

# VSM

(Vintage Sewing Machine)

# TFSR

(Tools For Self Reliance)

SECTION	PAGE
<b>1 TFSR The Case Refurbishing</b>	<b>A 1-3</b>
<b>2 TFSR The Handle Mechanism Refurbishing</b>	<b>B 1-2</b>
<b>3 TFSR The Balance Wheel Refurbishing</b>	<b>C 1-2</b>
<b>4 TFSR The Bobbin Winder Refurbishing</b>	<b>D 1-7</b>
<b>5 TFSR The Machine Top Refurbishing</b>	<b>E 1-4</b>
<b>6 TFSR The Tension Mechanism Refurbishing</b>	<b>F 1-13</b>
<b>7 TFSR The Head Refurbishing</b>	<b>G 1-4</b>
<b>8 TFSR The Lower Bobbin Area Refurbishing</b>	<b>H 1-8</b>
<b>9 TFSR The Underside Refurbishing</b>	<b>I 1-9</b>
<b>10 TFSR The Sewing Test</b>	<b>J 1-3</b>
<b>11 TFSR Advanced Techniques</b>	<b>K 1-8</b>



(1) Round bobbin machines come in a variety of cases, but mostly in the suitcase, (shown above) or domed types (as below).



2

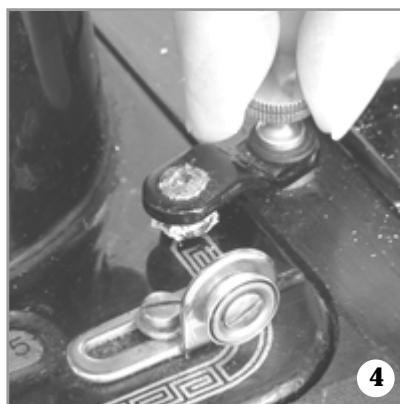
(2) Examine cases for signs of woodworm!

Customs do examine shipments. Signs of worm - treated or not - have previously delayed entire shipments. This is not only a disappointment, but also incurs expensive port levies for delaying clearance. So discard the box, do not treat it.



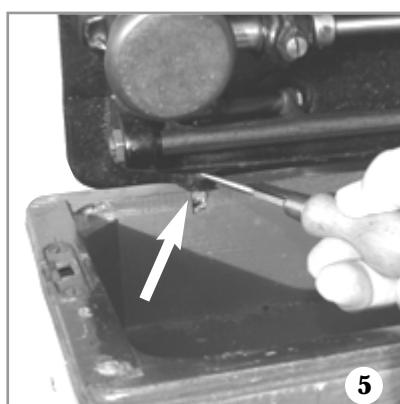
3

(3) The machine itself is held in a wooden base by two hinges at the back of the machine and a catch at the right hand side.



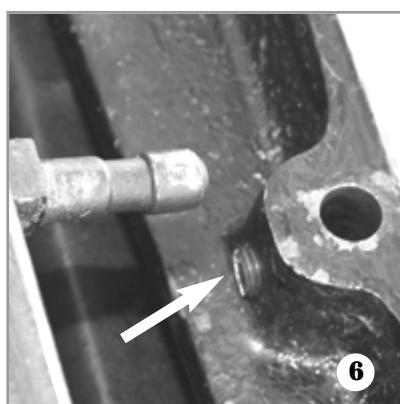
4

(4) Release the retaining catch.



5

(5) Remove the machine from its case by tilting it back and undoing the two grub screws.



6

(6) Then lift it clear of the two finger hinges.



7

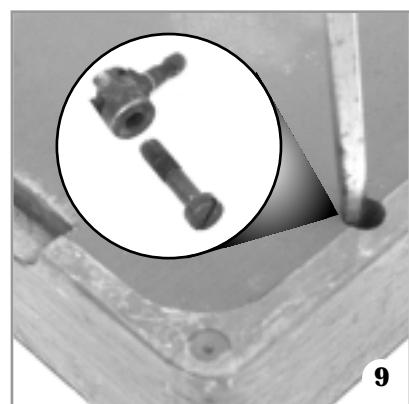
(7) Clean out all debris from under the machine and from the accessories compartment.

Remember that the machines will not remain upright during transit, so any pins, needles and fluff in the bottom may well be deposited in the works during that time unless you remove it.



8

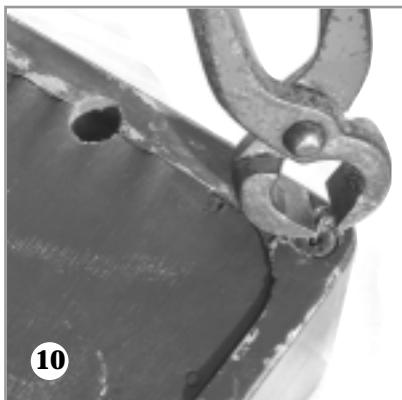
(8) Examine the state of any accessories and needles present for rust and damage. Discard any that are not in good condition.



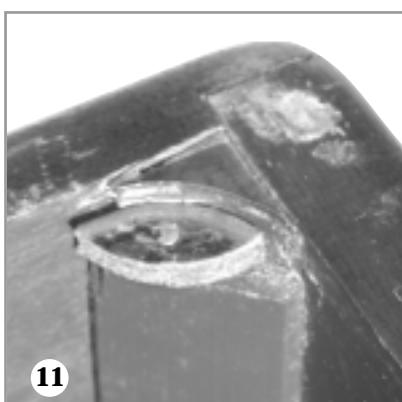
9

(9) Turn the base over and make sure the bolts holding in the machine hinges are present and tight.

Slight damage to the case is not important, but the case should be secure and safe to use. Check all joints and re-glue where needed. Make sure the corner blocks are present and secure. Either re-glue or remove any veneer that has split. Holes in the bottom may be repaired either by replacing the ply completely or where the damage is small gluing a patch to the inside of the base.



**(10) If one or more of the rubber feet are worn or missing, remove all four completely.**



**(11) Make sure the small 'half moon' leather or rubber pieces are intact on top of the corner blocks at the front of the machine.**

These deaden any vibration and also lift the machine a little so that the cover plate does not foul the side of the base when opened.

#### Domed case:

The lid and the base are held together by a lock at one end, and a case fitting at the other.



**12**

(12) Three different keys have been used over the years. The square ended one came first, then the one with the flat tongue, followed by the notched one. This last type cannot be removed from the lock while the lock is undone.

If a key is missing, the lid can be unlocked with a small screw-driver, or the tang of a file for the first type.

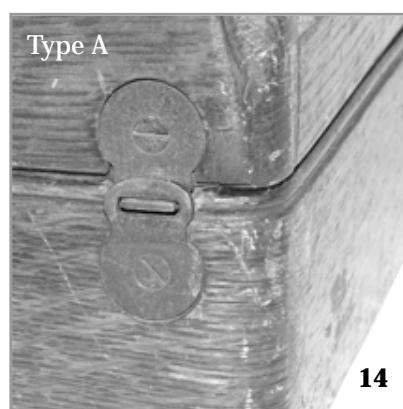


**13**

**(13) If the key is missing make a replacement from a flat cut nail, with the end filed as required and the other end bent for grip.**

The case fittings vary but in each case, they rely on the lock to hold the lid in correct alignment.

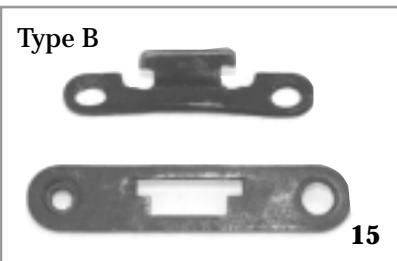
Each pair of fittings works in the same way with the top fitting entering the bottom one, and the lid then slid to the left to engage.



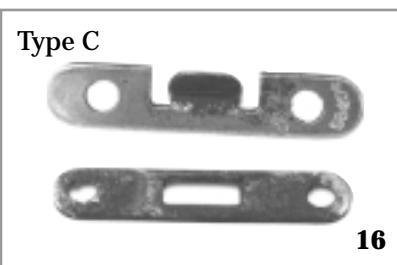
**14**

(14) Type A in the picture is an early model and attaches to the outside of the case.

Quite often the fixing screws work loose. If the holes are too worn to tighten the screws, push a sliver of wood into the holes and try again.



**15**



**16**

(15) Type B and (16) Type C are less problematical, but can sometimes become bent. Make sure the bottom fitting lies level with the case, and the top one then secures the case.



**17**

**(17) Clean out any fluff etc from the case fittings to ensure they can latch properly.**



**18**

**(18) Oil the lock and work it a few times to make sure it is working easily.**

The lock is only attached to its cover plate by two small flanges. If these have become loose, they can be tapped with a hammer and punch to tighten them.

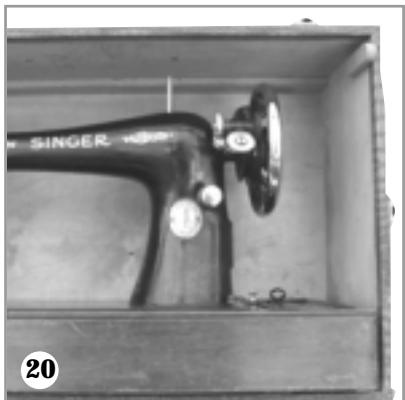


19

**(19) Check that the handle is secure. Tighten up the nuts inside the lid.**

If the handle has been loose for a while, the wood may be broken round it. If so, spread the load by sandwiching the handle between metal plates outside and inside the lid.

#### Suitcase type case



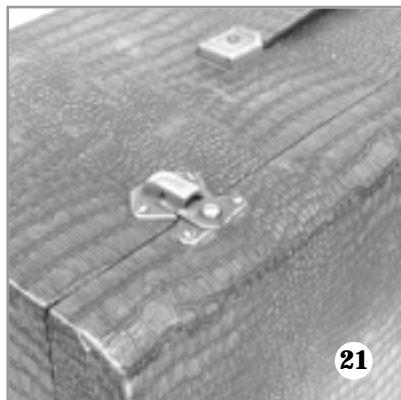
20

**(20) The machine in its base slides into the box, which opens from the side. There are two battens at each side that prevent the machine from moving.**

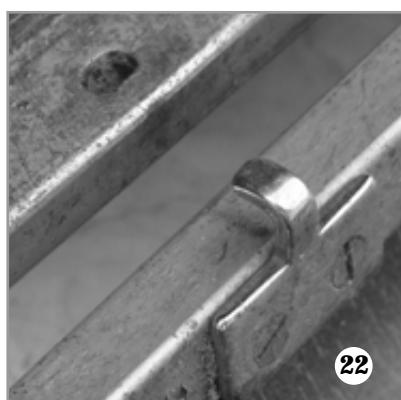
Two types of fastenings are used on these cases. One is a suitcase type lock with latch and lock.

Since the latch is secure enough, we do not bother with providing keys.

**(21) The other type uses spring catches, and these can be damaged. Replace them with a simple latch, or fasten up with string or rope and leave it to us at Netley Marsh, as we have spares.**



21



22

**(22) The bottom of the lid has pins, which fit into holes in small metal plates at the bottom of the box. Make sure these are intact.**

The leatherette cover of the case is frequently scuffed and torn. Where possible glue down any torn pieces.

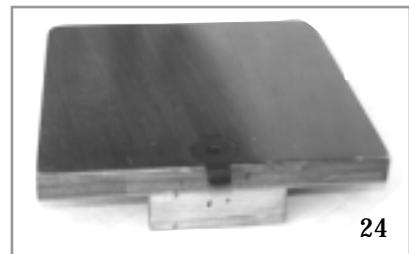
#### Finally, for all types



23

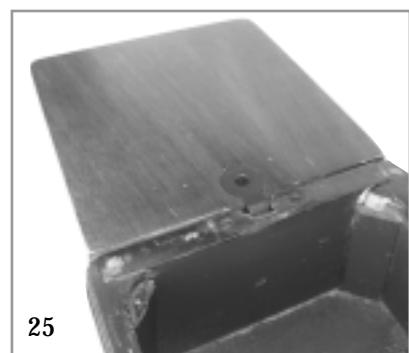
**(23) Wipe over the outside of the box with a damp cloth to remove fliespecks and dirt.**

If you wish, a final polish can be given. It can make it difficult to attach the Refurbishment Record form though!



24

**(24) You may find a base extension piece inside the box like the one shown above. This is a roughly square wooden piece with a metal bracket at one end.**



25

**(25) It fits into the left hand bottom case fitting to extend the working area. There is a different bracket for case fittings B or C.**

If present, check that: a. It is the right fitting for the case. (Cases do get swapped about), and b. That it is in good condition with no loose ply or bent brackets.

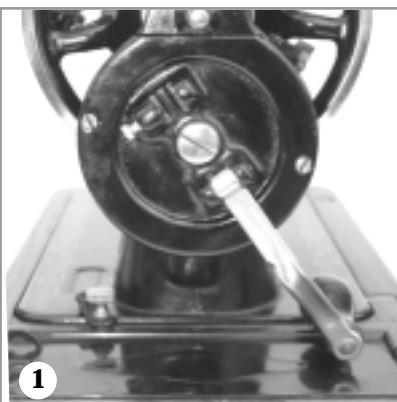
For storage, the extension piece is kept in the lid of both types of cases. The bracket fits into a notch or slot at one end, while a wooden bracket holds an opposite corner. It is then held in place by a catch similar to that holding the machine in the case. Make sure this catch is tight enough to do its function.



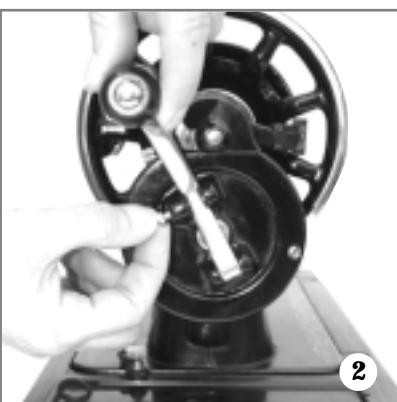
26

**(26) You will sometimes find other metal fittings inside the cases, intended to locate oil cans etc. You may remove these as they are not needed.**

The handle attachment may have suffered wear and tear but we have to ensure it is in good condition both comfortable and quiet to use for hours at a time.



**(1) Remove the machine from its case. The handle arm will be folded down.**



**(2) Place the handle in its working position by lifting the arm and clicking into place. To release pull the small spring stud.**

On older machines, the handle is held in the latched position by a pin inside the bracket, rather than the spring stud.

If the spring inside the bracket is broken and the pin does not hold the handle arm in position, either change the handle from any spares you may have, or note it on the refurbishment record on the outside of the case and Netley Marsh will change it.

Make sure the wooden handle is free from worm or splits and turns freely on the spindle. If it is stiff apply some penetrating oil and leave for a while.

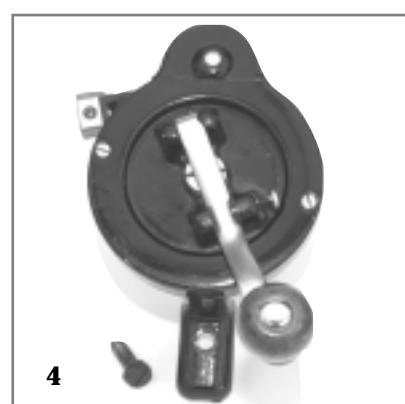
Check that the wooden handle is turning on its spindle, not that the spindle is turning with it. The spindle should be securely held in the crank handle lever, neither turning with the wooden handle, nor being loose.



**(3) A possible solution to correct this problem is to rest the end of the handle on a metal object and tighten the joint using a punch and hammer.**

If the handle is in poor condition or refuses to budge, it could be more productive to exchange it for a better quality spare unit. If you don't have a spare, highlight the problem on the refurbishment record on the outside of the case and we will replace the unit from our stock at Netley.

It is worth noting that some handle units vary in size and are not interchangeable between different models. In particular, the bracket length varies. If you change handles between models, make sure that the driver arm engages with the balance wheel without fouling the bobbin winder when it is latched down.



**(4) Detach the handle mechanism from the machine body by undoing the single screw bolt.**

The machine you are working on has probably stood idle for a number of years and the oil in the handle gear housing may have become gummed.



**(5) Remove the cover plate to reveal the internal gear mechanism and make sure the workings are clean and free from grime and any odd bits of lint or thread.**

After cleaning, turn the handle slowly through a complete turn. If there is resistance at any point, examine the teeth and clean out any debris.

Apply a drop of oil before replacing the cover plate. There are oiling holes in both the drive arm and the main gear. Apply a drop of oil to each and run for a few turns.



**(6) Hold the reassembled unit in your left hand and ensure the whole mechanism runs smoothly and easily.**



**(7) See that the small hinged flap on the rear drive arm turns back easily and is properly cushioned.**

This flap locates between the spokes of the balance wheel and engages the machine ready for use.



**(8) Older machines have a thin leather sleeve on the end of the hinged flap to cushion and silence the action. If the leather is worn out or missing the machine will be noisy.**



**(9) To re-cushion the hinged flap, trim off any excess leather and press a tight fitting small piece of plastic tubing over the arm.**



**(10) More modern machines have a fibre pad with a small metal plate and screw to hold it in place.**

If the pad is missing or badly worn, replace it if you have any spares. Otherwise, note it on the refurbishment record on the outside of the case and Netley Marsh will change it.

Put the refurbished handle mechanism with its fastening screw to one side until the rest of the refurbishment has been done.

**Standard Spoked Wheels:**

When engaged, the balance wheel transmits the power from the handle (or treadle) to run the machine. The combined weight and spinning motion helps smooth out the action.

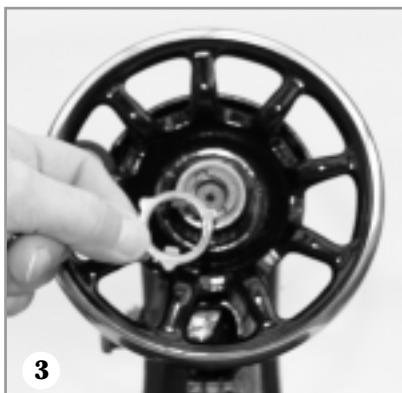
When disengaged from the main transmission, the balance wheel is used to drive the bobbin winder.



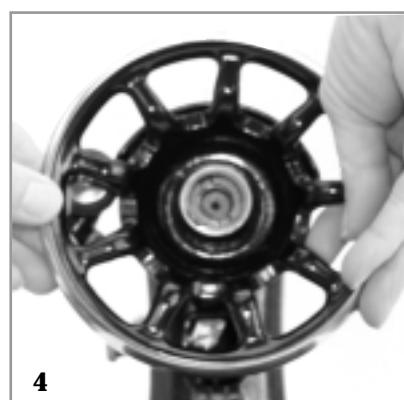
**(1)** Slacken the small pin screw in the face of the shiny knurled hub disc - known as the stop motion screw.



**(2)** Unscrew the stop motion screw hub disc.



**(3)** Remove and clean the odd shaped clutch washer.



**4**  
**(4)** Draw the balance wheel off its spindle then clean and oil spindle and wheel bearing.

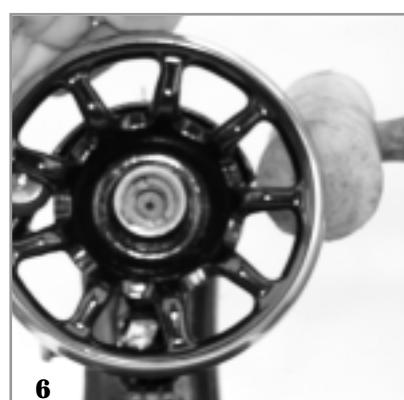
If the wheel is tight on the shaft, try easing it by liberally applying penetrating oil.

If the outer rim of the balance wheel is badly pitted or rusted, a replacement wheel may be the best solution.

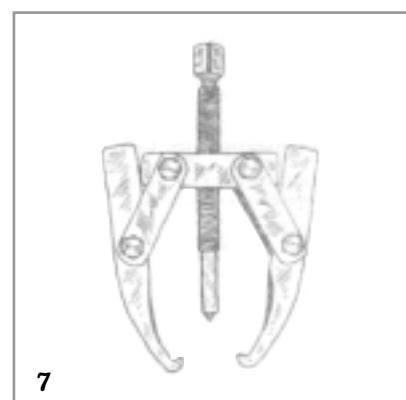


**5**  
**(5)** If the balance wheel is really stuck, place a block of wood beneath the needle bar.

This prevents the machine from turning while you work the balance wheel free. Do not use excessive force because there is a danger of disrupting the timing.



**6**  
**(6)** If the wheel is still seized on the shaft, turning it slowly whilst tapping gently with a fibre mallet should dislodge it...

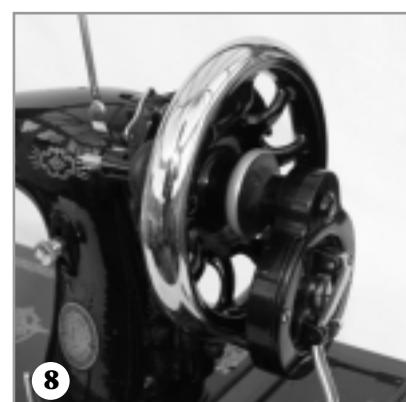


**7**  
**(7)** ...or, if you have one, use a Gear Puller like the one illustrated above.

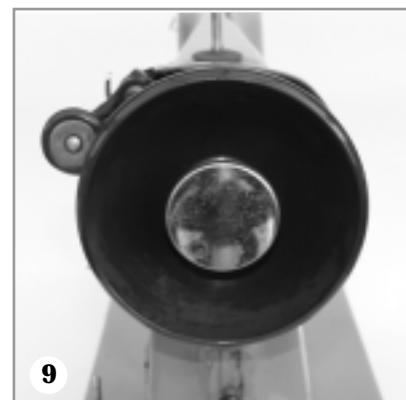
You may need to reverse the arms so the hooks are pointing outwards and can lock on the rim of the balance wheel through the spokes.

**Solid & Larger Size Wheels:**

Machines with spoked balance wheels are designed for use with handles and/or treadles.



**8**  
**(8)** Some very early machines have balance wheels with a thick rim like the one shown. This can sometimes preclude the opportunity of inter-changing handles from some other later models.



## 2 REFURBISHING - BALANCE WHEEL: STOP MOTION - RE-ASSEMBLY [2]

Some machines are designed to be driven solely by a belt and have a solid balance wheel like the one shown.

**(9) Dismantle and draw a solid wheel off its spindle in the same way as a spoked one.**

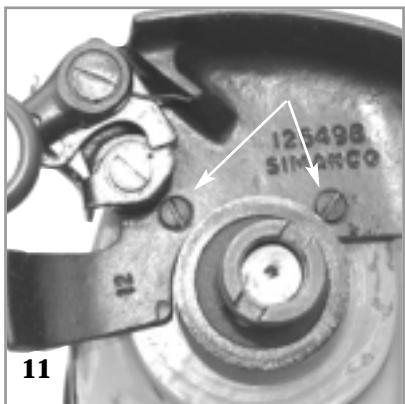
These solid balance wheels have a larger diameter flange for the bobbin winder to work on than the spoked wheels.

We cannot therefore just substitute a spoked wheel, as the bobbin winder cannot be adjusted to engage with the spoked balance wheel.



**(10) Check if the bobbin winder attaches at the top of the machine.**

If so, the balance wheel and the bobbin winder can be changed as a pair. If you do not have spares, note it on the refurbishment record on the outside of the case and Netley Marsh will change it.



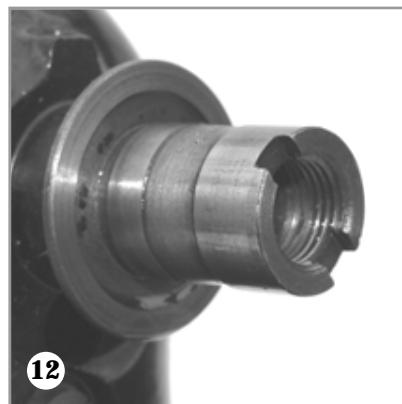
(11) In most cases you will find that the bobbin winder attaches by screws at the side of the machine behind the balance wheel.

All is not lost in this case, as we can use any long base machine - 15K, 66 or 201- for a treadle base, releasing a spoked balance wheel machine for conversion to hand.

Again, a few solid balance wheels have an indented notch cut in them to allow a handle to be fitted.

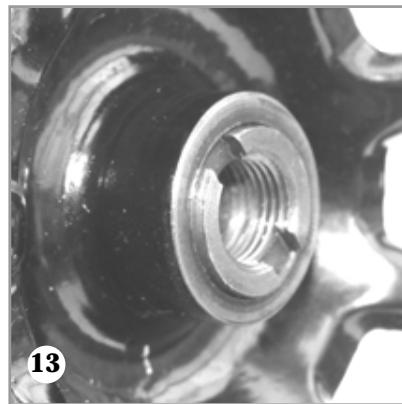


We do not recommend that this conversion is attempted on other machines such as 99 and 185.



(12) The picture above shows the Balance Wheel (stop motion) bushing on the end of the end of the driveshaft.

What concerns us is the operation and adjustment of the clutch mechanism which is common to all the machines we send.



(13) Here we see the end of the bushing, projecting through the hub of the balance wheel. Notice particularly the notches at the end of the bushing.



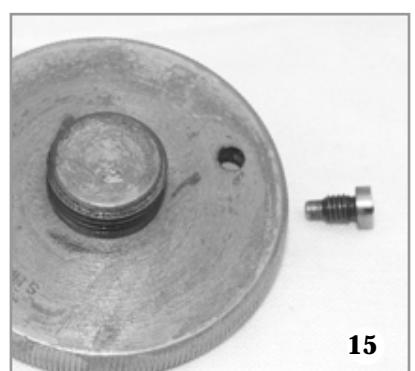
(14) Now the clamp stop motion (or clutch) washer has been added and you can see how the two inside lugs fit into the two notches at the end of the shaft.

Notice how these lugs bend outward from the bushing. This is important because it provides a creeping action for tightening the clutch.

In other words, the clamp stop motion washer acts like an ordinary spring washer except that it is not designed to lock into position.

If the lugs are pointed inward there is no 'give' to the washer at all. It locks almost instantly and is likely to work loose when the machine is working.

Exact adjustment of the stop motion washer is an easy matter if the clutch is understood.



(15) This picture shows the reverse side of the hub disc and the stop pin screw that threads through the hole.

## 2 REFURBISHING - BALANCE WHEEL: STOP MOTION - RE-ASSEMBLY 2



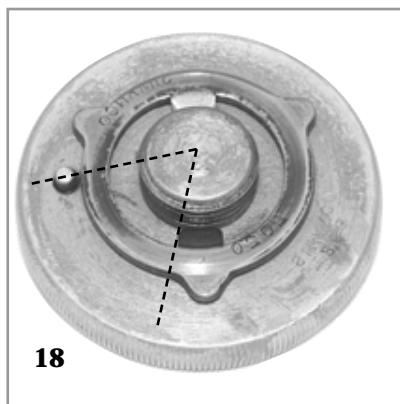
16

(16) When threaded into position the end of the screw projects far enough through the hole so it can strike against the outside ear lugs.

When winding a bobbin it is desirable to have the balance wheel run free, and not turn the driveshaft which operates the machine.

Imagine you could see what was happening behind the disc...

To help you understand, the action the following photos are mirror images.



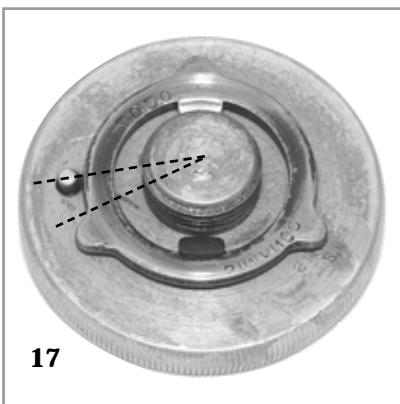
18

(18) If, when the hub is screwed in to its maximum, it is still not tight enough - you will have to remove the clutch washer and turn it through 180 degrees.

The dotted lines show how by doing this you get six times more movement between the pin and the ear lug which allows the thread of the hub screw to bite deeper and increases the pressure.

When you replace the stop motion screw, you can have no idea whether you have located the washer correctly.

However, it will soon become obvious. If it isn't right, take off the screw, turn the washer round  $180^\circ$  and try again.

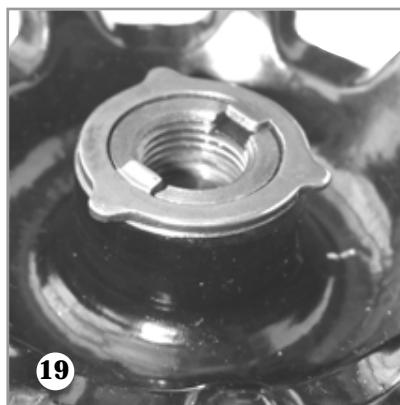


17

(17) The hub disc is unscrewed (anti-clockwise) releasing the pressure until the pin clicks against an outer ear lug, stopping the hub from undoing completely.

When the bobbin is wound, the operator turns the clamp stop hub screw clockwise and, in so doing, tightens the clutch.

The white lines added to photo (16), show where the tips of the projecting sprung lugs rub against the inside surface of the hub screw.



19

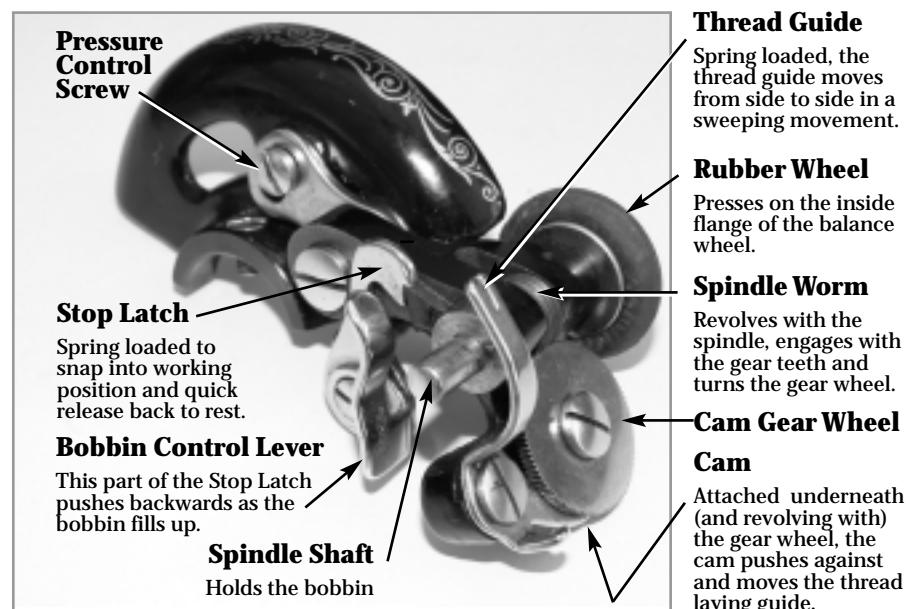
(19) It is much easier to fit the washer and screw if you tip the machine up on to its end.

The bobbin winder is a separate unit screwed on to the machine, adjacent to the balance wheel.

Its function is to wind a reserve of cotton evenly onto an empty bobbin and (in most cases) spring release when the bobbin is full.

The most frequently seen type actually performs three tasks: (1) winding (2) evenly distributing (or guiding) the thread and (3) stopping when full.

In order to achieve this multi-tasking, the bobbin winder has three sets of components, springs and levers doing different jobs but all working in unison.



There are three main types of bobbin winder. Before you start to dismantle one and work on it, you firstly need to identify which type it is.

And then familiarise yourself with how it works.

### TYPE A



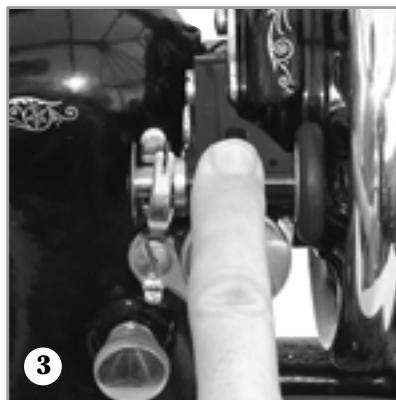
(1) With small variations, TYPE A was installed on 66, 99 and 15K models over a long period.

It has a winder, thread guide and a release mechanism. It is the one most frequently seen and is the most complicated.

For this reason, it is really useful to have an assembled spare example to hand, so you can refer to it as you work.

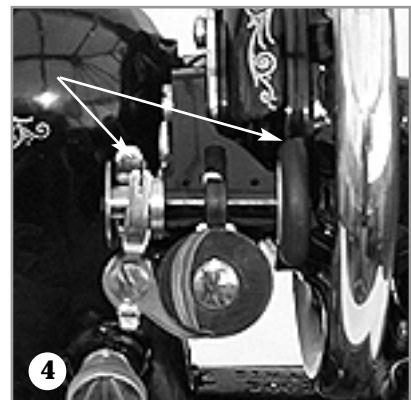


(2) An empty bobbin is inserted on to the bobbin spindle until the small pin in the spindle shoulder locates in the hole in the bobbin side plate.



(3) When the spindle housing is pressed down, the stop latch snaps forward.

(4) With this action, two things happen:



(a) The rubber wheel is pressed against the balance wheel and...

(b) The stop latch comes to rest between the side plates of the bobbin and holds it in place.



(5) As the handle is turned the bobbin fills with cotton, the stop latch is forced upwards until it eventually spring releases back into its original

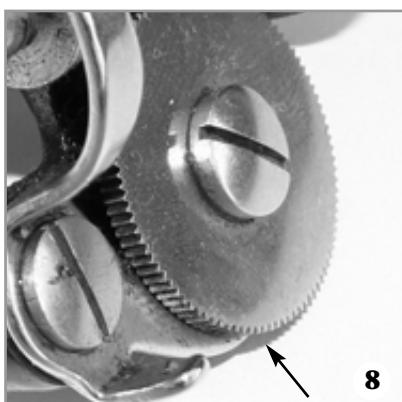
When the handle is turned the worm on the spindle turns the thread guide gear wheel. This is fixed to a cam which pushes the thread laying guide to one side.



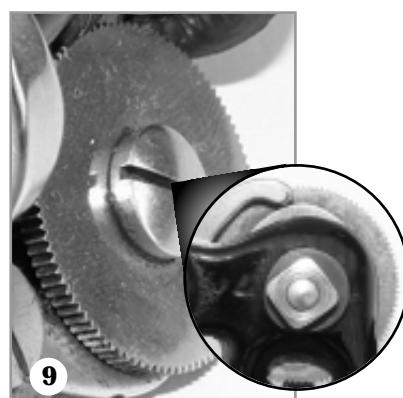
(6) When the cam is at its maximum diameter the thread guide lever is pushed to the right



(7) The guide is held against the elliptical cam by a spring, so when the cam rotates the guide returns with a sweeping action, distributing the cotton evenly along the drum of the bobbin.



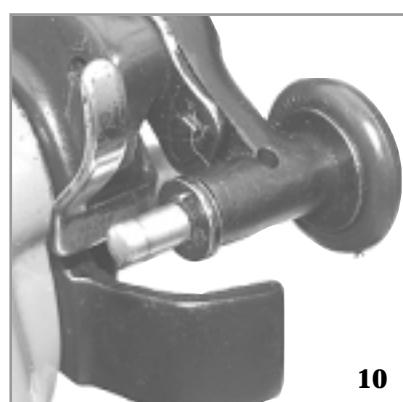
(8) On some bobbin winders the cam is fixed behind the gear wheel (as shown here) but the principal is the same.



(9) The gear wheel is retained by a central (eccentric) screw with a small square lock nut at the back.

It is a common mistake to remove the eccentric screw and gear wheel for cleaning not realising the *adjustment* between the worm and gear teeth must be set correctly on reassembly.

#### TYPE B

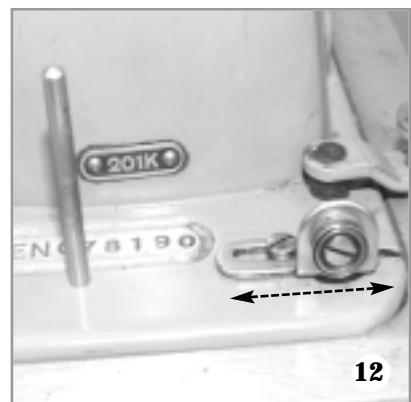


(10) Type B has a winder and release mechanism but no thread guide. It was fitted to 201s and later models of the 66, 99 & 15K.

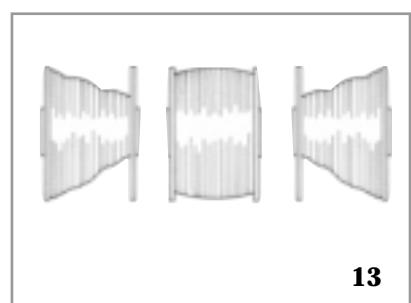


(11) This modification dispensed with the complicated thread laying device and introduced a base plate bracket.

In its simplest form the bracket has two slots that the thread is taken through.



(12) Another variation of the base plate thread guide has two small sprung loaded - tension wheels.



(13) These base plate thread guides can be moved to the right - if the the bobbin winds too heavily on the left side - and vice versa, then locked in position.

There is also often a second cotton reel holder on the base plate for bobbin winding.

It is important to clean this area but be careful about oiling. Over oiling could negate the tension by allowing the cotton to slip.

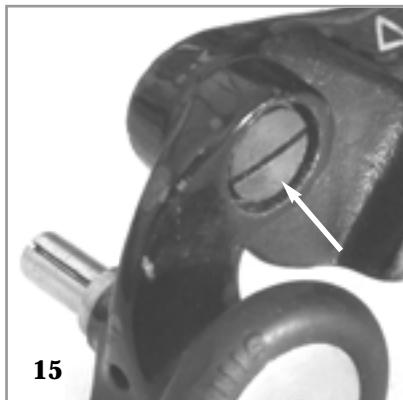
#### TYPE C



**TYPE C**

(14) This simple winder - without thread guide or release - relies on the operator to stop when the bobbin is full.

It uses the same brackets on the base plate to deliver the thread to the bobbin. When in use, the operator pushes the arm down on to the balance wheel.

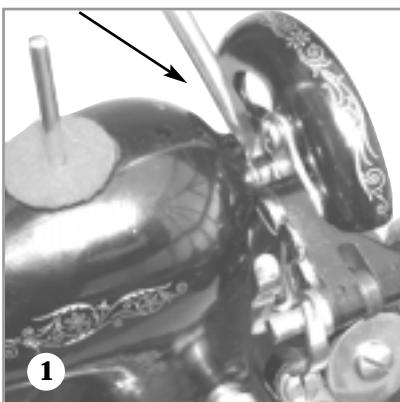


(15) Make sure the screw holding the arm is tight enough to keep the arm on the balance wheel.

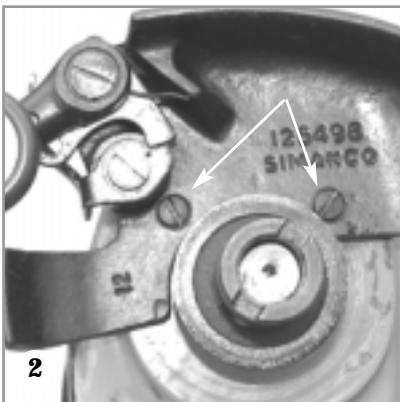
Apart from oiling, cleaning and checking the rubber ring, there should be no other problems.

Type C has a spring fitted in the bobbin shaft which provides enough resistance to keep the bobbin in place while winding.

It was fitted to electric machines and recent models of the manual ones.

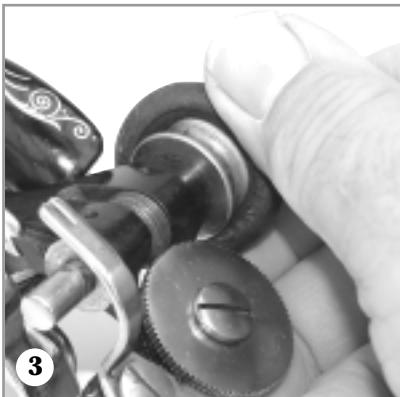


**(1) Undo the single attachment screw and remove the bobbin winder assembly from the machine.**



**(2) Sometimes the bobbin winder is held on by two screws which are only visible when the balance wheel is removed.**

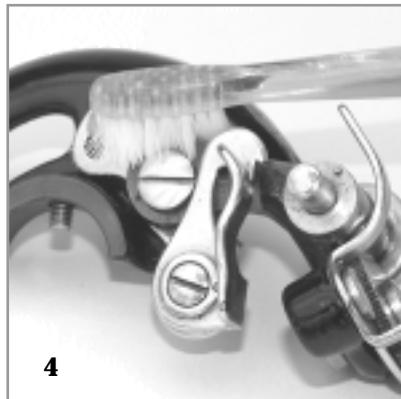
If the bobbin winder appears to be in good working order, *it is better to avoid taking it apart.*



**(3) Remove the rubber wheel.**

This small rubber wheel on the end of the bobbin winder spindle is pressed against the balance wheel to pick up the momentum when the handle is turned.

The rubber wheel has to be in perfect condition and *must* be replaced if it is hard and cracked, or spongy and loose on its rim.



**(4) Clean all the components and lightly oil all the moving parts.**

This may be all that is necessary. Remove all traces of oil from the drive wheel before replacing (or renewing) the rubber wheel. *Oil rots rubber* - therefore do not over-oil the mechanism.

Also, to avoid the wheels slipping, take a clean dry cloth and wipe the inside flange of the balance wheel where it comes into contact with the rubber wheel.

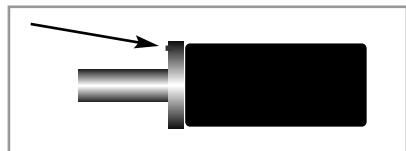
If there are no problems you can re-attach the unit to the machine and move on to the next section.

If the bobbin winder unit is really dirty in places you can't get to, or if the components do not move smoothly or do not perform the functions properly then you will have to dismantle it.

## FAULTS & SOLUTIONS

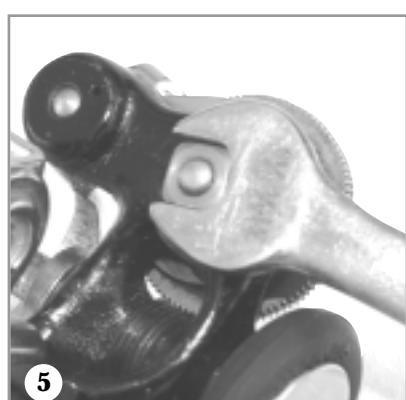
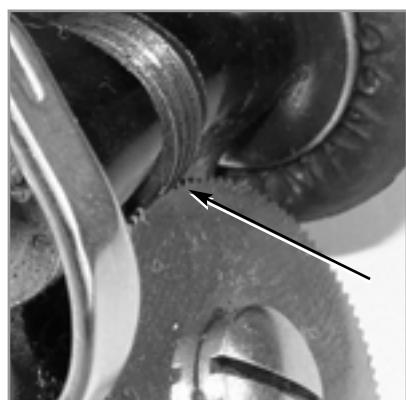
What follows is a breakdown of the most commonly found faults, of Type A and Type B, together with suggestions of how to remedy them:

### :( Pin Badly Worn



Change the bobbin winder if you have an available spare, otherwise make a note on the Netley refurbishment form.

### :( Worm Gear does not engage with cam gear, or won't turn.

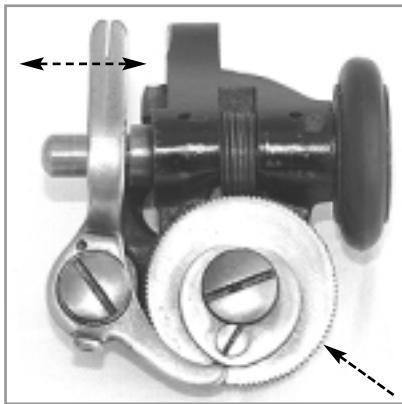


**(5) Loosen the nut at the back of the eccentric screw.**

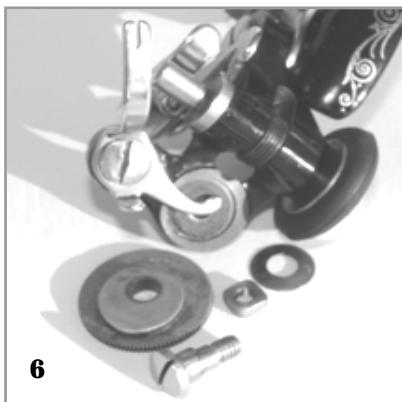
Turn the screw until the worm gear engages with the cam gear without binding.

Re-tighten the nut, *making sure the screw doesn't move*, and re-check.

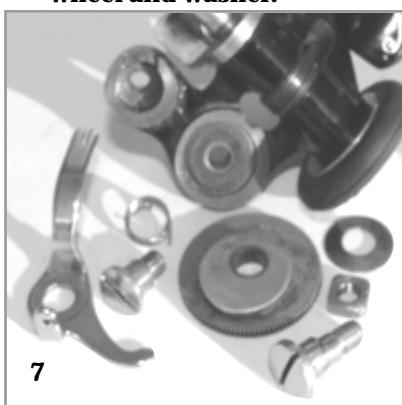
**Thread guide does not follow the cam.**



The answer may be a missing or damaged spring under the screw in the base of the guide.



**(6) First undo the cam screw and remove the screw, nut, wheel and washer.**



**(7) Now undo the thread guide screw and remove the guide lever and the spring.**

When replacing the spring you will see that one small bent end locates in a pin hole in the lever housing the other end of the spring has a short tail.

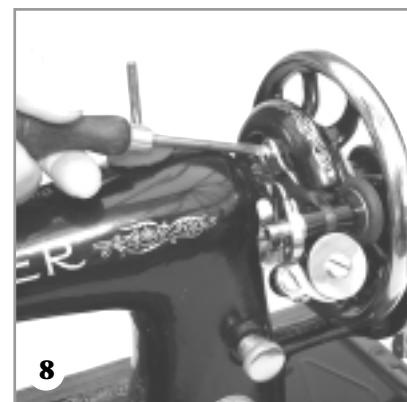
Put the thread guide back on top and locate the other end of the spring in the hole in the thread guide.

The thread guide must be turned anticlockwise, pointing well over to the left - as it was (see 6) when you dismantled it.

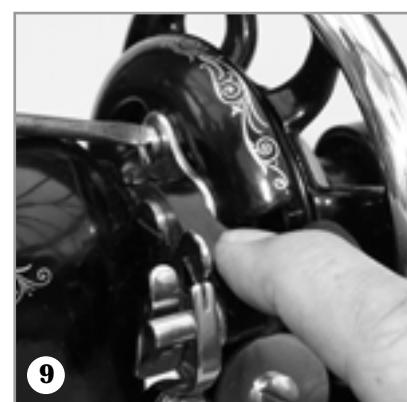
When you have replaced and tightened the screw, make sure the thread guide lever moves freely with the tension from the spring.

Replace and adjust the cam as already explained (see 5).

**The rubber wheel does not turn when pressing on the balance wheel.**



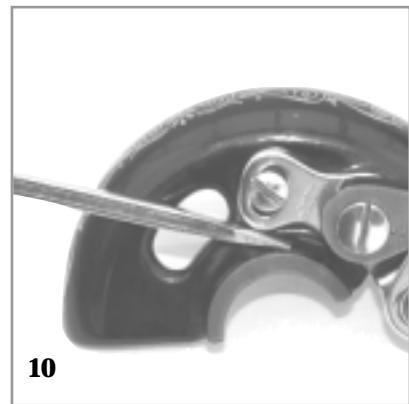
**(8) Loosen the pressure control screw.**



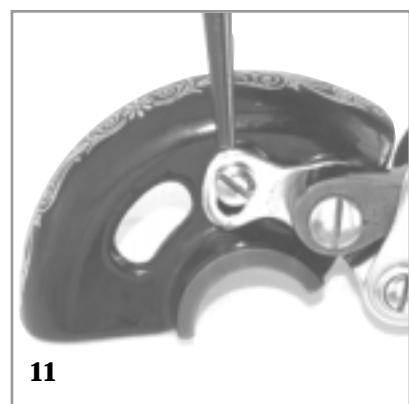
**(9) Re-tighten the screw whilst pressing the rubber wheel firmly against the balance wheel.**

You may need to repeat this until you get the tension between the two wheels just right for easy turning action.

**The rubber wheel is still not pressing firmly enough against the balance wheel.**



**(10) Try loosening the pressure screw and the pivot screw very slightly and levering the pressure arm upwards using a screwdriver**



**The rubber wheel stops turning before the bobbin is full.**

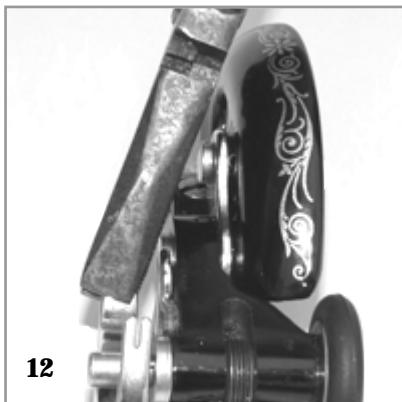
This should also be cured by getting the correct pressure between the rubber wheel and the balance wheel

**(11) With the pressure screw and the pivot screw very slightly loosened tap gently downwards on the pressure arm with a punch or screwdriver.**

**The bobbin does not turn with the shaft.**

If the pin on the spindle shoulder is okay (see previous page) the bobbin may not be engaging with it.

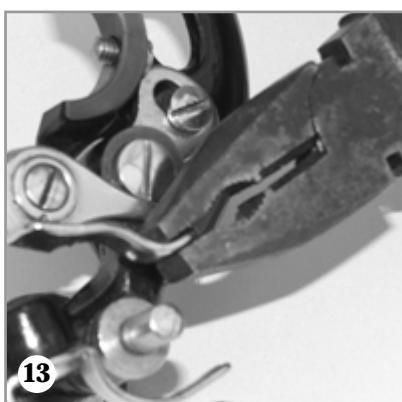
This probably means the stop latch is not holding the bobbin close enough to the right end of the shaft.



**(12) Using a pair of pliers, bend the stop latch slightly to the right.**

**(?) The winder does not lift off when the bobbin is full.**

This could be for one of two reasons:



**(?) Hopefully, it may simply be - that with years of use - the stop latch has been bent backwards slightly and, if this is so, it is easily corrected.**

**(13) Bend the stop latch slightly forward.**

**(?) When an empty bobbin is slid on the shaft and the winder pushed down in the engaged position, there should only be a very small gap between the stop latch and the bobbin core.**

This is to make sure the bobbin winder will snap off before the bobbin is over-wound.

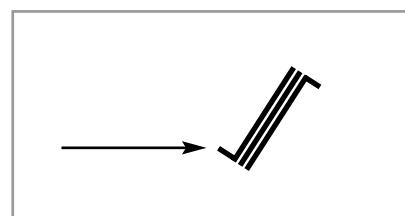
**(?) The winder still does not lift off when the bobbin is full.**

It may be that lifting spring is missing or not correctly fitted and you will need to dismantle the Bracket Assembly.



**14 Remove the pressure screw, then release the pivot screw and detach the assembly from the bracket.**

The whole assembly is actually pivoted and sprung at two points. The main one is the lifting spring, located in a housing at the end of the lifting arm.



As with the thread guide assembly, this spring also has the two ends bent at right angles to locate in retaining holes.



**15 Detach latch and pressure arm from the lifting arm.**



**16**

**16 Detach the latch from the pressure arm.**

**(?) Now replace any missing, worn or broken springs or parts and reassemble.**



**17**

**17 Re-connect the latch and the pressure arm with no tension in the spring.**

*The next part is tricky - but this tip will make it a little easier:*



**18**

**18 Place this sub assembly on the bracket and - just for now - put the pivotal screw through the arm and tighten.**



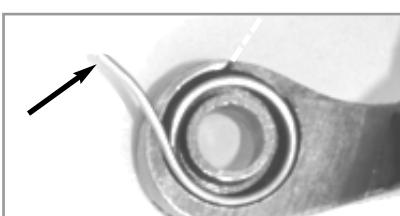
**(19) Put the pressure screw through the slot in the arm and screw tightly home into the bracket.**



**(20) Now, with the assembly held firmly in place, remove the pivotal screw.**



**(21) Pick up frame assembly and place spring into the deep recess - again locating the end of the spring in the hole.**



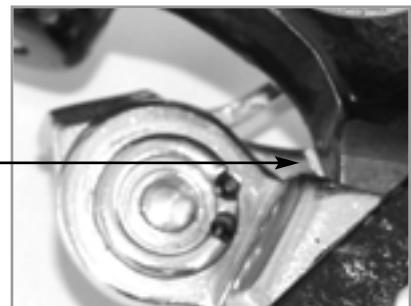
As the complete unit is reassembled the long tail of the spring is pushed round to create the pressure to release the winder when the bobbin is fully wound.

The spring can (If you're lucky) be persuaded to fit inside the recess completely, making the rest of the assembly easier.



Here's a reminder of the assembled unit (back view) to see the ultimate position of the spring tail resting against the bend in the pressure arm.

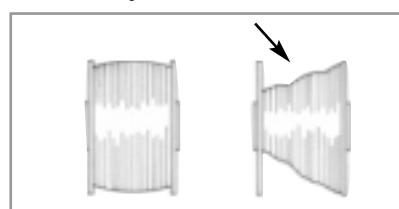
At this stage the spring tail comes to rest against the shoulder of the cutaway in the side of the deep recess.



Sometimes the spring does not stay in the recess and prevents the screw tightening properly, but with patience and practice the whole assembly will rotate round the pivotal screw again.

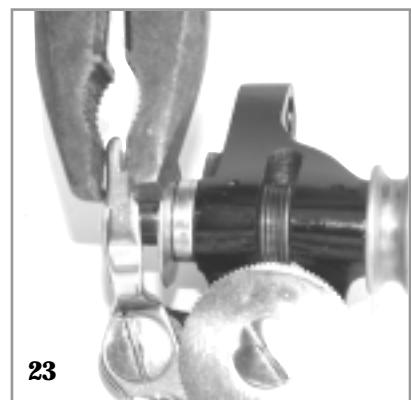
**(22) Hold the two halves of the frame assembly together (against the pressure) and push the pivotal screw back through the frame and screw into the bracket again.**

⊖ The thread does not lay evenly on the bobbin.



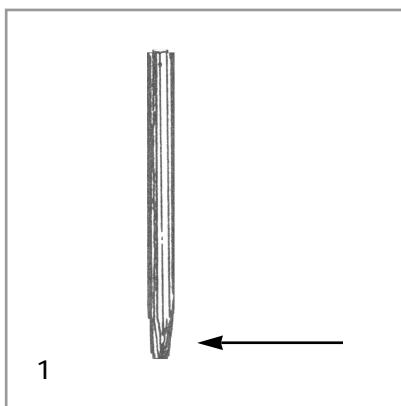
First check that the bobbin shaft is turning the cam and that the thread guide is following the cam smoothly.

⊖ If these are working properly, it could be that the thread guide has been bent so that it does not traverse the full width.



**(23) Using a pair of pliers, carefully bend the thread guide so that it is centred between the cheeks of the bobbin.**

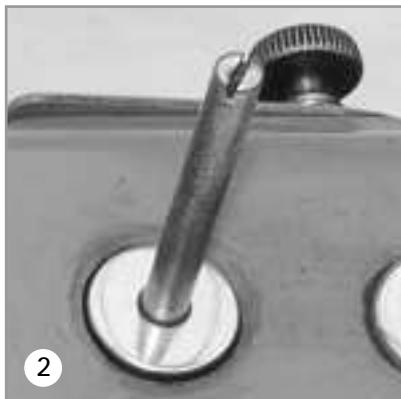
## Spool Pin



- (1) Make sure the cotton reel holder (or spool pin) is in the correct hole and tight.

With the earlier machines one end of the spool pin is slightly tapered and push-fits into the retaining hole.

They sometimes become loose but a few taps with a light hammer generally solves the problem. If the pin is still loose, roughen up the tapered end with a file to make it stay tight.

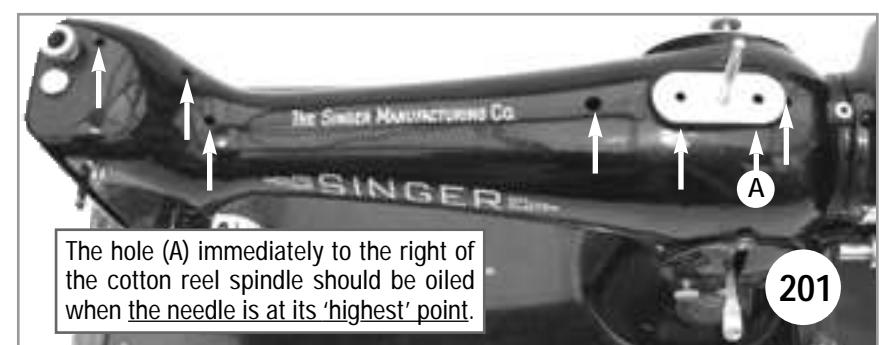
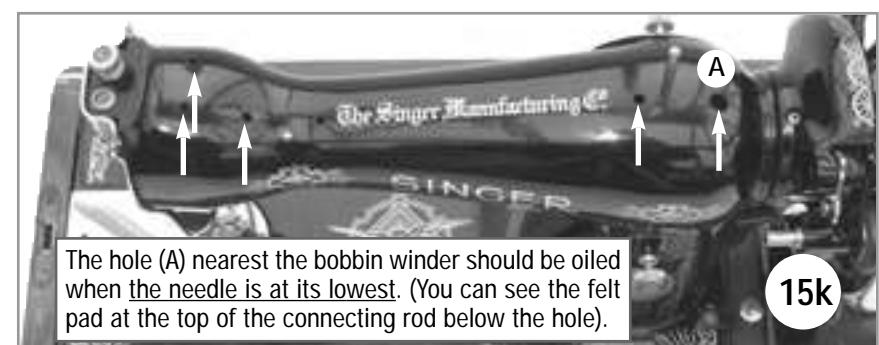
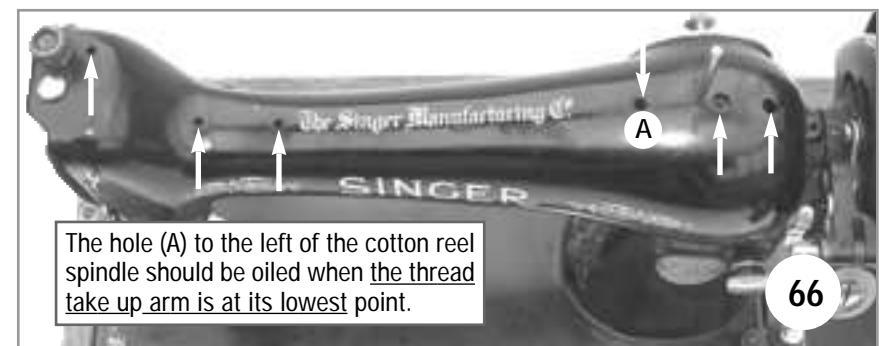
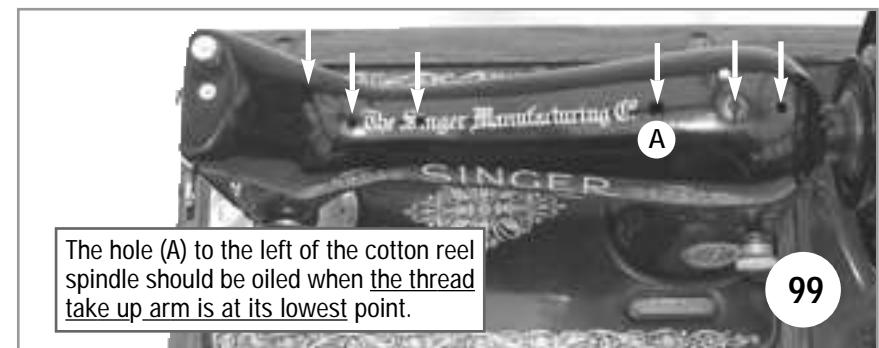


- (2) On the later 201s, like the one above, the pin is threaded at one end and has a screwdriver slot at the other.

## Oiling (Top of Machine)

An elderly sewing machine that has not been properly refurbished and lubricated will run hard.

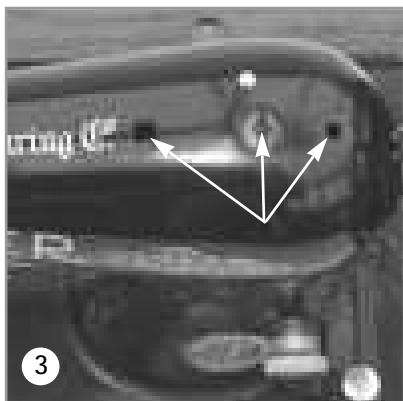
In a hot dry climate, considerable energy will be wasted using a machine that doesn't turn easily - besides shortening its future life and usefulness.



Like all other machinery a sewing machine will not give satisfaction if its working parts have become gummed or dry.

Oiling holes are provided above otherwise inaccessible moving parts where there are bearings and friction. All moving parts in contact must be covered with a film of oil and not allowed to become dry.

You should always use good quality sewing machine oil. Thicker, inferior oil will clog the bearings, prevent efficient working and cause rapid wear of the mechanism.



(3) First make sure all the oiling holes in the top of the machine are clean and not gummed up.

A drop of oil injected properly into each oiling hole is sufficient - do not over oil.

It is most important that each machine should be turned according to the instructions on the previous page - when oil is applied at point 'A'. This allows the oil to drop directly on the mainshaft crank below which might otherwise be missed.



(4) When oiling, insert the oil can spout well into the oil holes.

After oiling run the machine rapidly for a few moments and then wipe the top arm over with a clean cloth.

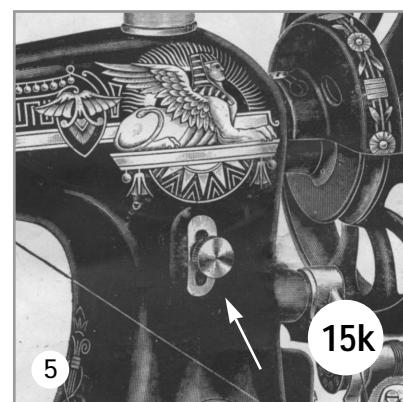
### Stitch length setting

The length of the stitch, and its easy regulation, is a crucial part of successful sewing.

Fine material requires a fine needle & thread and a short stitch. Heavy material requires the opposite. About 18 stitches to the inch makes a suitable seam for ordinary sewing.

The visible part of stitch setting is the stitch control knob or lever on the front of the machine.

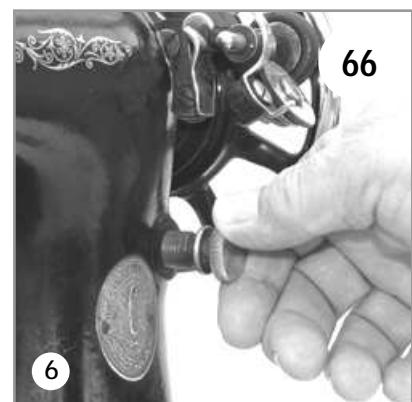
There is also the mechanism inside. These two elements are dealt with here - first the control, then the mechanism model by model.



(5) Check that the knob is free to turn and can easily be moved up and down.

To alter the stitch length on the 15K machine, first loosen the screw then move upwards to increase or downwards to decrease; except on the 15K26 model when it operates in the opposite way.

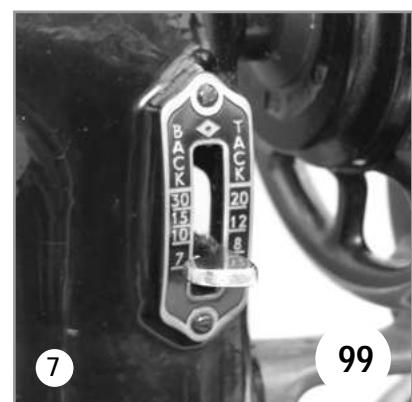
When the required stitch length has been obtained, it can be set by tightening the knob.



(6) Unscrew the knob as far as it will go, clean the knob and the thread. Put a couple of drops of oil on the thread and screw it up again.

The 66 and early 99 models use a screw to control the stitch. Fully screwed in for the longest stitch, unscrewing the knob produces shorter stitches until the fabric remains stationary.

The ability to reverse stitch was introduced on later 99s and gave rise to the following two types of control levers (7 & 8). This allowed the more accurate and faster setting of stitch length.

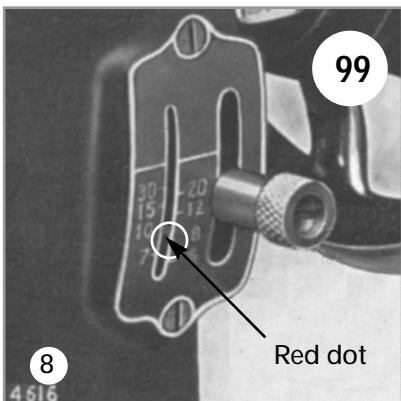


(7) At first this consisted of a simple lever and a scale in stitches per inch.

If the lever is moved above the horizontal line, the machine will 'Back Tack' or stitch backwards.

This is used to 'seal' the end of seams so that they cannot loosen (not for long runs).

This in turn was modified as we show overleaf...



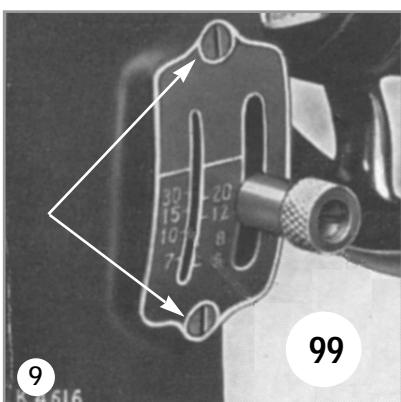
(8) The scale is now on the left, and the red dot in the slot indicates the setting from 6 to 30 stitches per inch. Check that the lever moves freely from top to bottom of the slot.

To regulate the length of the stitch, first turn the thumb nut on the lever anticlockwise away from the stitch indicator plate as far as necessary.

Then move the lever up or down until the red dot is at the desired stitch setting.

Now turn the thumbnut inward until it touches the indicator plate (do not over-tighten as this can cause the setting to change). The machine is now set to stitch the desired number of stitches per inch in a forward direction.

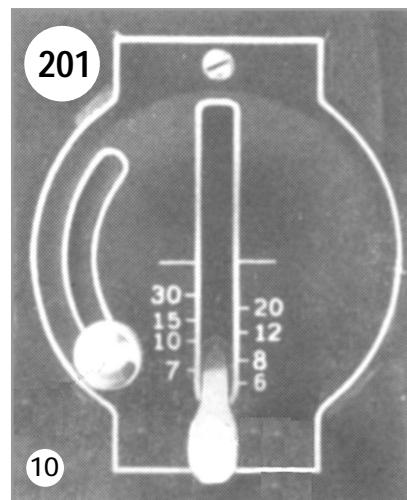
For 'Back Tacking', raise the lever to the upper end of the indicator plate. The machine will now stitch in a reverse direction, making it easy to fasten the ends of the seams.



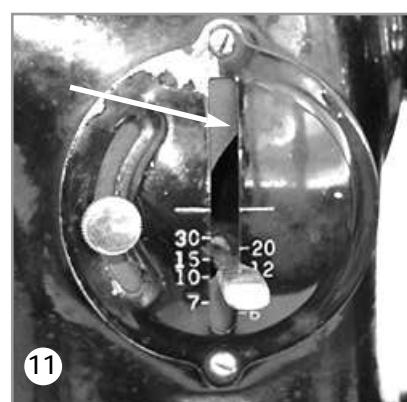
(9) If the indicator plates or levers need cleaning, they can be removed by undoing the two retaining screws.

In the case of the simple lever (7), the indicator plate can be removed by turning it by 90° when it will slide past the lever.

In the second case (8), there is a screw inside the knob. Unscrewing this will remove the knob.



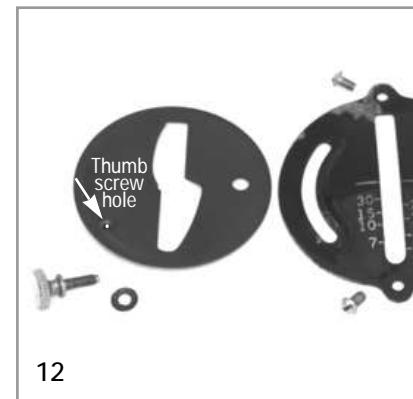
(10) The 201 introduced a further variation. A lever with the stitch length being set by loosening the thumbscrew at the left and sliding it in the curved slot.



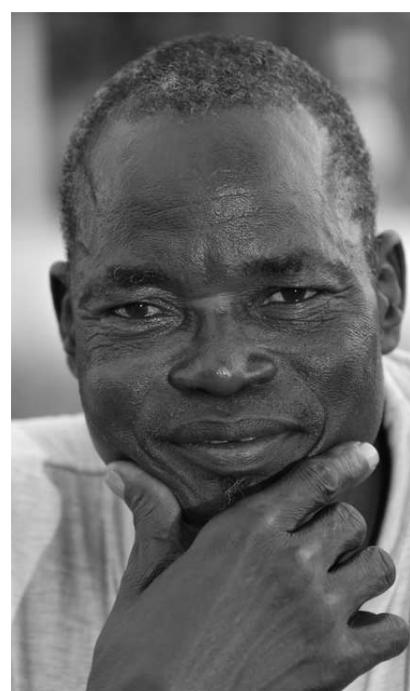
(11) The plate under the indicator scale revolves with it, blocking off the lower part and the upper part of the lever slot as it is lifted.

Tightening the thumbscrew then locks the stitch at that maximum length, while again allowing back stitching to be done at a flick of the lever.

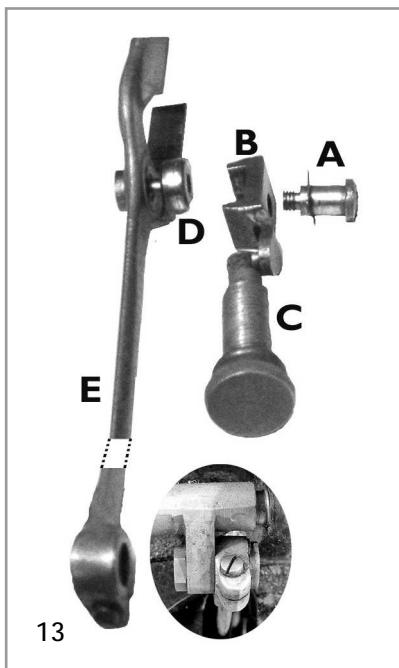
Check that the lever moves freely from top to bottom of the slot. If the indicator plates or levers need cleaning, they can be removed by undoing the two retaining screws.



(12) This picture shows the components of the 201 stitch length setting control.



## Stitch Length Mechanism



(13) In all models, the stitch length control levers or screws connect with a mechanism in the base of the machine.

There is very little difference between models in this area, so the 66 is used as an example.

All the internal components of the stitch length control are shown in the above mockup.

## Stitch Control Parts:

A: Locating screw and thrust washer - located under balance wheel.

B: Slide. Rotates on A, under the control of C, the Stitch length knob. Note the pin on the slide engaging with the groove on C.

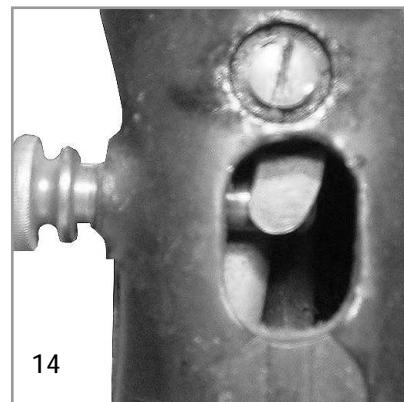
C: Stitch Length Screw or lever on other models.

D: Roller which fits into the slide.

E: Connecting rod. The yoke at the top fits into a crank which 'wiggles' the rod. The roller provides a fulcrum. The bottom end is fixed to the feed dog arm as shown in the inset.

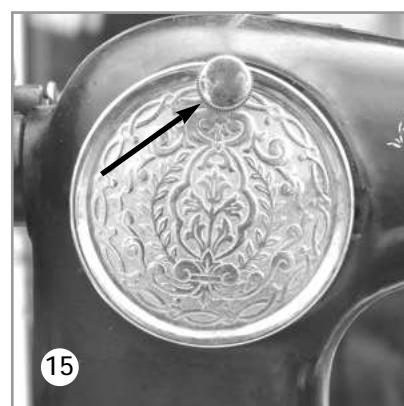
As the stitch control screw or lever is moved, the slide turns, changing the fulcrum point and varying the movement at the base of the rod.

As the whole of this mechanism is enclosed in the machine, it normally needs little cleaning.



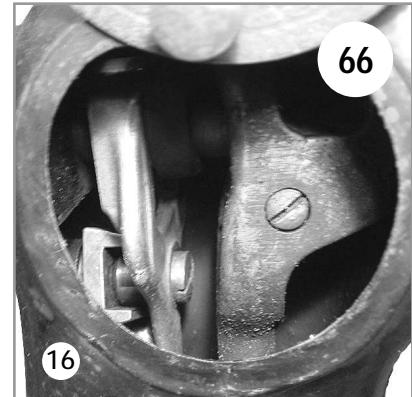
(14) This shows the locating screw and washer under the balance wheel. Check that the washer is intact.

The washer has three projecting lugs. These, with its shape, provide some friction which prevents the stitch length wandering from its setting, particularly with the lever types.

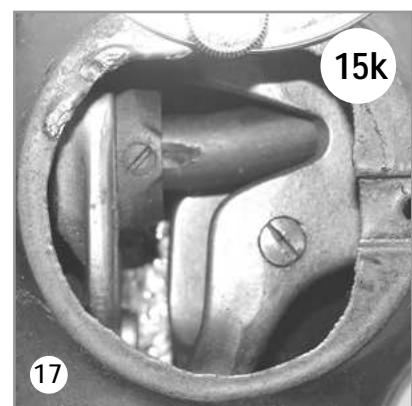


(15) The best view of the mechanism is obtained from the back of the machine. Loosen the screw on the cover plate to make it visible.

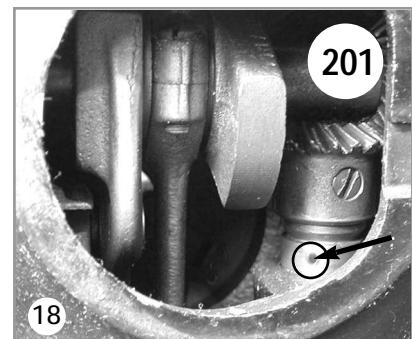
(16) Put a drop of oil on the slide and the locating screw.



## Model differences



(17) On the 15K there is an arm projecting into the machine at the bottom of the back opening. The stitch length mechanism is attached to this, instead of the side of the machine.

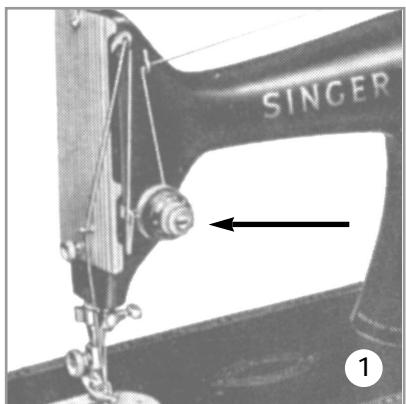


(18) On some 201's only (the later ones with the brown colouring) there is an oiling hole inside the back inspection cover just below the gear wheel.

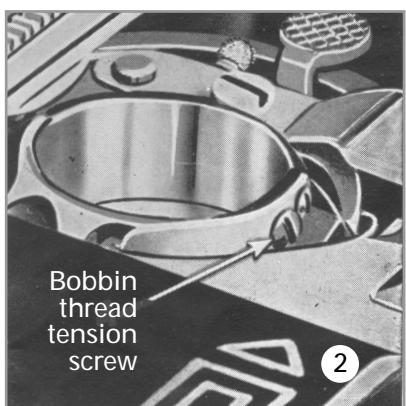
Give it a drop of oil and turn the balance wheel a few times to lubricate.

Note: 99 Models do not have a back opening. Oiling must be done from the opening under the balance wheel.

The principals of thread tension have already been covered in the section on 'How a Sewing Machine Works' page [1] E - 4.



(1) The majority of tension adjustments for changes in thread and fabric thickness or stitch length are made through the upper tension mechanism.



(2) Once set, the lower bobbin tension should not need to be altered for normal operations.

How you set the tension correctly is something we discuss in section [2] J when we look at performing a sewing test. Here we deal with refurbishment only.

There are basically only two types of tension mechanisms. However, because they have constantly improved over the 100 years or so, there are now variations for each model.

We start this section by explaining these two types, and then cover the work involved - model by model starting with the 66/99.

For the 15K turn to page [2] F - 8 and for the 201 see page [2] F - 10

### Early Type (66 & 99)

To avoid snapping the thread as it is pulled tight at the end of the stitch formation ( see page [1] E - 2) it is passed through the thread take up spring (A) which 'takes-up' or cushions the strain.

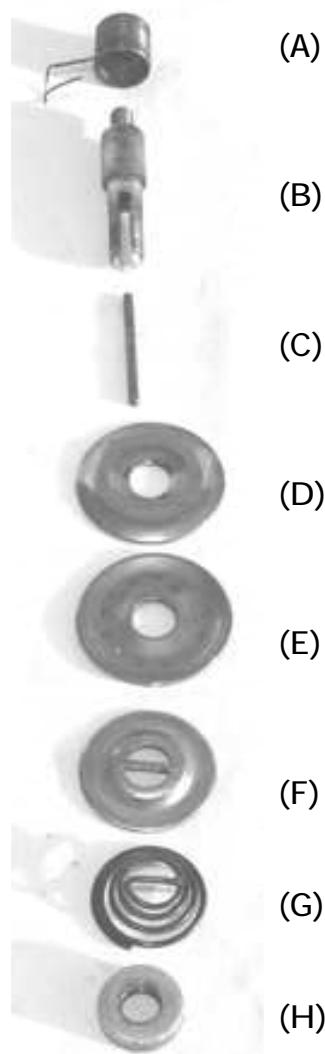
The tension stud (B) has a hole drilled through it endwise, so the tension release pin (C), can slide within it.

The thread passes between the tension discs (D & E). These discs are pressed together by the tension release disc (F) as pressure is exerted on it by the beehive shaped spring (G).

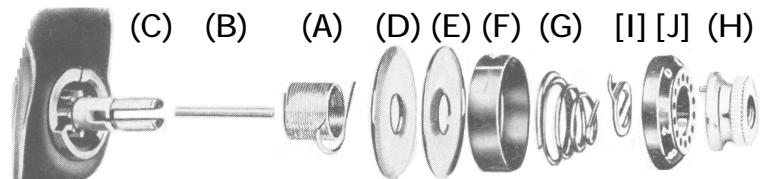
The amount of pressure is regulated by turning the knurled thumbnut (H).

When the presser bar lever is lifted, the release pin is made to slide through the stud until the end of the pin presses against the cross-piece bar in the centre of the washer (F).

This relieves the pressure on the spring. See the diagram on page [1] E - 4.



### Later Dial Type (66 & 99)



The tension release disc (F) has changed in shape. It now houses the spring (G) and has a guide on top as a visual aid to tension setting.

Two new components have been added; a stop washer [I] and a dial [J].

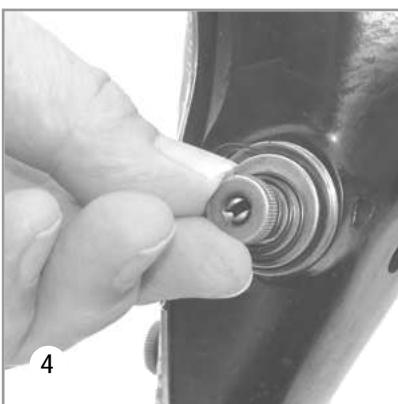
The stop washer has a protruding tail which makes contact with a ridge inside the dial preventing it from making more than one revolution - so the thumbnut (H) cannot be screwed off the stud or tightened excessively.

The thumbnut (H) now has a pin on the back face which fits into one of the holes in a circular pattern on the tension dial (J). This means that the dial revolves with the thumbnut as it is screwed in or out.

## Early Type (66 &amp; 99)



(3) This picture shows the take up spring and tension stud which is used with the 66/99 simple tension mechanism.

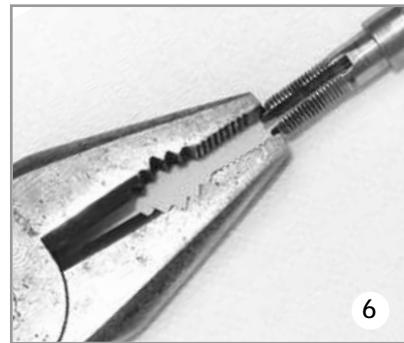


(4) Remove thumbnut and take off the components down to the tension discs.



(5) Clean or replace the discs if they are rusty or grooved.

Next check the condition of the stud. Sometimes the two pronged arms have been splayed by careless use of a screwdriver which makes the thumbnut difficult to turn.



(6) Use pliers on the end of the arms (*just before the thread starts*) to gently bend them back to a parallel position.



(7) ...or, lever *gently* with a screwdriver if the arms have been pinched together.

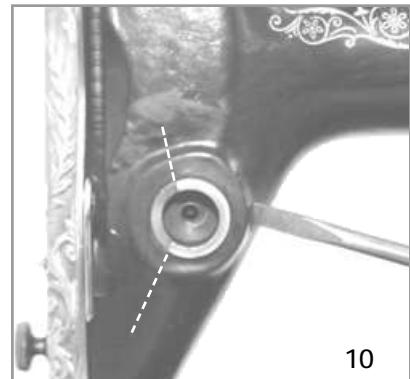


(8) Check the condition of the take up spring.

This delicate part is easily damaged - if it has little resistance, or is broken or bent, then it must be replaced.

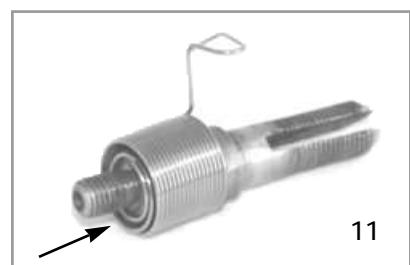


(9) First screw the thumbnut back on the stud a few turns and then use a screwdriver to undo the stud and remove the stud and spring.



(10) At this stage, check that the recessed shoulders of the tension mechanism housing are in the 'clock hands' position equivalent to around 25 minutes to 11.

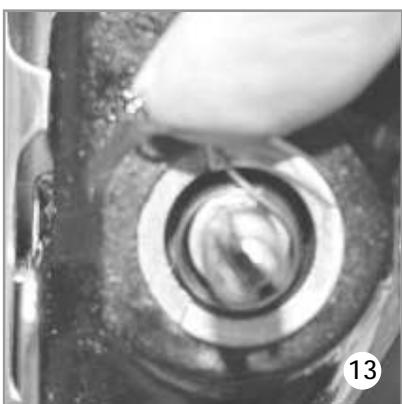
Adjust if required - by first releasing the grub screw under the arm and then rotating the tension mechanism housing to the required position.



(11) On the early 66 and 99 models the end of the take-up spring is held tight between the shoulder of the tension stud and the mechanism housing when the stud is screwed fully home.



(12) Fit the new spring on the tension stud. Hold the spring at about 2 o'clock while you screw the tension stud tight.



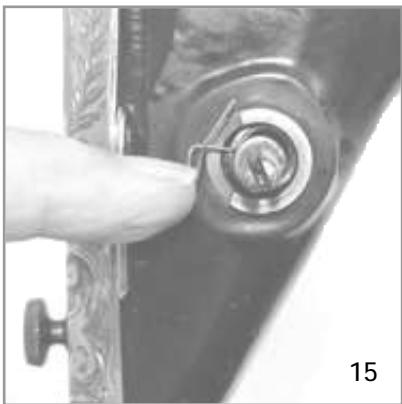
13

(13) When the stud is tight, make sure the tension spring is still at 2 o'clock, then gently push it anticlockwise until it drops into the slot.



14

(14) Here the housing and the spring are seen in the correct rest position prior to sewing.



15

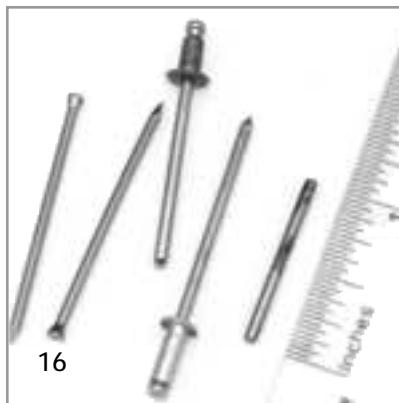
(15) Deflect the spring and check that it returns to the correct position.

When the machine is being used the spring will be deflected to about 9 o'clock.

When you come to reassembly, remember to locate the pin inside the stud.

Next refit the two discs facing each other thus: )(, the domed pressure plate dome towards you - and lastly the conical spring and thumbnut.

Screw in the thumbnut for a few turns and leave further adjustment until test time.

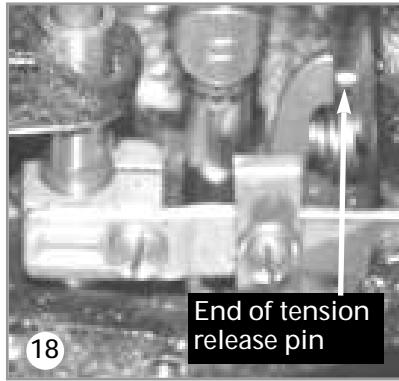


(16) The 66/99 tension pins have nothing to hold them in place and often get lost. A suitable replacement can be cut from a long panel pin, or the tail of a pop rivet. It should be exactly 1" long.



17

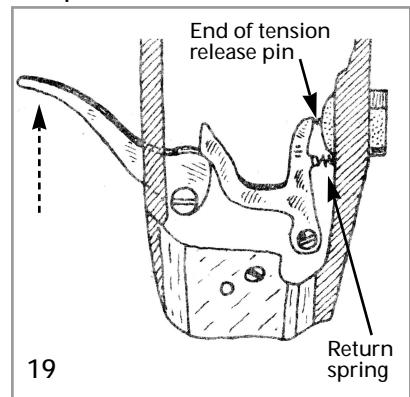
(17) When the reassembly is complete check that when you lift the presser foot release arm the tension is released allowing the thread to pull through easily between the dished plates.



18

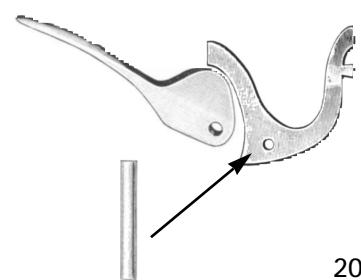
End of tension release pin

(18) If the tension does not release, remove the face plate and check inside.



(19) Make sure that when the presser foot lever is raised, the tension release lever at the back of the face cavity moves across to push the tension release pin. Picture (18) shows the early type of release lever mechanism which is partly obscured by the presser bar and the needle bar.

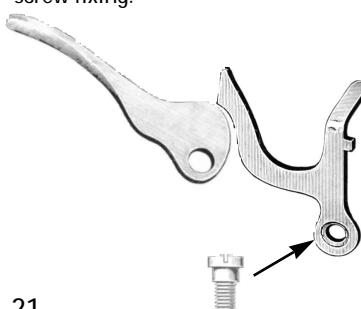
Type A: Early model with pin location



20

(20) In these early models, the release lever fits into a slot in the bottom of the face cavity, held in with a pin. This slot clogs with old oil that has drained into it.

Type B: Later model with shouldered screw fixing.



21

(21) The later type of release lever is held in place with a shouldered screw - so that the screw can be tightened while allowing free movement to the lever.

In both cases the lever must move freely and easily. If it does not, then work through the following sequence:

**Remedial Action:  
Type A**

If you are working on an early model and the tension release lever is stiff or unmoveable, squirt in some penetrating oil, leave and try again later.

If still in trouble, you might like to note it for Netley Marsh to deal with. The lever can be removed but it is difficult for the following reasons:

The pin is difficult to remove.

You will probably have to remove the presser bar and needle bar to clean out the slot.

Then you will need to re-adjust the needle bar height.

**Remedial Action:  
Type B**

On the later model, if the lever doesn't move freely and easily, make sure the shoulder part of the screw is sitting correctly in the recessed rim of the hole in the lever.

**Remedial Action:  
Both types**

*If the lever moves freely and easily with a screwdriver, but does not move the pin, check the following:*

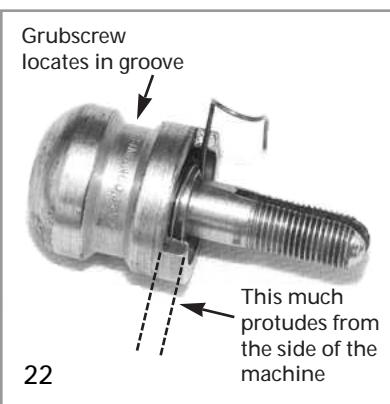
The screw fastening the presser foot release lever is tight.

For Type B, the shouldered pivotal screw holding the tension release lever is tight.

The tension release lever moves when pushed with a screwdriver.

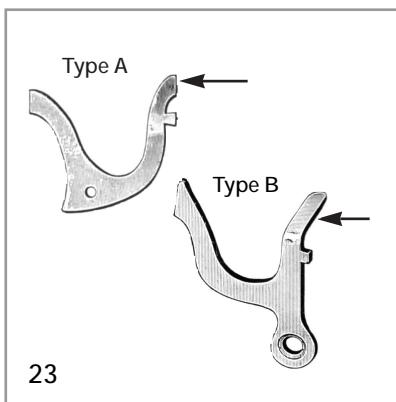
*If the lever is moving OK, but it is not contacting the pin:*

Check that the barrel holding the tension assembly is fitting correctly in the machine.



(22) The grub screw should locate in the circular groove in the barrel. The end of the barrel protrudes about 3/32" or 2.5 mm from the side of the machine.

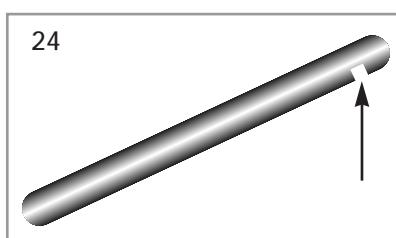
If this is OK, it is probable that the release lever has become bent.



(23) Carefully bend the lever a little so that it can make contact with the pin at the point indicated.

This is relatively easy with type (B) as it has a horizontal bar which makes contact with the pin, and the lever can be unscrewed and wriggled out of the machine for attention.

With type (A) check that the lever contacts squarely with the pin. It may be that bending it slightly away from you or towards you will do the trick.



(24) A simple adjustment tool can be made to tackle this task in situ by cutting a 3/32nd of an inch wide slot, 1/8th of an inch deep in a piece of 5/16th steel rod.

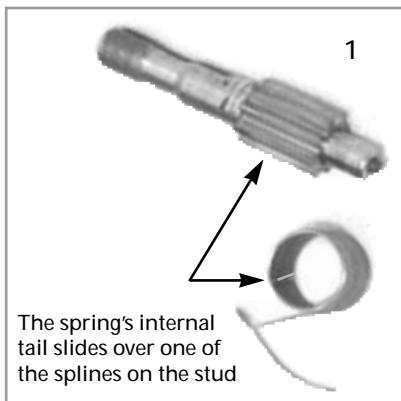
If this is not an option for you, then it means clearing the presser bar and needle bar out of the way to remove the lever - or leaving it for Netley to correct.

If the tension lever needs to be bent towards or away from the pin, do not be tempted to use a screwdriver pressing against the needle bar for leverage.

In all cases you must make sure that when the presser bar lifter is down, the tension release lever does not continue to press on the pin, as this will stop tension.

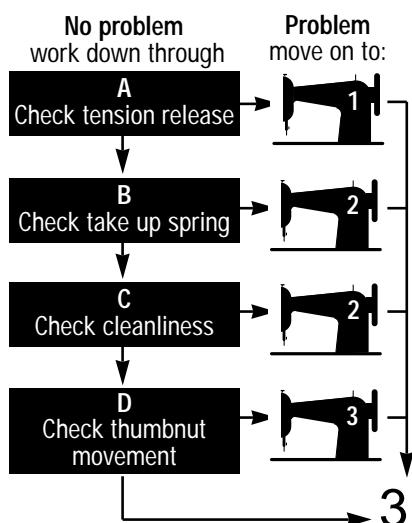
**Dial Type (66 & 99)**

The tension stud and spring are changed from the early type.



(1) The end of the take up spring fits into the splines on the tension stud. The stud is a push fit into the barrel, held by a screw.

To refurbish the 'Dial Type' tension mechanism work your way through steps A to D in the following Flow Chart. If you encounter a problem follow the relevant numbered symbol to find the solution.



(A) Raise the presser foot release lever and check that the tension is released.

(B) Check that the take up spring is in good condition. Pull it gently forward. The spring should come round to approximately 10 o'clock. Return it to its position.

(C) Because the tension spring is enclosed, the unit can usually be cleaned with a soft brush, and passing a cloth between the tension discs. If very dirty, take apart as described in [2].

(D) Check that, with the presser foot lever down, when the thumbnut is turned the tension can be turned up to 10 and down to 0.



(2) The thumbnut should stop turning at position 0, as shown above.

**Remedial Measures**

If you have a problem with the tension releasing make the same checks as described for the simple type on pages [2] F - 3 & 4

**Disassemble**

If you have a problem with the positioning of the tension spring - or if the tension mechanism is very dirty - you will need to disassemble the unit as follows:



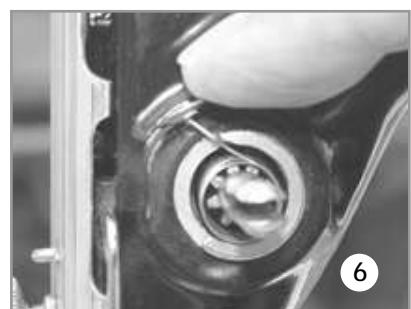
(3) Turn the thumbnut anti-clockwise until it stops then press in the dial to disengage the pin in the back of the thumbnut from the dial.



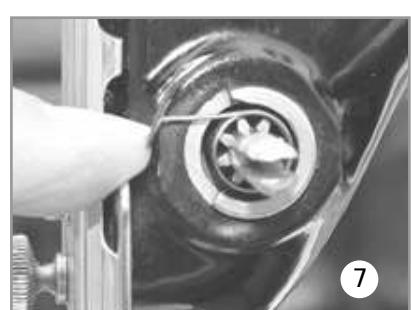
(4) Undo the thumbnut and remove all the components down to the tension discs



(5) Now slide out the take up spring, turn it to 1 o'clock, and replace it.



(6) Latch the take up spring at 11 o'clock again.



(7) Test that there is now some resistance to moving it to 9 o'clock.

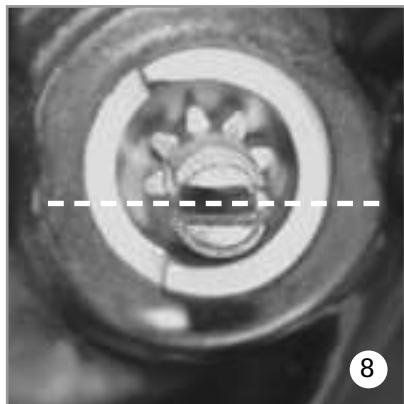
If there is a problem, the splines on the tension stud have probably come loose from the stud. If this is the case, there is no alternative except to change the tension stud.

#### Rebuild and Reset

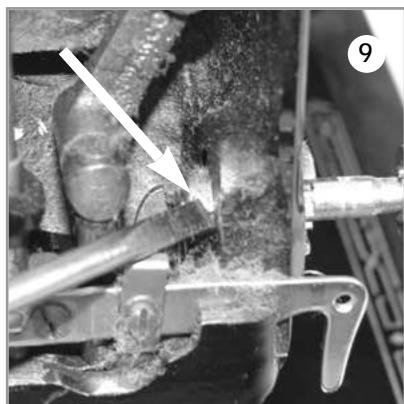


If the spring is okay - or you have had to disassemble in order to reset the dial - you can begin to replace the components as follows:

*The presser foot release lever should be down before you start these rebuilding steps:*



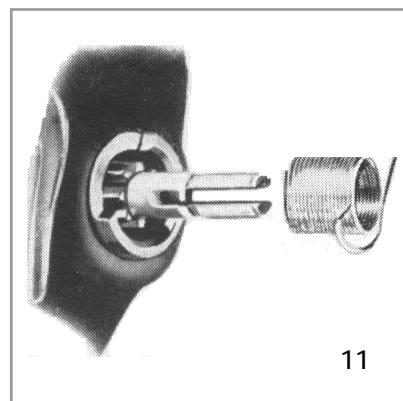
(8) The tension stud should be positioned in the barrel so that the slot between the prongs is horizontal. (*This allows the dial setting to be at the top*)



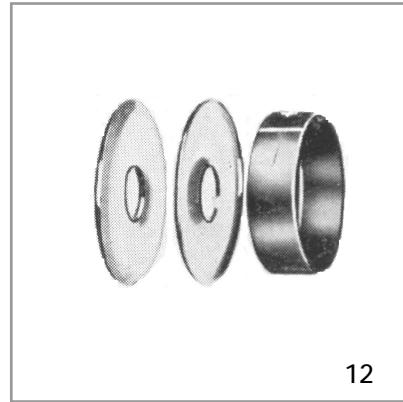
(9) If the stud is not positioned horizontally, undo the retaining screw located inside the head.



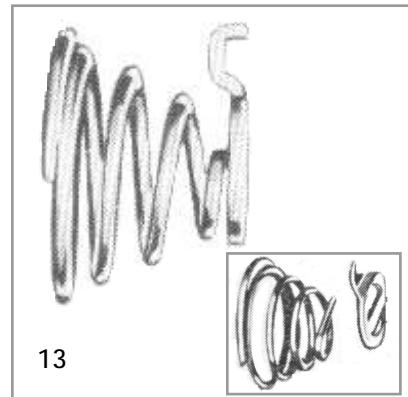
(10) Replace the thumbnut a few turns; use a screwdriver to reposition the tension stud and retighten the retaining screw



(11) Slide the take up spring over the tension stud at about 1 o'clock, latch into the correct position at 11 o'clock - as shown on previous page.



(12) Replace the tension discs with the domed sides together (. Replace the tension release washer, with the flat side towards the machine, and the dial setting mark at the top.



(13) Now fit the tension spring and stop washer as shown..



(14) Place the numbered dial on the stud, with the number 2 uppermost.



(15) Push the dial towards the machine to compress the spring. Screw on the thumb-nut and carefully guide the pin on the back of the thumbnut into one of the holes on the dial.

Turn the thumbnut anticlockwise. The dial should stop at 0. If not, turn it back to 2, press the dial again and screw the thumbnut in further, guiding the pin in to a hole further round the dial. Repeat until the dial stops on 0.

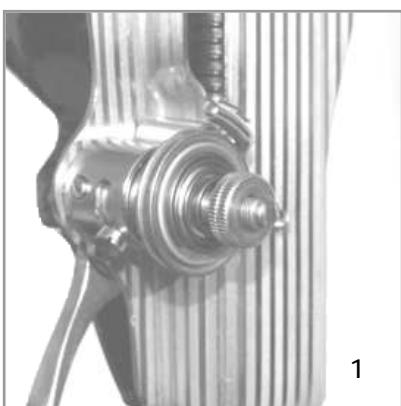
At this point there should *just* be zero tension on the thread. Adjust this by pressing in the dial (without turning it) and turn the thumbnut (clockwise to increase the pressure or anticlockwise to decrease) locating the pin in the hole adjacent to the one it was previously in. Repeat this until you have it right.

Check that the dial will now revolve through a complete clockwise turn, stopping on 9. Turn the dial to 5, ready to test the stitching later.

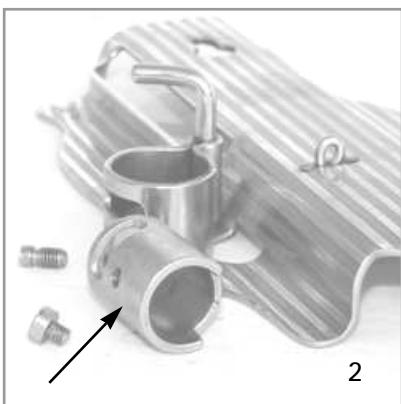
Finally, test that the tension releases when the presser release lever is raised. If not, the corrective procedure is the same as for the simpler type covered earlier.



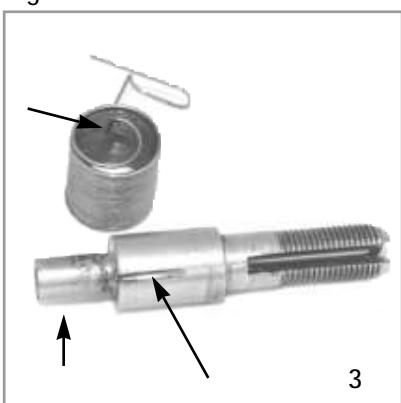
## 15K



(1) The components of the 15K model tension mechanism are assembled partly within their own housing located on the front of the face plate.

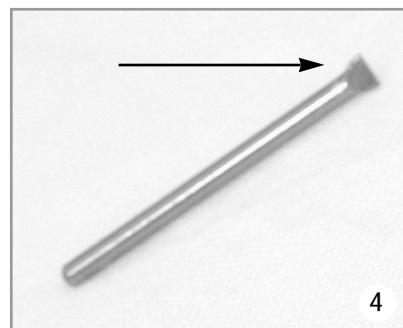


(2) The sleeve (seen here removed from the housing) is adjustable so that the sweep of the take up spring can be regulated.

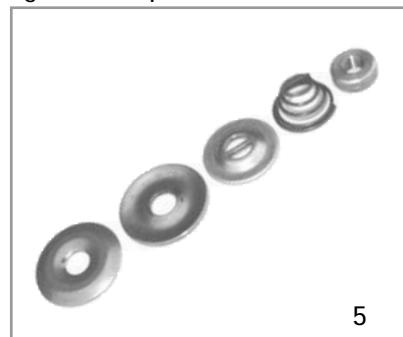


(3) The end of the take-up spring fits into a groove on the spline of the tension stud.

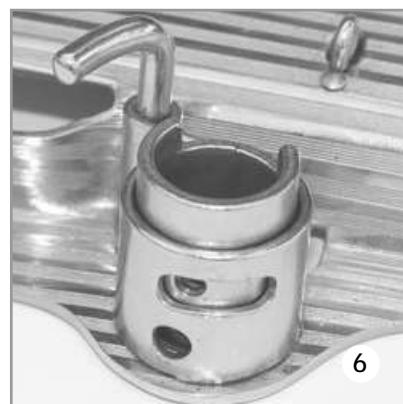
The locating end of the shaft is smooth and not threaded like the 66. It 'push fits' into the hole in the base of the housing.



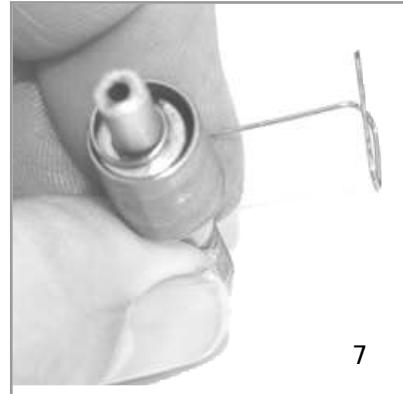
(4) The tension release pin is flattened at the end that presses against the pressure release disc.



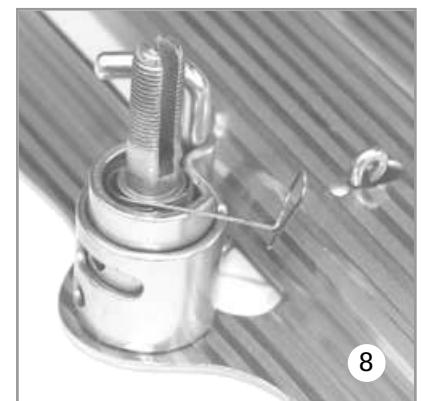
(5) The remaining components are the same as the basic 66/99.



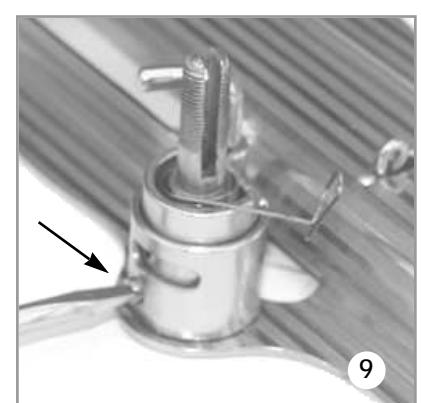
(6) To re-assemble, place the sleeve back in the housing, with the cutout end facing towards you, and rotated towards the middle of the face plate.



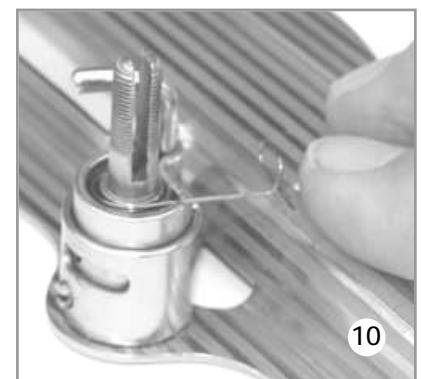
(7) Slide the take up spring over the tension stud, making sure the tail of the spring is located in the groove in the stud.



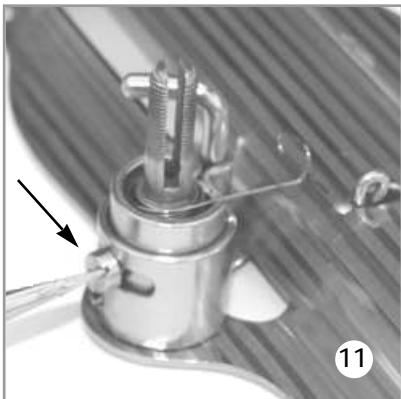
(8) Push the tension stud into the sleeve making sure it is fully home. Turn the stud until the take up spring is at 5 O'clock.



(9) Insert and tighten the locating screw which holds it in place.



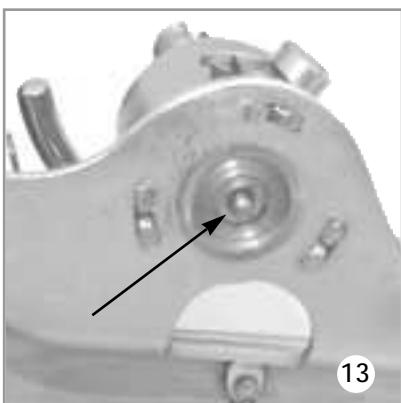
(10) Push the take up spring round anti clockwise until it drops into the cutout in the sleeve



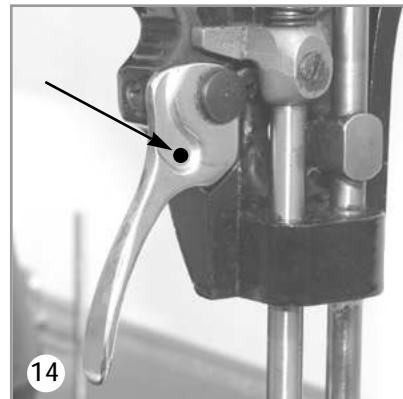
(11) Now rotate the sleeve anti clockwise until the take up spring arm is horizontal. Insert and tighten the housing screw.



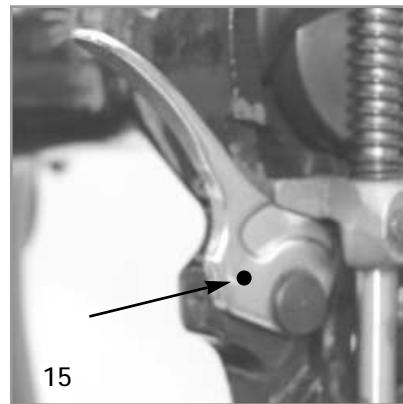
(12) re-assemble the other components as covered earlier in the simple 66/99 section.



(13) Make sure, when the mechanism is reassembled, the rounded end of the pressure release pin protrudes slightly through the back of the casing.



(14) When the faceplate is reattached the end of the tension pin is pushed backwards (by the pressure of the tension spring) into the indent in the presser lever arm.



(15) When the arm is raised the pin is pushed forwards out of the indent and pushes back on the tension release plate which releases the pressure between the two tension discs.

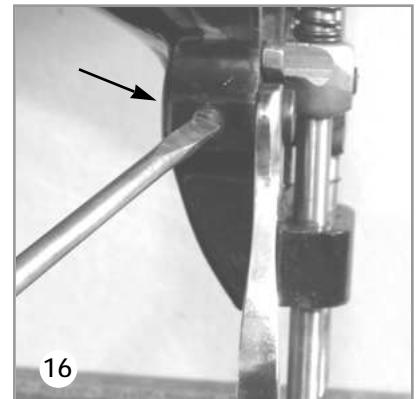
#### Remedial Measures



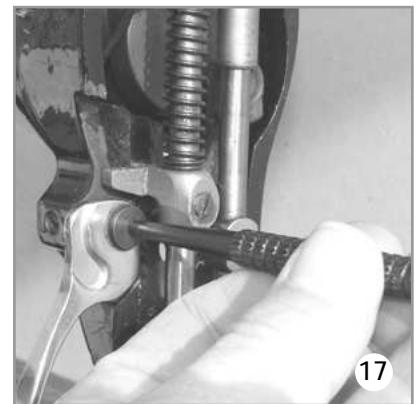
If the tension does not release, check that the face plate is fitting close up to the face, with no debris inside it and that it has been fastened securely.



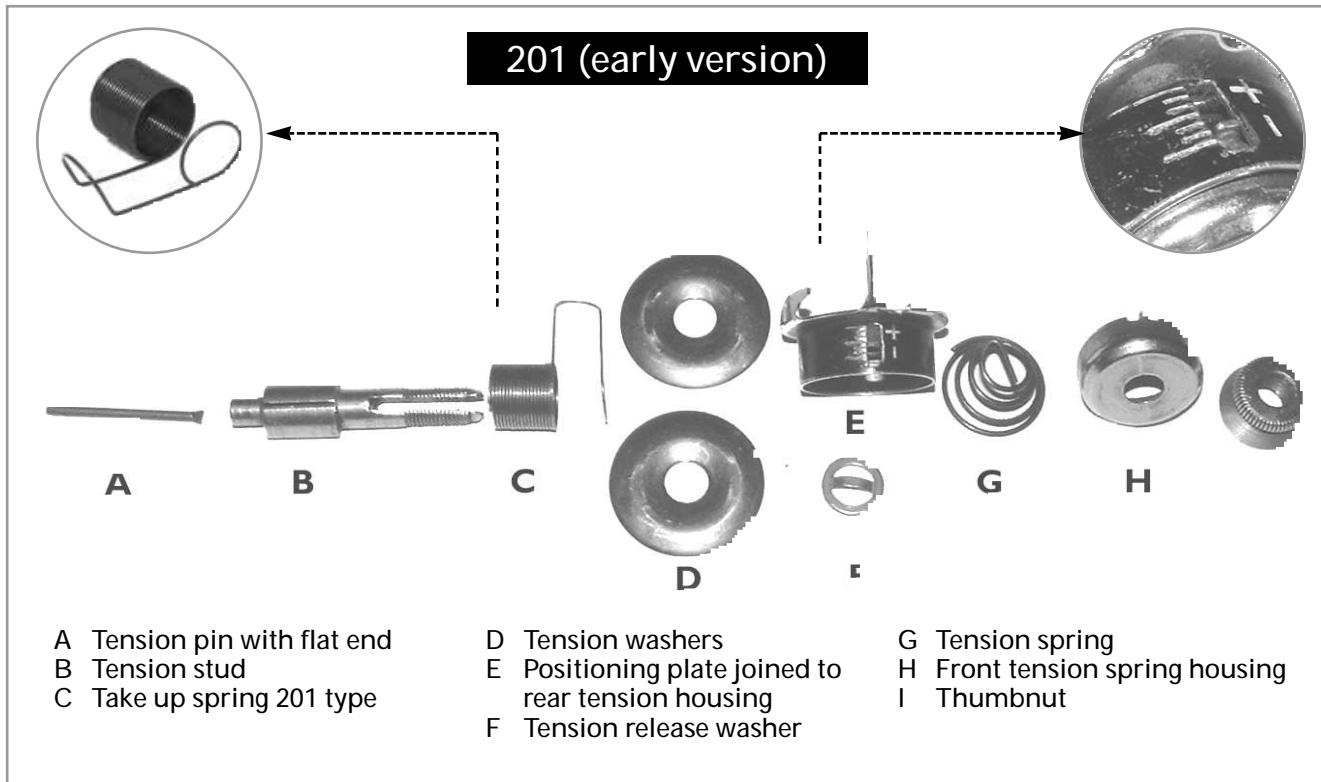
If the release lever wobbles about - read on...



(16) Undo the grub screw holding the securing pin in place and make sure the presser release lever is held firmly in place.



(17) Using a punch, gently tap the end of the release pin until the lever is held firmly. If too tight, tap the other end of the pin. Finally retighten the grub screw.



(1) The parts shown above comprise yet another variation on the dial-up tension mechanism which was introduced with the early 201s.

The tension spring is enclosed in a housing, so that as the thumbnut is tightened, the two halves of the housing telescope. This allows for a simple bar and scale measure of the tension applied to be incorporated - which can be seen in the picture.



(1) Clean the unit with a soft brush and between the tension discs with a cloth.



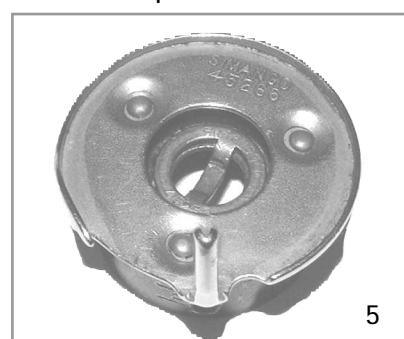
(2) Check the take up spring is in good condition and springs back to its position when deflected.



(3) If the spring needs more - or less - tension, undo the fastening screw inside the head and turn the tension stud with a screwdriver.

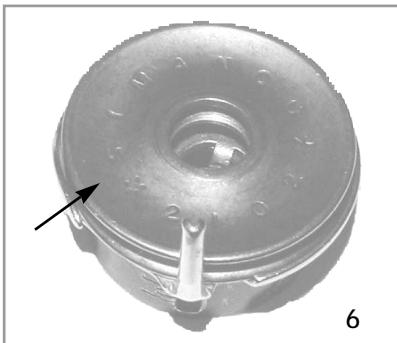


(4) If the spring needs changing or the unit is very dirty, undo the tension stud fastening screw, remove the unit and take it apart.



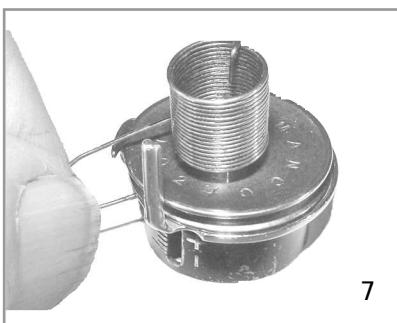
(5) To re-assemble this type of early version first place the rear tension housing (E) face down on the bench, with the locating arm in the air.

This is actually two parts, the rear tension housing and the positioning plate.



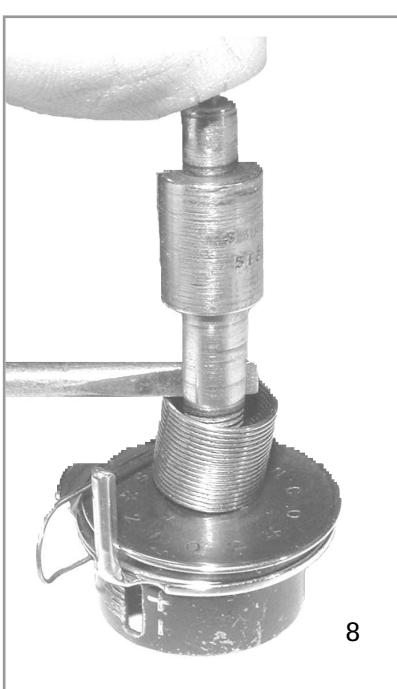
6

- (6) Put the tension release washer (F) into the rear tension housing, domed side down.



7

- (7) Now place the two tension washers (D) on top and slide the end of the tension release spring between the parts of the rear tension housing in the area of the arrow in picture (6).



8

- (8) Holding the tension release pin in the tension stud with a small screwdriver, place the tension stud into the assembly.

You may need to rotate it to pass the tension release washer but the worst is over.



9

- (9) Pick the unit up holding it by the tension housing. Reverse it while you add the tension spring and the front tension housing



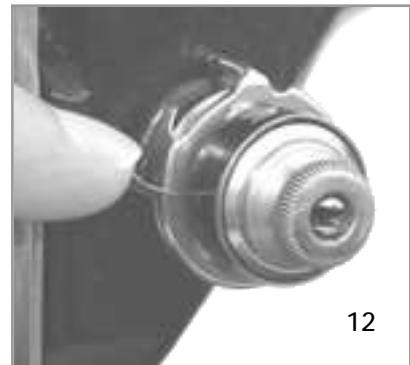
10

- (10) Tilt this so you can get the tension marker bar into the slot in the rear tension housing. Screw on the thumbnut and the unit is complete.



11

- (11) Insert the unit into the machine arm, locating the guide tail in the small hole above the housing recess.



12

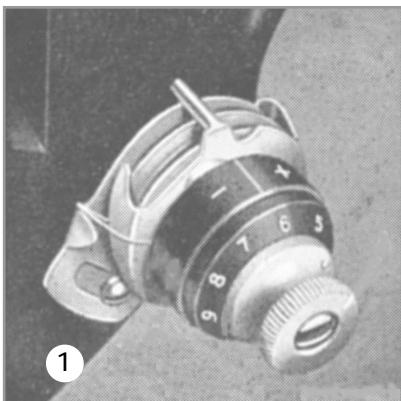
- (12) Make sure the take up spring is within the cutout and check that it springs back to this position when deflected.



13

- (13) If it needs more - or less - tension, turn the tension stud with a screwdriver, then tighten the holding screw inside the face.

## 201 Modern Types



(1) If the unit looks in good condition, clean the components with a soft brush to remove fluff and surface dirt. Then, with the tension released, clean between the tension disks with a soft cloth.

Check that the take up spring is in good condition. *The spring on a type 201 differs from all the other machines because it pulls in the opposite direction.*

With tension off, lift the spring off its rest. It should slip round anticlockwise to roughly 6 o'clock. If not the mechanism will have to be disassembled.

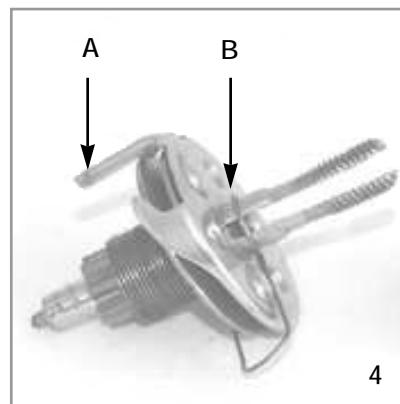


(2) To disassemble, turn the thumb nut anti-clockwise until the numeral 0 on the numbered dial stops opposite the centre lines between plus and minus.

Next, press in the dial to disengage the pin in the back the thumb nut from the dial.



- (3) Now remove the thumb nut and dial, stop washer, tension spring and indicator disc.



- (4) It is not necessary to remove the stud from the machine arm (as seen here) to disassemble the thread tension - but it does help to show it for the purpose of illustration.

However, check that the stud is set with the slot horizontal so that the pointer for the stitch setting can be at the top of the machine.

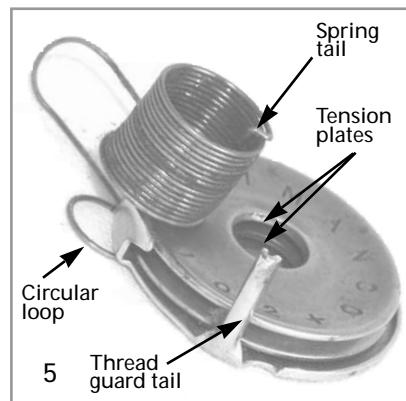
You can see that the 201 has two differentiating features compared with the other models:

A: The addition of a thread guard plate with a tail at the top which locates into a hole in the machine arm.

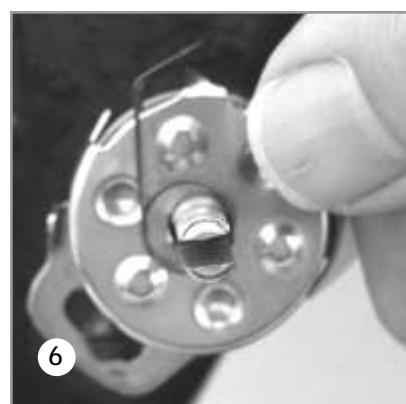
B: The opposing end of the spring has a circular loop which hooks over the front end of the stud.

In order to have the necessary pretension, the take up spring has to be guided on to the stud with its loop in a vertical position.

To start reassembly, first make sure the tension release pin is in place in the stud.



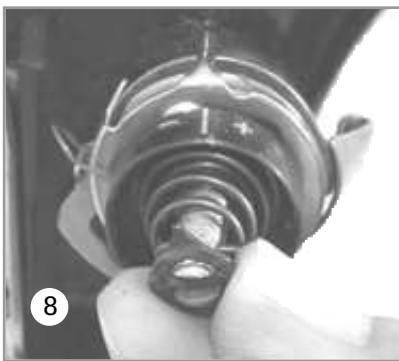
- (5) Place the two tension plates with their flat thread-bearing sides together then pass the circular loop of the spring under the thread guard with the coils of the spring above.



- (6) Guide the tension disc assembly on to the stud so that the extension of the thread guard enters the hole in the machine arm.



- (7) Replace the indicator with the large open side facing the end of the stud so that the plus and minus marks will be at the top (with the minus sign at the left).

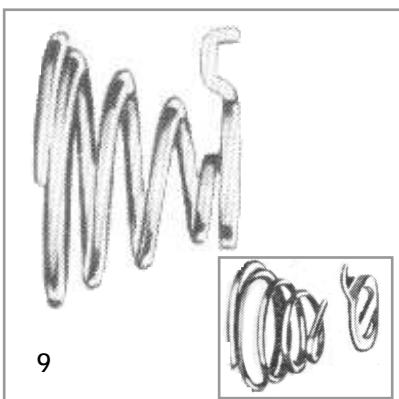


8

(8) Insert the remaining parts.

Hold the parts thus assembled against the shoulder of the stud then inset the tension spring in the indicator with the first (half) coil of the spring straddling the lower half of the stud.

Then guide the stop washer on to the stud so that the little hooked beak is at the top.



9

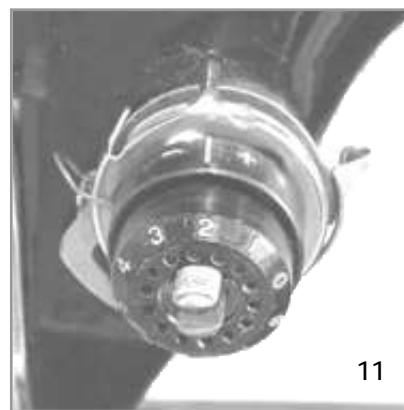
(9) If the spring and stop washer are in the correct position, the little hook will clear the first (half) coil of the tension spring.



10

(10) If you look inside the numbered indicator dial you will see a small ridge directly below numeral 0.

This ridge is for the stop washer hook to engage against which prevents the whole mechanism from coming unscrewed when the thumb nut is undone to its full extent.



11

(11) Next place the numbered dial on the stud so that numeral 2 is opposite the stop washer hook.



12

(12) Now push the dial to compress the spring so that the thumb nut can be turned on to the stud.

Carefully guide the pin on the thumb nut into one of the holes of the numbered dial.

Turn the thumbnut anticlockwise. The dial should stop at 0. If not, turn it back to 2, press the dial again and screw the thumbnut in further, guiding the pin in to a hole further round the dial. Repeat until the dial stops on 0.

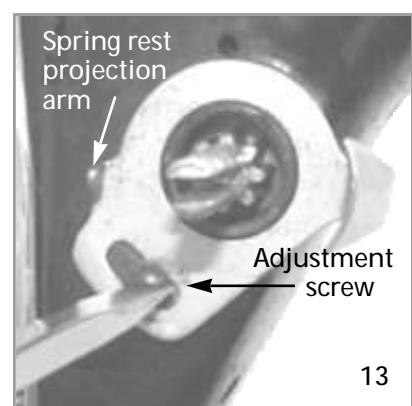
At this point there should *just* be zero tension on the thread. Adjust this by pressing in the dial (without turning it) and turn the thumbnut clockwise (to increase the pressure and anticlockwise to decrease it) locating the pin in the

hole adjacent to the one it was previously in. Repeat this until you have it right.

Check that the dial turns together with the thumb nut through a complete revolution clockwise stopping on 9, providing a full range of tensions from light to heavy. Then turn the dial back to 5, ready to test the stitching later.

Finally, test that the tension releases when the presser release lever is raised. If not, the corrective procedure is the same as for the simpler type covered earlier.

The take up spring should be resting horizontally, to fine tune it an adjustment plate is provided which regulates the distance the end of the spring travels as it makes its arc.



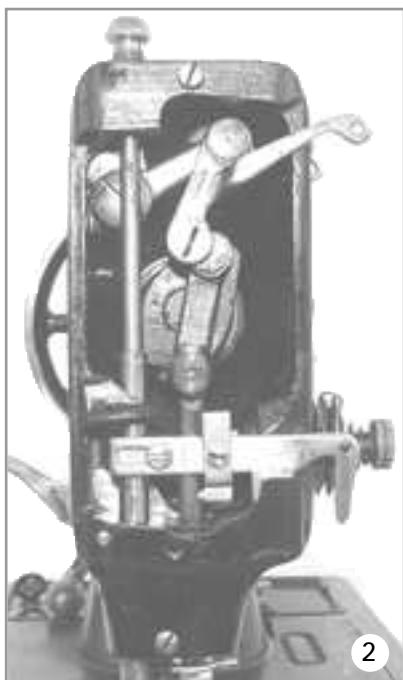
13

(13) Loosen adjustment screw and reposition the take-up spring adjustment plate if required to raise or lower the projection arm on which the spring rests.

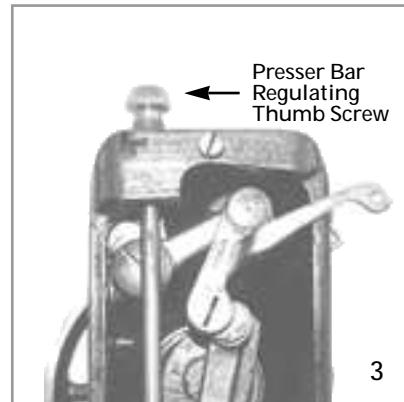
Particularly bad areas for an accumulation of gummed oil and fluff are inside the Lower Bobbin housing and inside the Head. The Head is often worse because it is less frequently opened and seen.



- (1) First loosen the head screw (if there is one), then unscrew the thumb screw and lift off the face plate.

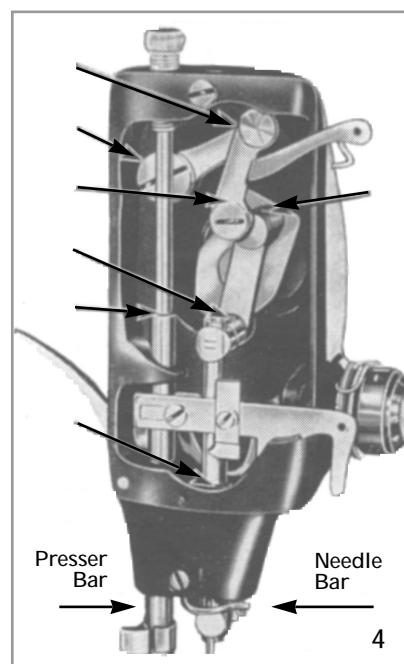


- (2) Thoroughly clean inside the head cavity.



- (3) Make sure the thread of the Pressure Bar Regulating Thumb Screw is oiled and the screw is easy to turn.

On the 15K, 66 & 201 you will see that the the regulating thumb screw is hollow or sealed with a fibre plug. You should apply a couple of drops of oil either into the hole or onto the plug.

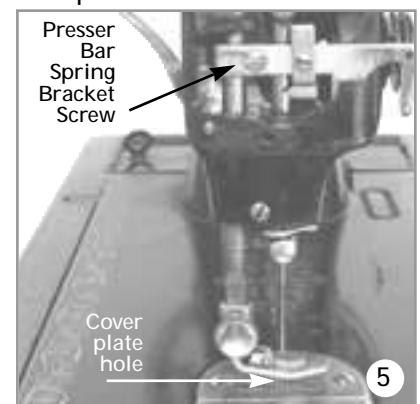


- (4) Oil all the moving parts as indicated by the black arrows.

As you can see from the illustration, most of the moving parts are associated with the levers that convert the rotating movement of the drive shaft into the up and down movement of the needle bar.

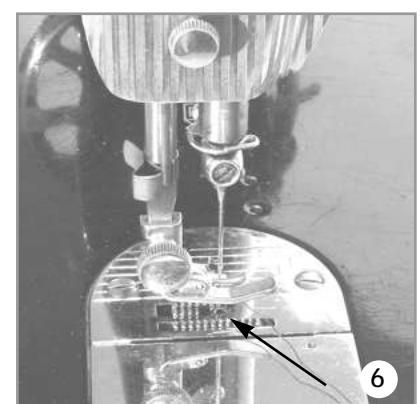
On top of some of these small hinge bearings you will see an oiling hole. Put a drop of oil in

each of these and also on all other moving joints. Do not overoil, as the surplus oil can run down the needle bar, spoiling the workpiece.



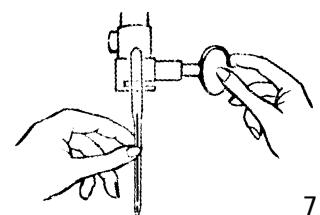
- (5) When lowered, make sure the slot in the foot does not foul the cover plate hole.

A swivel adjustment of the presser bar and presser foot can be achieved by loosening the spring bracket screw.



- (6) Make sure the needle is centred over the cover plate hole.

If there is a problem it could be due to a bent needle, or the needle not locating properly in the needle clamp. Always fit a new needle.



- (7) To adjust the needle, first raise the needle bar to its highest point by turning the balance wheel towards you.

Now release the clamp screw very slightly and check that the needle is squarely secure and pushed fully up in the clamp before retightening.

If the needle still fouls the hole try a new needle and if the problem persists you will have to examine the clamp itself which we explain shortly.

At this stage, if everything connected with the Head is clean and working properly - and you have successfully ticked all five items on your check list you are ready to move on to the next section dealing with the Lower Bobbin Area.

If you have any remaining problems read on:

When the face plate is removed four areas of the sewing machine are revealed inside the Head:

1. TENSION RELEASE.
2. NEEDLE HEIGHT & TIMING ADJUSTMENT.
3. PRESSER BAR ACTION.
4. NEEDLE BAR ACTION.

#### 1. TENSION RELEASE:

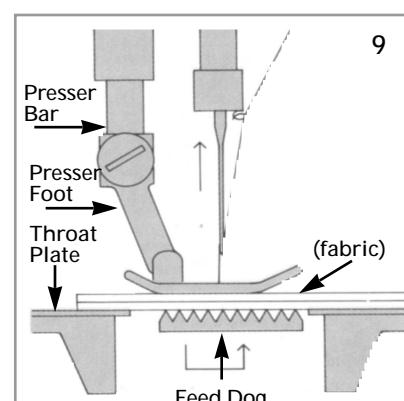
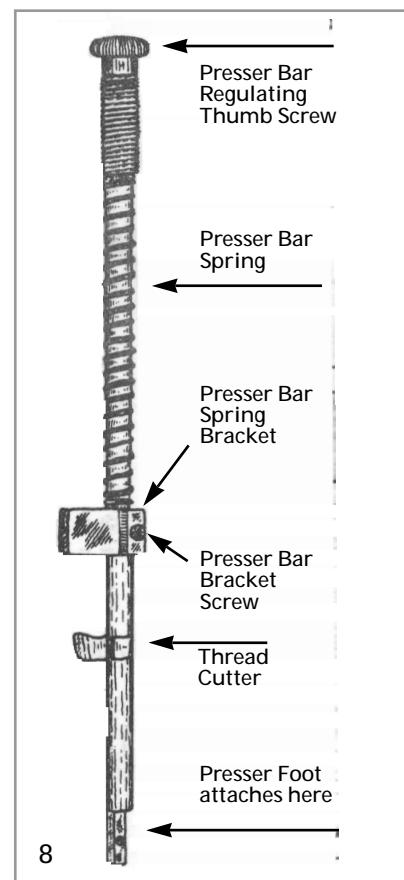
We have already discussed the Upper Thread Tension Release in the previous section.

#### 2. NEEDLE HEIGHT & TIMING ADJUSTMENT:

The needle height can be adjusted although seldom required. Most machines also include timing marks to adjust the overall timing of the machine. However, as these features will seldom be needed, they are left until the Fault Finding section.

#### 3. PRESSER BAR ACTION.

(8) The presser bar is an adjustable spring loaded component central to the fabric control function of the machine.



(9) The presser foot, attached to the end of the presser bar, presses down on the fabric holding it in contact with the feed dog. This enables the feed dog to grip and pull the material forward for the next stitch.

The pressure applied by the presser foot is adjusted by the presser regulating thumb screw at the top of the presser bar.

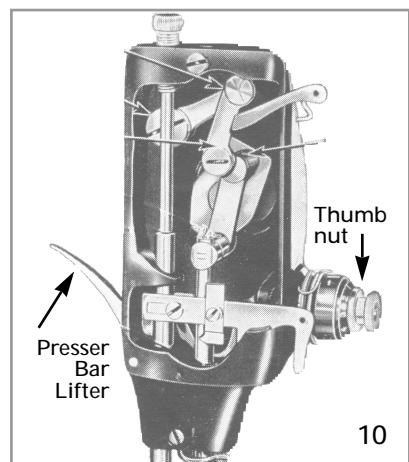
This knurled control is turned clockwise to increase the amount of compression on the presser bar spring and anticlockwise to reduce it.

*Too little pressure on the presser foot (especially when sewing thick or compact material) can result in shorter stitches than set as the feed dog fails to grip the fabric firmly.*

*Also, with too little pressure, the presser foot may not hold the fabric properly and it will pucker.*

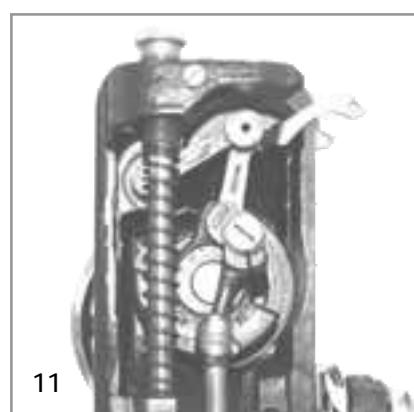
*Too much pressure will impose a drag when operating the machine and induce wear on the teeth of the feed dog.*

To insert, remove or adjust material from under the presser foot the bar has to be raised using the presser bar lifter lever.

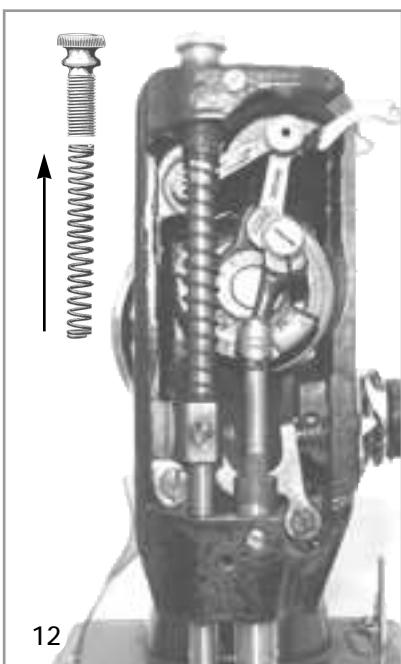


(10) Feel the difference in the pressure on the lifter arm with the thumb nut screwed fully in and then fully out.

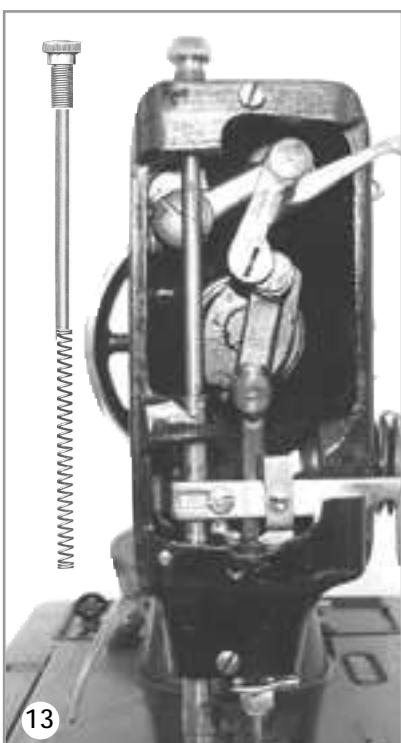
If there is little noticeable difference in pressure, it may be that the spring needs replacing.



(11) With the 15K, 66 and 201 models the spring can be seen on the outside of the Presser Bar.



(12) To replace the spring, undo the thumb nut completely and slide out the old spring.



(13) With the 99 model, the top of the spring is attached to a rod and then encased inside a tube.

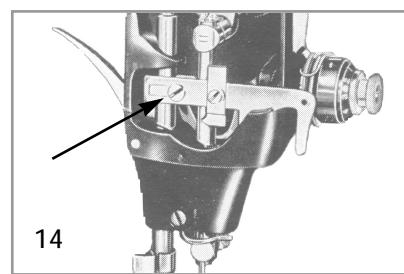
It is removed in the same way by undoing the thumb nut completely. If you do not have a spare spring please highlight the compression problem on your check list and we will remedy it at Netley.

#### Setting the Presser Bar Lifter:

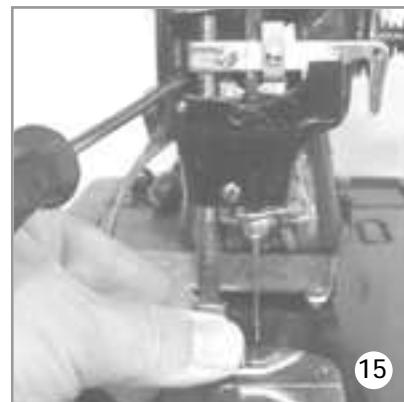
It is important that there should be a small amount of 'free play' in the action of the presser bar lifter when the presser foot is down.

This 'free play' makes it certain that the downward spring pressure is on the material beneath the presser foot instead of on the top of the presser bar lifter.

If the bar and foot start to lift straight away when the lever is raised you need to work through the following adjustment procedure: - *first making sure the teeth of the Feed Dog are below the surface of the Needle Plate.*



(14) Loosen the Presser Bar Bracket Screw.



(15) With the presser bar release lever down, lift the presser foot slightly by hand and insert the blade of a small screwdriver between the presser foot release lever and the presser bar bracket.

Let the presser foot down again, check the presser foot is clear of the needle hole and tighten the presser bar bracket screw.

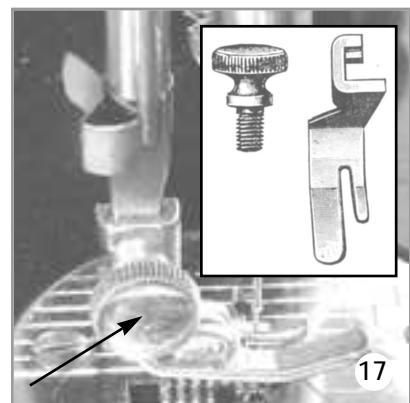
Check that there is the required small movement of the presser bar release lever before contacting the presser bar bracket.

Before tightening the presser bar bracket screw, make sure that the presser foot is not fouling the needle hole. If necessary, rotate the foot until it is clear.

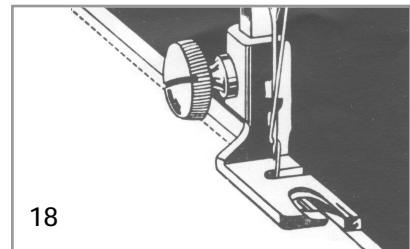


(16) The metal clip attached to the end of the presser bar above the foot is a simple Thread Cutter.

It is occasionally necessary to remove the presser foot to thoroughly clean the end of the presser bar and the foot itself.



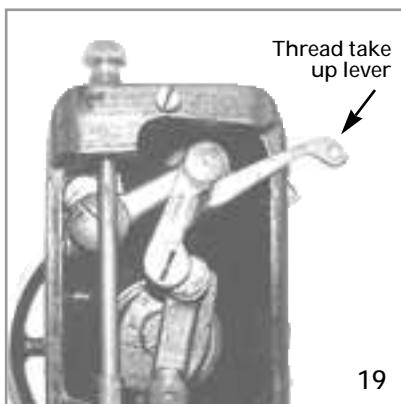
(17) Raise the Presser Bar and the Needle Bar, loosen the knurled thumb screw and remove the Presser Foot



(18) The standard foot has been designed for easy detachment from the end of the presser bar because it is interchangeable with other styles like the Hemmer Foot shown above.

There is also a range of accessories designed for specific tasks. These are attached to the end of the presser bar in place of the standard foot and are discussed in detail in a later section.

## 4. NEEDLE BAR ACTION:

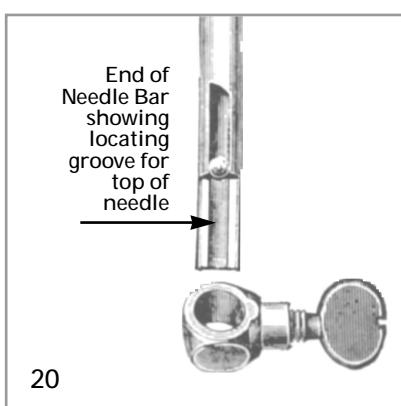


(19) On occasion you may encounter a machine with a broken or badly bent Thread Take Up lever which needs replacing.

Because this is infrequent - and a tricky operation on certain models - we describe the action required in the fault finding section.

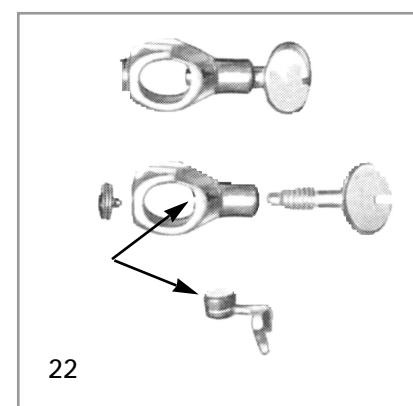
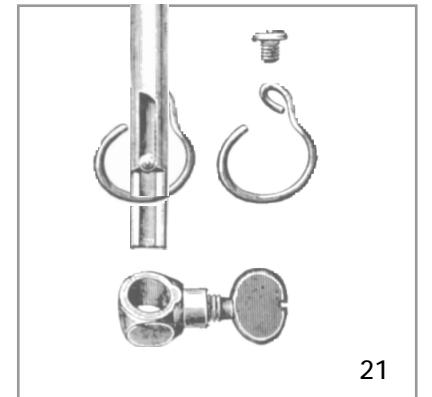
## Needle Clamping:

The last area we need to look at is the needle clamp. This can usually be successfully cleaned in situ using a tooth brush. If you do have cause to dismantle it, you should be aware of the slight variation between models.



(20) The illustration above shows the simplest form of needle clamp as fitted to early 99 and 66 models.

(21) A later modification included a thread guide attached to the back of the Needle Bar with a small screw.



(22) The latest and most complicated system has a small thread guide component located inside the needle clamp - and the clamp itself is secured to the bar with a small grub screw.

When re-assembling it is easiest to seat the thread guide in the clamp then slide both upwards onto the needle bar - then insert and tighten the grub screw.

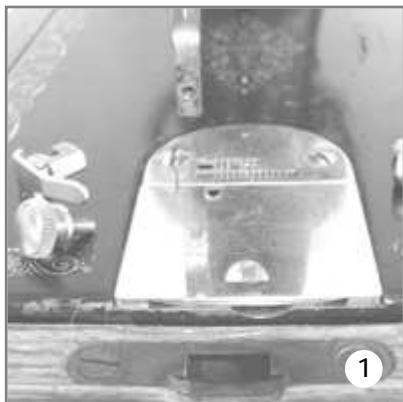
The thumb screw is then required to secure the needle. It presses on the anvil end of the thread guide which in turn presses on the side of the top end of the needle.

It is worth a reminder here that the flat side of the needle on the 201 machines should face to the left (away from the machine). On all the other models the flat side faces right (inwards towards the machine).

If you get this wrong the machine simply won't sew, for reasons explained in the first section on 'How a sewing machine works'..

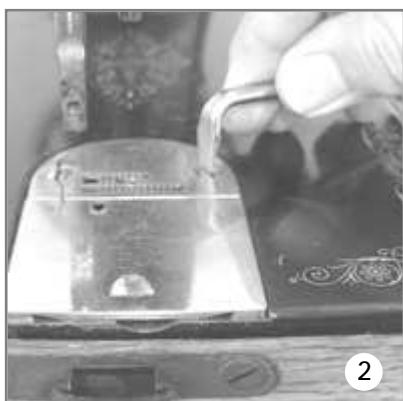
## INTRODUCTION

This section covers the mechanisms revealed when the cover plates are removed. This includes removing, cleaning and resetting the feed dog, hook ring and lower bobbin.

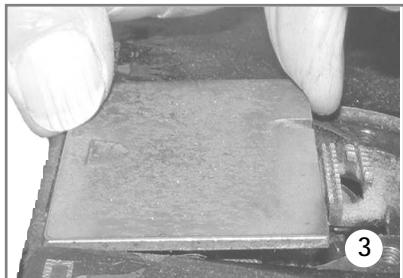


(1) You will find it easier and possibly less painful if you remove the presser foot and the needle before starting work in this area.

## COVER PLATES

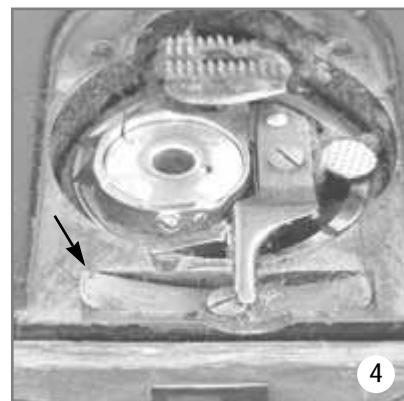


(2) The semi-circular feed plates, while different in size, all attach in the same way with two screws. These are easier to remove by using a long screw-driver, (a) particularly one with the blade cut at an angle of 15° or (b) with a cranked (or angled) screwdriver. Clean and set aside.



(3) Remove the rectangular cover by lifting the inside edge up a little, pushing it over the feed dog and sliding it off.

Before you stow it away, clean out the grooves underneath with a discarded needle or a knife blade and give a single drop of oil to each.

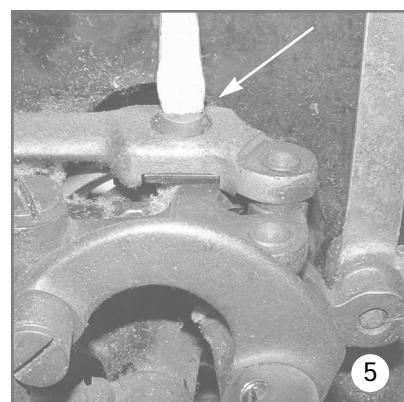


(4) The cover is held in place with a plate spring. Brush out any debris from this area and check that the spring is intact.

The screw holding this spring in place has a very narrow diameter. If you decide to remove it for cleaning, be very careful how much force you use.

## FEED DOG

This is held in by a screw under the machine shown here.



(5) Turn the machine up on end, resting on the face plate, if the screw is difficult to turn.

(6) The feed dog can then be lifted out upwards from the machine for cleaning. (This one needed it!)



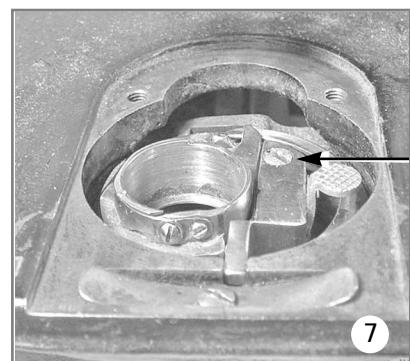
Make sure you remove all fluff from between the teeth of the feed dog as well as giving it a general clean. Put to one side for the moment as it is easier to clean the hook ring area with it out.

## HOOK RING AREA

The components are shown in these illustrations. The *early type* had a fixed bobbin holder position bracket.

The *later type* was changed to allow the removal of the bobbin holder without removing the position bracket as well. In both cases remove the bobbin holder and the position bracket to clean the hook ring.

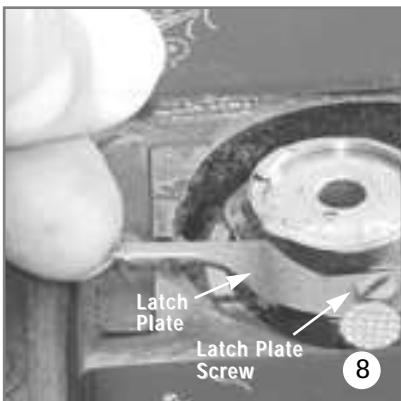
### Early type



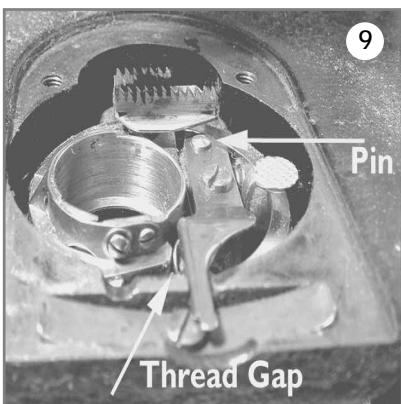
(7) Undo the screw holding the position bracket in place. Take it out and the bobbin holder should also come out easily.

### Later type

The position bracket now consists of two parts, the main body and a latch plate, joined by a screw.

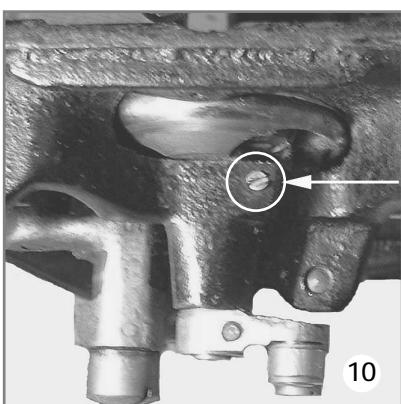


(8) By hooking a fingernail under the latch plate, it can be lifted and moved side-ways, making enough space for the bobbin holder to be re-moved.

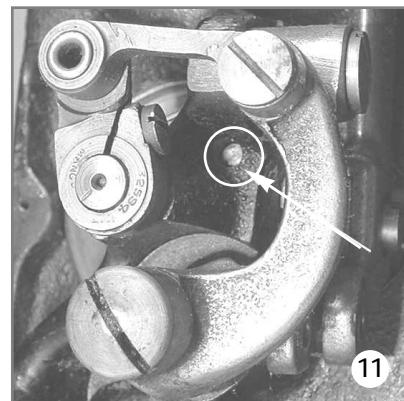


(9) To remove the main body first undo the screw and remove the latch plate.

The screw holding the position bracket in the early type is replaced by a pin (see arrow above).

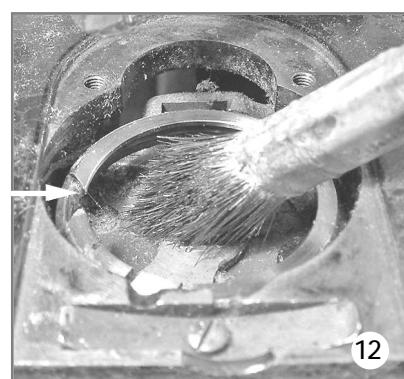


(10) The pin is held in by a grub screw under the base plate. Loosen this screw.



(11) Now locate the underside of the pin. Its position is shown here and can usually be seen as a small shiny circle.

Push on this with a nail punch and it will lift up and can be removed from the top. Hold the position bracket aside for cleaning.



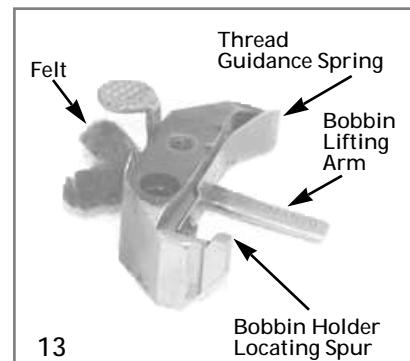
(12) Now clean the hook ring.

If the machine is of any age it will have collected a lot of fluff, which mixed with oil can take a while to remove.

Scrape round the inside of the hook ring as well as the outside, and clean the cuts in its surface. *Do not try to remove the hook ring for cleaning - it destroys the machine's timing.*

Clean out any debris from the hook ring area and check the condition of the actual hook (arrowed). It should have a clean sharp point, free of fluff.

#### Bobbin Holder Position Bracket

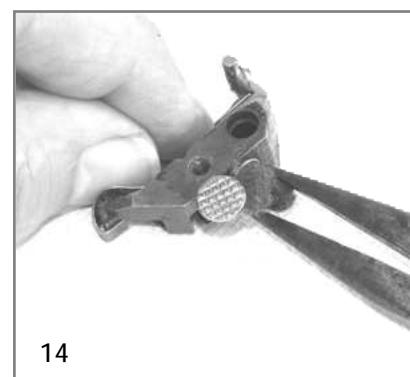


(13) Apart from keeping the bobbin holder in position, this unit has:

a felt wick to keep the hook ring free of fluff

a lever, which when depressed, lifts the bobbin out of the holder for easy removal.

at one side there is a flat spring that provides a smooth path for the upper thread as it goes round the bobbin holder.



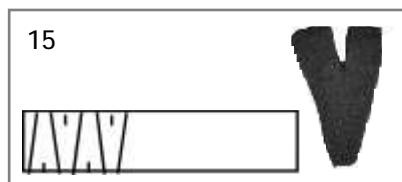
(14) If the felt has been worn, remove it in its spring holder.

The felt can be difficult to remove from its holder. Some-times it yields to snipe-nosed pliers, or driving an old needle through from the side and 'unscrewing' it.

As a last resort, a small drill can be used to bore most of it out and then pick the rest out with a needle.

Clean the rest of the bracket. A stiff toothbrush is ideal for this.

If needed, a new felt can be cut. At present, Netley Marsh has a small stock of this felt, 5 mm thick, which can be supplied in a strip 17 mm wide. From this a trapezium needs to be cut, with a wide end 9 mm and the other end 3 mm.



(15) If these are cut from alternate directions there is virtually no waste. Make a cut 5 mm deep in the wide end to fit over the rim of the hook ring.

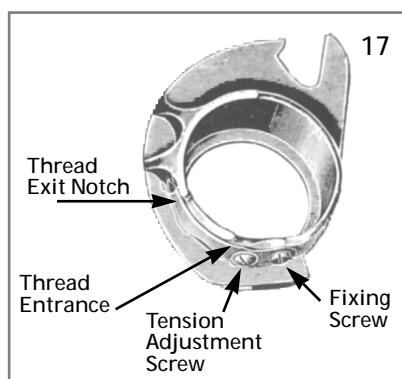


(16) Screw the narrow end of the felt into the spring as far as it will go

Then screw the spring into the side of the bracket, finishing with the slot horizontal. It is now ready for refitting.

#### BOBBIN HOLDER

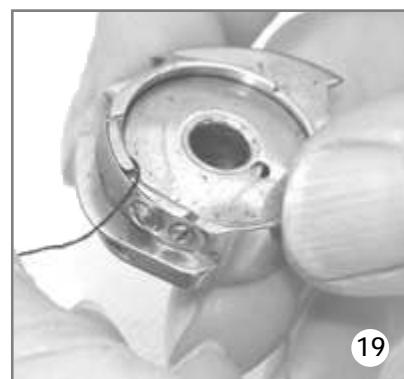
Remove the bobbin and clean the holder. You will see there are two small screws in the side of the holder: the fixing screw and the tension adjustment screw.



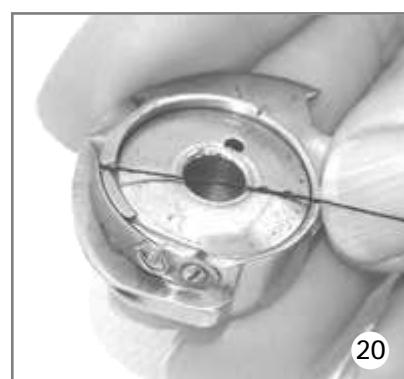
(17) There is a small spring in the side of the holder which controls the lower bobbin thread tension. The fixing screw fastens the spring to the body of the bobbin holder, and the other varies the tension on the spring.



(18) After cleaning, return the bobbin to the holder. Hold the bobbin with the thread leaving it in an anti-clockwise direction.



(19) Draw the thread into the top of the slot in the side of the bobbin holder...



(20) ...then backwards so the thread is drawn into the exit slot.

The thread then feeds from the notch in the bobbin case towards the needle.

Check that there is some resistance when you pull the end of the thread. To be precise, this should be equivalent to 1 oz (28 grams).

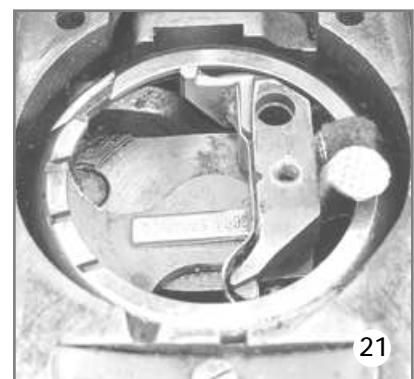
You can test this by hanging a 1 oz weight or equivalent (3 one pound coins) from the thread and turning the bobbin holder nearly vertical. The thread should just about leave the bobbin.

Adjust the tension as required. If you can't get enough tension, it is probably one of two reasons:

The spring has been damaged. Fit a different one if you have a spare, or note for attention on the checklist.

Fluff has collected under the spring. Remove the spring, clean and refit.

#### REASSEMBLY



(21) Place the bobbin position bracket in the hook ring in its approximate position.



(22) Now replace the bobbin holder, so that the groove in its side saddles the edge of the hook ring and the notch in its end is located in the spur on the position bracket.

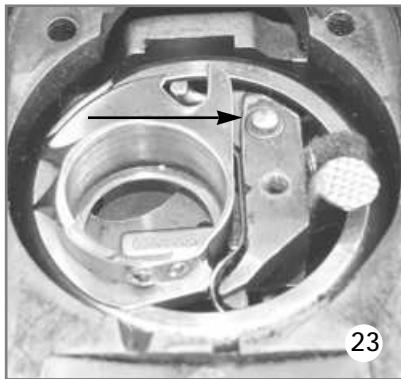
Now wriggle the position bracket into place, with the felt half above and half below the hook ring top edge.

2

## LOWER BOBBIN AREA (66 &amp; 99)

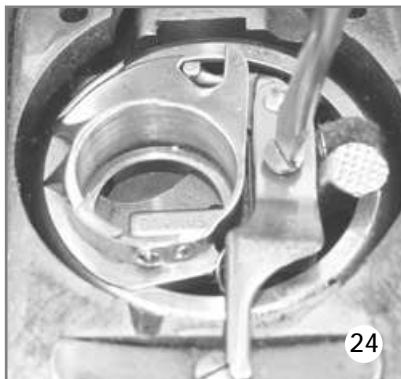
2

If you have the early model with the screw, make sure the tail of the position bracket is in its notch, then fasten the screw.



23

(23) If you have the pin type, insert the pin until the shoulders of the pin are completely in the position bracket, then tighten the grub screw holding it in place.



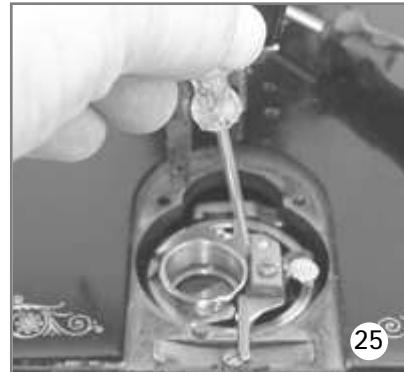
24

(24) Finally, put the latch plate back on the position bracket, and replace its screw - but not tight at this stage.

The screw hole in the plate is larger than the screw, so that although the plate is held firmly in the notch, the bracket underneath can be moved from side to side.

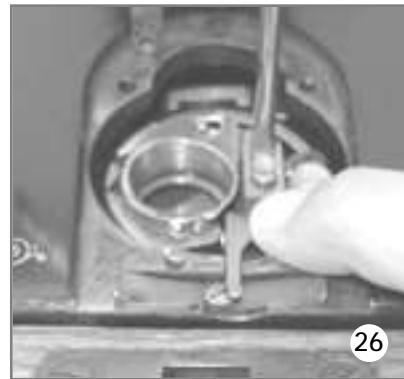
It is essential that, when the screw is finally tightened, there is a small gap between the back of the bobbin holder and the position bracket to allow the top thread to slip through unhindered when the stitch is made. See picture (9) on page H - 2.

If a large gap is left, the machine will work, but can be noisy.



25

(25) Lever the position bracket across to make this small gap...

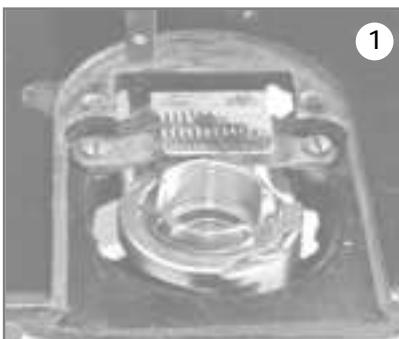


26

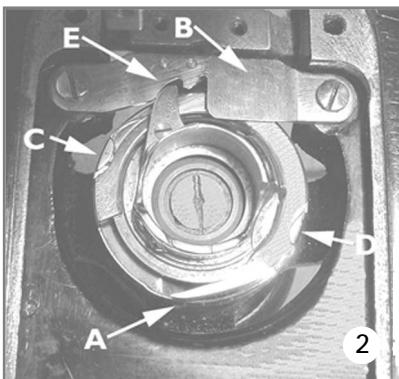
(26) ...then press down firmly on the plate with a finger while tightening the screw.

Give the balance wheel a couple of turns to make sure everything is in the right place.

201



(1) Remove square cover in the same way as the 15K (see picture and paragraph 11 on page H-6). Remove, presser foot, needle and bobbin.



(2) The 201 lower bobbin area is shown here. The hook ring and bobbin holder has been condensed into one neat package. The only other component is (B) the bobbin holder latch. The operation is as follows:

The hook (A) turns clockwise and picks up the thread from the needle. It continues to rotate, carrying the thread with it over the top of the lower bobbin.

As the take up arm ascends, the thread is pulled down through the gap (E) between the bobbin holder arm and the bobbin holder latch.

The thread slips off the hook and the stitch is made while the hook ring makes another complete revolution, i.e. two revolutions per stitch.

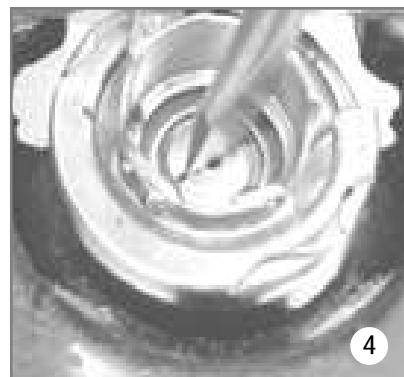
The picture also highlights the two clips, (C) and (D) that hold the hook ring and bobbin holder together as a unit.



(3) Remove the bobbin holder latch for cleaning.

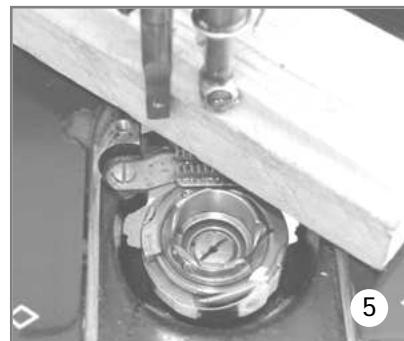
The illustration is of the underside of the part. The spring thread guides tend to collect fluff.

Clean round and under the hook unit with a brush or cleaning rag. Frequently, you will find that you can avoid removing the unit for cleaning. Most of the debris collects inside the bobbin holder and can be removed with a cleaning rag.



(4) If very dirty however, remove this unit from the machine by undoing the large screw which can be seen in the centre.

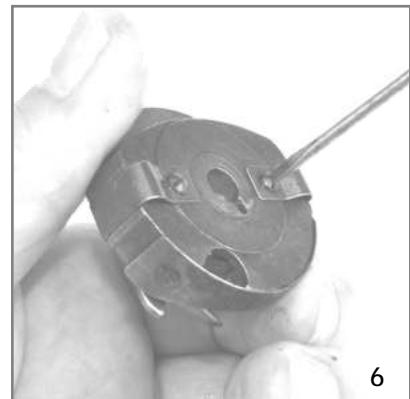
Hold onto the balance wheel while you undo this, as the hook ring will be turned by the screwdriver.



(5) If this proves difficult, place a block of wood on the base plate underneath the needle holder.

When the needle holder descends, it will stop the machine action. If the screw is really stubborn, do not persist. You are in danger of spoiling the timing of the machine.

Instead, lever back the two clips, (C) & (D) and remove the bobbin holder and its retaining ring, leaving the hook ring in place.



(6) Otherwise, take out the unit for cleaning. Unscrew the two clips (preferably over a container to prevent losing the screws).

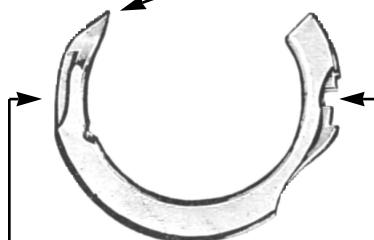


(7) The unit will then come apart into the three pieces shown.

The bobbin holder is a sliding fit within the hook ring. There is a circular groove in the top of the bobbin holder, and the retainer ring has a circular 'tongue' which corresponds with this to hold it in place.

Clean all the components and reassemble. Put a single spot of oil in the groove on the bobbin holder before replacing the retainer ring.

The pointed end of the retainer ring has to be slid round slightly under the hook to line up the clip positions.

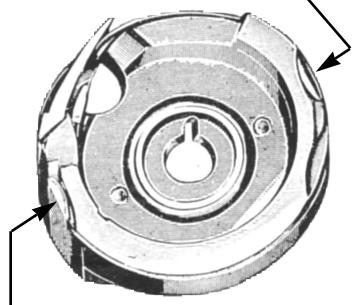


The location positions for the clips can clearly be seen on the hook ring and the retainer ring.

8

(8) Replacing the retainer ring.

The clip opposite the hook is the easiest to align.



9

(9) Hook the end of the clip on to the top, press it in to the side of the hook ring so that the holes for the screw line up underneath and fasten. Repeat for the other clip.

If you did not remove the unit to clean it, lever the clips out from the side of the hook ring slightly with small screwdrivers or slivers of wood. Reassemble the parts, lining up for the clips as above. Then remove the wedges and press the clips into place.

Replace the bobbin holder latch, with the bobbin arm secured as shown in picture 2.

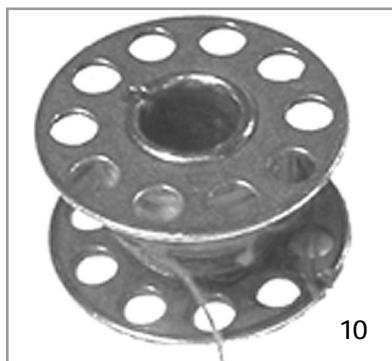
The hole in the centre of the screw holding the bobbin holder in place is an oiling hole. Give it one or two drops of oil before you return the bobbin.

Test that there is some tension on the thread as covered for the 66/99 on page [2] H - 3.

Finally replace the feed dog after cleaning.

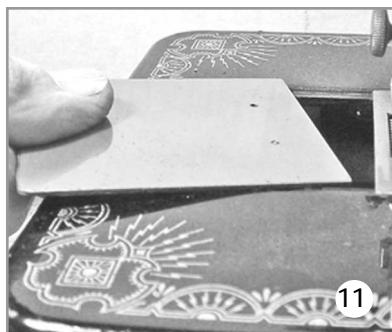
15K

This is the earliest of the round bobbin machines we send.



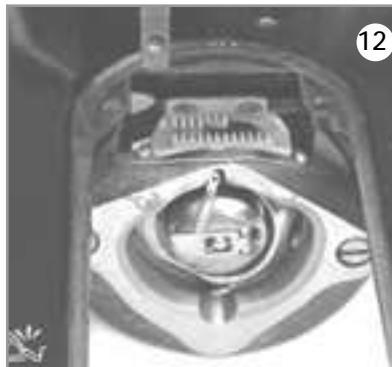
10

(10) It uses a larger bobbin, not interchangeable with that for the other machines.



11

(11) Remove the cover plate by lifting the outside edge very slightly and twisting the plate with a little pressure towards you and upwards.



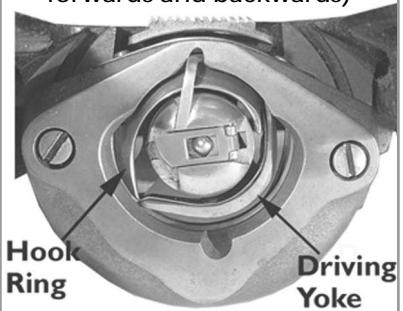
12

(12) Remove the rear cover plate, presser foot and needle.

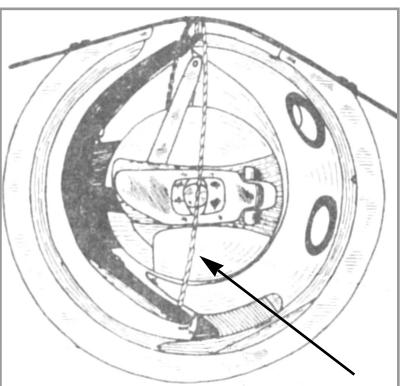
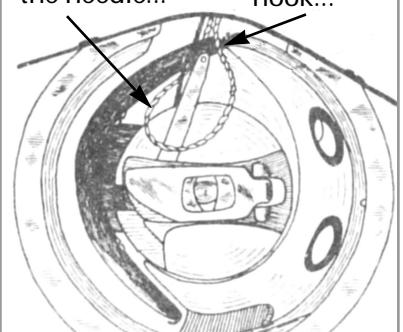
The lower bobbin, hook ring etc is enclosed in a removable unit - the shuttle race.

Although unfamiliar in appearance, this unit works in exactly the same way as the others.

(The hook ring is turned by the driving yoke and oscillates forwards and backwards)



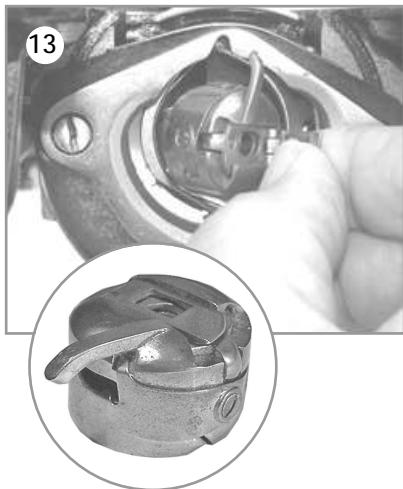
The thread loop from the needle... ...is picked up by the hook...



...and brought clockwise over the face of the bobbin holder.

As the hook reaches the end of its downward travel, the thread slips off the hook. The take up arm is rising and pulls the thread up over the bobbin face, past the bobbin holder arm and the stitch is made.

It is easier to work on the shuttle race if you rest the machine on its balance wheel end.



(13) Remove the bobbin holder by lifting the latch on its face.

As the latch is raised, a bar underneath it slides across and grips the edge of the bobbin cheek, holding it inside the bobbin holder.

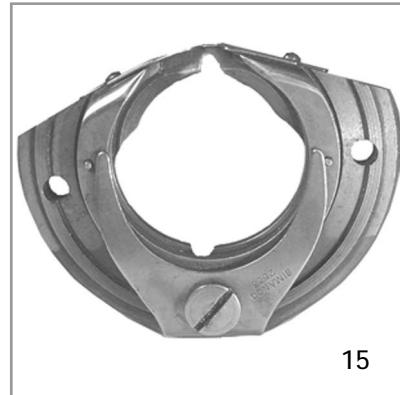
Check that it does so, because otherwise with the vertical operation, it is difficult to return the bobbin holder with its bobbin after changing the thread.



(14) Raise the needle bar to its highest position, undo the two screws on the front of the shuttle race and the unit will lift off.

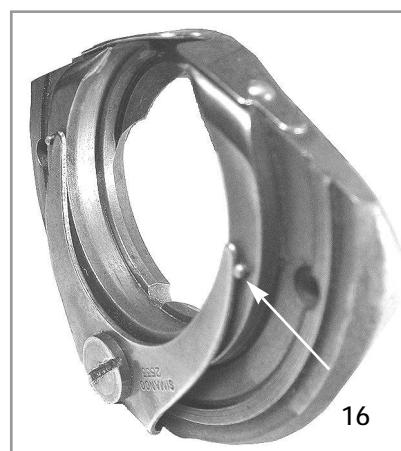
If it is stuck with old oil, lever gently with a screwdriver to release it.

Now is the best time to clean the feed dog and the area surrounding the shuttle race.

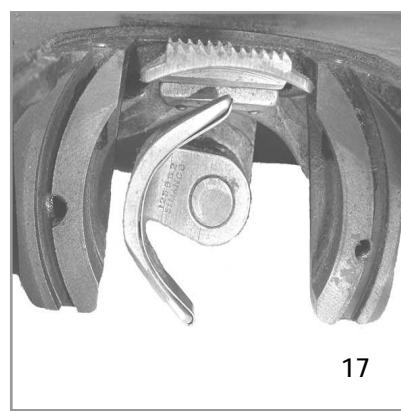


(15) Turn the shuttle race over to take it apart and undo the large screw which releases the spring plate.

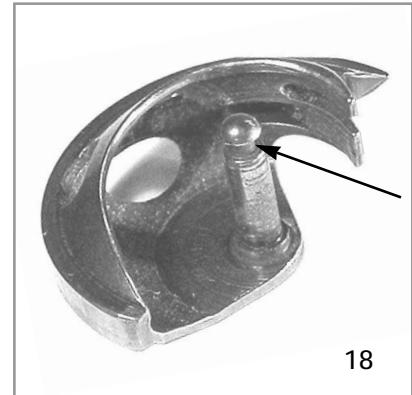
The unit can now be broken down into its three parts; the front and rear parts of the shuttle race and the hook. Clean all three.



(16) The two halves of the shuttle race are located together by pins. When in place they provide a square-edged channel for the hook to slide in, while holding it in place.



(17) The hook is turned by the driving yoke at the end of the main driving rod.



(18) Note that the hook has a spindle to locate the bobbin holder. At the top of this spindle there is a circular groove.

Check that when the bobbin holder latch is closed, the bar underneath it slides across into this groove, preventing the bobbin holder from falling out.

The tension spring on the bobbin holder has only one screw. The tail of the spring is held in a slot, so the screw can combine the functions of holding the bobbin in and vary the tension. It is easier to check the tension before returning the bobbin holder to the machine.

#### Re-assembly



(19) After cleaning thoroughly, marry the two halves of the shuttle race together. Put the spring plate on, with the two arms just inside the two pin ends and tighten the retaining screw completely.

2

## LOWER BOBBIN AREA (201 &amp; 15K)

2



20

(20) Next, put the hook into the channel in the shuttle race.

Put the hook vertically into the race from the rear. First locate the point of the hook in the channel just to the left of centre at the bottom with the hook leaning backward. Now bring the hook up vertical.

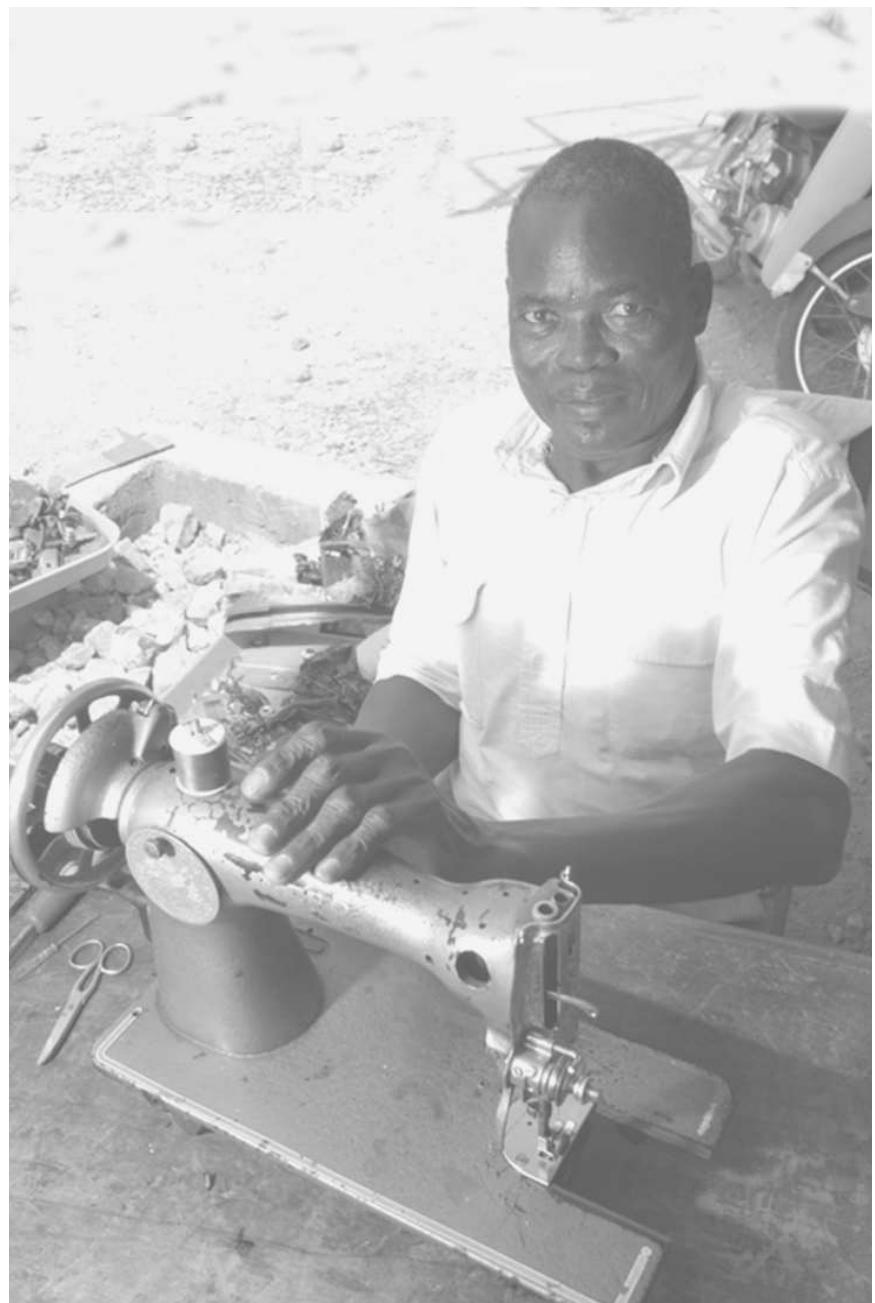
Push the hook to the right and it will fit into the channel. Hold it there while you fit the whole unit back into the machine.



21

(21) Tighten the two holding bolts. Refit the bobbin holder, with the arm located in the notch at the top of the shuttle race.

Turn the balance wheel a few turns to make sure everything has gone back into its right place.



## INTRODUCTION

Apart from the usual cleaning and oiling, there are four tasks to be done under the base:



### Checking the Rollers

*Most important: Every time the feed dog is raised, the roller slides in a channel. If the roller does not rotate, it wears itself and the channel.*



### Replacing the Feed Dog and checking the height

*It is important* to set the Feed Dog height as accurately as possible.

Too little and the Feed Dog disappears back under the cover plate before any long stitch lengths can be obtained, too much and the pressure foot tends to bounce and loses control of the fabric.



### Checking the Stitch Length



### Checking for excessive play in the connecting arms.

Each machine is dealt with in turn, apart from this last item.

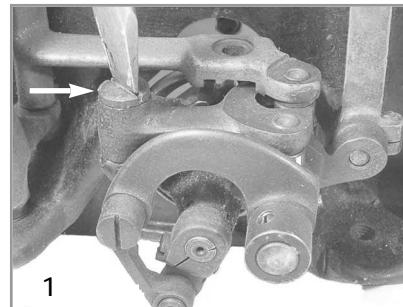
This task is so similar for each model that it is dealt with as a common task at the end of the Underside section.

## 66/99

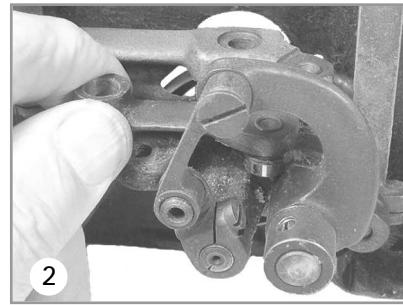
The underside of the machine collects a lot of dirt, fluff and surplus oil during its lifetime. "Out of sight, out of mind" perhaps.

Brush out all fluff and wipe all the connecting rods with cloth or paper towel to remove grease and dirt. Use a scouring pad on very dirty parts.

### Checking the Rollers

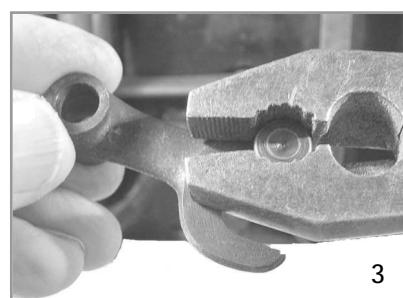


- (1) Turn the machine up so it is resting on the head end. Undo the screw holding the feed dog lifting arm in place.



- (2) Pull the arm out to the left.

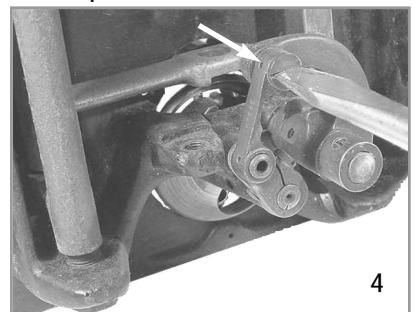
If the arm is difficult to remove, turn the balance wheel while pulling on the arm.



- (3) Check that the roller on the arm turns easily. If not, apply penetrating oil and leave. Then grip with pliers and loosen. Continue until the roller moves easily.

Wipe off any penetrating oil and apply a drop of oil at each end of the roller. Check the other roller on the feed dog control arm.

If the roller is stuck, you may have to remove the hook ring link to use pliers on the roller.



- (4) Remove the screw in picture and the link can be lifted off.

Turn the balance wheel until the feed dog control arm can be lifted up through the gap in the linkage.

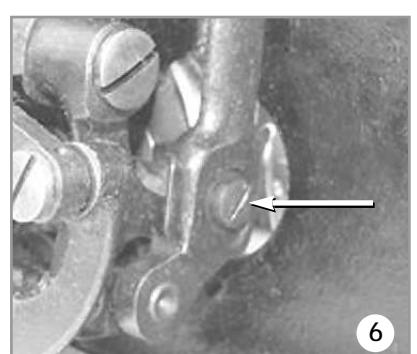


- (5) The roller can then be freed as the other.

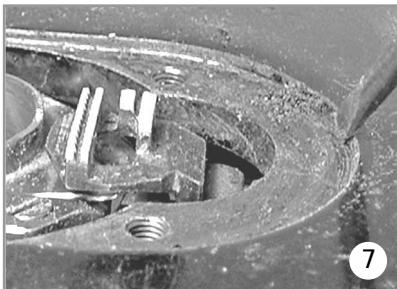
Replace the link if you have had to remove it. (Refer to picture (4) to get it the right way round). Tighten its screw.

Return the feed dog lifting arm by reversing the actions to remove it.

### Checking the Feed Dog Height



- (6) Replace the feed dog, with its holding screw just tight.



7

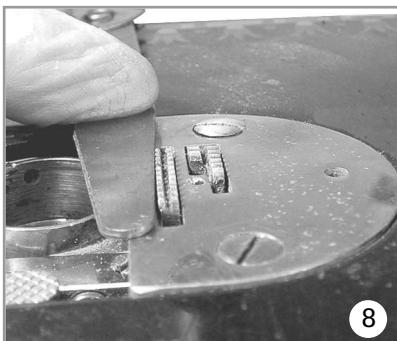
- (7) Before you replace the half round cover plate clean out any debris from the edge of the depression into which it fits with a small screwdriver.

An accumulation of debris can move the plate over slightly when it is replaced. Replace the cover plate and check that the feed dog comes up through it without touching either side. *If this is a problem see the 'Advanced Techniques' section later in this manual or note for Netley Marsh.*

The points on the teeth of the Feed Dog (at the maximum projection above the cover plate) should be set at an optimum height of around 3/64ths of an inch. This equates to 50 thousands of an inch.

You could use feeler gauges to make up close to this. Alternatively, set the height to a whisper under the thickness of a 5p coin.

Set the stitch length to maximum and turn the balance wheel until you judge that the feed dog has reached its maximum height.



8

- (8) Lay any guide you have alongside the feed dog. The tip of the teeth should be just level with the top of the guide.

Adjust by loosening the feed dog screw, raising or lowering the feed dog and retesting.

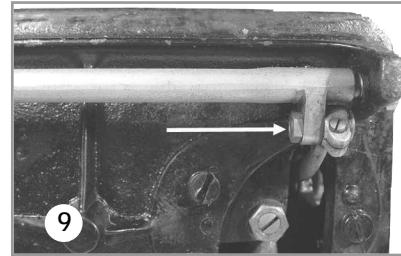
*Note: Always test with the machine in its normal horizontal position and push down on the feed dog to make sure it is fully down before you test.*

Tighten the feed dog screw firmly.

#### Checking the Stitch Length

Now is a good time to check this. With the stitch length control set to maximum, turn the balance wheel and check that the feed dog traverses the slot in the cover plate for *almost* all of its length.

If it is set shorter than this, do the following:



- (9) Lay the machine on its side, hinge side down, and locate the link from the top of the machine to the long connecting rod.

Loosen the nut on this linkage. A 3/8" AF ring spanner is best. You may need to hold the bolt firmly with a screwdriver to stop it turning while you do this.

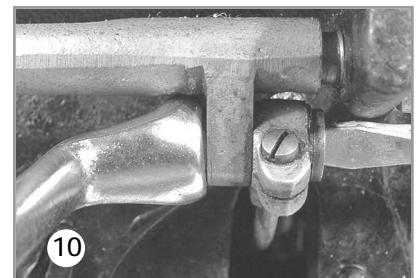
There is no need to remove the nut completely - just loosen it enough to allow the bolt to be turned.

The bolt is an eccentric. You will see that it changes the position of the feed dog as it is turned.

Turn the balance wheel until the feed dog is at the end of its travel.

Turn the stitch control bolt with the screwdriver until the feed dog approaches the end of the slot in the cover plate.

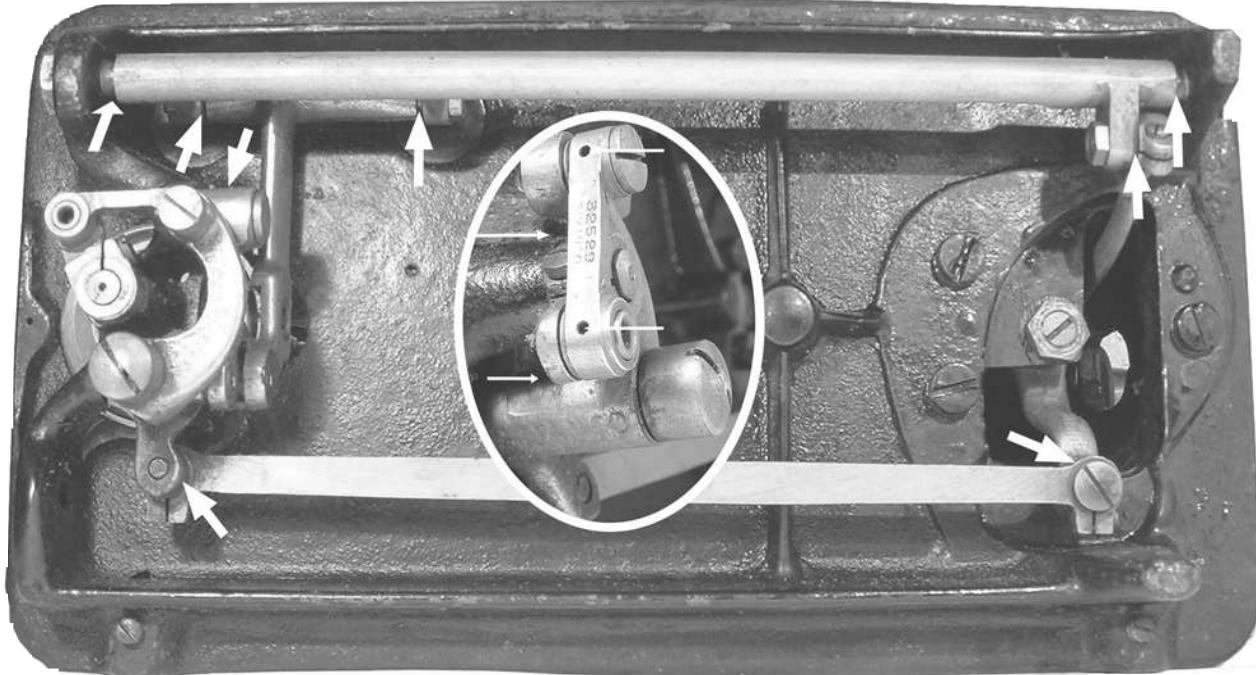
Turn the balance wheel for a full stitch cycle to make sure that you have not overdone your adjustment which can cause the feed dog to catch on the bedplate.



10

- (10) If all is well, re-tighten the nut while holding the bolt still with the screwdriver.

Continued Overleaf



## OILING

This picture shows the underneath oiling points.

With the machine resting in this position, put a drop of oil in each place marked with an arrow. Some of these points are pivots, others are oiling holes. Make sure all the oiling holes are clear of debris.

*Specifically these are:*

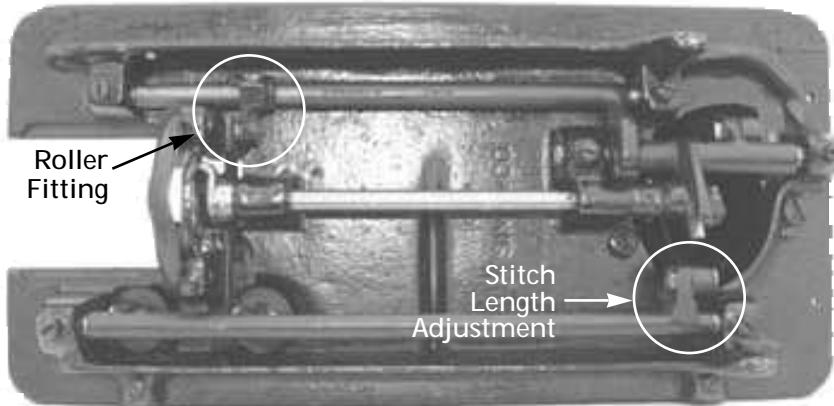
The bearings at the end of the top connecting rod, and the feed dog arm.

The joints at each end of the bottom arm.

In the inset picture, the oiling holes in the linkage arm, the post holding the hook ring arm, and the bottom cam into which the roller fits.

*(This oiling hole can only be seen when the mechanism is in the inset position).*

Run the machine for a few revolutions to work the oil into the bearings before turning the machine upright.

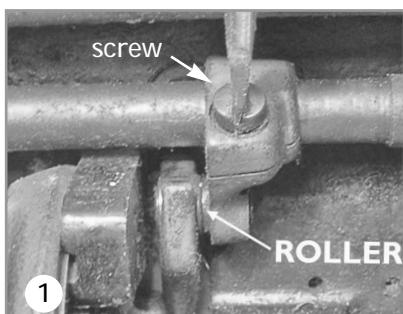


Lay the machine on its back i.e. with the hinge points on the table. Brush out all fluff and wipe all the connecting rods with cloth or paper towel or - in bad cases - a scouring pad. to remove grease and dirt.

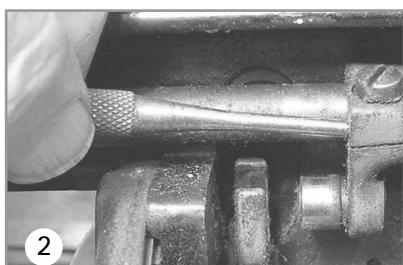
#### Checking the Roller

The 15K has only one roller. It is on a fitting connected to the long connecting rod at the front of the machine.

The roller is difficult to see and difficult to detect whether it is turning. If in any doubt, you must make sure, as otherwise the machine will wear unnecessarily.

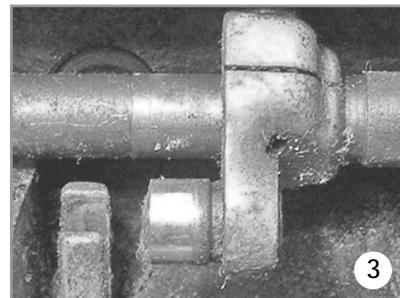


(1) Loosen the screw on the roller arm.



(2) Use a nail punch and a hammer to gently tap the fitting to the right.

You can now test the roller for movement.



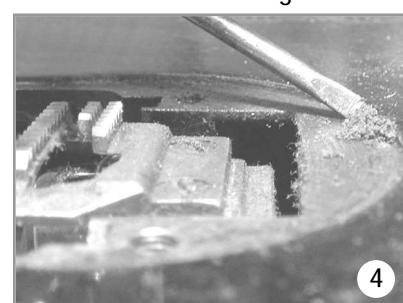
(3) If still stuck, rotate the fitting towards you, oil both ends of the roller, and grip it with pliers to loosen it.

Replace the fitting by rotating it back, and sliding the fitting back along the shaft until the yoke on the feed dog arm is in the middle of the roller.

This operation will have upset the height of the feed dog, so do not re-tighten the screw at this stage.

#### Checking the Feed Dog Height

Replace the feed dog - if you removed it for cleaning.



(4) Before you replace the half round cover plate clean out any debris from the edge of the depression into which it fits with a small screwdriver.

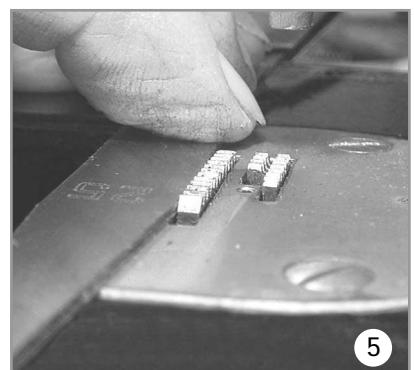
An accumulation can move the plate over slightly when it is replaced. Replace the cover plate and check that the feed dog comes up through it without touching either side.

If this is a problem see 'Advanced Techniques' later in this manual or note for Netley Marsh.

The points on the teeth of the Feed Dog (at the maximum projection above the cover plate) should be set at an optimum height of around 3/64ths of an inch. This equates to 50 thousands of an inch.

You could use feeler gauges to make up close to this. Alternatively, set the height to a whisper under the thickness of a 5p coin.

Set the stitch length to maximum and turn the balance wheel until you judge that the feed dog has reached its maximum height.



(5) Lay your gauge alongside the teeth of the feed dog and check the height.

If you need to adjust the height, loosen the feed dog screw. (You may have already done so checking the roller.) See picture (1).

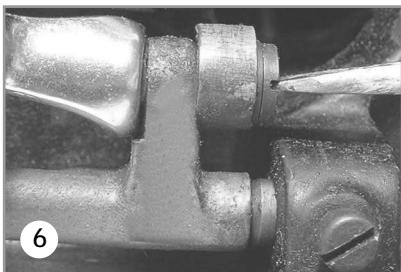
Rotate the fitting until the feed dog is at the right height. Retighten the screw.

#### Checking the Stitch Length

Now is a good time to check this. With the stitch length control set to maximum, turn the balance wheel and check that the feed dog traverses the slot in the cover plate for almost all of its length.

If it is set shorter than this, do the following.

Lay the machine on its side, hinge side down, and locate the link from the top of the machine to the long connecting rod. At the bottom of the machine.



6

(6) Loosen the nut on this linkage

A 3/8" AF ring spanner is best. You may need to hold the bolt firmly with a screwdriver to stop it turning while you do this. There is no need to remove the nut completely - just enough to allow the bolt to be turned.

The bolt is an eccentric. You will see that it changes the position of the feed dog as it is turned. Turn the balance wheel until the feed dog is at the end of its travel.

Turn the stitch control bolt with the screwdriver until the feed dog approaches the end of the slot in the cover plate.

Turn the balance wheel for a full stitch cycle to make sure that you have not overdone your adjustment which can cause the feed dog to catch on the bedplate.

If all is well, re-tighten the nut while holding the bolt still with the screwdriver.

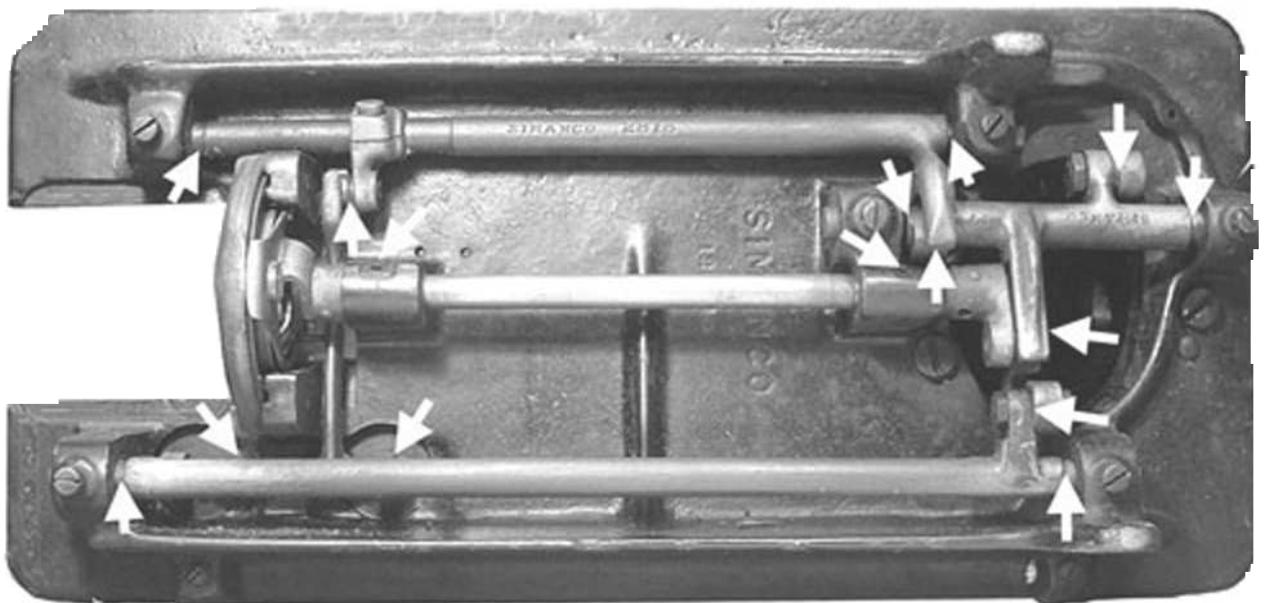
Turn the balance wheel over a few times to make sure the machine is moving freely.

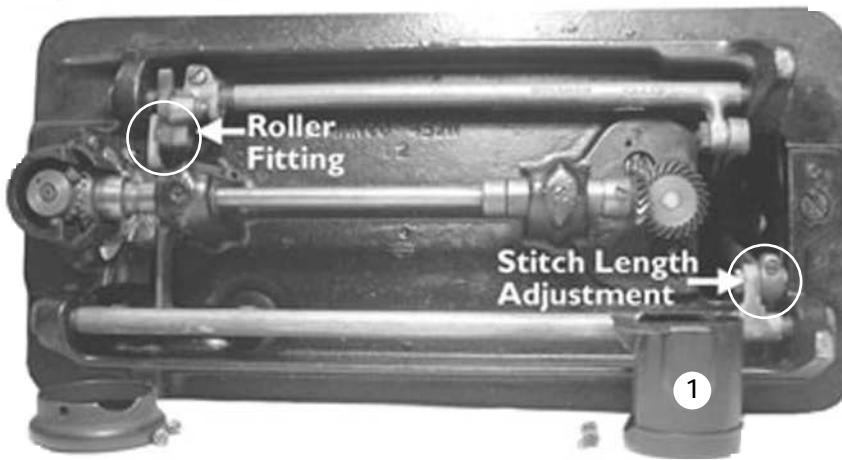
## OILING

This picture below shows the underneath oiling points.

With the machine resting in this position, put a drop of oil in each place marked with an arrow.

Some of these points are pivots, others are oiling holes. Make sure all the oiling holes are clear of debris.





(1) Lay the machine on its back i.e. with the hinge points on the table.

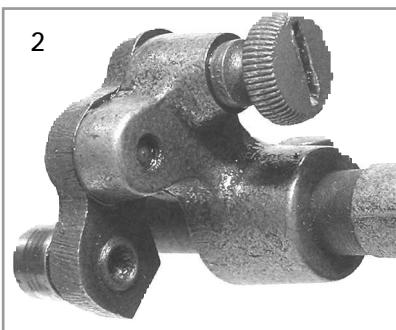
The covers have been removed from the gears in this illustration.

The shallow cover under the hook ring area collects dust and fluff. Remove it to clean.

Normally the other gear cover need not be removed. Brush out all fluff elsewhere and wipe all the connecting rods with cloth or paper towel or - in bad cases - a scouring pad to remove grease and dirt.

#### Checking the Roller

The 201 has only one roller. It is on a fitting connected to the long connecting rod at the front of the machine. (See picture (1))

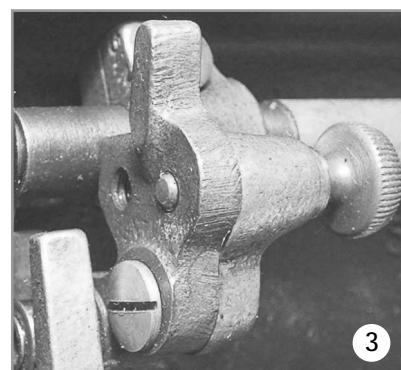


(2) This fitting allows the user to keep the feed dog below the cover plate when doing 'free form' work - embroidery or darning for instance.

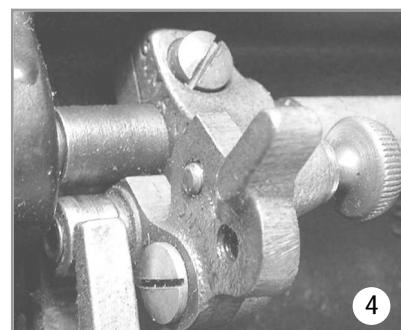
By unscrewing the knob, the roller part of the fitting will swivel.

Refix the screw and the feed dog arm will be held down.

Because this feature is seldom used, the knob can be difficult to turn. If you fail with a screwdriver, use pliers and add a couple of drops of oil as soon as you have a crack between the knob and its fitting. Only unscrew the knob sufficiently to release the bracket holding the roller.

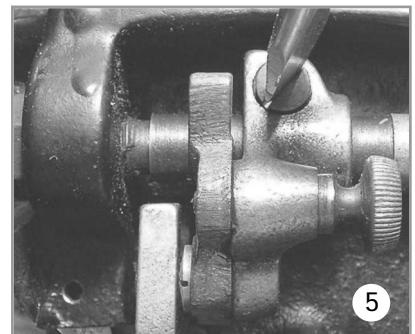


(3) This picture shows the setting for normal sewing...



(4) In this one the machine is set for free form work.

The roller is easier to see - and to detect whether it is turning - in this setting. If in any doubt, you must make sure, as otherwise the machine will wear unnecessarily.



(5) Loosen the screw on the roller arm and push it to the right. If necessary, use a nail punch and a hammer to gently tap the fitting over.

It is now easier to test the roller and to grip it with snipe nosed pliers to free it.

If still stuck, the roller bracket can be removed. Rotate the fitting towards you so that the screw holding the bracket in place can be undone. (It is normally obstructed by the feed dog arm).

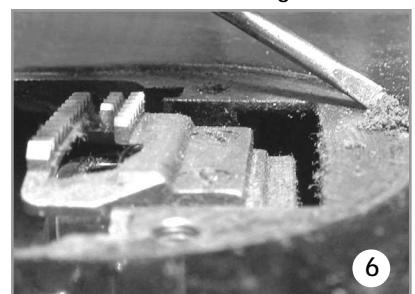
With a little wriggling, the bracket can be removed. Replace the bracket when the roller has been freed and oiled.

Replace the fitting by rotating it back, and sliding the fitting back along the shaft until the yoke on the feed dog arm is in the middle of the roller.

This operation will have upset the height of the feed dog, so do not re-tighten the screw at this stage.

#### Checking the Feed Dog height

Replace the feed dog - if you removed it for cleaning.



- (6) Before you replace the half round cover plate it is worth cleaning out any debris from the edge of the depression into which it fits with a small screwdriver.

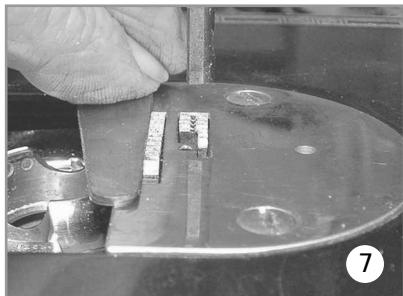
An accumulation can move the plate over slightly when it is replaced.

Replace the cover plate and check that the feed dog comes up through it without touching either side. If this is a problem see "Advanced Techniques" later in this manual or note for Netley Marsh.

The points on the teeth of the Feed Dog (at the maximum projection above the cover plate) should be set at an optimum height of around 3/64ths of an inch. This equates to 50 thousands of an inch.

You could use feeler gauges to make up close to this. Alternatively, set the height to a whisper under the thickness of a 5p coin.

Set the stitch length to maximum and turn the balance wheel until you judge that the feed dog has reached its maximum height.



- (7) Lay your gauge alongside the teeth of the feed dog and check the height.

If you need to adjust the height, loosen the feed dog screw. (You may have already done so checking the roller - see picture (5)).

Rotate the fitting until the feed dog is at the right height.

Re-tighten the screw.

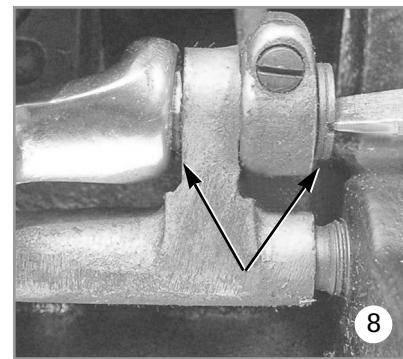
#### Checking the Stitch Length

Now is a good time to check this.

With the stitch length control set to maximum, turn the balance wheel and check that the feed dog traverses the slot in the cover plate for almost all of its length.

If it is set shorter than this, do the following:

Lay the machine on its side, hinge side down, and locate the link from the top of the machine to the long connecting rod at the bottom of the machine.



- (8) Loosen the nut on this linkage. A 3/8" AF ring spanner is best. You may need to hold the bolt firmly with a screwdriver to stop it turning while you do this.

There is no need to remove the nut - just loosen enough to allow the bolt to be turned.

The bolt is an eccentric. You will see that it changes the position of the feed dog as it is turned.

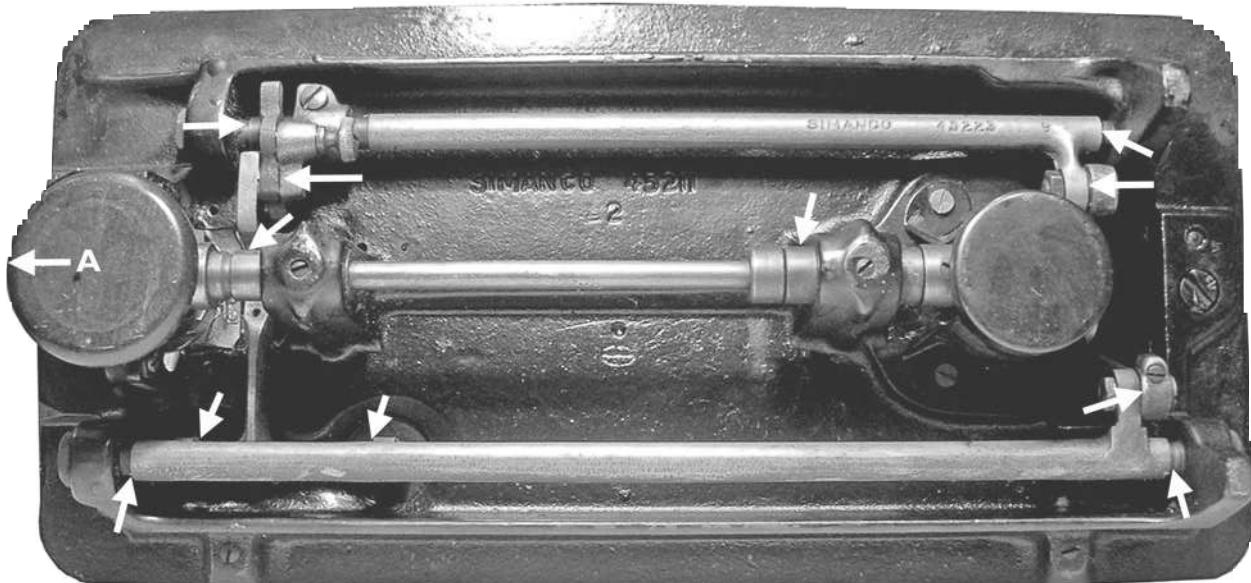
Turn the balance wheel until the feed dog is at the end of its travel. Now turn the stitch control bolt with the screwdriver until the feed dog approaches the end of the slot in the cover plate.

Turn the balance wheel for a full stitch cycle to make sure that you have not overdone your adjustment which can cause the feed dog to catch on the bedplate.

If all is well, re-tighten the nut while holding the bolt still with the screwdriver.

Turn the balance wheel over a few times to make sure the machine is moving freely.

Continued Overleaf



## OILING



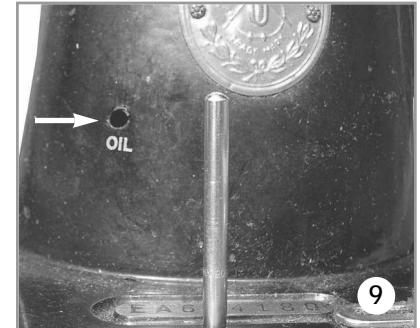
The main picture shows the underneath oiling points.

With the machine resting in this position, put a drop of oil in each place marked with an arrow, except A.

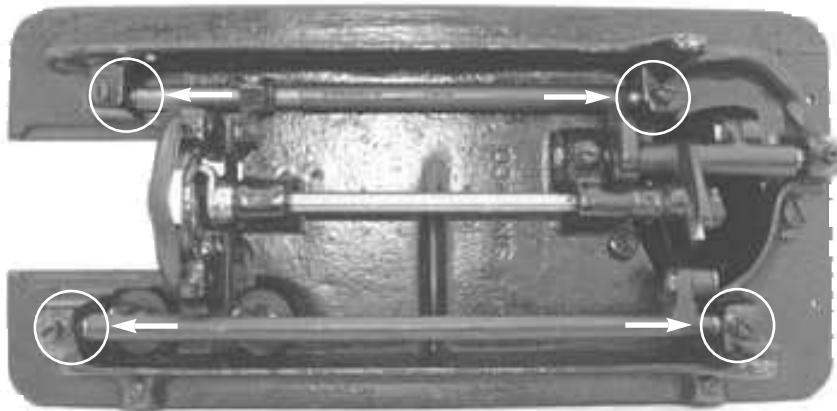
Some of these points are pivots, others are oiling holes.' Make sure all the oiling holes are clear of debris.

Turn the balance wheel a few times to circulate the oil.

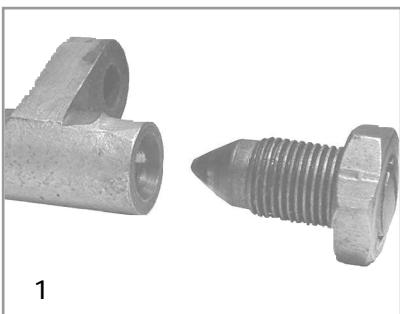
To oil point A, bring the machine back upright and put a couple of drops of oil in the hole which is visible about halfway up the hook ring casing. This oils the gear wheels below.



(9) To oil the gear wheels at the other end of the machine, put a couple of drops of oil into the hole on the main pillar, shown in the adjacent picture.

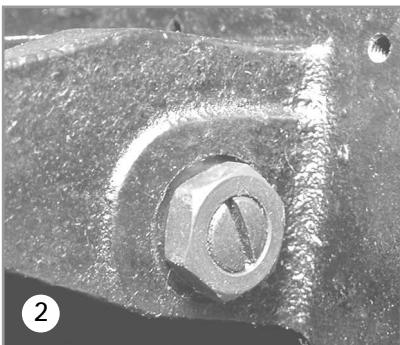


## CONNECTING RODS &amp; PIVOTS



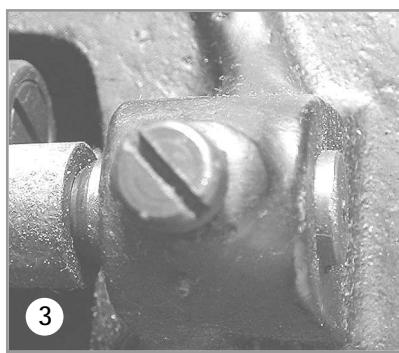
(1) Pivots are used for connecting rod bearings on all machines, similar to that shown above.

It consists of a screw with a conical pointed end, which locates into an opposite shaped fitting on the end of the connecting bar.



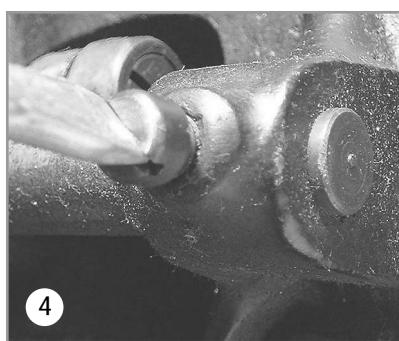
(2) The screw is held in brackets on the bedplate of the machine, the end of the screw and the locknut being visible at the side of the bracket.

(3) Older machines use pivots without threads and locknuts. These are held in place with screws located on the end of the brackets.



(3) Check that, when holding the connecting rod, it has the minimum movement from left to right. If there is discernible movement, it needs adjusting.

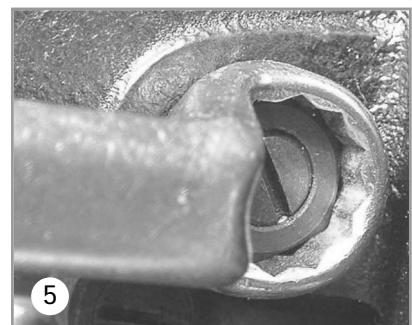
## PLAIN TYPE



(4) Undo the fixing screw. Gently tap the end of the pivot with a nail punch to move it towards the connecting rod.

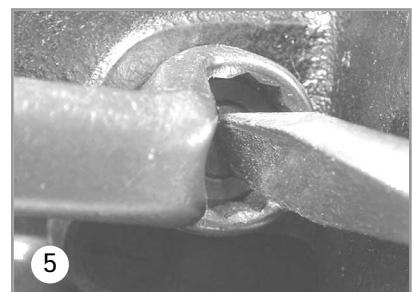
Check the amount of movement. There should be the barest trace of freedom. Too tight and the machine will run hard. Tighten the screw when adjusted to your satisfaction.

## SCREW TYPE



(5) Use a 9/16th AF ring spanner to undo the locking nut. The screw can now be turned inwards with a screwdriver.

Test the amount of movement as for the plain type.



(6) Hold the screw firmly in place while you tighten the locknut with a spanner.

## ADJUSTABLE CONNECTIONS



(6) You will see this type of fitting on some connections under the bed and in the head.

The purpose is to take up any wear which may occur in the bearing by tightening the screw, which decreases the gap visible in the picture.

If you feel this is necessary, be very careful not to overdo it, as it can make the machine very heavy to turn.

**INTRODUCTION**

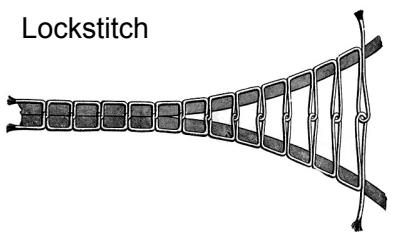
The sewing test should establish that:

- The needle is set correctly to pick up the lower thread.
- The timing of the machine is correct.
- The tensions are correct.
- The machine sews at short to long stitch lengths - and reverse if fitted.
- The feed dog height and foot pressures are set correctly.

The test is little different from model to model. Any variations are covered as the test is explained.

Each stitch is formed by the top thread being picked up by the hook and guided round the lower bobbin. This 'locks' the two threads securely together.

Lockstitch



The aim is to achieve stitching where the tension is equal on both top (needle) and bottom (bobbin) threads, so that the loops lie between the two pieces of material.

We do not know the variety of fabrics, stitch lengths and thread sizes that will be used with the machine. So the best we can do is to adjust the tensions at a 'normal' stitch length with an average weight of fabric.

We can then test at other stitch lengths to show that the machine can be adjusted to cope with the changes.

**PREPARATION**

Choose a piece of fabric for the test. It should be of sufficient size that you have room on it to sew lines of 3 to 4 inches (70 to 100 mm) length.

This will allow you to work up a reasonable speed and also check the machine's line control. So a piece of 6" x 6" (150 x 150 mm) folded over is needed.

The material should not be flimsy or stretchable. Curtain liner is our preference for weight and lack of pattern.

Always fit a new needle. It is essential that needles be perfectly straight and have a sharp point.

Machines arrive with bent and blunted needles. Replace them and use them to clean 'difficult to get at' places.

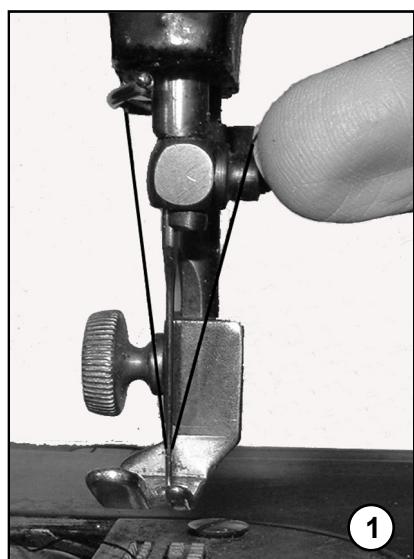
The test is best done with a medium size needle (14/90) and thread to suit.

This section does not contain detailed instructions on fitting needles, threading up etc, as these are covered in the user manuals for each machine.

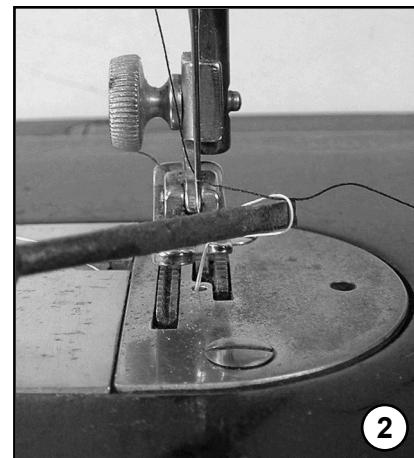
Keep one of each manual by you for guidance. If this means you send us a machine without a manual, note it on the Refurbishment Record on the outside of the case.

Choose a different thread colour for top and bottom. It makes it much easier to see the stitch formation.

Thread up the top and bottom according to the user manual.

**PICKING UP THE LOWER THREAD**

**(1)** With the presser foot lever raised, and the thread take up lever at its highest position, hold the end of the needle thread, leaving it slack from the hand to the needle.



**(2)** Turn the balance wheel towards you until the needle moves down and back up again to the highest position. Pull up the needle thread and the bobbin thread should come as well.

**Tip:** If you leave the cover slide open, you can watch the top thread encircle the lower bobbin.

**Note:** If the hook fails to pick up the top thread and capture the lower thread, it can be due to the following reasons:

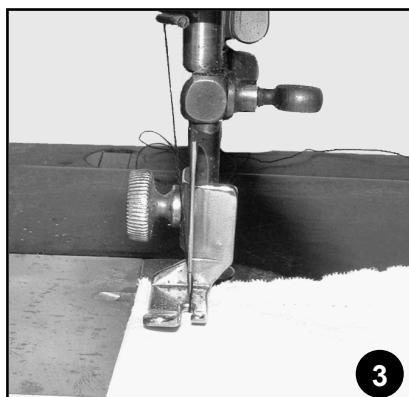
- You are holding the top thread too tight.
- The needle has not been pushed up into the needle holder as far as it will go.
- The needle is the wrong way round. (Flat side to the left for 201, to the right for other models.)
- The needle has been threaded the wrong way. (From right to left for the 201, left to right for other models).
- The needle is bent. Always start with a new needle.
- The machine timing needs adjustment. This is rare, so it is covered in the section "Advanced Techniques".

Guide the top thread through the slot in the presser foot and lay both threads towards the back of the machine.

**The following paragraphs assume that you have set the lower tension correctly.**

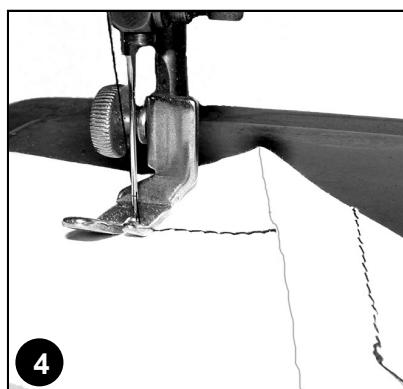
See page [2] H-3 for further help.

### SEWING TEST



- (3) Insert the folded test piece and lower the presser foot. Choose a

medium stitch length to start the test.



- (4) Sew a seam down most of the length of the cloth, stop and turn the fabric through 90° so you can examine the results.

**Note:** Do not try to help the feeding of the work by pulling the material, as this may deflect the needle and cause it to break. The cloth should feed without assistance if the foot pressure and feed dog height are set correctly.

### Tension

**Tip:** With contrasting coloured thread on top and bottom, it is easier to see which thread is looser.



Needle Thread Tension  
Too Tight

- (5) The diagram shows the loops of the bottom thread visible on top of the fabric.

In this case, loosen the top tension a little and try again. (Turn the thumbnut anti-clockwise.)



Needle Thread Tension  
Too Loose

- (6) If the top thread loops are visible below the work piece as in this diagram, tighten the tension a little and try again. (Turn the thumbnut clockwise.)



Balanced Tension

If you are lucky - or have persevered - the tension will be just right.

**Note:** It is not always easy to obtain as perfect a result as in the diagram. With thinner materials, particularly, you will have to settle for near perfection.

As you test at various stitch lengths, you will probably have to lessen the top tension at the longest stitch. This is normal.

If you can adjust the tension between too loose and too tight, then the subsequent user will have the same control when changing fabrics, weight of thread etc.

### Stubborn top loops under the fabric

If you still have an apparently loose top thread even at the point that the thread snaps or the material buckles, there are three possible causes.

- The cotton is not threaded through the tension check spring - or the spring is ineffective.
- 66/99 only, the top thread is not passing between the lower bobbin and the retainer arm easily. (If you leave the cover plate open you can watch this at slow speed.) See page [2] H-2 (9).
- The feed dog is set too high. In this condition, the feed

dog rises up too far on its return journey, and feeds the material backwards, shortening the stitch after the top thread has been pulled through the tension plates, so that too much thread remains.

### Missing Stitches

The stitches should all be of the same length. If some pickups of the lower thread have been missed, the cause will be one of the reasons given on the previous page for not picking up the lower thread. The solutions are the same.

### Puckering

The material has to be pulled through the machine by the feed dog. The presser foot holds the material firmly against the feed dog. Make sure the presser foot screw is screwed down enough to provide this pressure. (Enough pressure is also needed to keep the seam straight.)

If this fails to solve the problem, it is because *both* tensions are set too high, the feed dog cannot pull the fabric through against the resistance of the tensions - so the fabric slips.

**Check the lower bobbin thread tension and start again.**

### Stitch length control

When you have achieved a satisfactory stitch formation at a medium setting, try stitching at various settings of the stitch length control.

At the maximum setting you will probably have to reduce the top tension to achieve a balanced stitch.

### Reverse Stitching

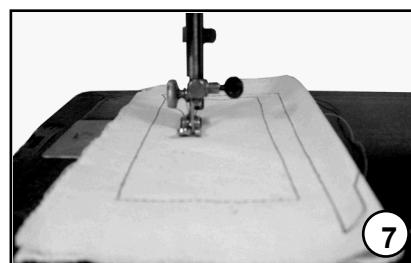
Reverse stitching is available on 201s and some late model

99 machines. This function should be tested. It is normally used only for finishing seams, so do not alter the tension - just check that it works.

### Completion of Test

When you are satisfied that the machine is sewing properly at a range of stitch lengths the sewing test is complete.

**And finally...**

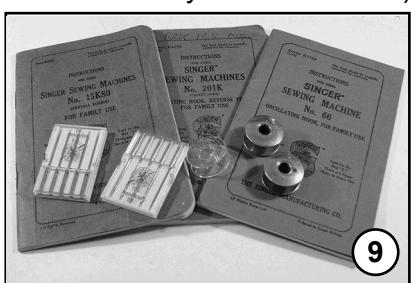


(7) Leave the piece of test fabric under the presser foot. This demonstrates that the machine has been tested and is working perfectly.



(8) Remove the cotton reel from the spool pin, unwind a few inches of cotton then cut it off and wind the end a few times round the pin.

Leaving the machine threaded in this way will hopefully help the recipient to follow the threading sequence. (Cotton reels inevitably fall off in transit.)

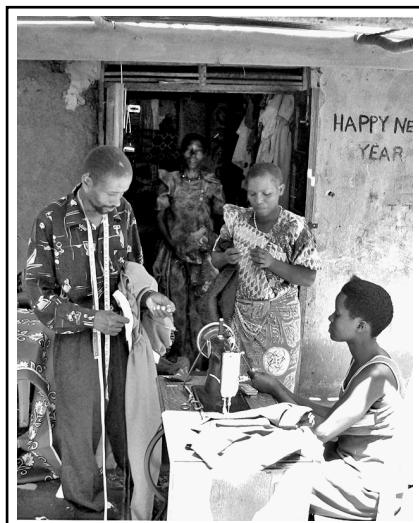


(9) Add the spare needles, bobbins and handbook if you have them, give the machine a wipe with a clean cloth and complete the paper work.



(10) Tie up the handle to the balance wheel and the handle bracket to avoid it being damaged in transit.

**Congratulations!**



## CONTENTS

You should not need to use this section unless you have been referred to it from earlier sections for the following tasks:

### Setting Timing and Needle Height

- 66/99 Pages K-1 to K-3
- 201 Pages K-3 to K-5
- 15K Pages K-6 to K-7

### Replacing a broken take-up arm

Page K-8

## TIMING AND NEEDLE HEIGHT

**Before dismantling anything, check the following:**

- You have used a new needle.
- The needle is the right way round. (Flat to the right for 15K, 66 & 99, flat to the left for 201.)
- The needle housing is clean with no dirt stopping the needle lying flat in its groove.
- The needle is pushed up in the needle bar as far as it will go.

If you now need to go further, read on.

## STITCH FORMATION

To successfully make a stitch, the hook has to pass the needle at exactly the right time to pick up the loop of cotton at the eye of the needle, and the needle must also be at the right point in its travel. A fuller description of stitch formation is given in Part 1 of this manual, Section E.

To enable this timing to be set, apart from early 15 & 66 models, all machines have timing marks. Two marks are provided.

- The top mark establishes a datum point when the needle is at its lowest point.

- The lower mark then gives the point at which the point of the hook should be passing the needle.

**Except for the 15K, the timing gauge has to be set before the check can be made. Details are given for each model.**

**66/99**



- (1) To ensure you have a clear view of the needle/hook interaction, remove the cover plates, feed dog, presser foot and bobbin case, also the head plate.**

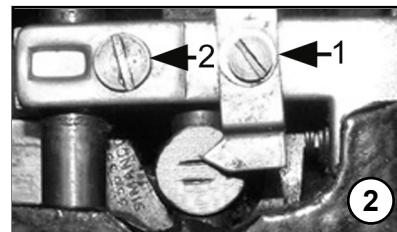
### SETTING TIMING GAUGE - EARLY 66/99 MODELS

The timing gauge for these models is the arrow-headed pointer attached to the slack thread regulator arm shown in picture (2). This can be easily misaligned during cleaning work and its position needs to be checked before checking the timing.

**Turn the balance wheel until the needle is at its lowest position.**

There are two marks on the needle bar connecting stud. The pointer on the slack thread regulator should be exactly

opposite the upper of these two marks when the needle is at its lowest position.



- (2) To adjust, loosen screw (1) and set the pointer opposite the top mark. If there is insufficient movement, it may be necessary to move the slack thread regulator up or down by loosening screw (2).**

### SETTING TIMING GAUGE - LATER 66/99 MODELS

The timing gauge for these models is the top of the bush which is a sliding fit on the needle bar housing. As this can be easily disturbed during cleaning, its position must be checked and adjusted before checking the timing of the machine.

**Turn the balance wheel until the needle is at its lowest position.**

The top of the bush should be level with the top mark on the needle bar connecting stud when the needle is at its lowest point.



- (3) To adjust, slide the bush up or down on its mounting until the top of the bush is level with the top mark.**

**CHECKING TIMING**

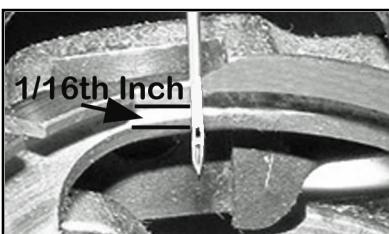
**When you have set the gauge:**

Turn the balance wheel further towards you until the gauge is opposite the lower timing mark.

**TIMING** The needle should now be immediately in front of the point of the hook.



**NEEDLE HEIGHT** The top of the eye of the needle should be about 1/16th of an inch (1.6 mm) below the hook.

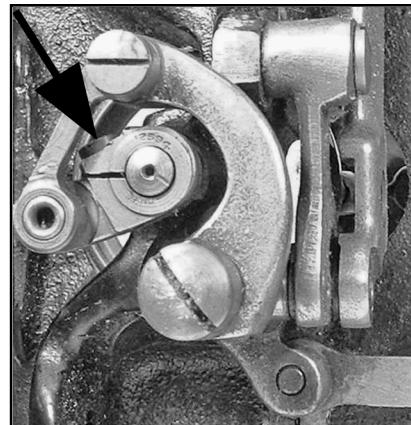


If the machine meets both of these criteria, then you need to look elsewhere for your problem. See the list of other points to check at the beginning of this section.

**CORRECTING THE TIMING**

If the timing is wrong, lay the machine on its back.

The hook ring shaft is clamped to the driving arm by a screw shown by an arrow in the next picture.



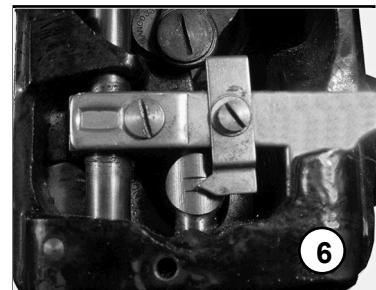
**(4) Turn the balance wheel until this screw is clearly visible and loosen it.**

You should now be able to twist the hook ring without moving the rest of the mechanism.



**(5) If the hook ring is stiff to turn, insert a small screwdriver into one of the slots as a lever.**

Hold the balance wheel still while rotating the hook ring until the hook point is immediately behind the needle.



**(6) Make sure you still have the needle bar set with the lower needle mark opposite the gauge. (Remember the needle bar passes this point twice in a cycle. You need to make sure the needle is rising when setting the timing.)**

Fortunately, the clamping screw is easily accessible at this point in the cycle. Before you tighten the clamping screw, make sure the hook ring is fully down and the driving arm is close to the base of the machine so there can be no vertical movement of the hook ring.

When you have tightened the screw, make sure the timing is correct by taking the machine through a complete cycle.timing.

Finally, make sure the clamping screw is really tight.

**CORRECTING THE NEEDLE BAR HEIGHT**

The needle bar is held in the needle bar connector by a screw. Loosening this screw allows the needle bar to be raised or lowered slightly. Access to this connecting screw is at the back of the head.



**66/99 CONTINUED**

Turn the balance wheel until the needle height gauge is opposite the lower of the timing marks. The screw will then be immediately behind the hole in the back of the head.

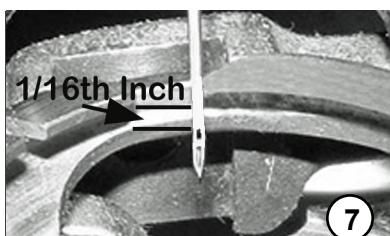


You may find it easier to loosen the screw with the machine standing on its head.

Do not remove the screw entirely - it is difficult to replace, and if unscrewed too far it fouls the inside of the head and the mechanism jams.



With the screw loose, hold the balance wheel still while the *lower* of the timing marks is opposite the gauge.



(7) Now wriggle the needle bar until the top of the hole in the needle is *1/16th* of an inch (1.6 mm) below the hook.

If the needle bar is difficult to move, try twisting it to break any adhesion caused by age.

When satisfied that the needle is now at the right height, tighten the connecting screw, being careful not to disturb the adjustments you have made.

There is a 'flat' at the back of the needle bar which ensures that when tight, the needle will face in the correct direction.

**Finally**

Before re-assembling, take the machine through a complete cycle, checking that at the lower timing mark, with a rising needle, both the timing and needle height are correct.

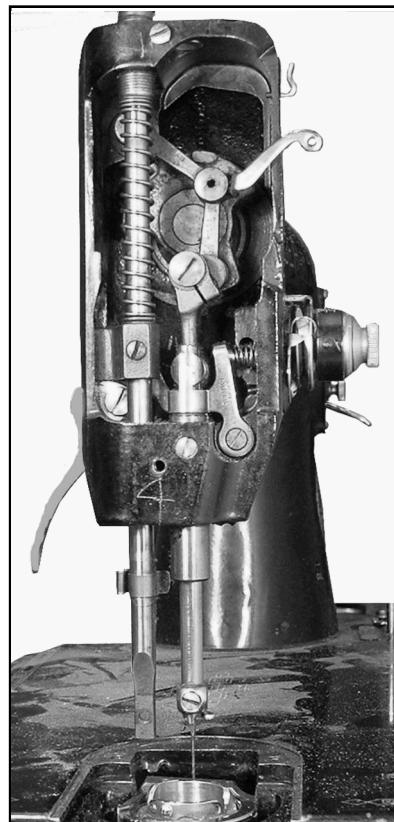
**201 MACHINE**

To ensure you have a clear view of the needle/hook interaction, remove the cover plates, feed dog, and bobbin holder latch, also the head plate and presser foot.

**SETTING TIMING GAUGE**

The timing gauge for these models is the top of the bush which is a sliding fit on the needle bar housing. This can be easily disturbed during cleaning.

Its position must be checked and adjusted before checking the timing of the machine.



**Turn the balance wheel until the needle is at its lowest position.**

The top of the bush should be level with the top mark on the needle bar connecting stud when the needle is at its lowest point.



Volunteer Carol Swift and Rahama Mohammed from TFSR Partner GIGDEV, Ghana at Netley Marsh

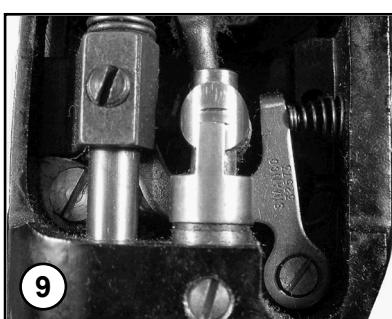
**201 CONTINUED**

Turn the balance wheel until the needle is at its lowest point.



(8)

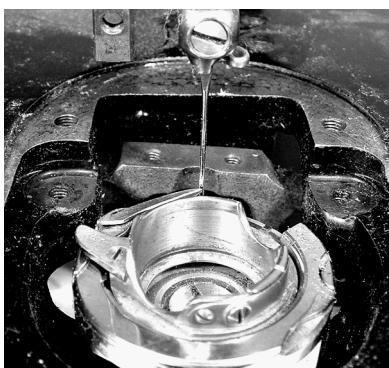
- (8) To adjust, slide the bush up or down on its mounting until the top of the bush is level with the top mark.**

**CHECKING TIMING**

(9)

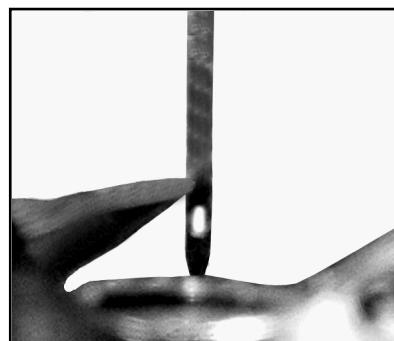
- (9) When you have set the gauge, turn the balance wheel further towards you until the gauge is opposite the lower timing mark.**

**TIMING** The needle should now be immediately behind the point of the hook.



**NEEDLE HEIGHT** At the same point, the top of the hole in the

needle should be 1/16th of an inch (1.6 mm) below the hook as shown in the picture below.

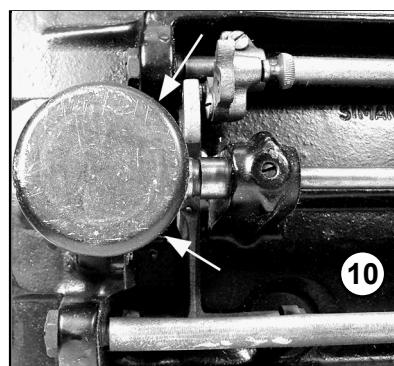
**CORRECTING THE TIMING**

It is unusual for the timing to be wrong on a 201. The hook ring connection to the bevel gears used on the 201 has a 'flat' on the shaft which makes it very unlikely that it has moved out of place.

All the other grub screws in the transmission are fastened very tight at the factory and one of them on each gear is pointed so that it bites into the shaft. Any timing problem is therefore more likely to be caused by someone having removed the hook ring for cleaning and not replaced it correctly.

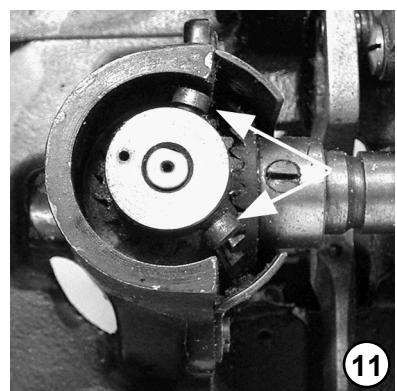
To correct the timing, lay the machine on its back.

The bottom of the hook ring shaft is hidden by the black cap.



- (10) Undo the two screws holding it in place, revealing the bevel gears.**

The two screws clamping the hook ring can now be seen. In the picture shown, the top screw is gripping the flat on the hook ring shaft.



(11)

- (11) Loosen the two fixing screws.**

You will need to turn the balance wheel a little to get at both screws. (Note that the screws will foul the housing if unscrewed too far.)



(12)

- (12) Holding the balance wheel still, with the needle bar at the lower mark on the gauge, turn the hook ring so that the hook is directly in front of the needle.**

If the hook ring is stiff to turn on its own, a tap with a punch and hammer on the base should loosen it. Make sure you push the hook ring back down after freeing it.

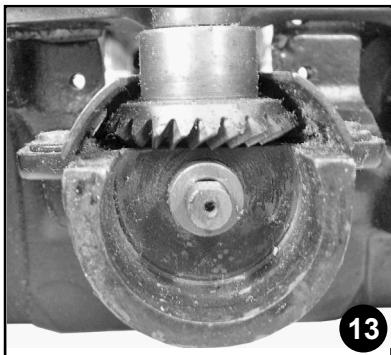
*If one of the screws is now opposite the flat on the hook ring shaft:*

- tighten any screw which is accessible. Turn the balance wheel until the other screw is available and tighten this also.

**201 CONTINUED**

- Turn the balance wheel for a full cycle, checking that the timing is accurate. Replace the cap.

If a screw is not opposite it is likely that the hook ring has been removed and not replaced correctly, so that when the hook is at the correct place, a screw is not opposite the flat on the shaft.



(13)

**(13) In this case, remove the gear wheel completely.**

Make sure the needle bar is at the correct height (i.e. with the lower timing mark opposite the pointer) and turn the hook ring until the hook is behind the needle. Now replace the gear wheel **with one of the fixing screws opposite the flat on the hook ring shaft.**

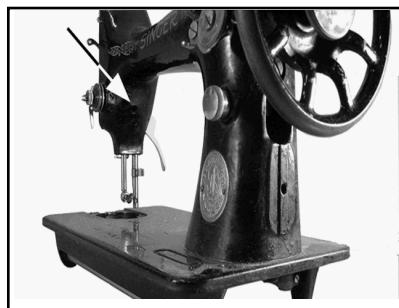
If you cannot do this exactly, it is better to use a setting slightly before the optimum position rather than after it. Tighten the screws in turn.

Turn the balance wheel for a full cycle, checking that the timing is accurate. Replace the cap.

#### **CORRECTING THE NEEDLE BAR HEIGHT**

The needle bar is held in the needle bar connector by a screw. Loosening this screw allows the needle bar to be raised or lowered slightly.

Access to the connecting screw is through a hole in the back of the head.



Turn the balance wheel until the needle height gauge is opposite the lower of the timing marks. The screw will then be immediately behind the hole in the back of the head.

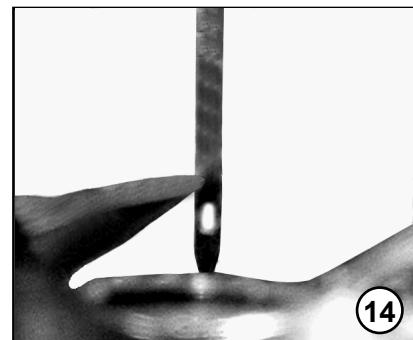


You may find it easier to loosen the screw with the machine standing on its head.

Do not remove the screw entirely - it is difficult to replace, and unscrewed too far it fouls the inside of the head and the mechanism jams.



With the screw loose, hold the balance wheel still while the lower of the timing marks is opposite the gauge.



**(14) Now wriggle the needle bar until the top of the hole in the needle is 1/16th of an inch (1.6 mm) below the hook.**

If the needle bar is difficult to move, try twisting it to break any adhesion caused by age.

When satisfied that the needle is now at the right height, tighten the connecting screw. There is a 'flat' at the back of the needle bar which ensures that when tight, the needle will face in the correct direction.

Once again, turn the balance wheel for a full cycle, checking that the timing is accurate.

#### **Finally**

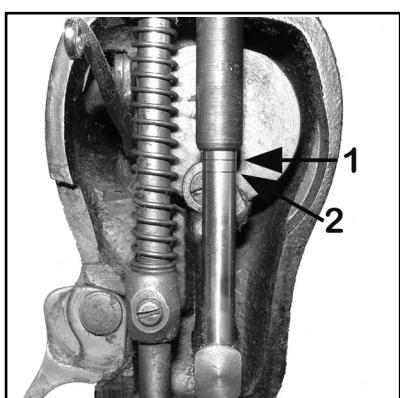
Re-assemble the machine ready for retesting.

**15K MACHINE****TIMING**

All the joints on the 15K have locking pins, presetting the timing at the factory. It would only be after severe damage to the machine that a replacement part - using grub screws - would be fitted. So far, we have never experienced this at Netley Marsh. Therefore we deal with needle height adjustment only in this manual.

**NEEDLE HEIGHT**

Very early machines did not have timing marks on the needle bar. This section deals first with machines with timing marks, then machines without.

**Machines with Timing Marks**

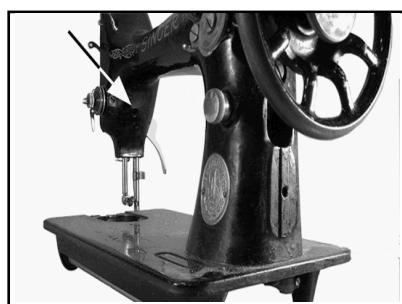
There are two timing marks at the top of the needle bar.

The needle bar has been deliberately lowered in this picture to show both marks clearly.

The top mark (1) will normally be just visible at the bottom of the bush above it when the needle is fully down. (i.e. the bottom of the bush acts as the datum point.)

When the lower mark (2) is level with the bottom of the bush on the upward direction, the needle should be directly behind the hook.

To check the needle height, turn the balance wheel until the needle is at its lowest position. The top mark should be level with the base of the bush. If it is not, adjust the needle height as explained in the following paragraphs.

**NEEDLE HEIGHT ADJUSTMENT**

As with the other models, the needle bar is held in place by a screw which is accessible through a hole in the back of the head.



You may find it easier to loosen the screw with the machine standing on its head.

Do not remove the screw entirely - it is difficult to replace, and unscrewed too far it fouls the inside of the head and the mechanism jams.

If the needle bar is stuck to the needle bar connector, twist it to release any adhesion from aged oil.

**Hold the balance wheel still with the needle bar connector at its lowest point. Slide the needle bar up or down until the top mark is level with the bottom of the bush.**

As there is no 'flat' at the back of the needle bar to align it, make sure that the needle holder is aligned correctly, at right angles to the sewing direction.

Tighten the needle bar connection screw. (You may find it easier to locate a screwdriver in the head of the screw before you adjust the needle bar height.)

Now take the machine through a complete cycle to satisfy yourself that the needle height is now OK. Re-assemble the machine.

If you still have a problem, it is just possible that the position of the bush has been moved. Use the method outlined below to check and set the needle bar height.

**Machines without Timing Marks**

As said earlier, you should have no problems with the machine timing as all the joints are factory pinned. This leaves the needle bar height as the likely cause of any problems. This is covered on the following page.

## 15K CONTINUED



(15) To check the needle height on these machines, remove the cover plates, the feed dog and the small plate covering the top of the shuttle race, (the shuttle race cap) which is held on by two small screws.

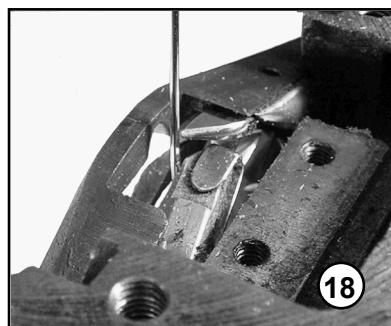


(16) You may find it easier to do this by removing the whole shuttle race from

the machine, remove the shuttle race cap and then replace the shuttle race in the machine.



(17) Turn the balance wheel until the needle is immediately behind the hook.



(18) The best view of the hook/needle relationship is seen by looking from a position slightly behind the head.

At this point, the top of the eye of the needle should be about 1/16th of an inch (1.6 mm.) below the hook (not less).

If not, loosen the connection stud screw as covered earlier.

With the hook immediately behind the needle, slide the needle up or down until the top of the eye of the needle is about 1/16th of an inch (1.6 mm) below the hook (not less).

Now re-tighten the connecting screw and check the positioning again.

Replace all the components removed and retest.

If you have been correcting a machine with timing marks and an incorrect bush position:



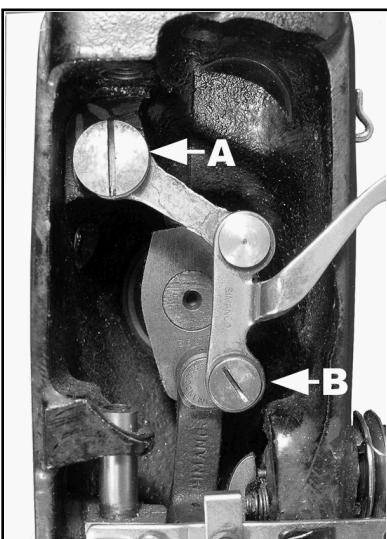
(19) Reset the bush position to accord with the needle bar timing marks i.e. the top mark should be level with the bottom of the bush when the needle bar is fully down.

**REPLACE TAKE UP ARM**

Very rarely, the take up arm on the 66/99 and 201 machines can be damaged. If these machines fall on their fronts, the take up arm can be snapped off. This can easily happen during refurbishment as well.

The 15K tends to be immune from this due to the position of the arm. In any case this can be replaced easily.

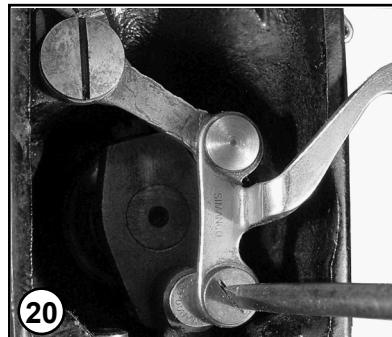
Netley Marsh does keep a small stock of these arms for all models, should you need to replace one.

**66, 99 & 201 TAKE-UP ARMS**

**A** Take-up Arm hinge pin screw.  
**B** Connecting link cap screw

The picture above is of the 99 machine. The head plate, the presser bar control screw and the presser bar spring have been removed.

For 66 and 201 models, with an exterior presser bar spring, the presser bar must be removed entirely to gain access to the take up arm hinge pin screw. Otherwise, these models have the same mechanism.



(20) Remove the connecting link cap screw.

**Note:** Because of the direction of rotation of the link, this screw has a 'left hand' thread. Use the screwdriver as if you are tightening the screw.



(21) Now remove the take up arm hinge pin screw. (Normal thread)



(22) The take up arm can now be lifted off and a replacement fitted.

With the 99, there should be no further adjustment necessary once the presser bar spring and pressure screw have been replaced.

The 66 and 201 require the height of the presser bar bracket to be reset, and a check made that the presser foot does not foul the needle hole in the cover plate. See page [2] G - 3.