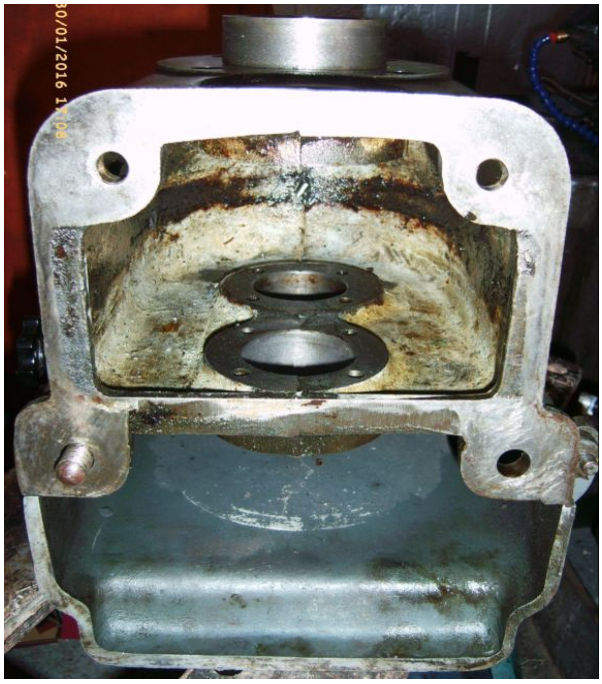
Lorant Rindis Head Assembly

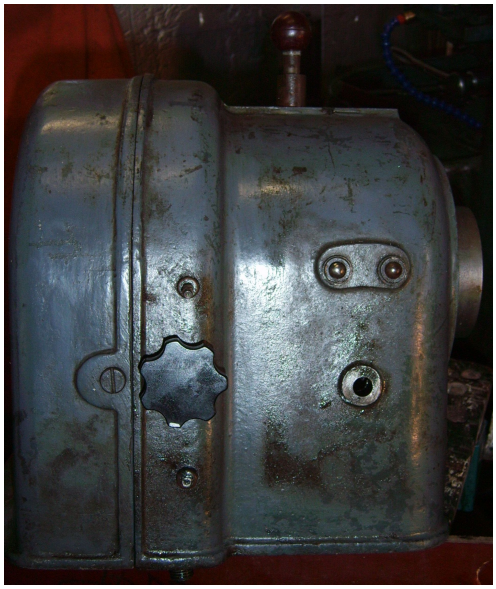


Inside head casing showing bearing bores, cover door for drive pulley, and spindle lock (on C/L of bores in grease mark).

Front View of Head Casing

Spindle lock is shown at top of picture. Push down to engage the large gear to lock the shaft. (Also used when in back gear).
Warning: Ensure it is disengaged before starting M/C. On my M/C it has a weak return spring and does not always release automatically (especially after doing up/undoing the arbour nut in horizontal mode), so I rock the drive pulley and pull up to ensure release.

The outside dia. of the main shaft bearing boss is used to locate accessories (vertical head, arbour support in horizontal mill mode). The 4off 1/2" B.S.F. tapped holes are used to secure these accessories.



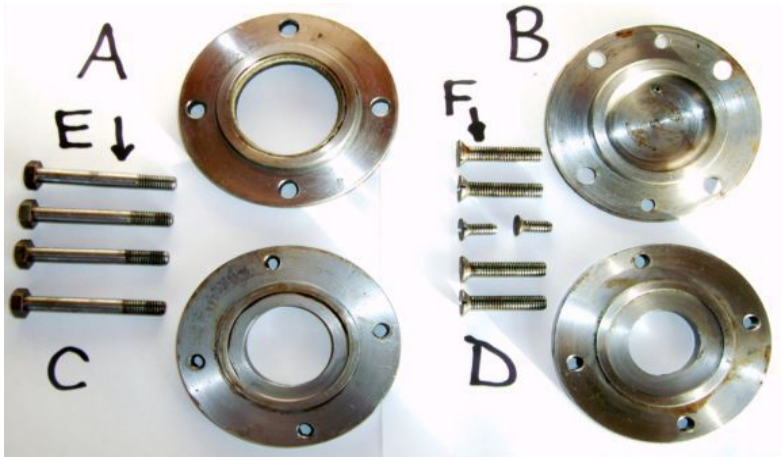
Side View of Head showing hole and detents for back gear changeover lever, grease nipples(straight nipples 3/16"B.S.F.) for rear bearing top up, and release catch knob for rear pulley access door.

Fixings for head and attachments

1: 2off 5/8 B.S.F.x1.75" long set screws and 2off 2.5" long set bolts(1"A/F Hex Heads). The short 5/8"set screws go in the front 2 threaded holes from underneath the main base casting into the head. The longer 2.5"x5/8" Bolts go through the rear 2 holes with a nut underneath the main base casting. **2:** 2off 5/8" B.S.F. Nuts. **3:** 4off 1/2" B.S.F. cap head screws for attaching accessories on the main shaft, using front bearing boss as locator. (3/8"AF.Hex.key required).

General view of rear end, showing access door mounting, securing latch, and in door, latch pin. Also one of the two, 2.5"x5/8"B.S.F. set bolts, for securing head to base.(This cannot be removed without taking off bottom grease feed pipe). Before tightening pull head towards back to locate square to table, coming off front set screws.

List of parts in head.



Low Speed Range Back Gear Drive Shaft Cover Plates.

A: Rear outside bearing cover plate with felt grease seal. Four (4) 5/16" clearance holes.

B: Front outside bearing cover plate showing grease nipple (top side). Four (4) 5/16" C/sink clearance holes. Two 1/4" C/sink clearance holes.

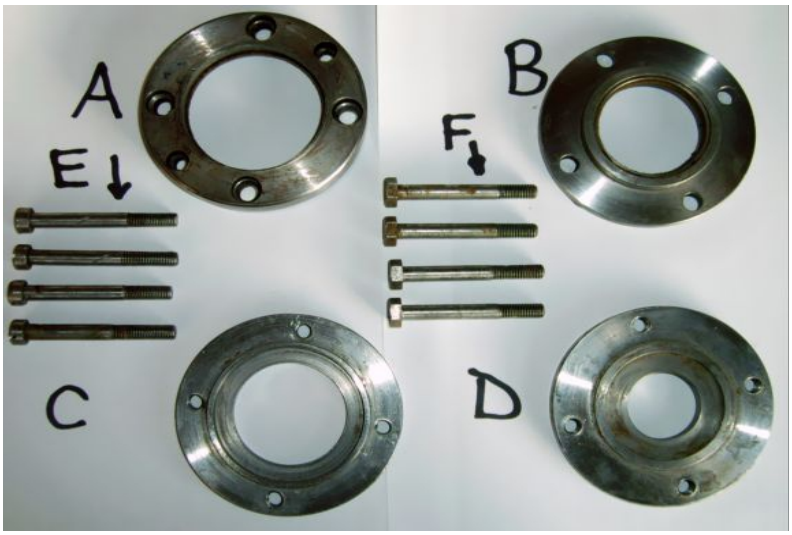
C: Front inside bearing cover plate. Four(4) 5/16"B.S.F. tapped holes.

D: Rear inside bearing cover plate. Four(4) 5/16"B.S.F. tapped holes.

E: Rear cover retaining bolts. 4 off 5/16"B.S.F.x2.73"O/A Hex head.

F: Front cover retaining screws: 2off c/sink 1/4"Whit.x 21/32"O/A. Locating screws. Slot head.

4off c/sink 5/16"B.S.F.x 1.53”O/A. fixing screws. Slot head.



Cover Plates: Main drive shaft.

A: Front cover plate(outside) with felt grease seal. Four (4) 5/16" C/bored clearance holes and two(2) 1/4" C/bored clearance holes.

B: Rear cover plate(outside) with felt grease seal. Four (4) 5/16" clearance holes.

C: Front(inside) cover plate with four(4) holes 5/16"B.S.F.

D: Rear(inside) cover plate with four(4) holes 5/16"B.S.F.

E: Front cover plate retaining bolts, four (4) off 5/16"B.S.F.x2.62"under head (.518"dia x.225"long). Note: 2off short 1/4" B.S.W screws to orient cover correctly, were missing and will be replaced (spec: 1.5" long under, a .4"Diax.25"long head, threaded to head). Screw driver slot in all heads.

F: Rear cover plate retaining bolts, four off 5/16"B.S.F.x2.75"O/A std. Hex. head.

Main shaft assembly.

A: Main shaft. Key drive for low speed range large gear, (shown later). Shaft front end has1.875"O/D register x.55"long and 5 full threads 8T.P.I. acme form, (O/A length 1.23"to register back face),for use with chuck or collet accessories.

B: 2off Timken taper roller bearings. Spec: outer race 16284 precision5 2.85"Dia.x.75"

Inner race 16150 precision5 1.5"bore dia.x.85"

C: 2.85"O/D. Bearing spacer (outer race) cut out for grease entry point.

D: 1.5"Bore washer (between inner race and bearing adjuster).

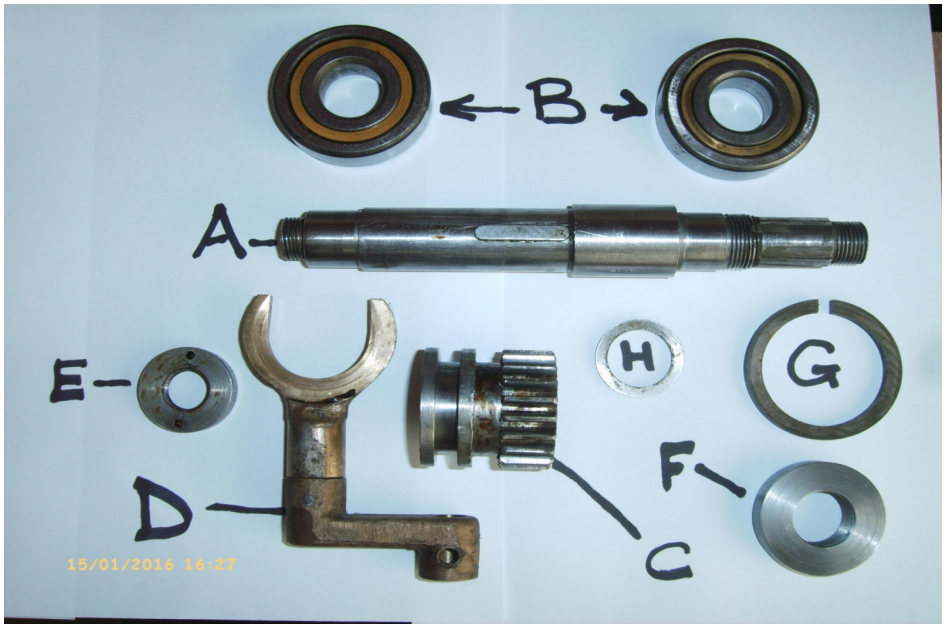
E: Bearing adjuster for pre-load on taper bearings. Thread 24T.P.I.Whitworth form.

F: Retaining circlip (to fit 1.15"dia.X.06"wide groove). Retains large gear, (shown later),in position on shaft. Ensure gear is correct way round. (See assy. picture and instructions).

G: Rear shaft bearing. Spec. Skefco SESL RM8 2"O/D.X1"bore dia.X.75" Double row, self aligning, ball race.

H: Rear bearing lock nut. Thread 1"x16T.P.I.Whitworth form.

Note: When using the High Speed Range, the three(3) "V" groove drive pulley(shown later), is mounted on the rear end spline of this shaft, retained against the rear bearing lock nut by a special nut.



Low Speed Range back gear shaft assembly.

A: Shaft showing drive key.

B: 2off Hoffmann MS10AC Thrust ball bearings. 2"O/Dx1"Bore dia. Note: Must be assembled correct way round, with thrust side towards each outside end of shaft. (Thrust side shown in picture)

C: Sliding small gear driven by key in shaft. (Shown in correct orientation for assembly).

D: Two part yoke that moves gear in or out of engagement. Retained probably by 1/4"B.S.F. screw originally, now modified to M8 hex. screw on my M/C.

E: Front end bearing locknut. .75"Dia.x16T.P.I.Whitworth form.

F: Rear end bearing locknut. 1"Dia.x16T.P.I.Whitworth form.

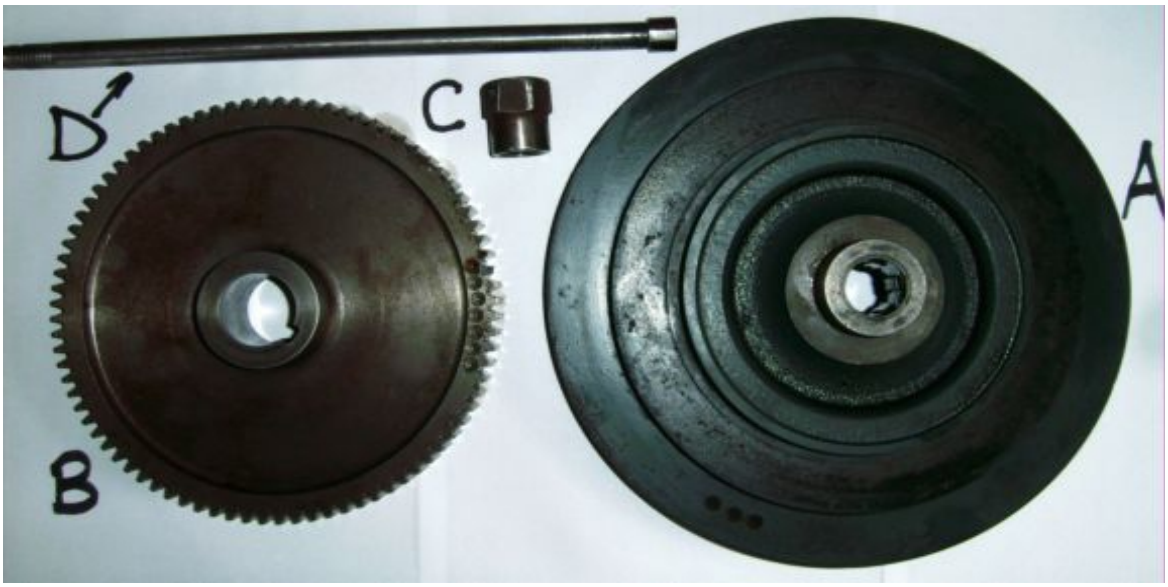
G: Bearing spacer, rear (spline) end side, with cut out for grease entry.

H: Stop washer for front end bearing (step on shaft too small to locate bearing correctly).

Note: When using the low speed range, the three (3) "V" groove pulley is mounted on the rear spline end of this shaft, retained against the rear bearing lock nut by a special nut. The gear, (item C), is moved to engage the main drive shaft large gear (shown later).

Change Over Lever

To move small gear. Note: Detent depression under ball handle. This locks on sprung, ball, detents in head casing (in/out) and a dimple in the shaft to locate the actuating yoke in correct angular relation to detents.



A: Three (3) groove drive pulley ("A" section) showing splines. A72 "V" belt required.

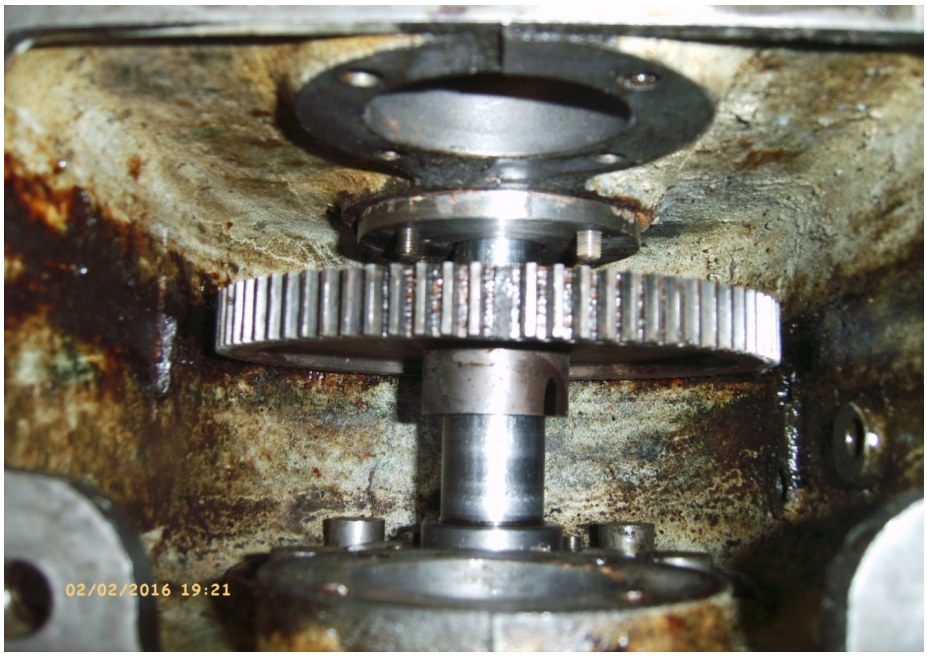
B: Large gear for main drive shaft. Part of low speed range back gear assy.

C: Retaining nut for pulley .75"o/a.x16T.P.I.Whitworth form.x1"AF.hex head.

D: Draw bolt. .5"Whit. (1.12"long thread)x11.375"long(under head). Head of draw bolt has 3/8"AF. hex. socket for Allen Key, to secure arbour, vertical head drive, and other drives in shaft nose.

Re-assembly

Main Shaft Assembly



Picture of main shaft assembled in head casing.

1: Pre-lubricate taper roller bearings and assemble to shaft (back to back) with outer race spacer between. Washer and bearing adjuster nut are then put on. I applied Loctite nutloc to the adjuster thread and tightened the nut finger tight, until there was no back to front play in the bearings. I then gave it the smallest tweak with a "C" spanner. The reason I had to take the head apart in the first place was because this nut had come undone!

2: Feed spline end of shaft into the front, top bore, of the head and as you go put onto it, in order, the front inside cover followed by the large gear, ensuring the long boss faces the front end, then place on the shaft the circlip and inner rear cover plate.

3: Place two packers 2.5"/68mm wide (preferably hard wood) between the rear inner face of the head casing and the rear face of the gear. Orient the gear to line up with the drive key, and gently drive the shaft through the gear to its' locating shoulder, using a (brass, bonze, hardwood), drift inside the shaft nose and a mallet. Remove the packers, and the front bearings are ready to go in their bore.

4: Expand the circlip and slide along the shaft to engage fully in its' groove.

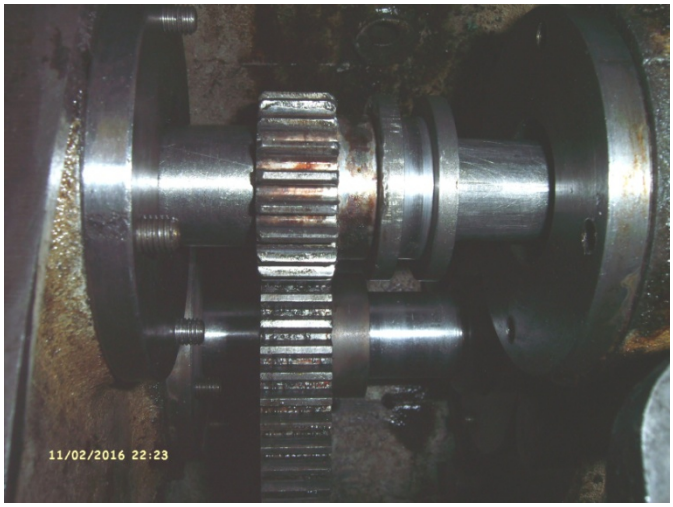
5: Supporting the back end of the shaft push the front bearings just into the bore, (it may require a **gentle tap** with the drift round the outer race), ensuring the gap in the spacer is aligned with the grease entry hole. Place a packer in the rear bore to support the free end of the shaft. Grease the felt seal and locate the front outside cover, securing it using the round headed bolts into the inner cover plate. (There should be two similar 1/4" B.S.W. screws that orient the cover one way only, which were missing, to be replaced). The register on the cover plate correctly positions the shaft front to back in the head as the bolts are tightened.

7: Pre-lubricate the rear self aligning ball bearing and enter this over the shaft. Using a small brass drift gently tap the centre race onto the shaft alternating between outer and inner races. Once the thread is visible start the special nut on the thread and wind this on until the inner race beds against its' locating shoulder, tapping outer race as you do this.(Use a wood wedge against large gear and casing to stop shaft rotating). Again a little nutloc was used. Grease felt seal in outer rear cover plate and place in position. Using hex. head bolts and inner cover plate, attach to casing. Check the shaft turns freely and pump grease in using grease nipples front/rear

Rear end view of assembly

Front end view of assembly. (Shows drive key)

Low Speed Back Gear Shaft Assembly



Shows drive key with small gear disengaged

Shows small gear fully engaged

Assemble as follows:

1: Grease and assemble small gear to shaft, ensuring free sliding action on shaft and key.

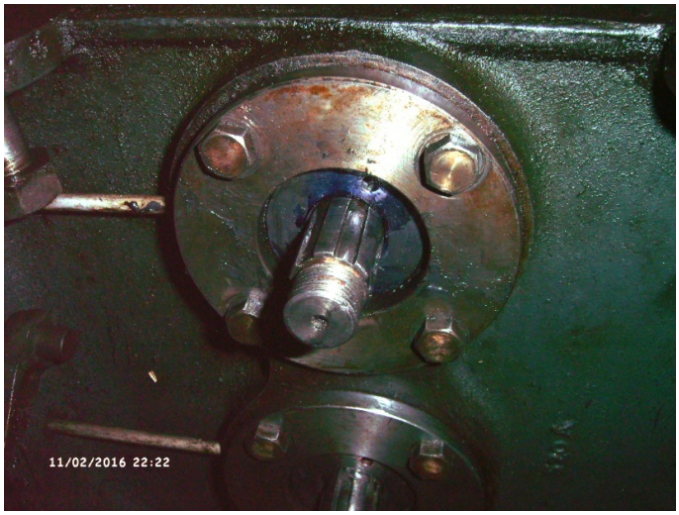
2: Enter splined end through front bearing bore and place rear inner cover over end. Push shaft through until front inside cover can be placed on, locating gear back on key as shaft is pushed back through the front bearing bore.

3: Place stop washer on front end shaft bearing dia. Pre-grease one bearing and enter onto front end seating, thrust,(wide)side of outer race to the outside of casing. Use brass drift on inner race and when engaged, enter outer race into bore, again using drift. Pre-grease 2nd. bearing and enter onto shaft over spline end(again thrust side to outside of casing), and tap fully onto shaft. (Place hardwood packer behind small gear and casing to stop shaft moving).

4: Progressively enter 2nd. bearing into bore and at this stage the front end bearing also needs to be tapped fully onto its' seating against the washer. Screw both bearing lock nuts on, (use nutloc), to fully seat bearings, with the small gear engaged.(Use a block of wood wedged in large gear to prevent rotation).

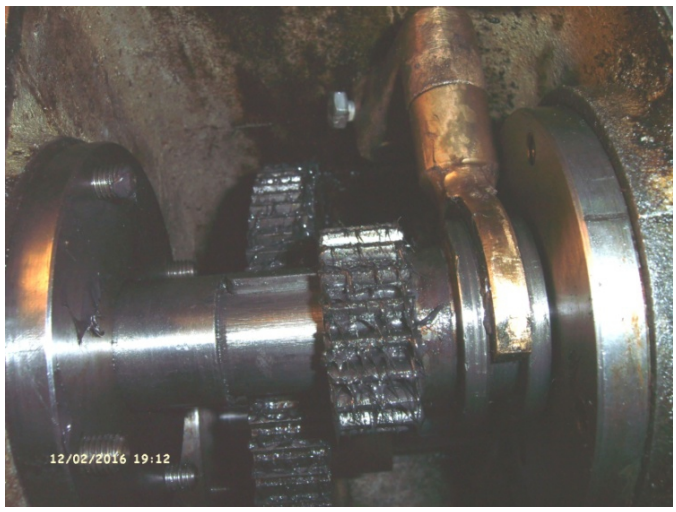
5: Take rear outer cover, grease felt seal, and use it to push rear race into casing bore. Remove and place outer race spacer ring in bore, with cut out lined up with grease entry hole. Refit outer cover and secure using 4off 5/16"B.S.F. hex bolts screwed into inner plate. This locates shaft back to front.

6: Attach front outside cover loosely to head casing, using 2off 1/4"Whit Csk. short screws, which orients the plate correctly, and use 4off 5/16"B.S.F. Csk. screws to attach cover to inner cover plate. Do up short screws fully and then long screws. Pump grease in using nipples front and back.



Front Cover Plate **Rear Cover Plate**

7: Assemble actuating yoke and changeover lever as follows: Separate yoke parts, grease, and reassemble (there is an air/grease release hole which may require unblocking in the "blind" bore in the fork part). Grease "fork" arms. Grease changeover lever shaft. With small gear disengaged with large gear, Insert yoke "fork" into groove in small gear and support with one hand, while inserting changeover lever through side of head casing and into yoke assembly. Rotate lever to line detent in shaft with tapped hole in yoke assy. insert and do up retaining screw.



Picture of gear change assy. in place. Engaged position. **Picture of gear change assy. Disengaged position.**

8: Grease main drive gear teeth and rotate to get even covering. Head is now ready to re-assemble to base.

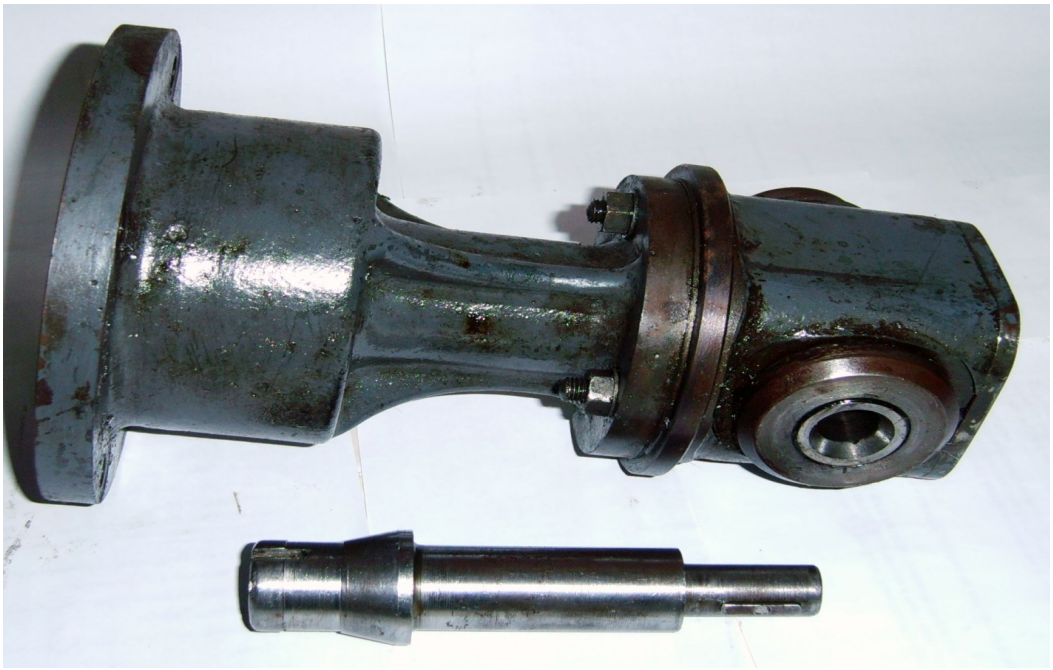
Lorant Rindis Mill: Two Attachments

For Horizontal Milling, the steady and homemade 1"Dia Arbour are shown below. The end support has a 5/8"Dia. bore, bronze, bearing bush with a connecting oil hole. I use commercial engine oil, although on setup I grease the arbour bearing surface beforehand (Moly/Lithium).

The arbour spacers were commercial items at the time for 1"Dia. The key (1/4"square) is about 80% of the working length between the 1"x12T.P.IWhit.x1.25"long, full thread and shoulder. The nut is 1.03"long and has two flats 1.312"A/F. The collet type end was made to the same dimensions as the vertical head drive shaft, with a .2"wide drive key slot. This end is tapped 1/2"Whitx1.5"full thread for the draw bolt. The material used was En16T steel, and I had it heat treated at a local small firm.

Capacity: Takes up to a 6" diameter cutter under support arms, anywhere on the arbour, between the end of the body casting and one .5"spacer from the arbour nut.

The Vertical Milling Attachment



Shows the vertical milling head and its' drive shaft. The head has a No.2 Morse taper. The machine originally came to me fitted with a No.2 Morse taper Clarkson chuck only, which can take a 5/8"shank cutter. As a result of over tightening or too heavy cuts, the end, indexing part, had a cracked bolting flange in one place. It is held by 3 Tee bolts with wedge heads in a, circular, wedge section, groove and the indexing part could not be firmly

clamped. A steel ring was heat shrunk onto the flange to close the crack. It now clamps Ok, but you have to be careful and use an eyeglass to set an angle!

The two types of collet:

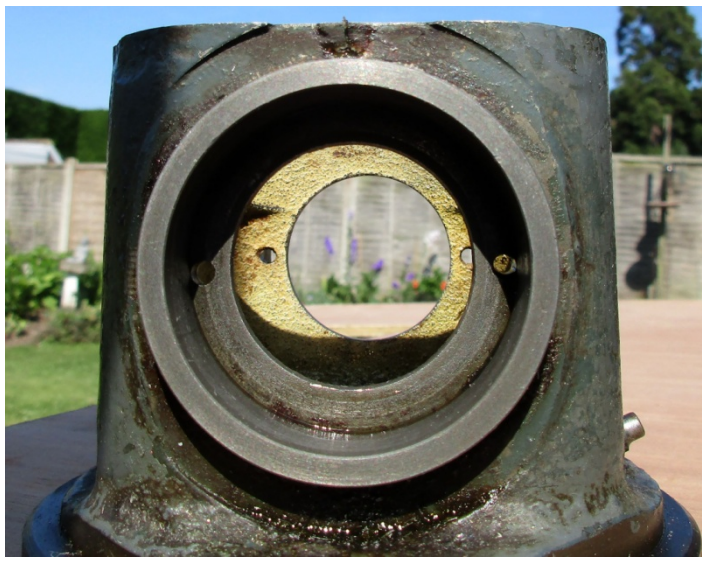
Standard No.2 Morse taper collet with 10mm-3/8" draw bolt. **Clarkson chuck with 3/8"draw bolt.**

The draw bolt should be 3/8"Whit.x3.25"long under the head. Mine seems to be a cut down 4"bolt (that came with numerous packing washers). I made a special spacer washer (as Whitworth is like rocking horse manure round here). The modern Morse taper collets are available but mainly with a 10mm. thread. As 10mm doesn't go through the hole in the shaft, a special drawbar had to be made (from 10mm. studding). Overall length 4.25" with 2.75" turned to 3/8"Dia and threaded 3/8"Whit.for 1.25". In operation you remove nut and washer, screw 10mm. part fully into the collet, then slide the assembly up the spindle bore from below. Replace washer and nut and do up. Pain in the wotsit but it does work!

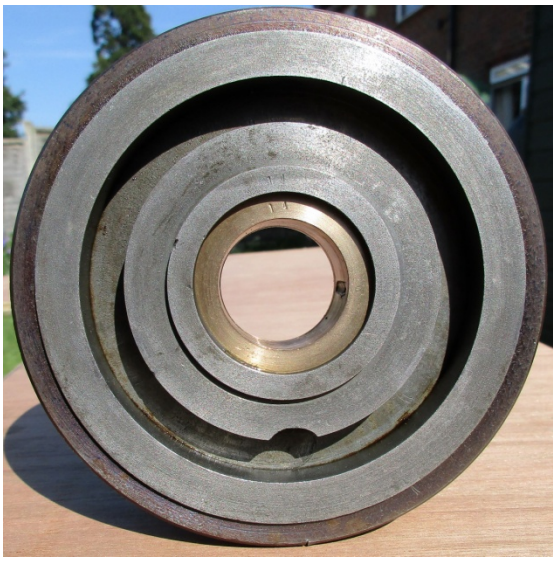
Rindis accessory mounting flange. Locates over front bearing housing. **View of indexing part of head. 2 of clamping bolts visible.**

Inside the Vertical Milling Head.

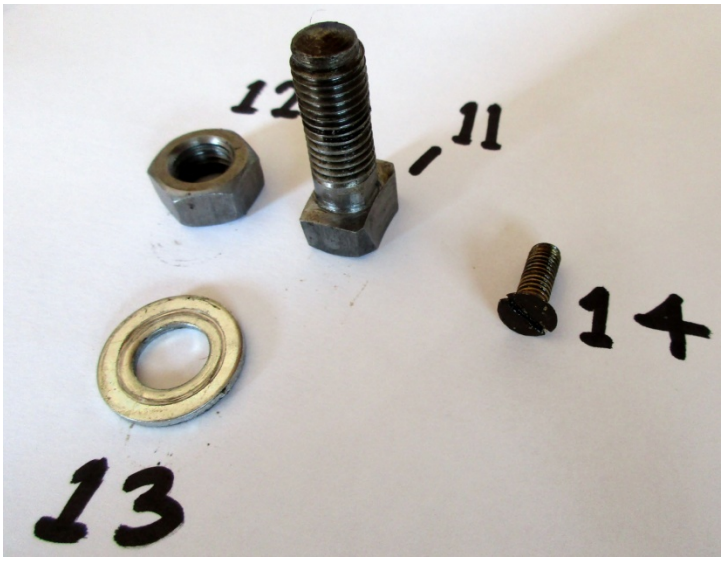
Like the rest of the machine the vertical head needed a service. There was about a 2 thou. “wobble” on the cutter, so I tried to redress this by adjusting the bearing clearance, to no avail. Nothing for it but to dismantle it and find out what was going on! Pictures of the various parts follow.



Inside head casting. Drive pinion bronze bearing in place. **Bottom bearing c’bore. (2 small holes to extract outer race)**



Rotating Head Mounting Face. Cutout for special T'bolts.



Special T'bolt, nut and Washer, also front cover plate screw.

The Parts inside the head

Parts List

1: Main shaft. This has 3/8" clearance hole through and No.2 Morse Taper in the bore at the flanged end. For bearing adjustment a 1" dia.x24T.P.I thread is provided at the top end. Key way for pinion drive key can be seen.

2: Drive key: A fitted key and drive fit in key way.

3: Driven Pinion. Tight slide fit on main shaft (**item1**). Driven by key (**item2**) in main shaft.

4: Bearing adjuster nut: Fits threaded end of shaft and has two, side, locking grub screws which bear on brass inserts to prevent thread damage.

5/6: Bearing end covers: These fit over the shaft each end and have a felt seal, and are a push fit on the register on the head casting.

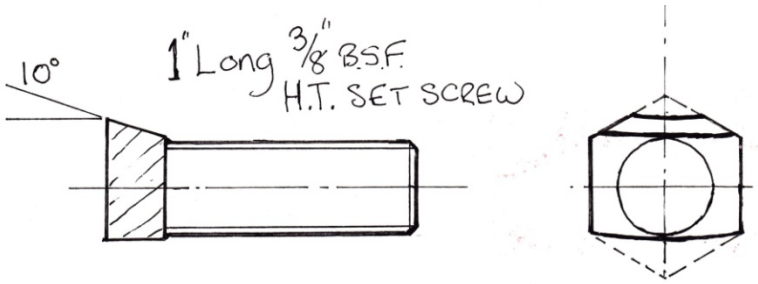
7: Taper Roller Bearing: 2 off 1" Bore x 2" O/D x .5" wide Timken. Inner race No.07100 (14 rollers). Outer race No. 07210X.

8: Drive Pinion: Runs in a bronze bush in the back of the head casing, driven by key in the stub arbour, which goes inside the bore of the pinion.

9: Retaining Circlip: Retains drive pinion in bronze bush.

10: Front Cover: Covers front of head casting. (Has offset dowels, so only fits one way round).

11: Special Head Retaining Tee Bolts: 3off 3/8"BSFx 1.312"O/A length. Sketch for ref.



A disc fixture was made with a 3/8" hole at pitch c/line of circular groove in fixing face of head. A screw was inserted thought with nut on the reverse and done up tightly oriented as shown. The points of the hex head were then turned as shown leaving about a .005" step on the angle side at the 3/8" dia. The other side was machined parallel to the screw as close to the thread as possible without touching. To enter the circular groove the top of the head needs grinding down to fit. The top face of the head must be .02/.03 below the joining face.

12: Nut: 3off 3/8"BSF nuts.

14: Washer: 3off Heavy duty steel washers.

14: Screw: 4off 3/16"BSFx.5" O/A length C/SK screws to retain front cover (**item10**)

To Dissemble

1. Remove the front cover plate by undoing 4off 3/16"BSF screws.
2. Undo 2off grub screws in circular bearing adjuster nut, and remove nut (using spindle lock to stop rotation).
3. With brass drift gently tap top of main shaft. As the shaft goes thought the top bearing a short 7/8" dia. rod should be used between drift and shaft. The bottom inner race will remove the bottom end cover as it is retained by the pinion drive key. Fully remove shaft.
4. Remove the driven pinion via front cover access.
5. Rotate head and tap out **top** inner race and end cover.
6. Using a slightly bent piece of 1/8"Dia silver steel rod, and the two small holes through each side of the bearing recess tap out the outer race both ends through the casting bore.
7. Remove head from support casting, undoing 3off nuts, and remove special tee bolts using cut out on inner edge of groove.
8. Remove circlip from drive pinion and remove pinion
9. Remove drive key from shaft. (This is a, tight, fitted key), Using drift remove bottom bearing inner race.

All items should then be thoroughly cleaned and inspected. I my case, new bearings were needed. Any run out between the shaft O/D and Bore was checked for, in case a new one was required to be made.

Reassembly

This was carried out in the reverse order to the foregoing, except at the point where the shaft was re entered into the top bearing, when both end covers were re- fitted. The bearings were both pre greased and the felt seals, as was the drive pinion bearing. The bearing adjuster nut was then fitted and done up until no up or down movement was detected using a D.T.I. when both locking screws were secured. Before fitting the front cover the pinions were liberally greased and then using a grease gun, pump grease through the nipple, while rotating shaft, to ensure adequate lubrication of the drive pinion bearing. **TIP.** If replacing bearings with new, as I was, use old outer race to seat new outer races. As the old race will stick in remove by just turning and pulling with large pair of pliers/grips.

Fly Cutter

Very early on I needed to square up some 6.5"long aluminium blocks so I needed a 6"Dia. side and face cutter, but one was outside my budget so I made this.

Cut from a scrap piece of 1" plate using the slitting saw I had. Bolted to my lathe faceplate and bored 1"slide fit, with a light counter bore, so the back face was square to the bore. Drilled through at 45 degrees 5/16"dia, with two 3/16"Whit. tapped holes into it on the centre line. A tool bit was made from a broken drill, with a flat on the opposite side from the cutting edge. Worked like a dream clamped up tight on the horizontal arbour, even without a key. After all this time, I now need to make a stub arbour, with key!

The Machine in Use: Horizontal Mode(speed changing)

For large diameter cutters (slitting saws, side and face) the machine needs to be set in back gear.

1. Remove "V" belt, then 3 groove pulley, (undo retaining nut), from main drive shaft. (use spindle lock).

2. Remove vertical head attachment, (undo 4off 1/2" cap head retaining screws). Loosen draw bolt through main shaft (use spindle lock) and tap end to release short drive shaft. Fully unscrew draw bolt and stow shaft with the vertical head.

3. Mount horizontal arbour steady (use 4off 1/2" cap screws), insert horizontal arbour in nose of main shaft and do up draw bolt firmly (use spindle lock).

4. Position cutter in correct position on the arbour for the work in hand and do up arbour nut finger tight.

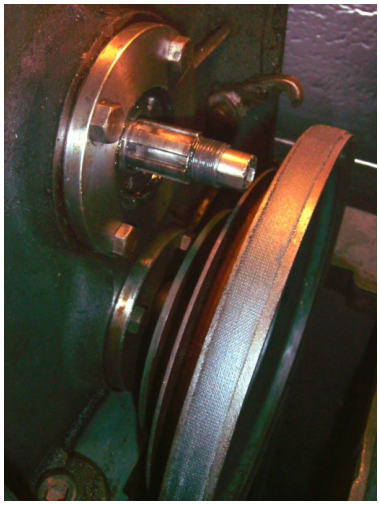
5. Grease arbour steady end support bearing and slide onto the two "arms" and arbour shaft bearing spiggot.

6. Tighten arbour nut with LARGE spanner (I use a 24" Bahco adjustable, using spindle lock to stop rotation). Position end support close to arbour nut and tighten locking bolt (3/8" B.S.F.).

7. Engage back gear by pushing side lever to position 2 (towards front of machine) while rocking pulley to ease engagement.

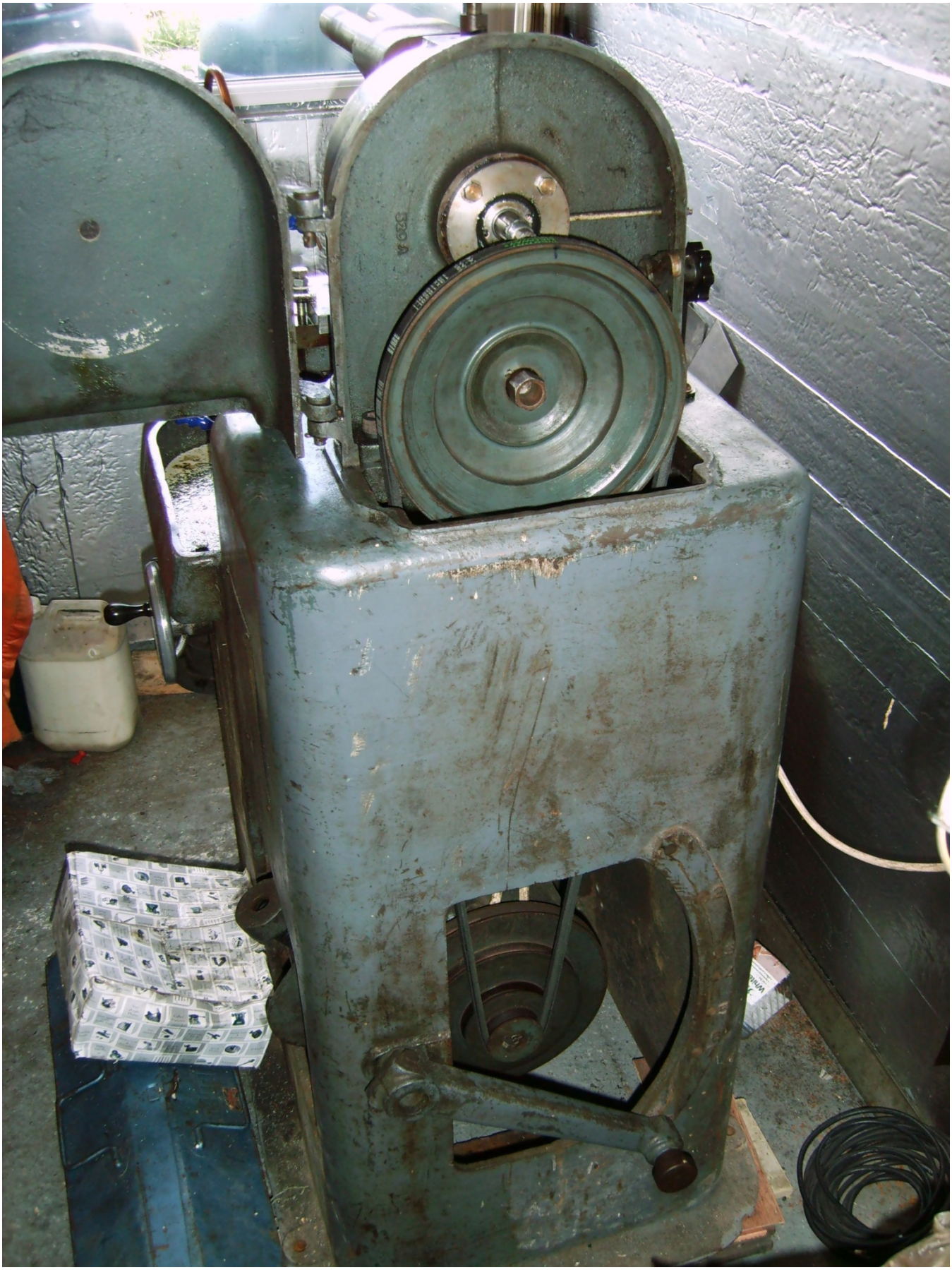
8. Place pulley back on **bottom (back gear) shaft** and secure with retaining nut, (using spindle lock).

9. Select required speed by sliding motor mount to line up top and bottom pulley groove combination, place belt on, then tension using rear arm.



Shows pulley position and draw bolt head in back gear.

Shows change over lever in back gear position 2

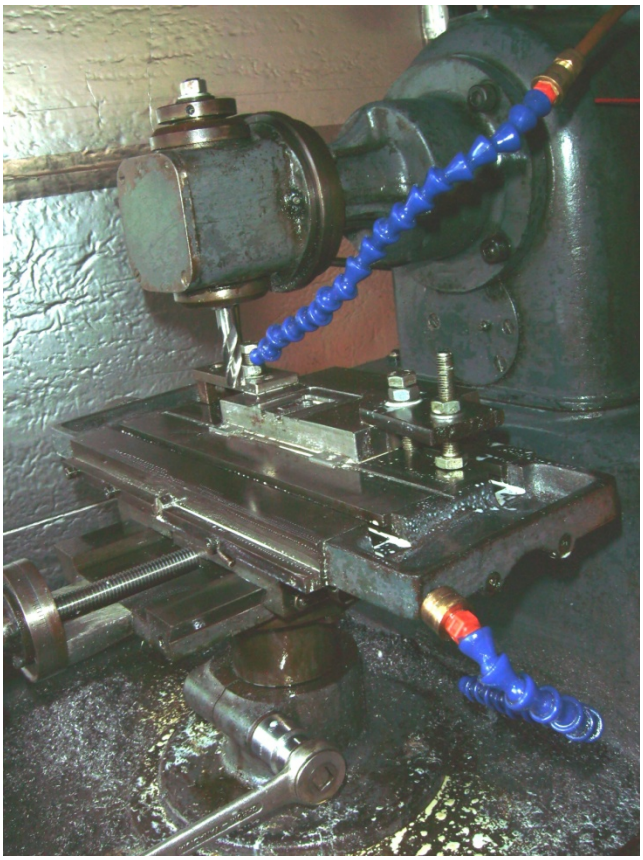


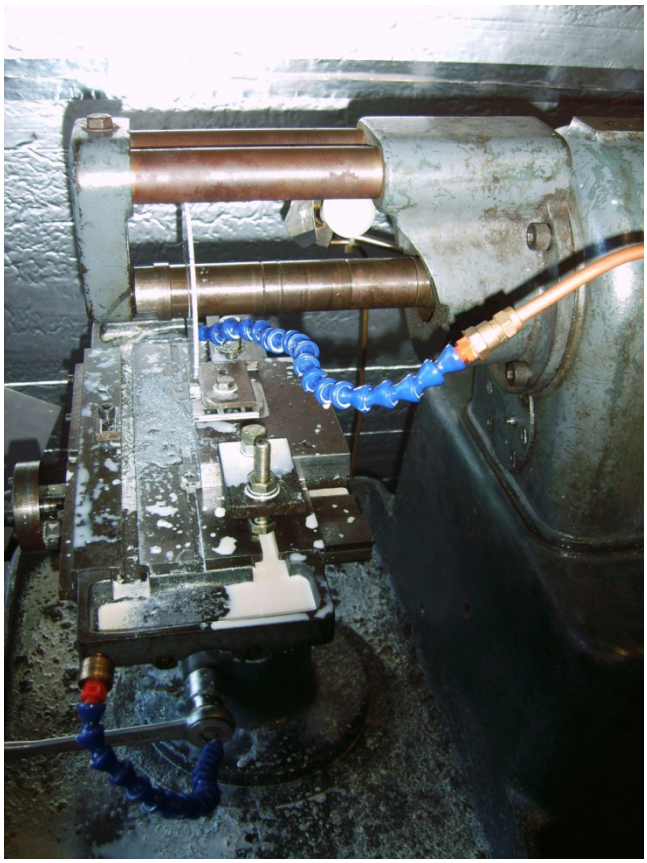
Shows rear view in back gear with machine set at slowest speed. Note: belt tension lever set at No.8 (lowest of 8 positions) position.

To change to vertical mill operation: Follow previous instructions but in reverse order. The following pictures show the direct drive arrangement.

Rear view set up in direct drive high speed range.

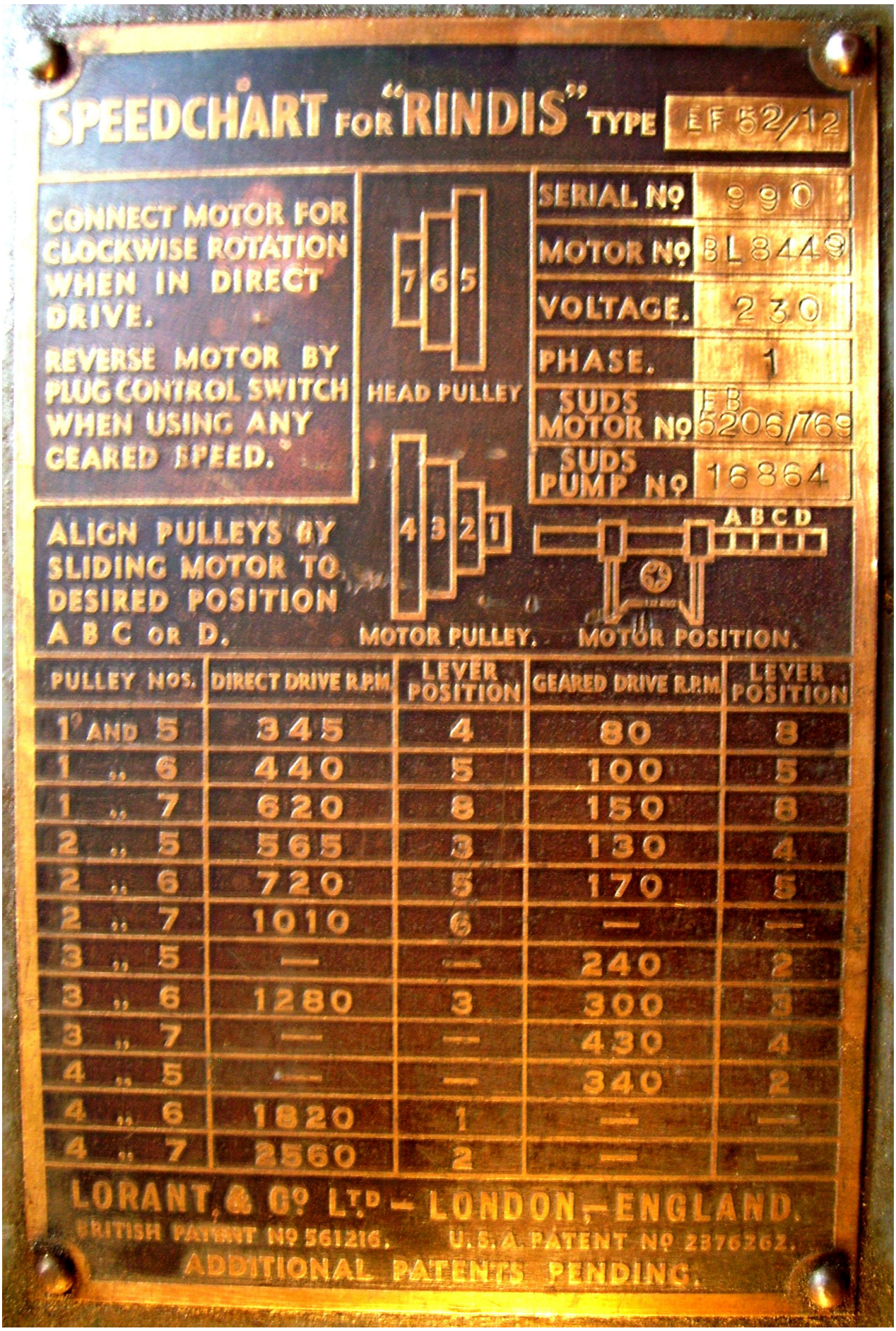
Position of side change over lever with back gear disengaged.





<u>Pictures of machine in use in both modes</u>

Speed Chart



SPEEDCHART FOR "RINDIS" TYPE EF 52/12

CONNECT MOTOR FOR CLOCKWISE ROTATION WHEN IN DIRECT DRIVE.

REVERSE MOTOR BY PLUG CONTROL SWITCH WHEN USING ANY GEARED SPEED.

HEAD PULLEY

SERIAL Nº	990
MOTOR Nº	BL8449
VOLTAGE.	230
PHASE.	1
SUDS MOTOR Nº	EB 5206/769
SUDS PUMP Nº	16864

ALIGN PULLEYS BY SLIDING MOTOR TO DESIRED POSITION A B C OR D.

MOTOR PULLEY.

MOTOR POSITION.

PULLEY NOS.	DIRECT DRIVE R.P.M.	LEVER POSITION	GEARED DRIVE R.P.M.	LEVER POSITION
1 AND 5	345	4	80	8
1 „ 6	440	5	100	5
1 „ 7	620	8	150	8
2 „ 5	565	3	130	4
2 „ 6	720	5	170	5
2 „ 7	1010	6	—	—
3 „ 5	—	—	240	2
3 „ 6	1280	3	300	3
3 „ 7	—	—	430	4
4 „ 5	—	—	340	2
4 „ 6	1820	1	—	—
4 „ 7	2560	2	—	—

LORANT & Co LTD – LONDON, – ENGLAND.

BRITISH PATENT Nº 561216. U.S.A. PATENT Nº 2376262.

ADDITIONAL PATENTS PENDING.

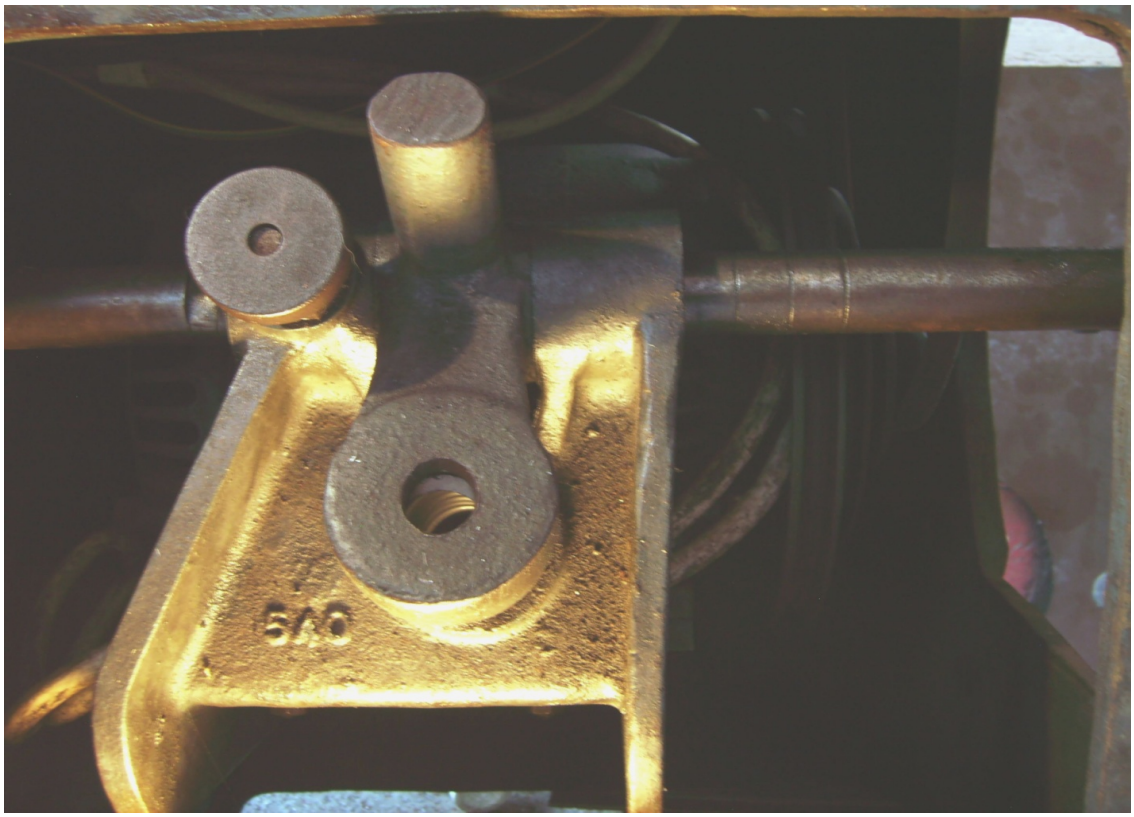
Note: Clockwise rotation looking at front of head not pulley side.

Picture of motor mounting

This is a two part assembly. The large mounting bracket, rotates freely on the shaft, and a central, non-rotating, sideways, moving bracket, keyed and running in a keyway, along the shaft.

On the left side of the mounting bracket can be seen the pull out detent. To disengage, pull out and quarter turn (either way). To engage, another quarter turn. It locates in 4 grooves in the shaft, and positions the whole bracket assembly, to align the motor pulley with the shaft drive pulley. The three visible grooves (to the right) are indicators of which position is in use. The large projection on the central casting is for a tubular handle, with which to slide the heavy, motor/bracket assembly, left or right on the shaft. Below this projection, (part of the same casting), is a circular part which has a cast, circular, recess aligned with a similar recess in the motor mounting bracket. Between is inserted a spring to reduce the weight on the "A" section, "V" drive belt. This spring was missing when I originally got the machine and it became clear what should be there only after a few years, and a snapped belt later! (it can just be seen through cast hole).

Spring Specification: 38mm O/D x 100mm Long x 5.0mm dia. spring wire. (Picture below)



The Motor

This is the original that came with the machine when new. It is a 1HP. single phase 230Volt, 1400rpm, six wire machine. It has an extra long 5/8"dia shaft with a 3/16"keyway. The four groove, "A" section pulley, is secured with a feather key, and a grub screw in the second pulley groove to lock it. Wiring goes through the same hole as the coolant hose, to the reversing switch.__

To Remove and Replace Motor

I have recently had to dismount the motor (it just sat and hummed at me). This is a pain in the backside job. After much thought, and after searching online for a replacement (which again, is like trying to find rocking horse manure), I found a small, local outfit who said they may be able to repair it.

1: After removing the drive belt, move the motor mounting bracket as far along the shaft to the right as the key will go in the keyway.

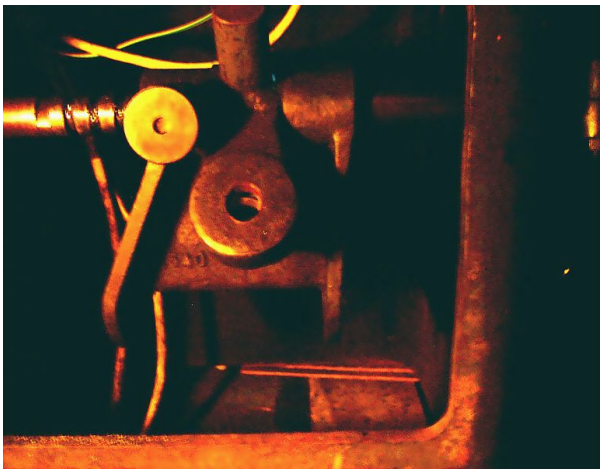
2: Undo the locking grub screw (see picture). Remove feather key, (I made an extractor tool from a You Tube article), but it's not easy.

3: Remove four (4) groove pulley, and undo nuts on motor mounting bolts. Lift mounting until level using rear arm.

4: A length of rope was passed over the top pulley and tied like a harness around the motor. The other end went round my shaper (opposite) and back through a loop I made near the pulley (see lorry drivers' hitch, again You Tube). Take the weight of the motor and tie off securely.

5: Drop the rear arm right down as far as you can and the motor will be hanging on the rope. Get help if necessary, to release, and let the rope down slowly while pulling the motor out of the back opening. Rest it on a packer (a small stool in my case) and either cut or disconnect the wiring harness.

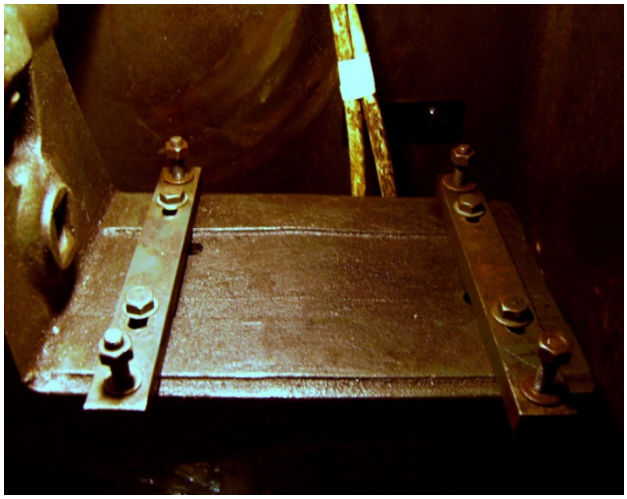
To replace the motor go from item 5 to 1. If you have to take the motor support bars off to re-pitch the mounting bolts for a different motor, place the mounting bars back on the bracket with the bolts finger tight to give some movement. Hang the motor back in position and bring the mounting bracket up to the motor to engage the mounting bolts for correct alignment. Position the motor mount sideways for a correct pulley combination and position motor pulley with the v-belt on. Drive home key and lock with grub screw. Any fine adjustment can be done on the motor mounting bars. Pictures of the various parts of the assembly follow:



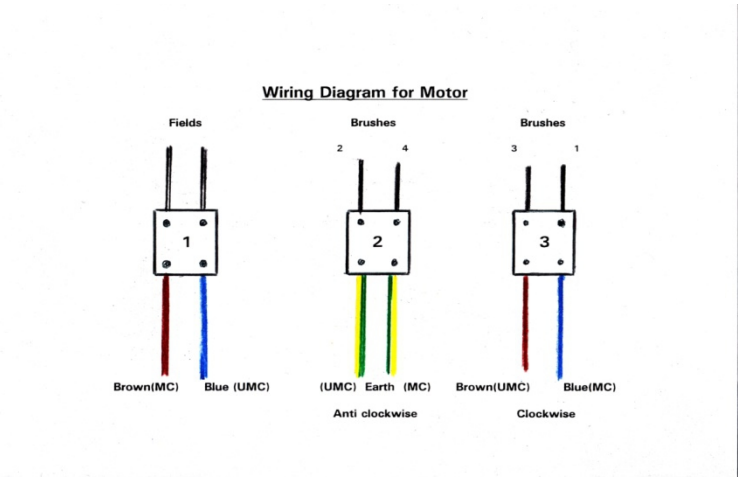
Mounting hard to the right

Motor mounting bars(slotted for adjustment

Mounting bar bolts: 1.5"longx5/16"BSFx.65"threaded

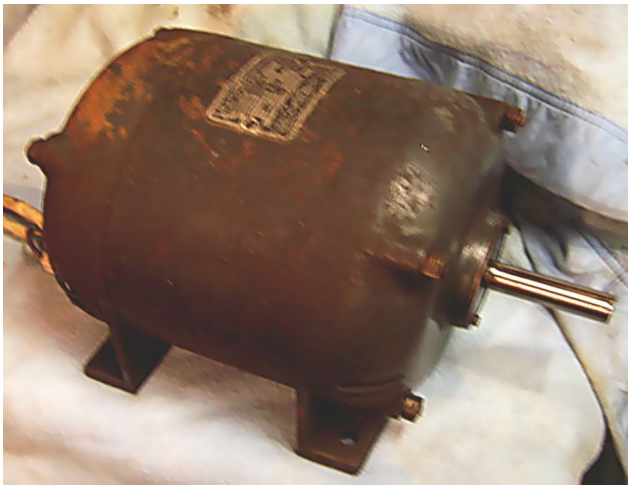


Bracket with mounting bars fitted. Note wiring harness.



Ceramic connector blocks with test wiring connected.

Wiring diagram for 6 wire motor using 2x3core cables.



Motor showing 4" long shaft

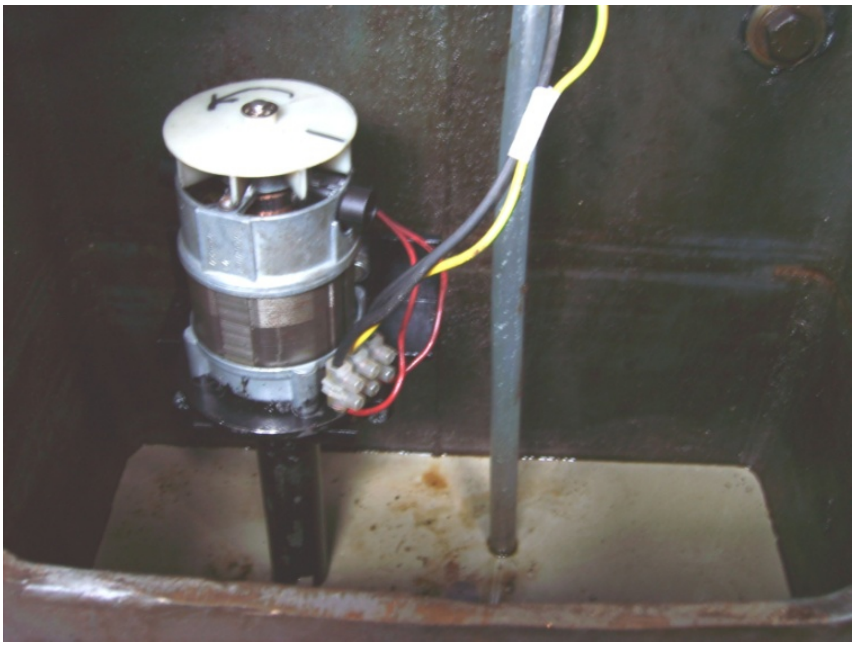
Maker's plate

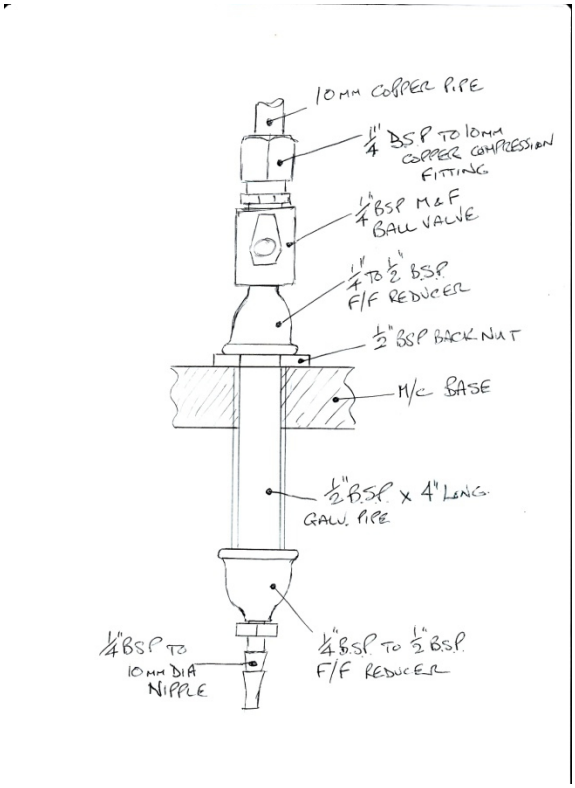
Four groove pulley with key(not fully inserted)

WARNING: An EARTH wire from the motor to the isolator earth is required and also from the pump, pump switch and reversing switch bodies.

Coolant supply.

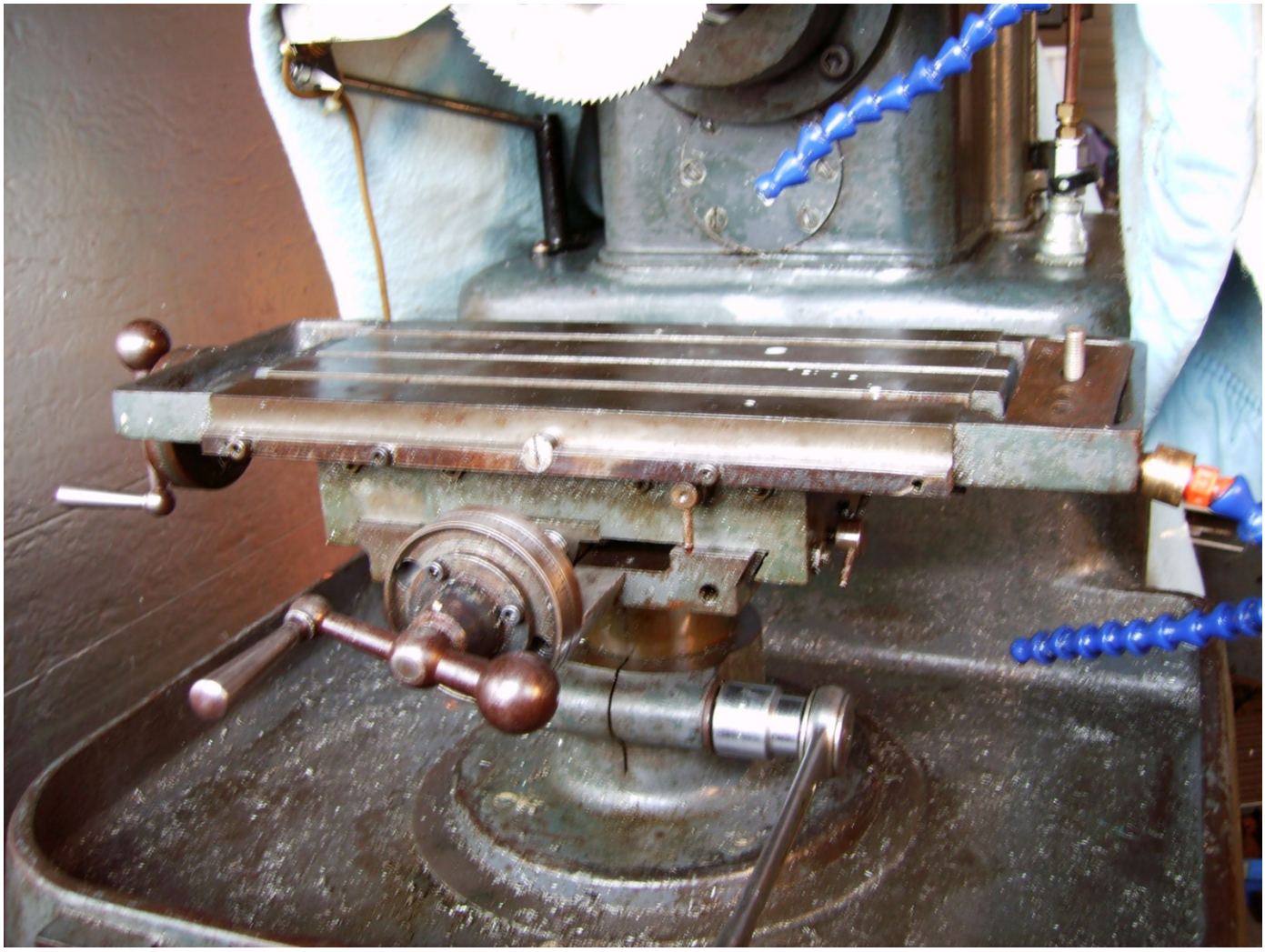
The coolant reservoir is in the front part of the base casting with a removable, push fit, cover. The coolant pump is mounted to a bracket secured by two (2) 5/16"B.S.W nuts and bolts through the dividing wall between the coolant tank compartment and the rear, motor compartment. As bought, the machine did not have a pump or supply pipe to the table area. As a temporary solution I made a pump, using an old washing machine pump motor to drive it (the whole assy. well earthed electrically). See the sketch and photos of the unofficial coolant system:





The original must have had a 1/2"B.S.P. base fitting as there is a 1/2"B.S.P. tapped hole through the base casting next to the head. An old, galvanised, barrel nipple was modified to have thread all along it. A 1/2" to 1/4"B.S.P female/female reducer with a 1/4"B.S.P. to 10mm hose fitting was tightly screwed on one end (with liberal use of PTFE tape). A length of 10mm bore plastic hose was then secured to the nipple with a worm drive clip. The assembly was then screwed as far as possible though the base casting from inside the motor compartment. A 1/2" B.S.P. back nut was put onto the projecting pipe followed by another F/F reducer which was done up tight with the back nut screwed up behind it. The whole assy. was then screwed back until the back nut was done up tightly against the outside face of the base casting. An old 1/4"B.S.P. M/F ball valve I had was fitted, followed by a 1/4"B.S.P. to 10mm copper compression fitting. A short piece of 10mm copper pipe, with a female 1/4"B.S.P compression fitting attached, was secured to the valve fitting and gently bent towards the table. To finish, a length of the blue plastic, flexible, sectional pipe was attached, and the other end of the 10mm hose was fed through the hole between the motor and coolant compartments, cut to length, and attached to the pump. The table drain hole was tapped 5/16"B.S,F. and a brass adaptor turned up with a 1/4"B.S.P. female thread to take another of the blue plastic bendy coolant pipes(see previous pictures). The waste coolant now goes back to the sump instead of on the floor!! However I think yet a further modification is needed, because the flexi pipe is getting clogged up with fine swarf. Possibly a piece of 10mm copper brazed to the adaptor and bent to suit.

The Machine Table Assembly



General View of the Compound Slide Table.

The picture gives a good view of the table assembly. The table is 12.375"long x 6.5"wide with a travel of 8.5"side to side, and back to front about 6.5" depending on how far you wish to overhang the slide way! A central tennon slot .25"x .18" deep with 3off equi-spaced 3/16"B.S.F. tapped holes to secure tennons, plugged when not in use, is provided. Two tee slots pitched at 3.5"x .4"wide are provided for clamping accessories to the table.

Table movement in both axis is by hand wheel graduated in .001" increments, turning a 10TPI lead screw. One turn =.10" movement in both axis. The transverse handle broke off early on, so a conical, flanged, part was turned, to which the handle was fixed, and the assembly was reattached to the dial with four 2BA cap head screws. The table locks can be seen to the right of the transverse hand wheel. Lastly, two cast "trays" are fixed, one each end, to catch and direct coolant.

The whole table assembly can be moved vertically about 6.5". It is attached by two 5/8"B.S.F. set screws, on a register, to a large diameter flange, on top of an 80mm dia. shaft. The attachment flange is slotted to allow the whole table assembly to turn about 30 degrees either way but by removing the set screws may be turned to 90degrees from its' original position. The shaft runs in a large, flanged, cylindrical casting with split clamp type lock at the top (ratchet socket attached to the 5/8"B.S.F. clamping screw head). There is a fixed .375" square key on which the shaft runs to stop rotation. As things are a little worn, I always lock the vertical travel before commencing any operation. This casting extends into the top of the coolant tank area and is secured with 4off 5/8"B.S.F. set screws, from the coolant tank side.

The vertical feed is through a lead screw driven by two helical gears, one on the lead screw and the other on a drive shaft, with a hand wheel on the outside of the machine base casting. The hand wheel is marked in .001" increments but one turn of this hand wheel is only .05" vertical movement. (very accurate, I've managed .0005" with it!!).

Further pictures of this assembly follow:

Table Vertical Feed Drive

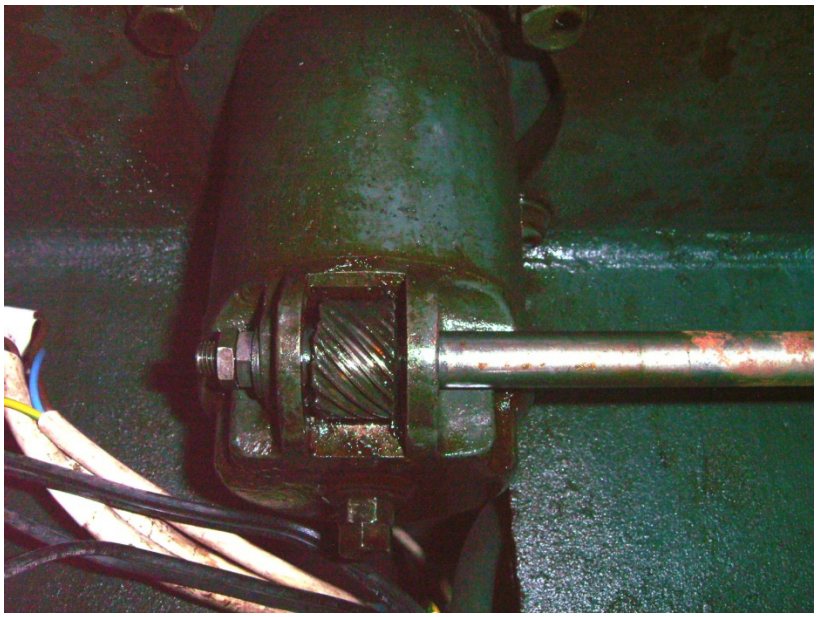
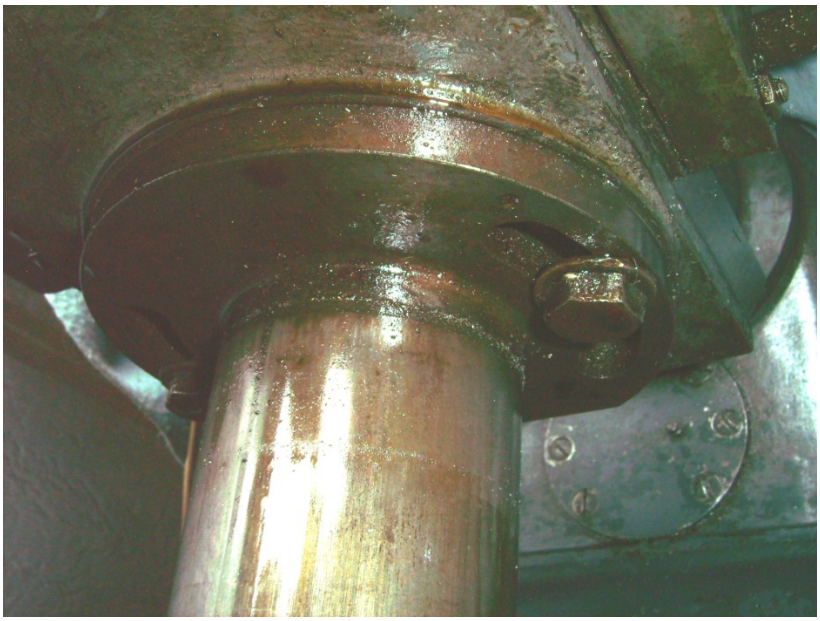


Table Fixing to Column



Vertical Slide Lock

Vertical Slide Feed Drive Hand Wheel

General

Well that's it. Over the years this little machine has done a considerable amount of work for me. I've used it exclusively as a milling machine, in my small plastics moulding company and now after about fifteen years standing idle in my home workshop, it is making a model steam engine. Of course, according to Murphys' law, as soon as I began my hobby It fell apart, hence the foregoing.

The last thing is you need some special tools, probably not common nowadays, as follows:

1. 1"A/F (ideally, one labelled 5/8"B.S.F.) open ended spanner, or combination spanner, or socket and wrench.

2. 3/8"A/F Allen key (preferably long series)

3. Two pin spanners for tightening the bearing lock nuts.

4. A "C" spanner for adjusting the main taper roller bearing adjuster.

As my machine looks like it may not be totally original inside the head I have not given dimensions for the last two items. A more original machine may be slightly different! I now know it can do much more with other attachments. Given time I may even make a chuck back plate for it and some collets for the main shaft with clamping nut, although I don't think a slotting attachment would be within my model making workshops' capacity, But, you never know.

To whoever takes on this machine after I am no longer around, please look after it, and it will look after you.