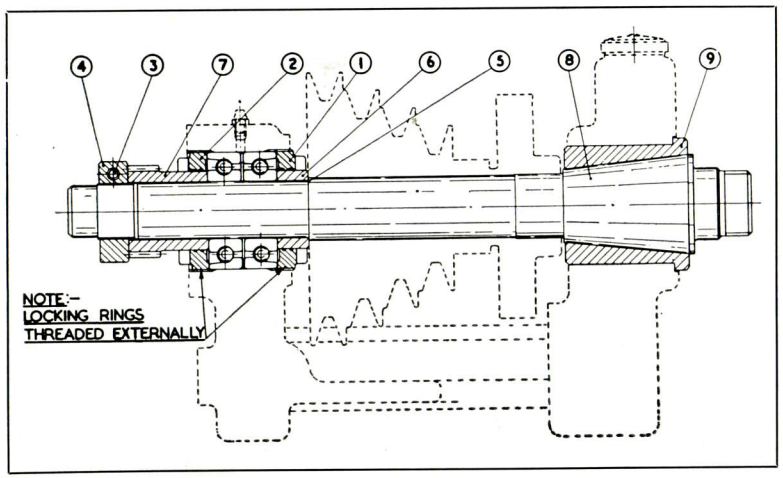


Fig. 35. Showing headstock spindle layout.

It follows that any axial displacement of the ball bearings will result in a similar displacement of the spindle. This in turn will affect the radial clearance between the tapered front journal (8) and the bronze bush (9).

The externally screwed rings (1) and (2) permit very fine axial setting of the spindle with resulting critical control over front journal clearance.

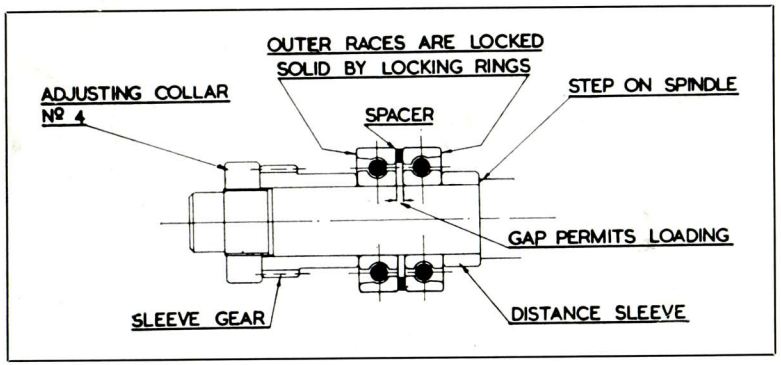


Fig. 36

ADJUSTMENT OF SPINDLE BEARINGS

1. To free spindle from front bush

Rotate locking ring (1) using the 'C' spanner provided, the top of the locking ring being turned towards the operator. Rotate locking ring (2) in the same direction until the ball bearings contact the locking ring (1) and the outer races are again locked together. This procedure moves the ball bearings and spindle bodily forward to a position free of the front bush as shown in Fig. 37.

IMPORTANT. Adjustment of rear ball bearings for correct loading cannot be made until the spindle is completely freed from the front bush. Please note that all threads are right hand.

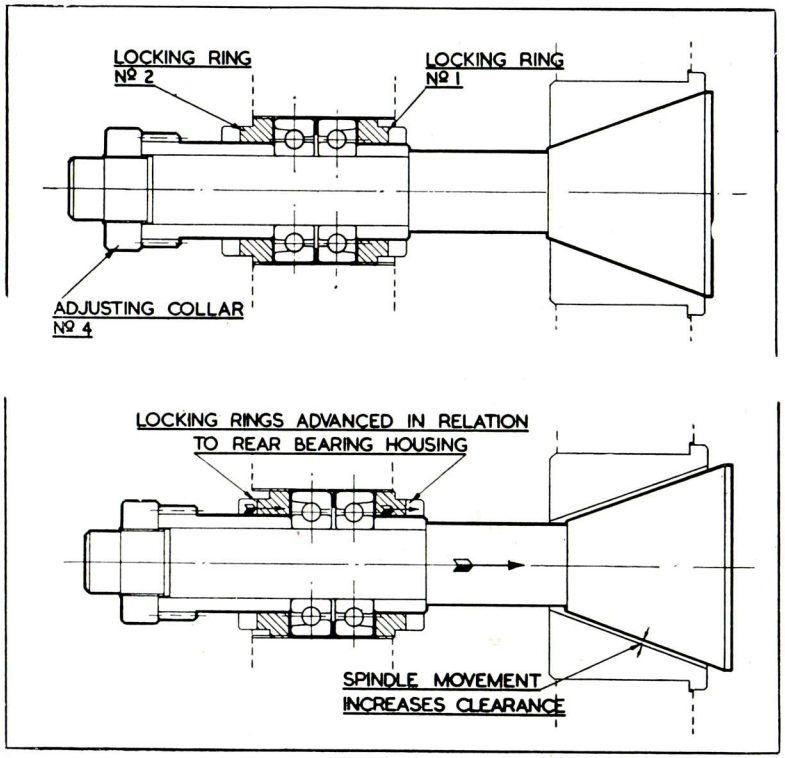


Fig. 37. Showing spindle movement exaggerated.

2. Loading the rear ball bearings

Refer to Fig. 35. Slacken screw (3) just sufficiently to allow adjusting collar (4) to be turned. Excessive freedom in the collar thread may allow the thrust face to move out of square and affect the setting of the ball bearings when the screw (3) is tightened. Rotate collar (4) clockwise (looking on end of spindle) to increase the loading.

3. Adjusting the front bearing

The correct clearance between the spindle cone and tapered bronze bush can now be restored. Move the ball bearings and spindle back until the spindle cone contacts the tapered bush and will not rotate, i.e. to a condition of no clearance. Clearance can now be set by moving the spindle forward from this 'solid' position by a $\frac{1}{4}$ in. rotation of the rim of the locking rings (i.e. 15 degrees). This provides a preliminary setting which may be varied according to running conditions.

Note. The ball races should not be loaded more than is necessary to remove all traces of spindle end play. **OVERLOADING WILL CAUSE RAPID DETERIORATION OF THE SPINDLE BEARINGS.** The races are a close fit on the spindle and, should collar (4) be overtightened, it may be necessary (after slackening) to tap the end of the spindle lightly to ensure that the ball races regain a free position.

Clutch (if fitted)

Reference to Fig. 38 will show that the countershaft clutch consists of a coned metal driving member, the clutchplate (3) which is tenoned into the end of the countershaft, and normally held in engagement with the tapered cone of the pulley (4) by a compression spring (6) which is inserted into the hollow countershaft (7) between the shoulder in the bore of the shaft and the head of the push rod (1).

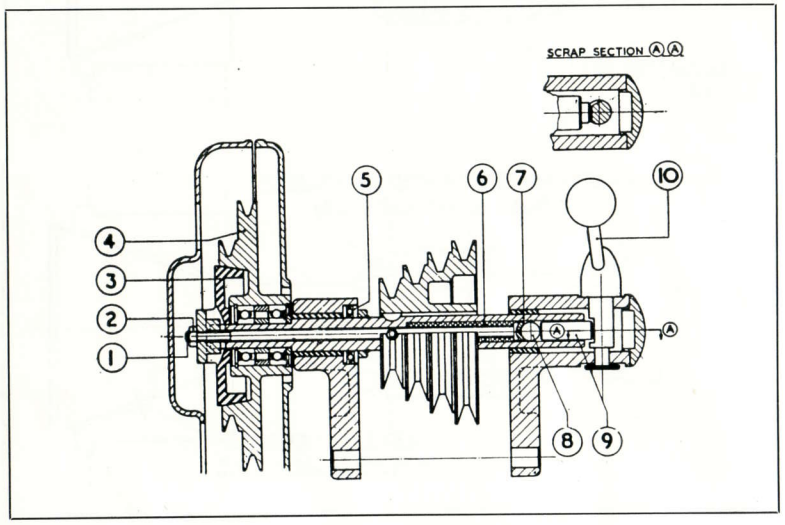


Fig. 38. Showing countershaft clutch layout.

The clutch is engaged or disengaged by rotation of the cam shaft assembly (10). Scrap Section A-A on the illustration shows that this has two flats machined on it. The larger flat corresponds to the engaged position of the clutch (lever knob close to headstock belt drive guard) and the smaller one, to the disengaged position (lever knob moved to the right). The flats operate on the push bar (9), thence to the push rod (1) via the steel ball (8).

During the early life of the machine, a certain amount of bedding in takes place between the clutch plate and the pulley, and it may be necessary to reset the push rod (1). This is screwed into a threaded hole in the clutch plate, and secured by the hexagon nut (2).

The clutch is correctly adjusted when there is 0·005″ to 0·010″ clearance between the push bar (9) and the larger flat on the cam shaft lever assembly (10), with the clutch engaged. (Approximately 45° to 90° rotation of the push rod from the 'no clearance' setting.) This clearance may be obtained by releasing the hexagon nut (2) and rotating the push rod (1), relative to the clutch plate (3), clockwise to reduce the clearance, and anti-clockwise to increase the clearance. (Play in operating lever about 5°).

N.B. The ball bearings in the pulley (4) are 'sealed for life', are pre-packed with grease, and do not need further lubrication. The hardened countershaft runs in 'Oilite' bearings. Oil is fed to the OUTSIDE of these bearings via the oil cups (Section Q. Part No. 7). They should be filled at regular intervals with Esso Nuto H32 Oil or equivalent. The ball thrust bearing (5) will be lubricated by 'Surplus' oil from the left hand countershaft bearing.

Erratum
Dials on both cross-slide and topslide give 0.001″ movement per division.

Tumbler reverse

The Tumbler Reverse or Leadscrew Reverse gear, provides a quick means of changing the rotation of the leadscrew drive to reverse the direction of travel of the lathe carriage. The central lever position is neutral and disengages the leadscrew drive.

Reference to Fig. 39 will show that the tumbler reverse assembly is supported on the headstock by a long swivel pin (1) which is a press fit in the tumbler reverse lever (2). The assembly is retained in position by the thrust screw (3) which draws the tumbler reverse lever back against the pivot boss facing on the headstock.

NOTE. It is important that the thrust screw (3) be set with light pressure only. Heavy pressure may extract the swivel pin (1) from its position in the tumbler reverse lever.

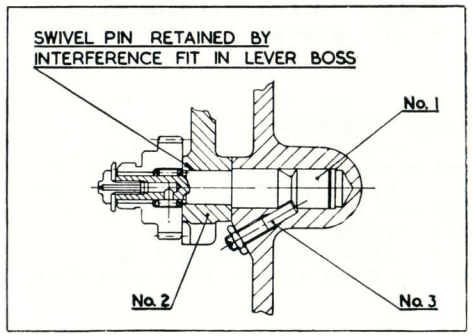


Fig. 39

Carriage controls

Fig. 40 gives the names and positions of the carriage controls. The apron handwheel moves the carriage along the bed, and the cross slide and top slide ball handles move the tool post in and out.

The cross slide feedscrew dial graduations represent slide movements in increments of ·001″, whereas the topslide is graduated in increments of ·002″.

On machines fitted with metric feedscrews, each division of the micrometer dial on the cross slide represents 0·05 mm off work diameter, and on the top slide, 0·05 mm movement.

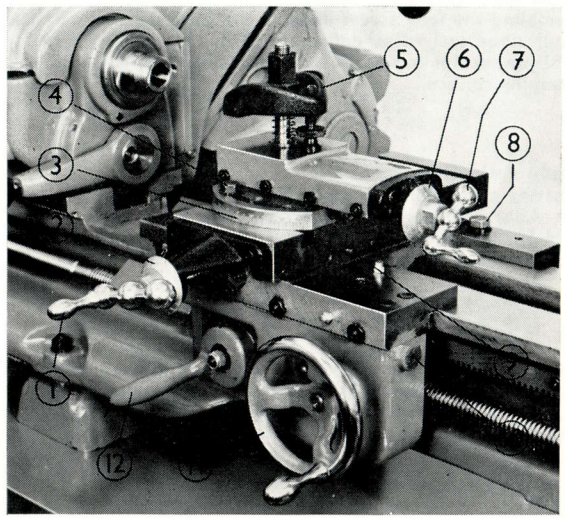


Fig. 40. Showing the carriage controls.

(1) Cross-slide ball handle
(2) Cross-slide micrometer dial
(3) Topslide base graduations
(4) Topslide base clamp bolt (2)
(5) Tool clamp
(6) Topslide micrometer dial
(7) Topslide ball handle
(8) Saddle clamp
(9) Cross-slide locking screw (2)
(10) Thread dial indicator mounting point
(11) Apron handwheel
(12) Leadscrew nut lever

A clamp screw (8) is provided on the saddle to lock the carriage to the bed for facing, parting off, and milling etc., CARE SHOULD BE TAKEN TO SEE THAT THE CLAMP SCREW IS NOT TIGHTENED WHEN THE CARRIAGE IS TRAVERSED BY THE LEADSCREW.

Two socket set screws, (9) on Fig. 40, visible on the parts list as C71, are fitted to provide cross slide clamping. (The two which project app. ¼″). This gives extra rigidity when carrying out certain milling and boring operations.

Longitudinal Feed

Depress the half-nut lever to engage the half nuts with the leadscrew when longitudinal movement of the carriage is required.

If the half-nuts do not engage immediately, DO NOT USE FORCE. Wait until the leadscrew rotates to a position which permits engagement of the half-nut by gentle pressure only.

The thread dial indicator will give visual guidance and show when the leadscrew is in the correct position for nut engagement.

Saddle and Slide Rests

All slides are provided with normal gib adjustment, and steel plates are fitted beneath the saddle to prevent saddle lift. These plates bear on the underside of the lathe bed and adjustment to ensure close contact is by means of laminated shims. These have a solid appearance, but are made up of 0·002″ laminations. By inserting a pen-knife blade it is an easy matter to peel off the desired thickness to allow the strips closer contact with the lathe bed.

The saddle and compound slides on a centre lathe are designed to withstand the cutting force of the tool and it is therefore necessary to maintain, by periodic adjustment, the close contact of gib strip and slide surface. Careful attention should be given to the screw adjustment to ensure an even pressure of the gib strip.

When stripping the compound slides for thorough cleaning and lubrication re-adjust the slides without feed screws and screw support brackets, testing the slides by hand motion, re-assembling the feed screw units as the last operation. By the very fact that the slides are built upon each other deflection of the turning tool is transmitted through the slides; so it is important to see that your lathe tool has the minimum overhang and is flat on its clamping surface.

Saddle Gib Strip Adjustment

When adjusting the saddle gib strip, first adjust the two outer screws, ensuring equal pressure. After tightening the locknuts, check for freedom of movement but without play. Next, adjust the inner screws, so that they contact the strip without increasing the friction and tighten their locknuts.

Apron

The apron is anchored to the saddle by means of four socket head screws, and a periodic check should be made to ensure that these screws are tight.

The 2 B.A. x 1¾″ cap screw (parts list, L14) must be so adjusted that the leadscrew nut will not close sufficiently to cause it to bind on the leadscrew.

The Tailstock

The Tailstock is securely locked to the bed by the quick-acting clamp lever which is located at the rear of the tailstock, Fig. 41.

The barrel is locked in place by means of the thumb lever, also at rear.

The Tailstock can be set-over 7/16″ for taper turning, by first loosening the bed clamp and then adjusting the screws which are located in the tailstock body, directly above the base tenon. A zero mark is engraved at the end of the tailstock to serve as a rough guide to set-over amounts, and to assist in returning the tailstock to its normal position for parallel turning.

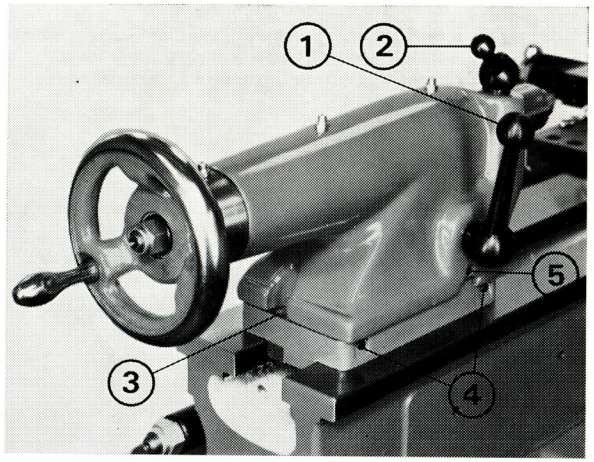


Fig. 41. Rear view of the tailstock.

(1) CLAMP LEVER
(2) BARREL LOCKING LEVER
(3) GIB SECURING SCREWS
(4) GIB THRUST SCREWS
(5) SET OVER SCREW

Tailstock Gib Adjustment

Refer to Fig. 42. Release gib securing screws (1) and retighten until just nipped.

Adjust thrust screws (2) just sufficiently to remove all trace of play of the tailstock relative to the bed shears, but without causing undue friction.

Retighten gib securing screws and check for freedom of movement but lack of 'play'.

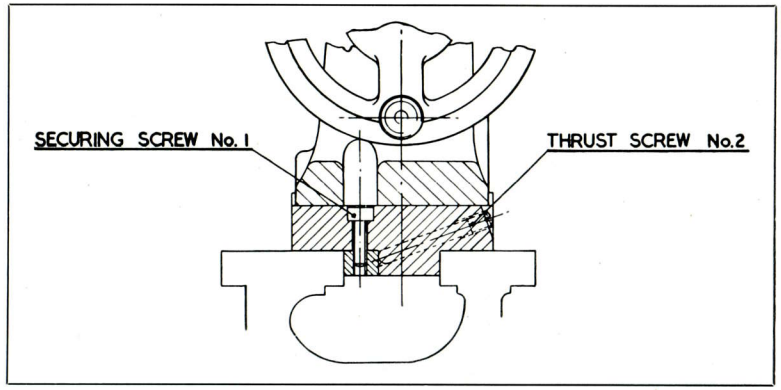


Fig. 42

Power Carriage Feeds

Standard change gear lathes are equipped with a set of 14 change wheels for cutting various screw threads and obtaining various power longitudinal feeds.

To set up the lathe for threading or feeding, refer to the change wheel chart inside the change wheel guards Figs. 44 and 45.

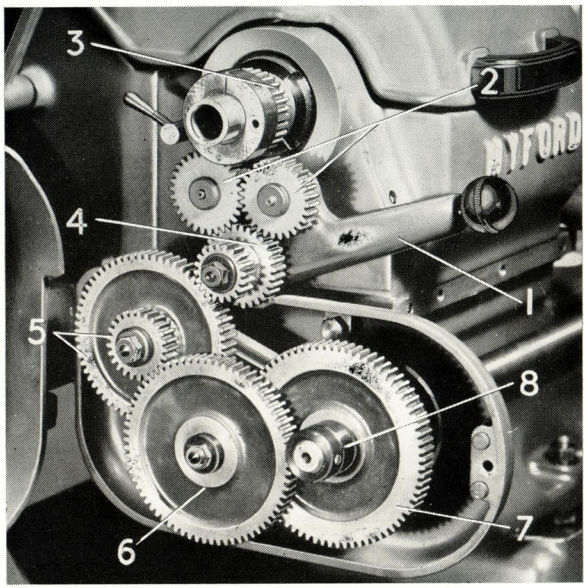


Fig. 43. Showing Leadscrew Drive.

(1) TUMBLER REVERSE LEVER
(2) TUMBLER REVERSE GEARS
(3) 30T SPINDLE GEAR
(4) TUMBLER SLEEVE GEAR
(5) 1st STUD GEARS
(6) 2nd STUD GEARS
(7) LEADSCREW GEAR
(8) SPACER

The thread pitch, or feed, to be set up will be located in the first two columns under the headings T.P.I. and Feed per Rev., respectively. In the third column under the heading DRIVER is listed a number of teeth in the change wheel which should be placed on the tumbler sleeve gear.

In the fourth and fifth columns under 1st stud and 2nd stud are shown the gears or pairs of gears which should be placed on the 1st and 2nd studs respectively.

The sixth column lists the gear to be placed on the leadscrew under the heading LEADSCREW.

The column headed SET-UP refers to the number of the diagram, Fig. 46, which will indicate the arrangement of gears and spacers for the pitch in question; see also Fig. 43 which shows set-up as in Diagram 3, Fig. 46.

When setting up the gear train sufficient backlash between each pair of meshing gears should be allowed. When the lathe is in operation the play in the gears is automatically taken up according to the direction of travel; the amount of gear clearance does not influence the accuracy of thread cutting. Gear noise can be reduced by the application of grease, preferably graphited.

INCH PITCHES Fig. 44

T. P. I.	FEED PER REV.	DRIVER	1ST. STUD		2ND. STUD		LEAD SCREW	SET-UP
			DRIVEN	DRIVER	DRIVEN	DRIVER		
8	·1250"	20	IDLE 75 WHEEL		——	——	20	1
9	·1111"	40	IDLE 60 WHEEL		——	——	45	1
10	·1000"	40	IDLE 60 WHEEL		——	——	50	1
11	·0909"	40	IDLE 60 WHEEL		——	——	55	1
12	·0833"	40	IDLE 50 WHEEL		——	——	60	1
14	·0714"	20	IDLE 70 WHEEL		——	——	35	1
16	·0625"	20	IDLE 70 WHEEL		——	——	40	1
18	·0556"	20	IDLE 70 WHEEL		——	——	45	1
19	·0526"	40	38	20	IDLE 55 WHEEL		50	2
20	·0500"	20	IDLE 70 WHEEL		——	——	50	1
22	·0455"	20	IDLE 70 WHEEL		——	——	55	1
24	·0417"	20	IDLE 70 WHEEL		——	——	60	1
25	·0400"	40	50	30	IDLE 45 WHEEL		75	2
26	·0385"	20	IDLE 70 WHEEL		——	——	65	1
28	·0357"	30	35	20	IDLE 50 WHEEL		60	2
32	·0313"	30	40	20	IDLE 55 WHEEL		60	2
36	·0278"	30	45	20	IDLE 55 WHEEL		60	2
40	·0250"	30	50	20	IDLE 55 WHEEL		60	2
44	·0227"	20	55	30	IDLE 50 WHEEL		60	2
46	·0217"	20	46•	30	IDLE 45 WHEEL		75	2
48	·0208"	20	60	35	IDLE 45 WHEEL		70	2
52	·0192"	20	50	25	IDLE 55 WHEEL		65	2
54	·0185"	20	45	20	IDLE 55 WHEEL		60	2
60	·0167"	20	50	25	IDLE 55 WHEEL		75	2
64	·0156"	35	40	20	60	30	70	3
72	·0139"	25	50	30	45	20	60	3
80	·0125"	25	50	35	70	30	75	3
88	·0114"	30	40	25	55	20	75	3
92	·0109"	20	46•	30	50	20	60	3
96	·0104"	30	40	20	60	25	75	3
104	·0096"	20	50	30	60	25	65	3
	·0087"	20	55	30	60	25	65	3
112	·0089"	25	50	30	60	20	70	3
120	·0083"	20	50	30	60	25	75	3
	·0058"	20	55	25	60	20	65	3
	·0043"	20	60	25	65	20	75	3
	·0037"	20	65	25	70	20	75	3
	·0018	12*	65	20	70	20	75	3

LEADSCREW 8 THREADS PER INCH

● Not a Standard Gear. Available as an extra.

★ 12/30 tooth fine feed tumbler cluster gear (1974A) available as an extra.

The tumbler reverse lever should not be shifted during thread cutting operations, as such movement may alter the position of the headstock spindle relative to the leadscrew, thereby causing split threads.

METRIC PITCHES Fig. 45

FEED PER REV. MILLIMETERS	DRIVER	1ST. STUD		2ND. STUD		LEAD SCREW	SET-UP
		DRIVEN	DRIVER	DRIVEN	DRIVER		
0·20	21•	50	30	60	21•	70	3
0·25	30	40	21	60	21	70	3
0·30	21	60	45	50	21	70	3
0·35	35	40	21	50	21	70	3
0·40	21	50	21	IDLE 60 WHEEL		70	2
0·45	45	40	21	50	21	70	3
0·50	21	50	45	40	20	60	3
0·60	21	50	45	40	30	75	3
0·70	21	50	21	IDLE 60 WHEEL		40	2
0·75	45	40	35	50	21	70	3
0·80	21	50	45	IDLE 40 WHEEL		75	2
0·90	45	25	21	40	21	70	3
1·00	45	40	21	IDLE 50 WHEEL		75	2
1·10	45	50	55	40	21	75	3
1·20	45	25	30	50	21	60	3
1·25	45	40	21	IDLE 50 WHEEL		60	2
1·30	65	25	21	40	21	70	3
1·40	45	25	35	50	21	60	3
1·50	21	50	45	IDLE 35 WHEEL		40	2
1·60	45	25	21	IDLE 55 WHEEL		75	2
1·75	45	20	35	50	21	60	3
1·80	30	40	45	25	21	50	3
2·00	60	40	21	IDLE 55 WHEEL		50	2
2·25	45	40	60	40•	21	50	3
2·50	45	30	21	IDLE 50 WHEEL		40	2
2·75	55	20	30	40	21	50	3
3·00	45	25	21	IDLE 60 WHEEL		40	2
3·50	60	20	35	40	21	50	3

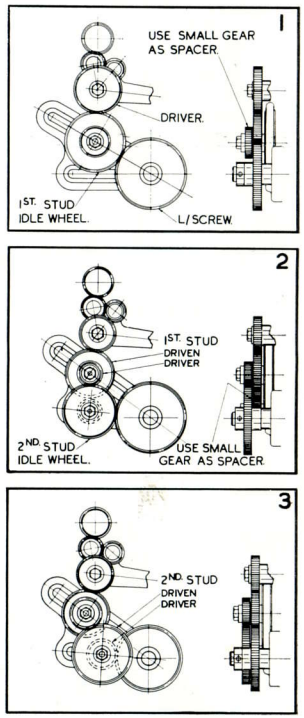


Fig. 46

Thread Dial Indicator

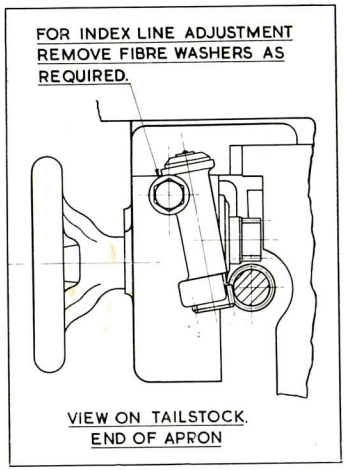


Fig. 47—Thread Dial Indicator Mounting

Every lathe is provided with a machined facing on the right hand side of the apron, drilled and tapped ready to receive this unit. Provision is made for the alignment of the dial markings with the zero mark on the indicator body as shown in Fig. 47. The indicator can be readily engaged or disengaged, and operates as follows:—

(1) For even number threads the clasp nut can be engaged at any numbered mark on the dial.

(2) Odd number threads should always be engaged at the same number or any alternate number.

(3) For half threads per inch, always engage the same number.

(4) For other threads, m/m sizes, etc., it is recommended that the clasp nut should not be disengaged.

Note. Threads that are exact multiples of the leadscrew pitch (8 T.P.I.) do not require the use of an indicator.

Replacement of Headstock Vee Belt

In order to change the vee belt it is necessary partially to dismantle the countershaft and headstock spindles. Both spindles must be withdrawn from their respective bearings sufficiently to allow removal of the vee belt.

The headstock ball bearings are arranged with an interference fit on the spindle diameter. Reassembly will be greatly facilitated if the appropriate portion of the spindle is greased before introduction to the ball bearings.

Countershaft (standard — without clutch)

For both dismantling and reassembly, reference should be made to paragraph 'K' on pages 6 and 7 under 'Assembly instructions of motorising equipment (standard machine').

With the belt tension released, open the primary drive guard. Release the socket set screws securing the countershaft vee cone pulley and the collar QR35. Push the vee cone pulley to the right and rotate the shaft so that the Woodruff key can be withdrawn. Move the cone pulley to the left and withdraw the shaft a sufficient distance to the left to enable the old belt to be removed and the new one fitted over the countershaft.

Reassemble and adjust as at paragraph 'K' on page 7.

Countershaft Clutch Unit (if fitted)

For both dismantling and reassembly reference should be made to Fig. 38 on Page 24 and paragraphs 'c' and 'd' on Page 8 under 'Assembly of motorising equipment'.

With the primary belt drive guard open and belt tensioning lever in the released position, release the grubscrew securing the countershaft cone pulley and rotate the shaft so that the key is near the top but towards the front. Slide the pulley to the right and remove the Woodruff key. Ease the circlip (to the right of the left hand bearing) from its groove. Withdraw the shaft complete with clutch and two step pulley, to the left, far enough to enable the old belt to be removed and the new one to be fitted. Reassemble as described in paragraphs 'c' and 'd' on Page 8. Line up the countershaft vee cone pulley as in Fig. 14, Page 8.

Headstock Spindle

Before attempting to dismantle the headstock spindle, remove the grub screw at the front end of the headstock below the main spindle and insert a suitable pointed pin (approximately $\frac{1}{16}$″) into the hole so that it passes completely through the Wick. This will ensure that the Wick is not forced upwards through the bearing by the compression spring below it, and will facilitate subsequent replacement of the spindle.

First read the description and instructions with regard to **Adjustment of Spindle Bearings** (pages 22 and 23) which will provide detailed information on the construction and operation of the headstock spindle.

Spindle Withdrawal. Refer to Fig. 35. Slacken screw (3) just sufficiently to allow adjusting collar (4) to be turned.

Remove adjusting collar.

Withdraw sleeve gear (7) and remove Woodruff key.

Release the screw securing the 60T backgear to the spindle.

Tap out the spindle in the direction towards the tailstock until it is free of the interference fit in the rear ball bearings.

Complete the withdrawal of the spindle and remove the pulley and 60T backgear, which should be held together as a single unit. The distance sleeve (6) should be left in position, supported by the bore of the screwed ring (1).

Remove and replace vee belt.

Reassemble.

Adjust the bearings as per the instructions on Pages 22 and 23.

Set the 60T backgear in the axal position which allows approximately ·005″ end play between the cone pulley and the distance sleeve (6).

Chuck Fitting

(1) Before screwing backplate on to spindle nose, ensure the cleanliness of spindle nose, backplate register faces and thread.

(2) Screw backplate firmly on spindle nose.

(3) Machine register diameter to light tap fit in chuck body.
Note.—With three-jaw gear scroll chucks, contact is made with the outer face of the chuck body and clearance with the inner face, see Fig. 48.
With four-jaw independent chucks, contact is made with the inner face of the chuck body, see Fig. 49.
With 6" four-jaw independent chucks contact is also made with the inner face of the chuck body but the threaded portion of the backplate is housed in the chuck body to minimise chuck overhang. see Fig. 50.

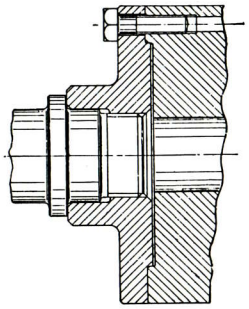


Fig. 48

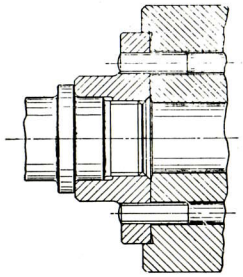


Fig. 49

(4) Remove backplate from spindle nose. Mark out and drill clearance holes for three-jaw chuck locking bolts, and core diameter tapping holes for four-jaw chuck locking bolts. Remove all burrs with countersink or scraper. Care should be taken when marking out the holes to ensure clearance between the bore of the hole and bolt stem. With the four-jaw chuck backplate, the drilling centres can easily be marked by means of a centre punch with the shank diameter acting as a guide through the chuck body holes. After centring one hole, drill, tap and lock the backplate lightly with a locking bolt. The other three holes can then be centred without fear of the backplate shifting.

(5) When tightening locking bolts, apply pressure evenly and gradually to all four in rotation.

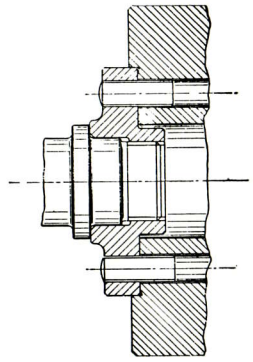


Fig. 50

Chuck Backplates and Threaded Body Chucks

Register bores are held to very close limits. When backplates or threaded body chucks are supplied as separate units after the machine has left these works the register bore may need very light scraping or polishing with fine emery cloth.

Do not screw equipment on to the spindle nose without ensuring that the spindle register diameter is lightly smeared with fine oil.

INSTRUCTIONS FOR ORDERING REPLACEMENT PARTS

The following information should be supplied with the order:—

1. Type and Serial Number of the lathe, and in the case of lathes with gearboxes fitted, also the serial number of the gearbox.
   For location of numbers see Figs. 51 and 52.
2. Section letter and drawing reference numbers of part as listed.
3. Quantity required.

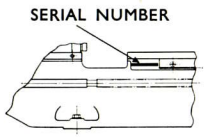


Fig. 51

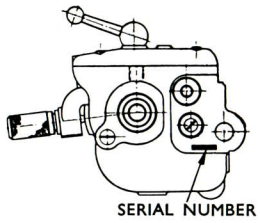
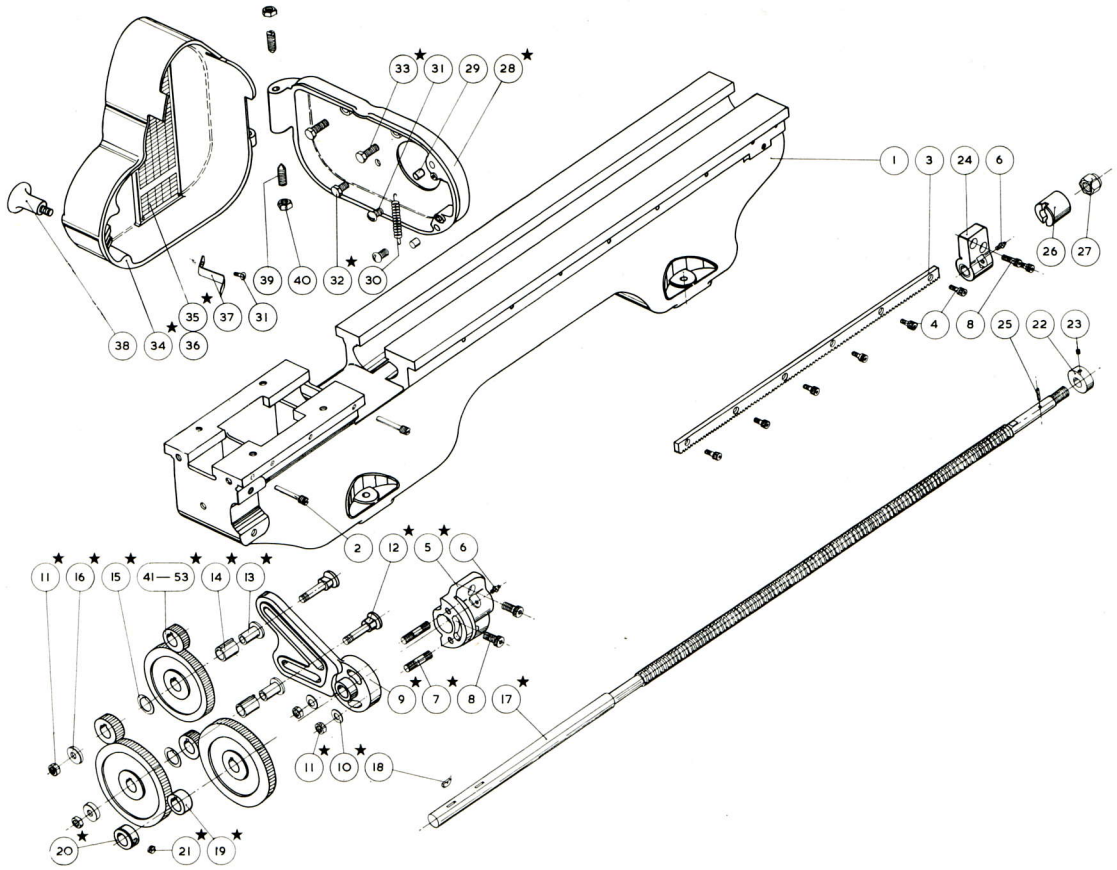


Fig. 52

As it is the Company's policy to improve its products whenever opportunity occurs, designs are liable to modification at any time. In some cases, due to the nature of the part, it will be necessary for us to supply additional related parts, particularly if the item required has been altered.



BED, LEADSCREW & GEAR TRAIN ASSEMBLY

SECTION GR

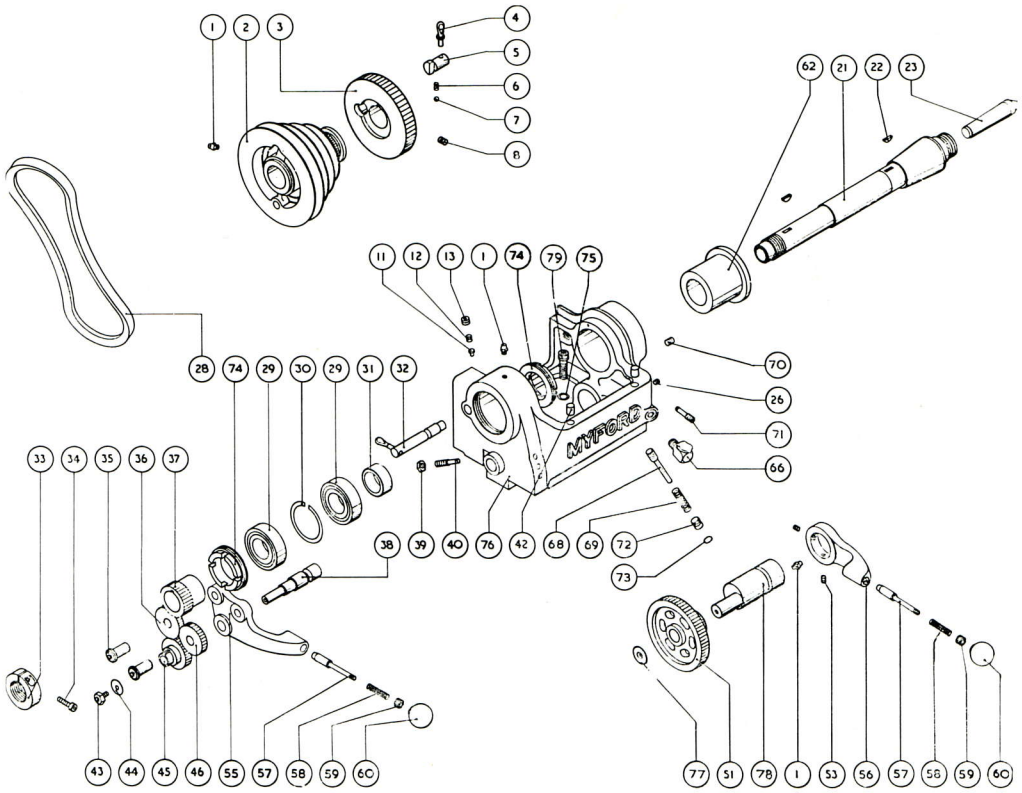
BED, LEADSCREW & GEAR TRAIN ASSEMBLY

Drg. Ref.	Part No.	Description	No. Off/Mc.
†GR1	A8724/1	Bed	1
GR2	A2137	Thrust Screw	2
†GR3	73/1112/1	Rack	1
†GR4		Cap Screw (2 B.A. x $\frac{1}{2}$″)	6
*GR5	73/1134/1	L.H. Leadscrew Bracket Assembly	1
GR6		Oil Nipple (2 B.A.)	2
*GR7	A4725	Stud	2
GR8		Cap Screw ($\frac{1}{4}$″ B.S.F. x $\frac{5}{8}$″)	4
*GR9	A4736	Change Gear Quadrant Assembly	1
*GR10		Washer ($\frac{1}{4}$″)	2
*GR11		Hexagon Nut ($\frac{1}{4}$″ B.S.F.)	4
*GR12	A1496	Change Gear Stud	2
*GR13	A1501	Sleeve	2
*GR14	A1500	Bush	2
*GR15	A1499	Spacer	2
*GR16	A1498	Washer	2
†*GR17	A2054/2	Leadscrew	1
*GR18		Woodruff Key (No. 404)	1
*GR19	A2604	Spacer	1
*GR20	MA2241	Collar	1
*GR21	MY2812	Grubscrew	1
GR22	75/1115/1	Thrust Collar	1
GR23		Socket Set Screw ($\frac{1}{4}$″ B.S.F. x $\frac{1}{4}$″) (Cup Point)	1
GR24	75/1135/2	R.H. Leadscrew Bracket Assembly	1
GR25	75/1114	Pin	1
GR26	75/1113	Collar	1
GR27		Simmonds Nut ($\frac{7}{16}$″ B.S.F.)	1
*GR28	A1960/1	Change Gear Guard Backplate	1
GR29	A2023	Pad	2
GR30	A2012	Tension Spring	1
GR31		Round Head Screw (2 B.A. x $\frac{3}{8}$″)	3
*GR32		Hexagon Head Screw ($\frac{1}{4}$″ B.S.F. x $\frac{1}{2}$″)	1
*GR33		Hexagon Head Screw ($\frac{1}{4}$″ B.S.F. x $\frac{7}{8}$″)	2
*GR34	A1959/1	Change Gear Guard	1
*GR35	A2639	Screwcutting Chart	1
GR36		Rivet (No. 0 x $\frac{3}{16}$″)	6
GR37	A3018	Spring Clip	1
GR38		Knob (Everite Ref. 221, $\frac{1}{4}$″ B.S.W.)	1
GR39	A2024	Hinge Screw	2
GR40		Hexagon Locknut ($\frac{5}{16}$″ B.S.F.)	2
*GR41	72/1116	20T. Change Gear	2
*GR42	72/1117	25T. Change Gear	1
*GR43	72/1118	30T. Change Gear	1
*GR44	72/1119	35T. Change Gear	1
*GR45	72/1120	38T. Change Gear	1
*GR46	72/1121	40T. Change Gear	1
*GR47	72/1122	45T. Change Gear	1
*GR48	72/1123	50T. Change Gear	1
*GR49	72/1124	55T. Change Gear	1
*GR50	72/1125	60T. Change Gear	1
*GR51	72/1126	65T. Change Gear	1
*GR52	72/1127	70T. Change Gear	1
*GR53	72/1128	75T. Change Gear	1

* These parts do not apply to ML7-RB quick change lathes.

† For long bed lathes

GR1	Bed	becomes A8779/1
GR3	Rack	becomes A3470
GR4	Cap Screws	become 10 off
GR17	Leadscrew	becomes A3472/1



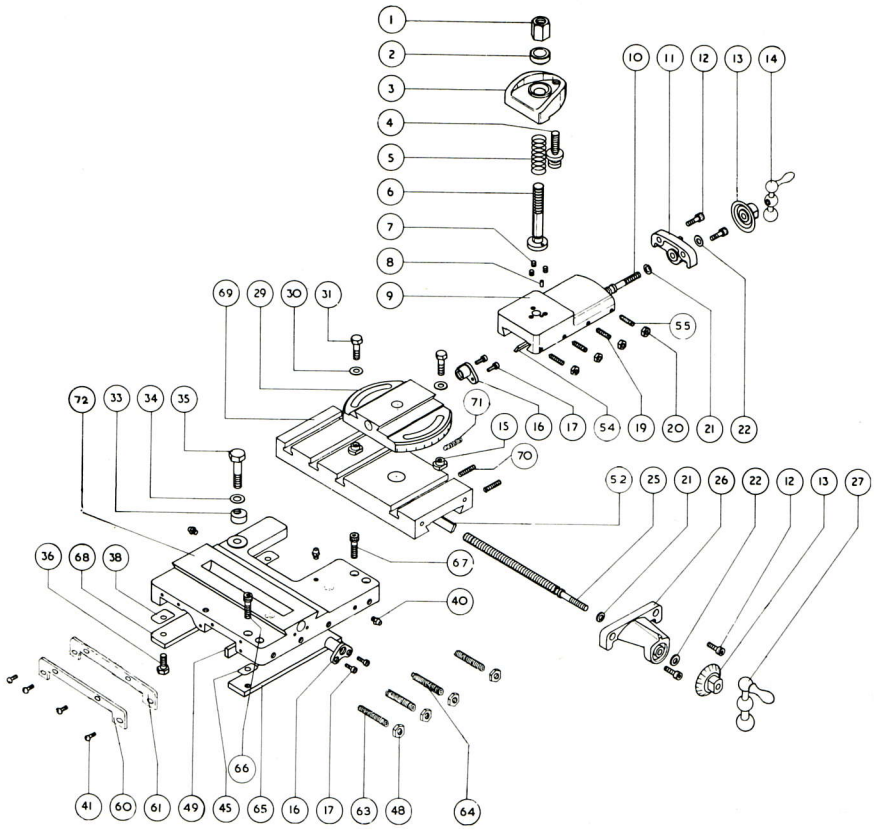
HEADSTOCK ASSEMBLY

SECTION H

HEADSTOCK ASSEMBLY

Drg. Ref.	Part No.	Description	No. Off/Mc.
H1		Oil Nipple (2 B.A.)	3
H2	A1994	Vee Cone Pulley Assembly (Includes H1)	1
H3	A1993/1	60T. Backgear Assembly (Includes H4, H5, H6, H7 & H8)	1
H4	A2004/1	Lever for Backgear Key	1
H5	A2002/1	Backgear Key	1
H6	A2003	Spring	1
H7		Steel Ball ($\frac{3}{16}$" Dia.)	1
H8		Socket Set Screw ($\frac{1}{4}$" B.S.F. x $\frac{5}{16}$") (Cup Point)	1
H11	A2001	Plunger	1
H12	A1610	Spring	1
H13		Socket Set Screw ($\frac{5}{16}$" B.S.F. x $\frac{1}{4}$") (Cup Point)	1
H21	A1992	Spindle	1
H22		Woodruff Key No. 404	2
H23	75/1249	60° Centre (Soft)	1
H26		Socket Set Screw (2 B.A. x $\frac{3}{16}$") (Cup Point)	1
H28		Vee Belt (Headstock) (A29·5)	1
H29		Ball Bearing (RHP 7205)	2
H30	A1991	Bearing Spacing Washer	1
H31	A2055	Distance Sleeve	1
H32	A2751	Pulley Lock Assembly	1
H33	A2056	Adjusting Collar	1
H34		Cap Screw (2 B.A. x $\frac{3}{4}$")	1
H35	A8244	Gear Pin Assembly	2
H36	A2006	30T. Tumbler Gear	1
H37	A1995	30T. Gear	1
H38	A2005/2	Tumbler Reverse Stud	1
H39		Hexagon Locknut ($\frac{1}{4}$" B.S.F.)	1
H40	A1997/1	Tumbler Reverse Locating Screw	1
H42	A2023	Pad	2
H43	A1999	Tumbler Sleeve Gear Retaining Screw	1
H44	VT220	Washer	1
H45	A1998	Tumbler Sleeve Gear Assembly	1
H46	A2007	28T. Tumbler Gear	1
H51	A1939	17/53T. Backgear Cluster	1
H53		Socket Set Screw (2 B.A. x $\frac{5}{16}$") (Cup Point)	2
H55	A1948/1	Tumbler Reverse Lever	1
H56	A1949/1	Backgear Lever	1
H57	A3021	Plunger	2
H58	A3025	Spring	2
H59	75/1220	Screwed Bush	2
H60		Knob	2
H62	A3609	Spindle Bearing (Front)	1
H66		Oil Cup (90° x $\frac{1}{8}$" B.S.P.)	1
H68	A3610/1	Lubricating Wick	1
H69	A3611/1	Spring	1
H70		Socket Set Screw ($\frac{1}{4}$" B.S.F. x $\frac{3}{16}$") (Cup Point)	1
H71	A1987/1	Backgear Eccentric Retaining Screw	1
H72	A4770	Sealing Plug	1
H73		'O' Ring (B.S. 011)	1
H74	G2340	Adjusting Ring	2
H76	A1934/6	Headstock	1
H77		Circlip (Anderton Type 1500–485E)	1
H78	A1986/1	Backgear Eccentric	1
H79		Cap Screw (M8 x 1·25 x 25 mm)	4

C



CARRIAGE ASSEMBLY

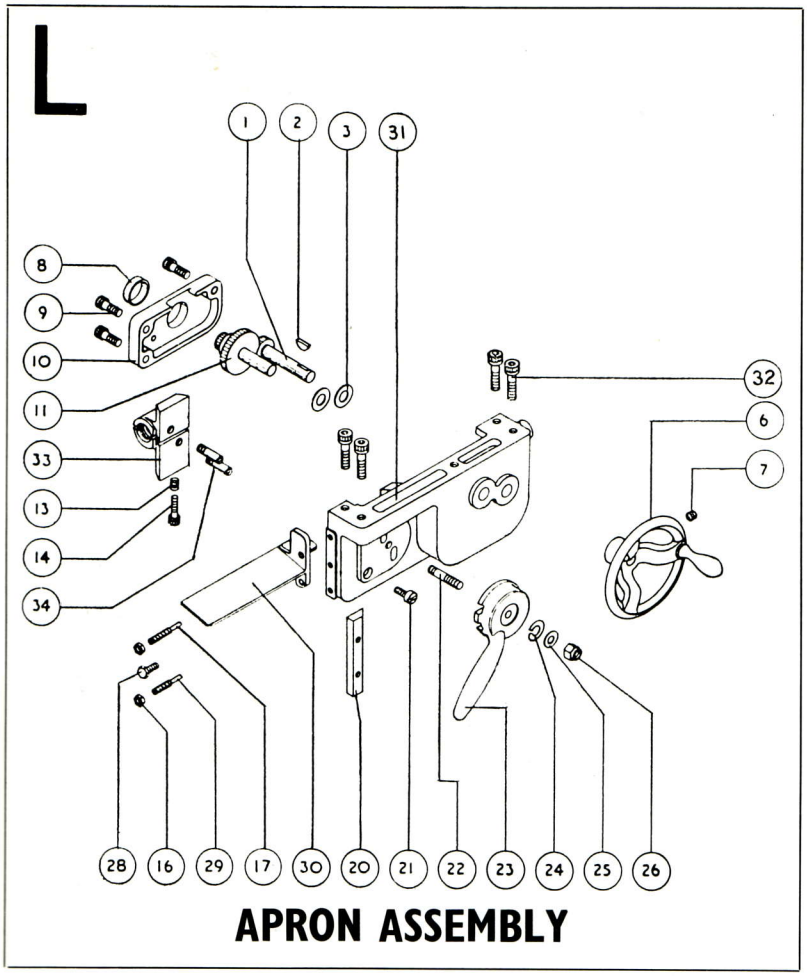
SECTION C

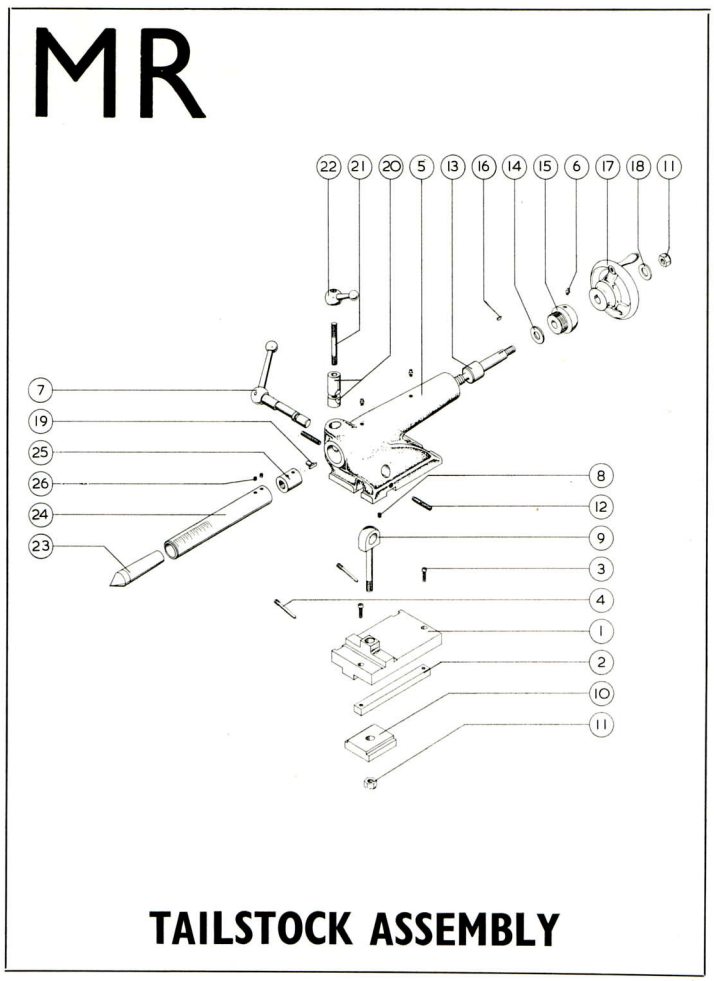
CARRIAGE ASSEMBLY

Drg. Ref.	Part No.	Description	No. Off/Mc.
C1	75/1412	Hexagon Nut	1
C2	75/1410	Spherical Washer	1
C3	74/1409/1	Tool Clamp	1
C4	75/1413	Adjusting Screw Assembly	1
C5	A2806	Spring	1
C6	75/1406	Tool Clamp Stud	1
C7	MY2811	Grubscrew	3
C8	75/1411	Pin	1
C9	73/1403	Top Slide	1
†**C10**	74/1408	Top Slide Feedscrew (Metric A4731)	1
†**C11**	74/1401	End Plate	1
C12		Cap Screw (2 B.A. x $\frac{5}{8}$″)	4
†**C13**	74/1303	Micrometer Dial	2
†**C14**	V1080	Top Slide Ball Handle Assembly	1
C15	A1845	Tee Nut	2
†**C16**	75/1302	Feed Nut (Metric A1648)	2
C17		Cheese Head Screw (4 B.A. x $\frac{3}{8}$″)	4
C19	MY2802	Gib Adjusting Screw	2
C20		Hexagon Locknut (2 B.A.)	4
C21	75/1984A	Washer (Hard)	2
C22	MY4103	Fibre Washer	2
†**C25**	74/1321	Cross Slide Feedscrew (Metric A4730)	1
†**C26**	73/1301	End Plate	1
†**C27**	75/1337	Cross Slide Ball Handle Assembly	1
C29	A8079	Top Slide Base Assy.	1
C30		Washer ($\frac{1}{4}$″)	2
C31	A7742	Hexagon Head Bolt	2
C33	75/1312	Clamp Eccentric	1
C34		Washer ($\frac{5}{16}$″)	1
C35		Hexagon Head Bolt ($\frac{5}{16}$″ B.S.F. x 1$\frac{1}{2}$″) (Hard)	1
C36		Hexagon Head Set Screw ($\frac{1}{4}$″ B.S.F. x $\frac{5}{8}$″)	3
C38	75/1304	Laminated Shim (Rear)	3
C40		Oil Nipple (2 B.A.)	3
C41		Round Head Screw (4 B.A. x $\frac{3}{8}$″)	4
C45	75/1305	Laminated Shim (Front)	2
C48		Hexagon Locknut ($\frac{1}{4}$″ B.S.F.)	4
C49	74/1319/1	Saddle Gib Strip	1
C52	74/1320/3	Cross Slide Gib Strip	1
C54	75/1405/2	Top Slide Gib Strip	1
C55	MY2803	Gib Strip Adjusting Screw	2
C60	A8736	Wiper Housing	1
C61	A8735	Wiper	1
C63	A7760	Adjusting Screw	3
C64	A7424/1	Adjusting Screw	1
C65	A2065	Saddle Strip (Front)	1
C66		Cap Screw ($\frac{1}{4}$″ B.S.F. x 1$\frac{1}{4}$″)	1
C67		Cap Screw ($\frac{1}{4}$″ B.S.F. x $\frac{7}{8}$″)	1
C68	A2122	Saddle Strip (Rear)	1
C69	73/1308/1	Cross Slide	1
C70	A8623	Socket Setscrew (Wedglok)	6
C71		Socket Setscrew (M5 x 20 mm) (Dog Point)	2
C72	A8734/1	Saddle	1

†For machines having metric feed screws with 80 and 40 division dials the following are used:—

C10	A2282/1	Top Slide Feedscrew Assembly	1
C11	A1649/1	Top Slide End Plate	1
C13	A3249	Top Slide Micrometer Dial	1
C13	A3250/1	Cross Slide Micrometer Dial	1
C14	A2093	Top Slide Ball Handle Assembly	1
C16	A1648	Feed Nut (Top and Cross Slides)	2
C25	A2636	Cross Slide Feedscrew Assembly	1
C26	A1384	Cross Slide End Plate	1
C27	A2073	Cross Slide Ball Handle Assembly	1
	A2058	Diaphragm Washer	2
	A1541/1	Screw—Ball Handle Securing	2
	A2229	Adjusting Collar	2
	MY4402	Copper Pad	2
		Socket Setscrew ($\frac{1}{4}$″ B.S.F. x $\frac{3}{16}$″) (Half Dog Point)	2





SECTION L

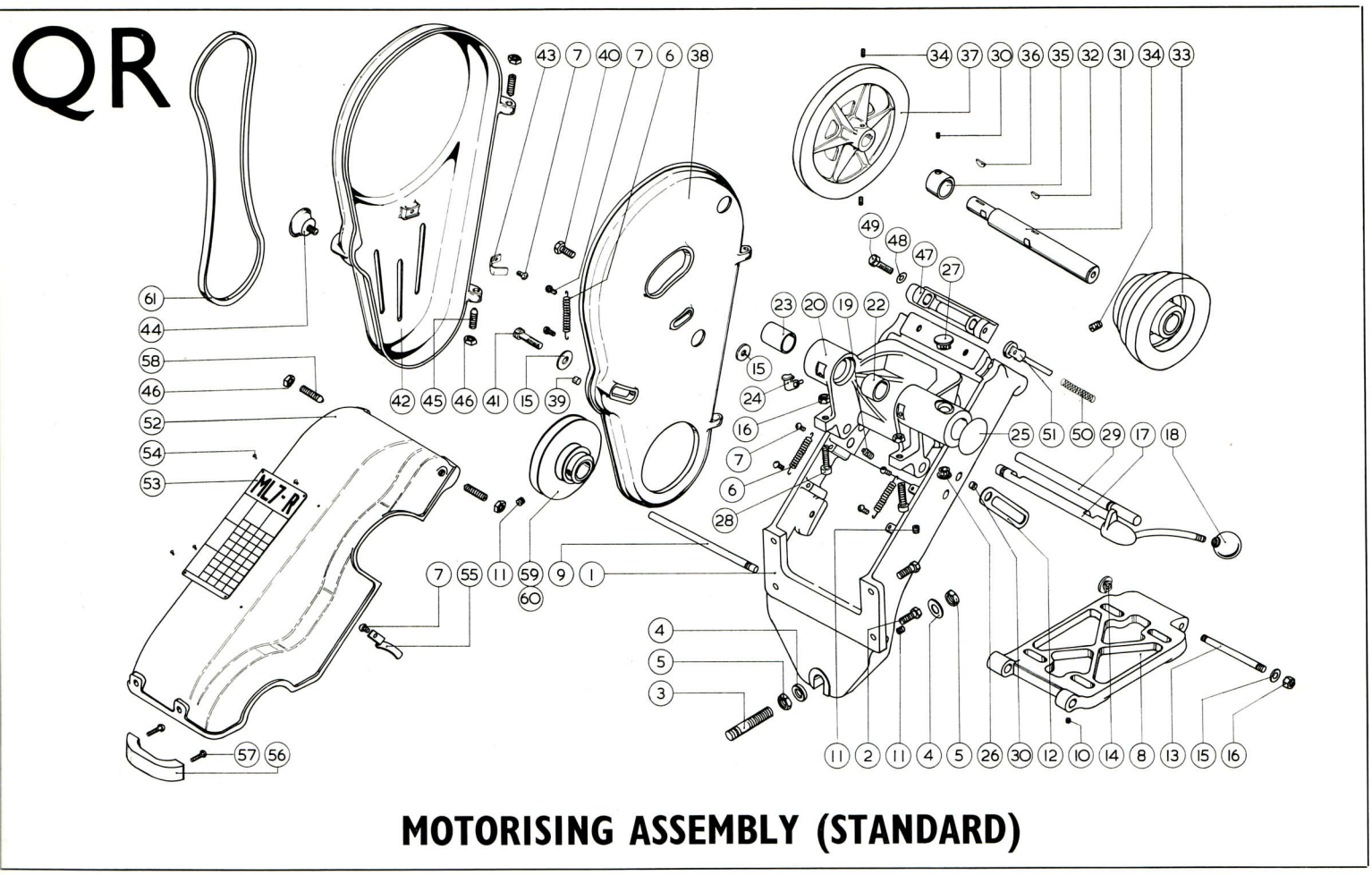
APRON ASSEMBLY

Drg. Ref.	Part No.	Description	No. Off/Mc.
L1	A2086	Hand Traverse Pinion	1
L2		Woodruff Key No. 404	1
L3	MY4106	Fibre Washer	2
L6	A2087	Handwheel Assembly	1
L7		Socket Set Screw ($\frac{1}{4}$″ B.S.F. x $\frac{1}{4}$″) (Cup Point)	1
L8		'Oilite' Bush (CT 15 x $\frac{1}{4}$″)	1
L9		Cap Screw ($\frac{1}{4}$″ B.S.F. x $\frac{5}{8}$″)	3
L10	75/1340	Gear Cover Assembly (Includes L8)	1
L11	A2085	Rack Pinion Assembly	1
L13	A4729	Spring	1
L14		Cap Screw (2 B.A. x $1\frac{3}{4}$″)	1
L16		Hexagon Locknut (2 B.A.)	2
L17	A9337	Gib Adjusting Screw	1
L20	A2082	Gib Strip	1
L21	A2147	Gib Securing Screw	2
L22	V123	Stud	1
L23	A1837/1	Cam Lever	1
L24		Spring Washer	1
L25		Washer ($\frac{1}{4}$″)	1
L26		'Simmonds' Nut ($\frac{1}{4}$″ B.S.F.)	1
L28		Hexagon Head Set Screw (2 B.A. x $\frac{1}{2}$″)	1
L29	A9338	Gib Adjusting Screw	1
L30	A4188/1	Leadscrew Guard	1
L31	A2081/2	Apron	1
L32		Cap Screw (M6 x 1 x 25 mm)	4
L33	A1975/3	Leadscrew Nut	1
L34	10508	Cam Peg	2

SECTION MR

TAILSTOCK ASSEMBLY

Drg. Ref.	Part No.	Description	No. Off/Mc.
MR1	A2099/1	Base	1
MR2	A2136	Gib Strip	1
MR3		Cap Screw (2 B.A. x $\frac{5}{8}$″)	2
MR4	A2137	Thrust Screw	2
MR5	A2098/1	Body	1
MR6		Oil Nipple (Tecalemit NC6055)	3
MR7	A2138	Eccentric and Lever Assembly	1
MR8	A2139	Eccentric Locating Screw	1
MR9	A2140	Eye Bolt	1
MR10	75/1514	Clamp Plate	1
MR11		Simmonds Nut ($\frac{3}{8}$″ B.S.F. Type P)	2
MR12	A2146/1	Set Over Screw	2
MR13	10359	Barrel Feed Screw	1
MR14		'Oilite' Thrust Washer	1
MR15	A2114	Cap	1
MR16		Woodruff Key (No. 404)	1
MR17	A2141	Handwheel Assembly	1
MR18		Washer ($\frac{1}{4}$″)	1
MR19	A2144	Barrel Key	1
MR20	A2118/1	Pad Bolt and Bush	1
MR21	10299	Stud	1
MR22	10297	Locking Lever	1
MR23	75/1248	60° Centre (Hard)	1
MR24	A2115	Barrel Assembly (Includes MR25) (Metric A8242)	1
MR25	A2117	Nut	1
MR26		Socket Set Screw (2 B.A. x $\frac{3}{16}$″) (Cup Point)	2



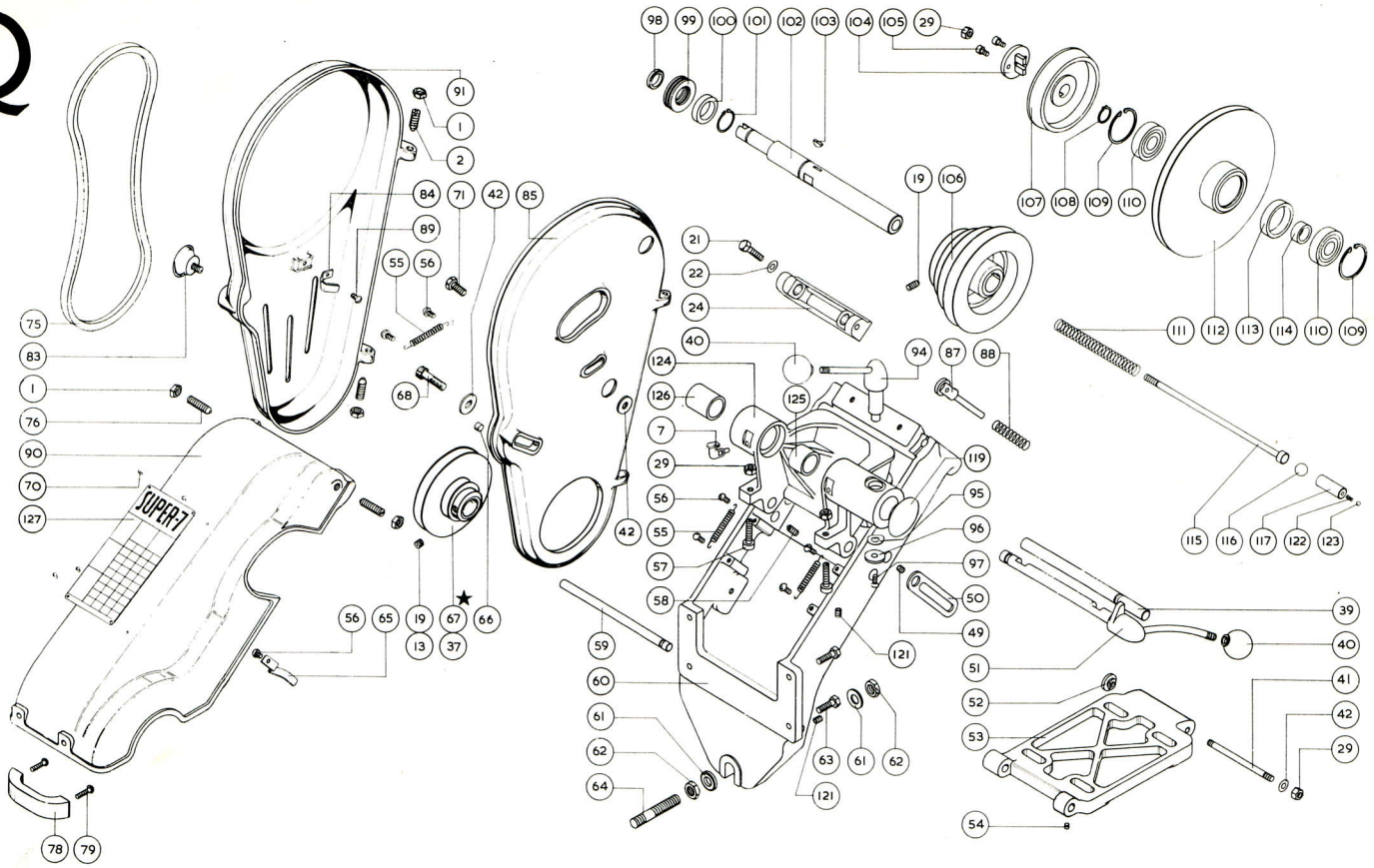
MOTORISING ASSEMBLY (STANDARD)

SECTION QR

MOTORISING ASSEMBLY (STANDARD)

Drg. Ref.	Part No.	Description	No. Off/Mc.
QR1	A1933/1	Countershaft Arm	1
QR2		Hexagon Head Screw (¼″ B.S.F. x ⅞″)	4
QR3	A2011	Stud	1
QR4		Washer (7/16″)	2
QR5		Hexagon Locknut (7/16″ B.S.F.)	2
QR6	A2012	Tension Spring	3
QR7		Round Head Screw (2 B.A. x 5/16″)	9
QR8	A1945	Motor Base	1
QR9	A2045	Pivot Pin	1
QR10		Socket Set Screw (2 B.A. x ¼″) (Cup Point)	1
QR11		Socket Set Screw (¼″ B.S.F. x 5/16″) (Half Dog Point)	3
QR12	A2046	Link	2
QR13	A2050	Clamp Screw	1
QR14	A2051	Clamp Screw Head	1
QR15	A2022	Washer	3
QR16		Hexagon Nut (¼″ B.S.F.)	3
QR17	A2038/1	Eccentric Shaft and Lever Assembly	1
QR18		Knob (1¼″ Dia. x 5/16″ B.S.W.)	1
QR19		Socket Set Screw (¼″ B.S.F. x ½″) (Half Dog Point)	1
QR20	A5487/1	Swing Head Assembly (Includes QR22, QR23 and QR24)	1
QR22	A9963	'Oilite' Bush	1
QR23	A9964	'Oilite' Bush	1
QR24		Oil Cup (Adams Style L No. 2511)	2
QR25	A3366/1	End Cap	1
QR26		Plug (Heyco P-375)	1
QR27		Plug (Heyco P-625)	1
QR28	A2123	Adjustment Screw	2
QR29	A2014	Pivot Pin	1
QR30		Socket Set Screw (¼″ B.S.F. x ¼″) (Cup Point)	2

Drg. Ref.	Part No.	Description	No. Off/Mc.
QR31	10360	Countershaft	1
QR32		Woodruff Key (No. 404)	1
QR33	A3312/1	Cone Pulley	1
QR34		Socket Set Screw (¼″ B.S.F. x ⅜″) (Cup Point)	3
QR35	10361	Collar	1
QR36		Woodruff Key (No. 606)	1
QR37	A2027	Twin Vee Pulley	1
QR38	A2961	Backplate	1
QR39	A2023	Pad	1
QR40		Hexagon Head Screw (¼″ B.S.F. x ¾″)	1
QR41		Cap Screw (¼″ B.S.F. x 1¼″)	1
QR42	A2962	Belt Guard	1
QR43	A3020	Spring Clip	1
QR44		Knob (Evans Ref. 780, ¼″ B.S.W. x ½″)	1
QR45	A2024	Pivot Screw	2
QR46		Hexagon Locknut (5/16″ B.S.F.)	4
QR47	A1941	Hinge Bracket	1
QR48		Washer (¼″)	2
QR49		Hexagon Head Screw (¼″ B.S.F. x 1″)	2
QR50	A2939	Compression Spring	1
QR51	A4733	Roller and Plunger Assembly	1
QR52	A1935/4	Front Belt Guard	1
QR53	10399	Speed Plate	1
QR54		Rivet (NPK Type U, No. 0 x ¼″)	4
QR55	A2044	Spring Clip	2
QR56		Handle (Everite Ref. 243/3, 3/16″ B.S.W.)	1
QR57		Round Head Screw (3/16″ B.S.W. x ¾″)	2
QR58	A2043	Pivot Screw	2
QR59	A2028/1	Motor Pulley (⅝″ Bore)	1
QR60	A2273/1	Motor Pulley (½″ Bore)	1
QR61		Vee Belt (M33·5)	1



MOTORISING ASSEMBLY (WITH CLUTCH)

SECTION Q

MOTORISING ASSEMBLY (WITH CLUTCH)

Drg. Ref.	Part No.	Description	No. Off/Mc.
Q1		Hexagon Locknut ($\frac{5}{16}$" B.S.F.)	4
Q2	A2024	Hinge Screw	2
Q7		Oil Cup	2
Q13		Socket Set Screw Wedglok ($\frac{1}{4}$" B.S.F. x $\frac{5}{16}$") (Cup Point)	1
Q19		Socket Set Screw ($\frac{1}{4}$" B.S.F. x $\frac{3}{8}$") (Cup Point)	2
Q21		Hexagon Head Set Screw ($\frac{1}{4}$" B.S.F. x 1")	2
Q22		Washer ($\frac{1}{4}$")	2
Q24	A1941	Hinge Bracket	1
Q29		Hexagon Nut ($\frac{1}{4}$" B.S.F.)	4
Q37	A2273/1	Motor Pulley ($\frac{1}{2}$" Dia. Bore)	1
Q39	A2014	Swing Head Pivot Shaft	1
Q40		Knob (1$\frac{1}{4}$" Dia. x $\frac{5}{16}$" Whitworth)	2
Q41	A2050	Clamp Screw	1
Q42	A2022	Washer	5
Q49		Socket Set Screw ($\frac{1}{4}$" B.S.F. x $\frac{1}{4}$") (Cup Point)	1
Q50	A2046	Tie Bar	2
Q51	A2038/1	Cam Shaft and Lever Assembly	1
Q52	A2051	Clamp Screw Head	1
Q53	A1945	Motor Platform	1
Q54		Socket Set Screw (2 B.A. x $\frac{1}{4}$") (Cup Point)	1
Q55	A2012	Tension Spring	3
Q56		Round Head Screw (2 B.A. x $\frac{5}{16}$")	8
Q57	A2123	Adjusting Screw	2
Q58		Socket Set Screw ($\frac{1}{4}$" B.S.F. x $\frac{1}{2}$") (Half Dog Point)	1
Q59	A2045	Pivot Pin (Motor Platform)	1
Q60	A1933/1	Countershaft Arm	1
Q61		Washer ($\frac{7}{16}$")	2
Q62		Hexagon Locknut ($\frac{7}{16}$" B.S.F.)	2
Q63		Hexagon Head Set Screw ($\frac{1}{4}$" B.S.F. x $\frac{7}{8}$")	4
Q64	A2011	Stud	1
Q65	A2044	Spring Clip	2
Q66	A2023	Pad	1
*Q67	A2028/1	Motor Pulley ($\frac{5}{8}$" Bore)	1
Q68		Cap Screw ($\frac{1}{4}$" B.S.F. x 1$\frac{1}{4}$")	1
Q70		Rivets (No. O x $\frac{1}{4}$")	4
Q71		Hexagon Head Set Screw ($\frac{1}{4}$" B.S.F. x $\frac{3}{4}$")	1
Q75		Vee Belt (Motor Drive) (M33·5)	1
Q76	A2043	Hinge Screw	2
Q78		Handle	1
Q79		Round Head Screw ($\frac{3}{16}$" Whit. x $\frac{3}{4}$")	2
Q83		Knob (F. W. Evans, Ref. 780)	1
Q84	A3020	Spring Clip	1
Q85	A2961	Motor Drive Belt Guard Backplate	1
Q87	A4733	Roller and Plunger Assembly	1
Q88	A2939	Spring	1
Q89		Round Head Screw (2 B.A. x $\frac{5}{16}$")	1
Q90	A1935/4	Headstock Belt Guard	1
Q91	A2962	Motor Drive Belt Guard	1
Q94	A3324	Cam Shaft Assembly (Clutch Operating)	1
Q95	A2058	Diaphragm Washer	1
Q96	A3326	Washer	1
Q97		Socket Countersunk Screw (2 B.A. x $\frac{1}{2}$")	1
Q98	A3329	Abutment Washer	1
Q99		Thrust Bearing (R. & M. FT $\frac{7}{8}$")	1
Q100	A3330	Collar	1
Q101		Cir-Clip (Anderton 1400—$\frac{7}{8}$")	1
Q102	A3319/1	Countershaft	1
Q103		Woodruff Key (No. 404)	1
Q104	A3320/1	Driver Plate	1
Q105		Cap Screw (2 B.A. x $\frac{3}{8}$")	2

Continued

SECTION Q—*Continued*

MOTORISING ASSEMBLY (WITH CLUTCH)

Drg. Ref.	Part No.	Description	No. Off/Mc.
Q106	A3312/1	Cone Pulley	1
Q107	A3313/1	Clutch Plate	1
Q108		Cir-Clip (Anderton 1400—$\frac{5}{8}$″)	1
Q109		Cir-Clip (Anderton 1300—1$\frac{9}{16}$″)	2
Q110		Ball Bearing (F.B.C. SN2062)	2
Q111	A3359	Spring	1
Q112	A3311	Twin Vee Pulley	1
Q113	A3328	Spacer (Outer)	1
Q114	A3327	Spacer (Inner)	1
Q115	A3321	Push Rod	1
Q116		Steel Ball ($\frac{1}{2}$″ Dia.)	1
Q117	A3322	Push Bar	1
Q119	A3366/1	End Cap	1
Q121		Socket Set Screw ($\frac{1}{4}$″ B.S.F. x $\frac{5}{16}$″) (Half Dog)	2
Q122	A2003	Spring	1
Q123		Steel Ball ($\frac{3}{16}$″ Dia.)	1
Q124	A5487/1	Swing Head Ass'y (includes Q7, Q29, Q57, Q125 and Q126)	1
Q125	A9963	'Oilite' Bush	1
Q126	A9964	'Oilite' Bush	1
†**Q127**	10399	Speed Plate	1

* Standard Bore Size–other bores available–state exact size when ordering.

† Reference Q127, part No. 10399 is the name and speed plate for ML7-R — not Super 7 as drawn.