

Singer 700 Series Repair Guide

Section 1



Golden Touch & Sew Model 750



Touch & Sew Model 756

Introduction:

[Return to Table of Contents](#)

This manual is designed to assist in the repairing of the Singer 700 Series machine. It is applicable to the following machine models: 750, 758, 756, 770, 778, 755, 771 and 775.

Others models that are similar in respect to the tension, hook timing and top end adjustments are: 776, 774, 724, 714, 717, 719. These models differ in the bobbin case style used and adjustment procedures.

The overall objective of this manual is to familiarize your self with your machine, show you how maintain, repair, adjust and install simple to complicated parts. It'll provide pictures, and with what I feel are rather simple to follow instructions. I'll be pointing out the parts, their names, functions and locations. Some special tools may be required to help you complete the job efficiently, and if you intend to repair the machine yourself, I highly suggest investing in some of these tools. As with all repair manuals, or guides, it is assumed that you have some basic mechanical skills, and practice safety when using any sort of hand tool.

The first section will cover the basic parts of the machine, and the most commonly used terminology, or names of the parts. The second section of the will cover basic service, and things to look for while you have the machine open. Next we'll get into simple parts replacement and adjustments, and finally we'll get into the major overhaul of the machine, along with major parts replacement. Anytime you take an item apart, it is highly recommended to lay the parts out in the order of disassembly, so give yourself plenty of working room. If you use the kitchen table, countertop or workbench, always place an old piece of carpet, or towel on the work surface first. This will avoid making a mess of the surface, and help provide protection to the paint job on the machine. Most hardware stores have carpet runners, or something similar to a front door place mat that is rubber backed. This also helps and will keep it from sliding around on you while you're working on the machine. And while I'm at it, let give you one basic piece of advice on how to handle a screwdriver. You don't just put a screwdriver onto a screw and assume it will loosen the first time you apply pressure. Sometimes it is necessary to give it the old snap routine. If you don't understand the snap routine, allow me to explain as best as possible. When you're going to loosen a screw, or even a bolt on a car, and you find it is rather tight, don't sit there and brut force it. On a car, we'd normally find a leverage tool, or otherwise call a breaker bar to attach to our tool being used. Well we don't normally do this on a sewing machine. Rather, we place the proper screwdriver into the slot of the screw, and start to give it some short and simple quick snapping twists, while not attempting to make a full break loose unscrew the screw turn. Put the screwdriver in the slot of the screw, apply enough pressure to get a good grip and firm lock, and give is a little snapping turn. A snapping turn is best described as perhaps attempting to turn the screwdriver only about a quarter or less of a turn. Just a short burst of power, rather than grunting down on it with all your might. For those that understand, it's like using an impact wrench, it provides a small burst of power just enough to crack the bolt, or screw in our case, loose. I certainly hope you get this, as you'll find it necessary in repairing your machine, and to avoid breaking screws off, or rounding them out and rending them useless. Another word of caution, as you go through this manual you may think that using a thread locking compound might be a good idea, well **DON'T**. If you have to do it again sometime, as is the case for any basic servicing, you'll have to loosen those screws again, and locking them with a compound will make that job just that much tougher.

Table of Contents:

Singer 700 Series Repair Guide 0

Introduction:..... 1

Table of Contents:..... 2

Basic Parts and Locations: 3

 Basic Parts and Locations (*continued*): 4

Basic Parts Descriptions: 4

Basic and Special Tools Required: 5

Basic Service: 6

 Basic Service (*continued*)..... 7

 Basic Service (*continued*)..... 9

Areas of Inspection for Worn or Broken Parts:..... 9

 Areas of Inspection for Worn or Broken Parts (*continued*):..... 9

 Areas of Inspection for Worn or Broken Parts (*continued*):..... 10

Minor Parts Replacement:..... 11

 Retaining Collar Replacement:..... 11

 Retaining Collar Replacement (*continued*): 12

 Feed Dog Replacement: 12

 Feed Dog Replacement (*continued*):..... 13

 Feed Dog Replacement (*continued*):..... 14

 Feed Dog Replacement (*continued*):..... 14

 Feed Dog Replacement (*continued*):..... 15

 Feed Dog Replacement (*continued*):..... 16

 Position Bracket and Position Finger Adjustment:..... 17

 Position Bracket and Position Finger Adjustment (*continued*): 18

 Position Bracket and Position Finger Adjustment (*continued*): 19

 Thread Pull Off Finger: 20

 Lower Thread Guide: 21

 Presser Bar and Lifter Inspection: 23

 Cam Retention Spring: 23

 Motor Gear and Clutch Spring: 25

 Motor Gear and Clutch Spring (*continued*):..... 26

 Light Bulb Replacement:..... 28

 Slide Plate and Slide Plate Spring: 29

Adjustments – Minor to Major: 30

 Timing the Hook to the Needle: 30

 Timing the Hook to the Needle (*continued*):..... 31

 Feed Dog Timing: 31

 Center Needle Position and Bushing Adjustments:..... 32

 Center Needle Position and Bushing Adjustments (*continued*): 33

 Center Needle Position and Bushing Adjustments (*continued*): 34

 Buttonhole adjustment:..... 35

 Buttonhole adjustment (*continued*): 36

 Adjusting the Flexi Stitch:..... 37

 Top tension repair and adjustment: 38

 Top tension repair and adjustment (*continued*): 39

 Top tension repair and adjustment (*continued*): 40

 High Speed Basting Stitch Adjustment: 41

 High Speed Basting Adjustment (*continued*): 41

 High Speed Basting Adjustment (*continued*): 42

Major Parts Replacement: 43

 Main Shaft Fiber Washer Replacement:..... 43

 Main Shaft Fiber Washer Replacement (*continued*): 44

 Drive Belt Replacement: 45

 Drive Belt Replacement (*continued*):..... 46

 Drive Belt Replacement (*continued*):..... 47

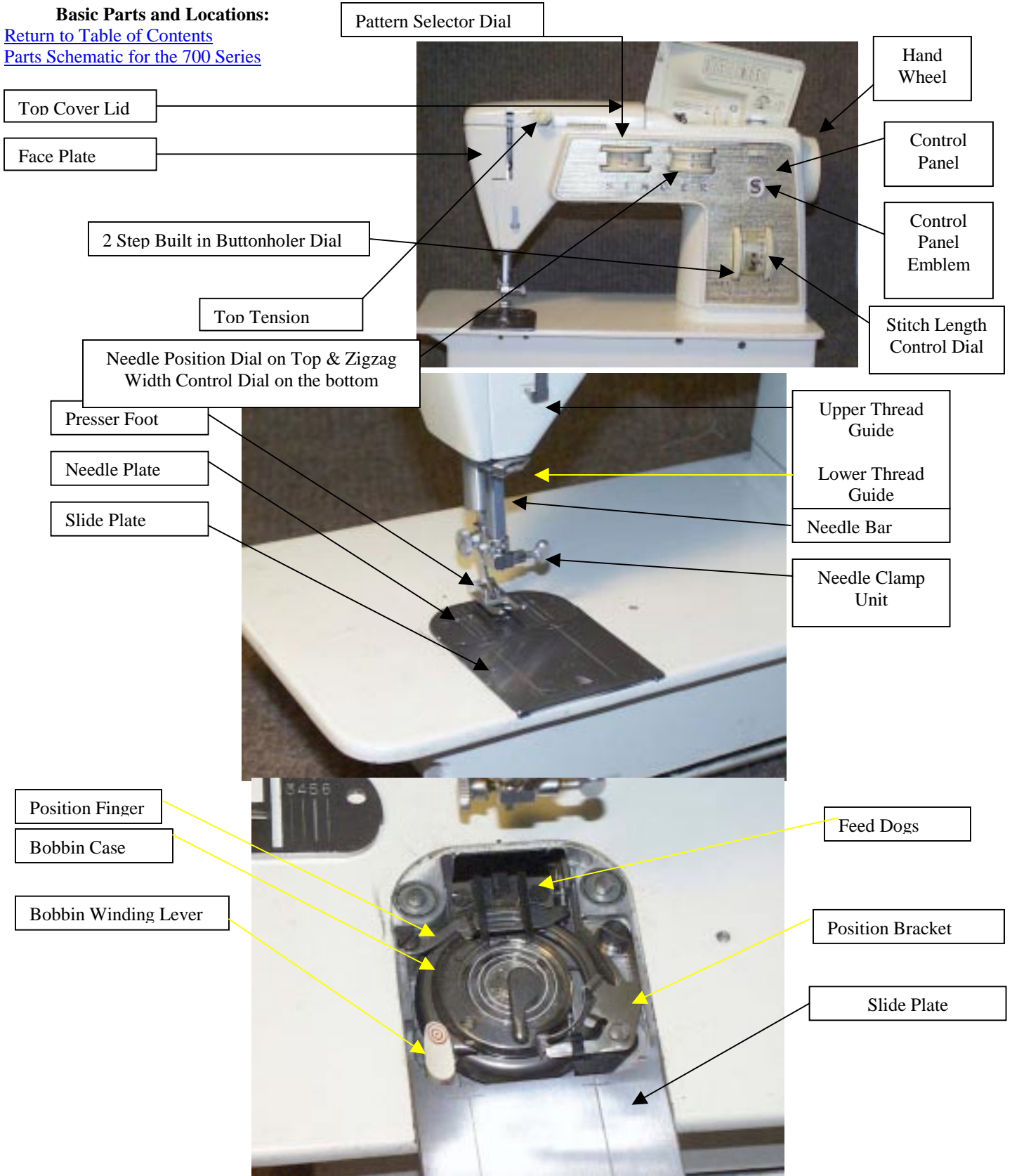
 Repairing a damaged lower timing cog:..... 48

Notes: 49

[Link to Section 2, Timing Belt Redo](#)

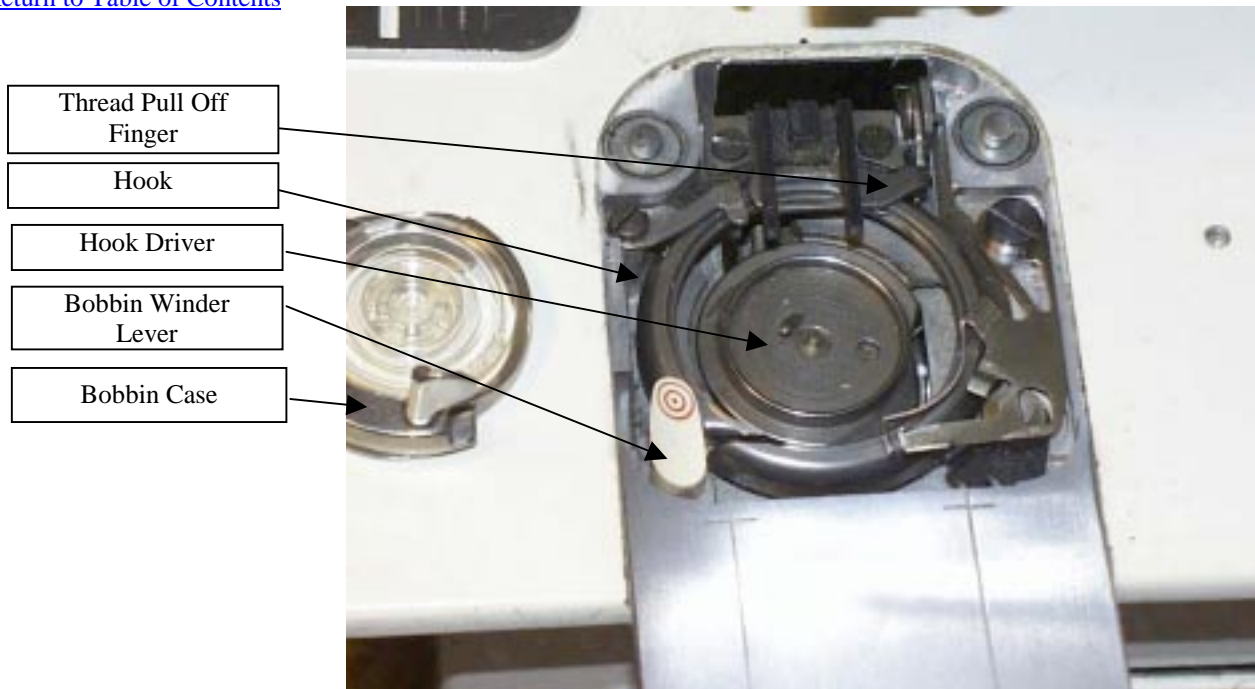
Basic Parts and Locations:

[Return to Table of Contents](#)
[Parts Schematic for the 700 Series](#)



Basic Parts and Locations (*continued*):

[Return to Table of Contents](#)



Basic Parts Descriptions:

- Top Lid – Holds the thread, and house's the top tension unit. For the 750, 758 types', has indicator plate showing settings for cams, and different patterns available.
- Face Plate – Side cover plate, or door.
- Top Tension Unit – Regulates the stitch appearance. If the knots are on the bottom of the fabric, increase the thread tension number. If the knots are on the top of the fabric, decrease the thread tension number. It's a good idea to change the number setting by one, and test the results.
- Control Panel – Generally has indicator lines showing dial alignments, and covers inside workings of the machine. Also used to identify the model of your machine.
- Control Panel Emblem – Hides the Control Panel fastening screw. The part is just pressed on, and can be easily removed by inserting a very small screwdriver behind the lower portion of the Emblem, and gently lifting outwards.
- Presser Foot – Holds the fabric down while sewing. Presser feet vary, depending on their intended usage.
- Needle Plate – Generally has seam guidelines, and like the presser foot, it comes in different designs for different purposes.
- Slide Plate – Covers the Bobbin Case area, and is held down with a flat spring. Don't ever lift this unit up to high, as you'll bend or brake the flat spring.
- Needle Bar – At the end of the Needle Bar is the needle clamp unit, which of course holds the needle. Most Touch & Sew Needle Bars have to lines inscribed on them. These are used for setting the overall needle depth.
- Position Finger – This plays a part in positioning the bobbin case correctly in the hook area. It also is held on with a left hand thread. Don't ever force it loose. Breaking this part will cause you major grief.
- Bobbin Case – Holds the bobbin
- Bobbin Winding Lever – When activated, it engages the hook driver and starts the bobbin winding process.
- Feed Dogs – Feeds the fabric through the machine sewing area
- Position Bracket – Like the position finger, it is used to adjust the position of the bobbin case in the hook area.
- Thread Pull Off Finger – Basically, keeps the thread from tangling around the feed dogs while sewing. This part is very important, and has to be in proper working order. It is fastened to the machine in the bottom pan area. Generally you do not need to remove it.
- Hook – Picks up the top thread and takes it around the bobbin thread. If this part is out of time in relation to the needle, the machine will frequently drop stitches, or otherwise known as skipping stitches. Also if the point is damaged, it'll case the machine to break or fray the top thread while sewing. Depending on the damage, it may require replacement.
- Hook Driver – This part is what winds the bobbin. Any damage to this part, and it's a pretty safe bet you'll have bobbin winding problems.
- Bobbin Winding Lever – When activated, it raises the hook driver and begins the bobbin winding function.

Pretty simple stuff, but all the parts must work together, and knowing the correct name will help you describe to your favorite mechanic what you may think is wrong.

Basic and Special Tools Required:

- Flat blade screwdrivers, medium and small blades. The longer the blade, the better. *
- Tension screwdriver, or a jewelers screwdriver set, all flat bladed *
- Allen wrenches – most commonly used: 1/16, 5/64 and 3/32. But do yourself a favor and buy a kit that contains at least a set with sizes from .050 to 1/4 inch. If you can find one's with handles like a screwdriver, it'll be even easier to work with.
- Moto tool, commonly called a Dremel. Or even a common household drill will work with the Moto Tool attachments.
 - Cutting Wheel
 - Polishing Wheel
 - Metal Cutting attachment (for a better lack of terms)
- Small needle nose pliers (see red handled item)
- Small round ended pliers (see black handled item)
- 1/4 inch diamond armature dressing stone. Available at most vacuum repair shops
- Machine oil – try to avoid products like WD40 or 3&1. These are great products, but will gum a sewing machine up to a point that they will not run. I recommend using only oil specifically for Sewing Machines. Generally can be purchased from you local Sewing Machine Dealer. One's in the tube, as shown below, work very nicely as they have an extendable spot for reaching those hard to get to places. *
- Very fine piece of sand paper, about 800 or higher grit will do
- Can of compressed air, like they use on computers, or a vacuum cleaner that has a exhaust hook up to blow with *
- Can of Teflon, or Silicone spray lubricant *
- Small ignition wrenches work very nicely for some repairs. Sizes 1/4, 5/16 and 3/8 work fine. The flatter the better.
- Hemostats, or other type of locking pliers.
- Depth gauge
- Feeler gauges
- Screw Launcher with magnetic end
- Tape measure, or Steel ruler about 6 inches in length will do, or a seam guide with measurements on it.
- Old worn out tooth brush, or lint brush
- Some sort of cleaner, like 409, Fantastic or Simple Green. My favorite is an Orange based cleaner, which there are many types on the market. It leaves with a nice sent
- Some sort of parts dip, or carburetor cleaner will work fine. Be careful though, these products are flammable, but will remove those tough oil stained parts, and help free up gummied up parts.
- Cleaning rags, Terry cloth works pretty good, but ensure it is fairly lint free. Basically you want a soft type of rag.
- Pliers, or Channel Locks

[Return to Table of Contents](#)

* Required for basic service

Uncommon Tools that may be required

- 3/32 Tap (not shown)
- Brass Rod
- Tiny Ball and Ping hammer
- Volt Ohm Meter



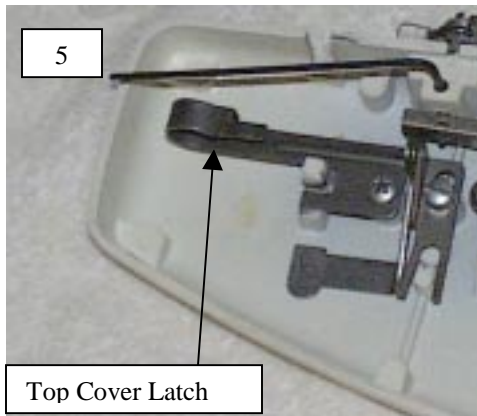
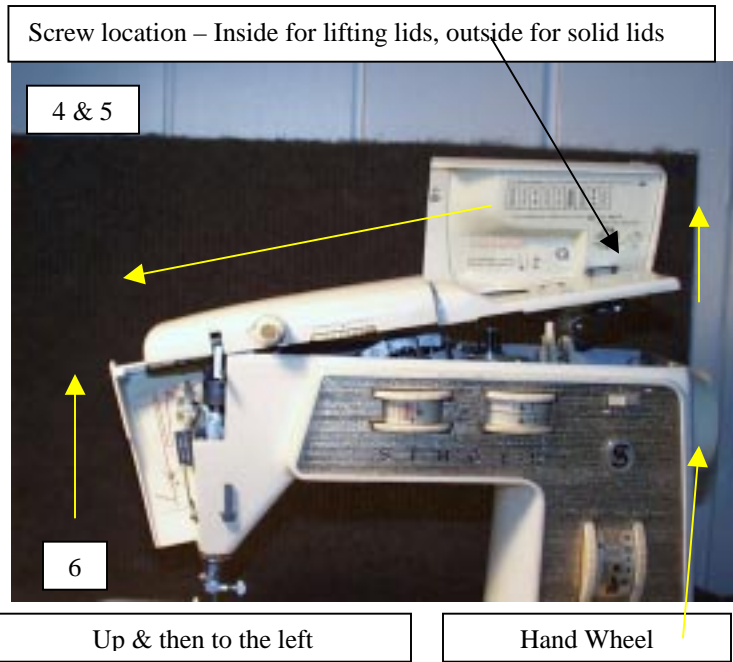
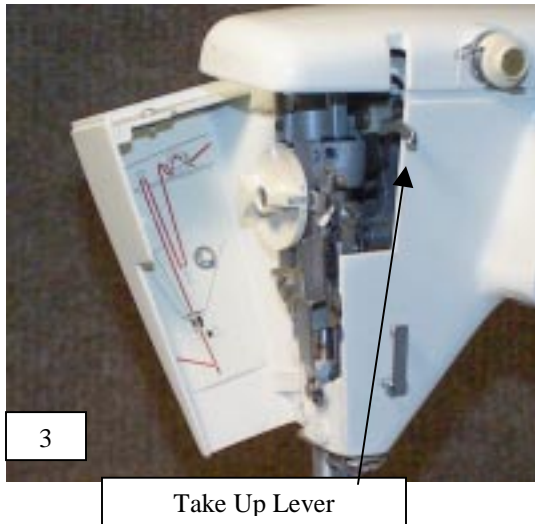
Moto Tool Attachments, which you will find very handy to have.

Basic Service:

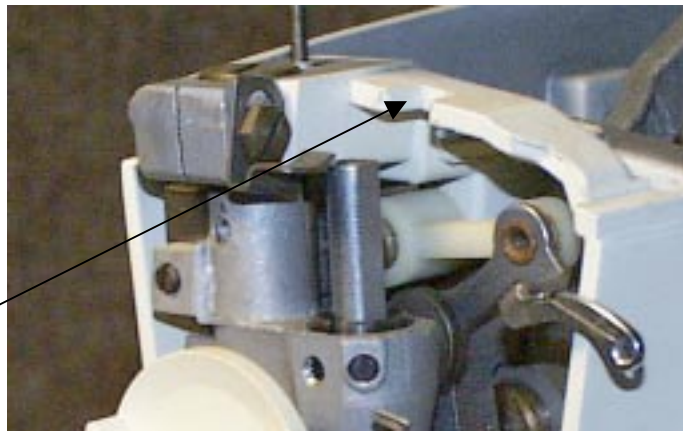
[Return to Table of Contents](#)

Lets do a basic routine maintenance, with no adjustments required. We'll be oiling, de-linting, and cleaning the machine. Depending on your usage of the machine will determine as to how often you should perform this simple task. This can range from every month, to once a year. If you don't use the machine that often, say once a month, then of course less maintenance would be required. But if the machine sets in a closed for months on end, I'd recommend doing this before you even start to sew with it. Either way, before beginning any sewing project, it's a good idea to blow the lint out, see how the machine runs without a needle or bobbin in it, and determine if it's running smoothly. Over oiling a machine will cause you just as much grief as a machine in need of oiling. If you over oil, next thing you know, you'll have oil flying all over the place, and perhaps staining the fabric your getting to work with. Not to mention the other damage it can cause to rubber and plastic parts.

1. Unplug the power cord, if you haven't all ready
2. Remove the needle from the machine and ensure the Take Up Lever is in the down position, or down far enough not to be in the way of the Top Cover
3. Open the Face Plate – see picture # 3
4. Remove the Top Cover. For those units with a hinged Top Cover, open the hinged part and remove the screw that secures the Top Cover to the machine – see picture # 4. If you ended up here from the Minor Parts Replacement, click here to return to the [Retaining Collar Section](#), or here for the [Feed Dog Section](#).
5. Lift the Top Cover gently up at the Hand Wheel end, about an inch, and push gently to the left. Notice the catch spring located underneath on the right side. This has to catch the Screw Stud on the machine when putting it back together.
6. Remove the Face Plate by lifting it straight up.



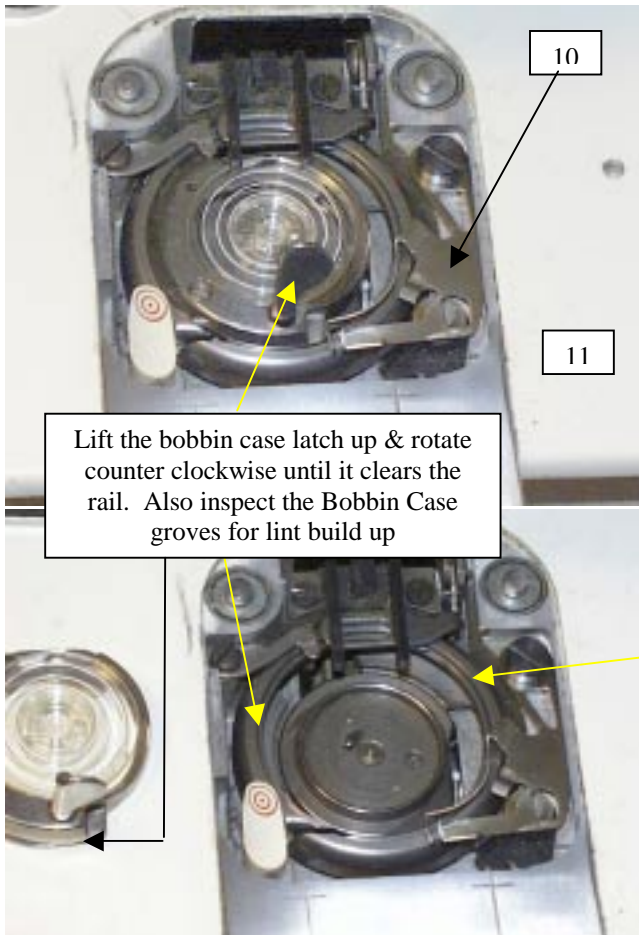
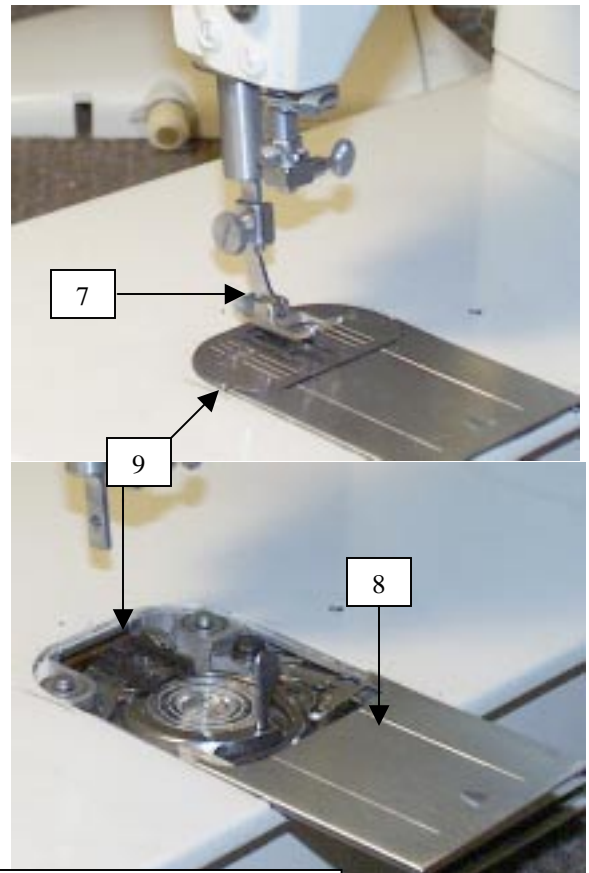
The Top Cover Latch Spring hooks under this area of the machine



Basic Service (continued)

[Return to Table of Contents](#)

7. Remove the Presser Foot Click here for [Feed Dog Section](#).
8. Open the Slide Plate, but don't attempt to remove it.
9. Remove the Needle Plate, it just lifts off.
10. Lift the Positioning Bracket up, very gently, and move to the right. Don't lift it up very high, just enough to clear the Positioning Adjustment Stud. Some units are equipped with a Position Locking Lever.
11. Lift the latch on the Bobbin Case, and rotate the Bobbin Case to the right (counter clockwise) until it will lift of the Hook Railing.

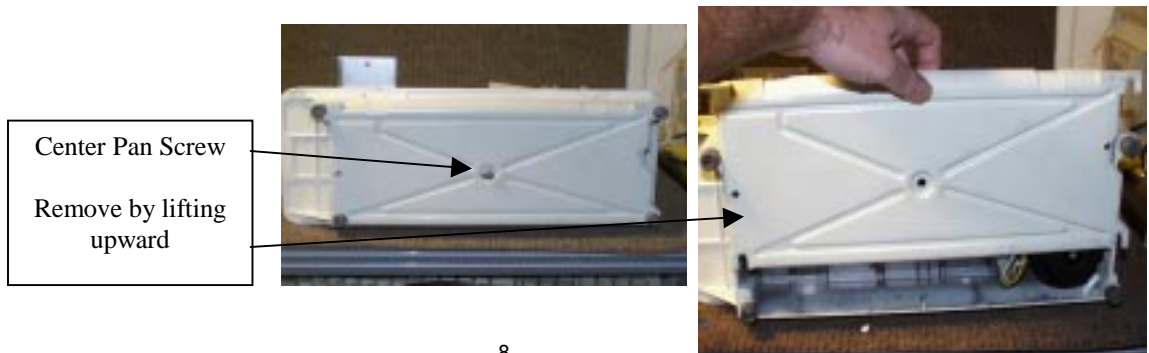


Lift the bobbin case latch up & rotate counter clockwise until it clears the rail. Also inspect the Bobbin Case grooves for lint build up

Notice the step down part on the Hook, that's what I'll call the rail. Put a little oil on your rag, and wipe if lightly on the rail. Just to give is a light trace of oil

Notice the Position Bracket. Most are black in color; this is an after market Bracket. Also note that this style bracket was not the original bracket used in the machines. This style is improved, and work much better than the original brackets that Singer used in the beginning.

12. Lay the machine on its back and remove the Bottom Bed Cover. You generally do not need to loosen the 4 rubber foot pegs, just the center Pan screw. Remove the Pan by lifting straight up. The Pan is usually slotted around the foot pegs. Return [to Feed Dog Section](#) if checking this out for referral.

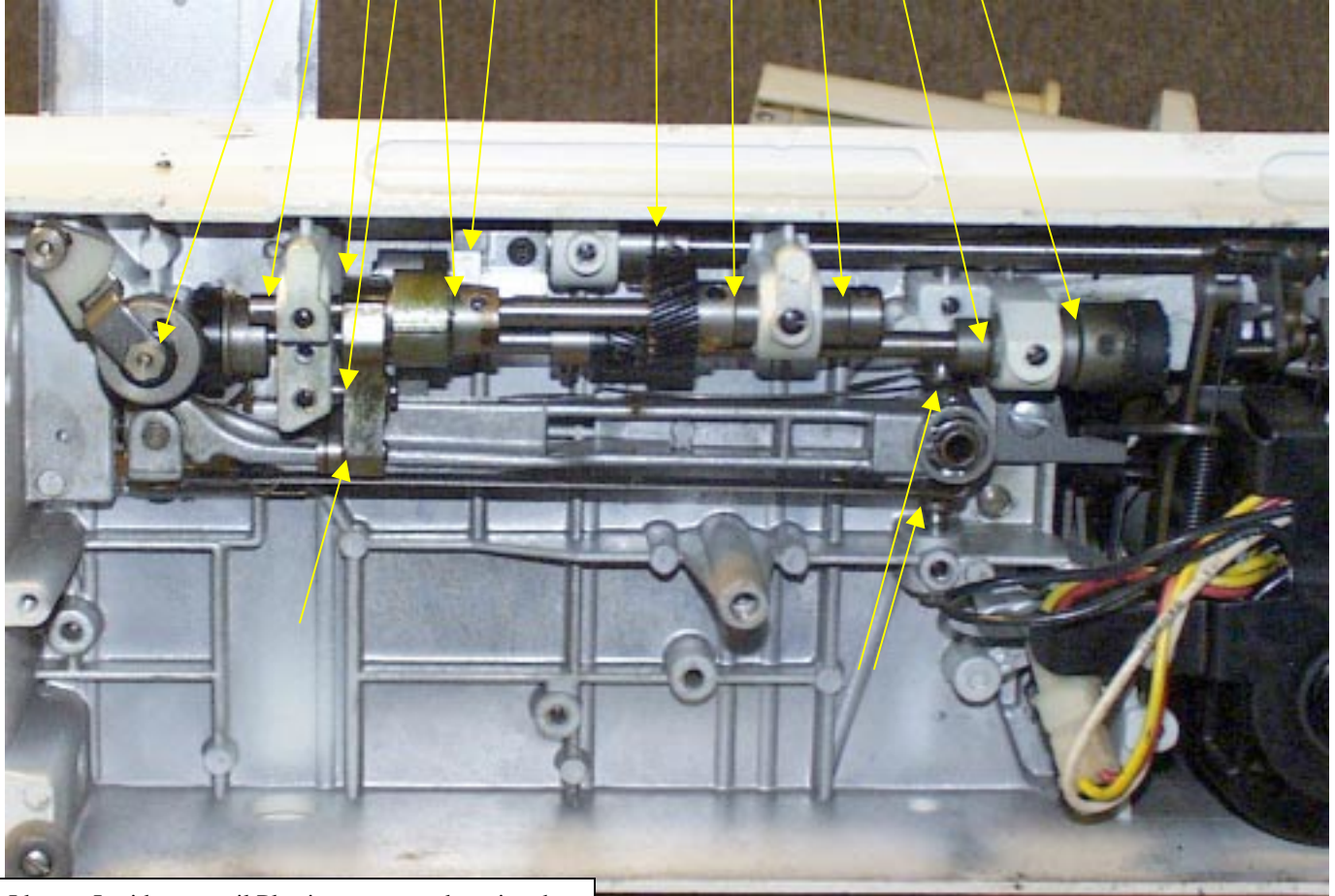


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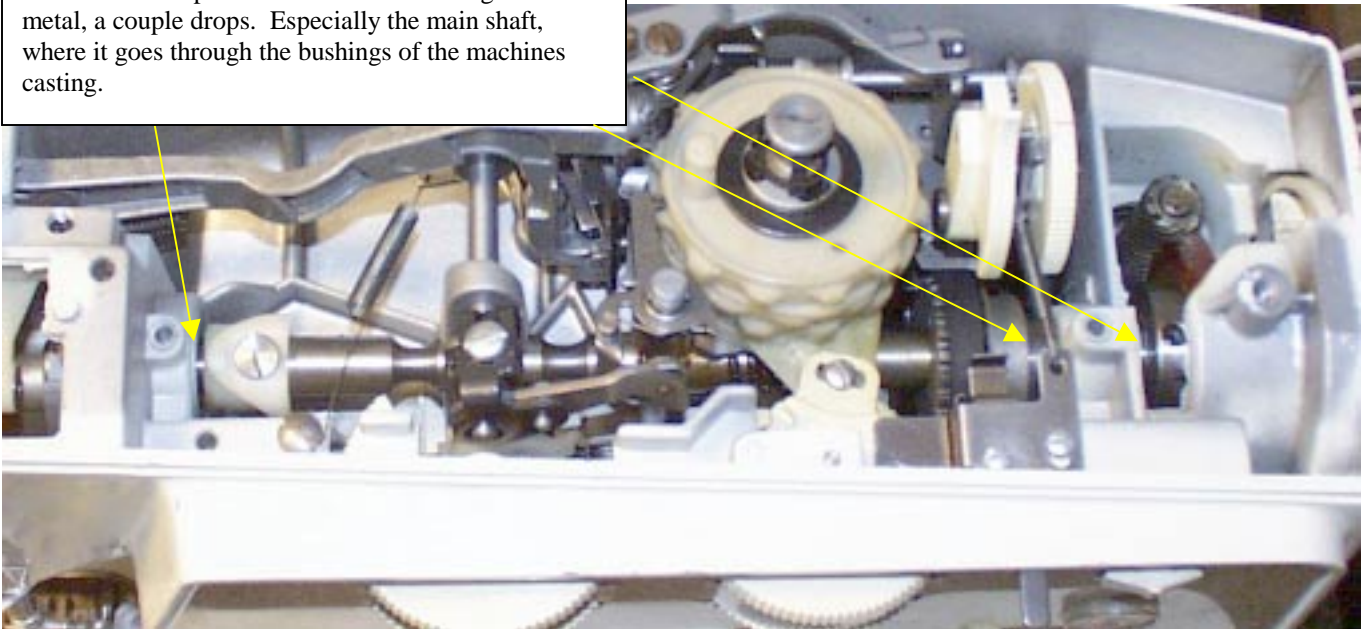
[Return to Table of Contents](#)

13. Ok, we've got the machine opened up. Blow all the lint out of the Bobbin Case area, Bottom Pan area, and Needle Bar area.
14. Give the machine one to two drops of oil wherever you see metal against metal. If it moves and it's not a plastic or rubber item, give a couple drops of oil. Again, do not oil the gears, drive belt, or motor area.

Oil Points – Just a couple drops now, don't over do it.



I know, I said not to oil Plastic parts area, but give the main shaft a drop or two here. If metal is against metal, a couple drops. Especially the main shaft, where it goes through the bushings of the machines casting.



Basic Service (continued)

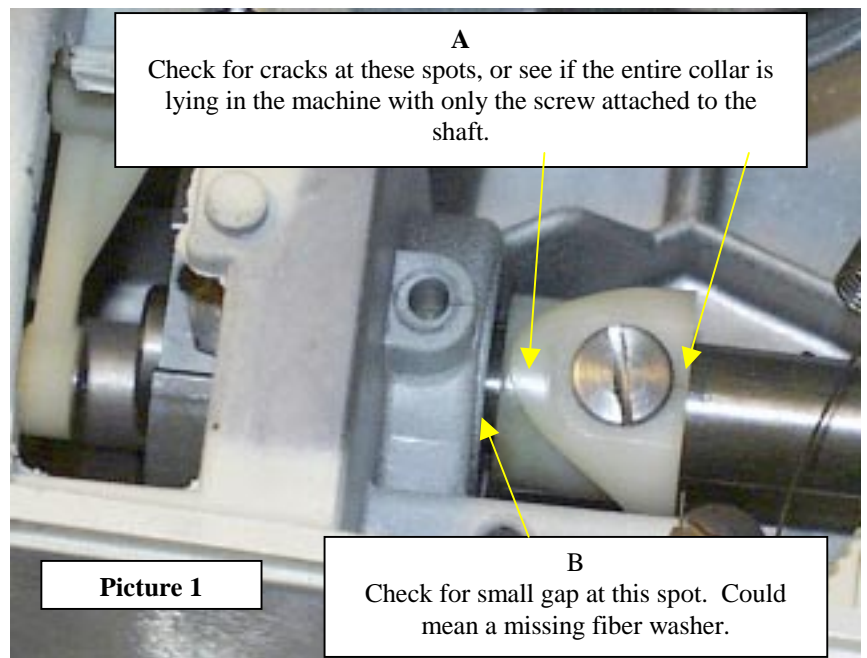
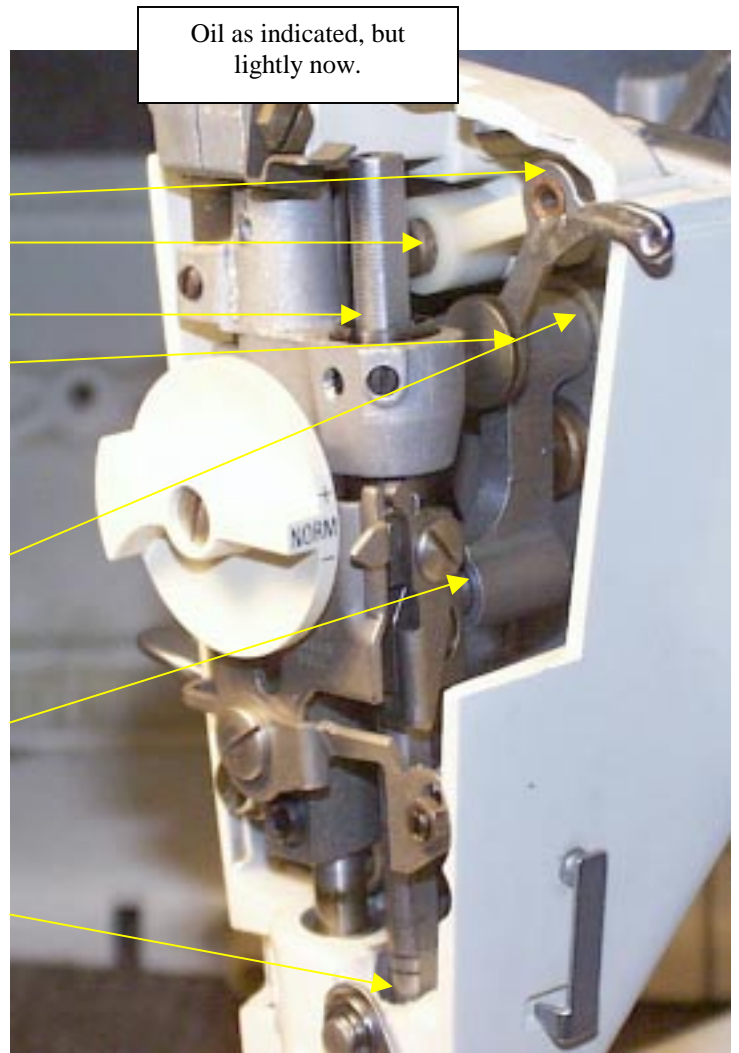
15. And just a drop in the Take Up Lever area, but don't overdo the Needle Bar. Only a drop, then turn the machine by hand a couple times and wipe off the excess. If you don't, you may have oil dripping from the needle after sewing for a while, and we certainly don't want that to happen.
16. Ok, we've oiled the machine, blown all the lint out, and cleaned it up somewhat. Again, just remember, this is only a very basic service we've done. Baring any problems with the machine itself, you can re-assemble the machine in the order you disassemble it. You did lay the parts out in order right?

Check out the next section before re-assembly, just for broken, or perhaps worn parts. If everything checks out, you're ready to put it together and get to that sewing project that you are just dying to start on.

Areas of Inspection for Worn or Broken Parts:

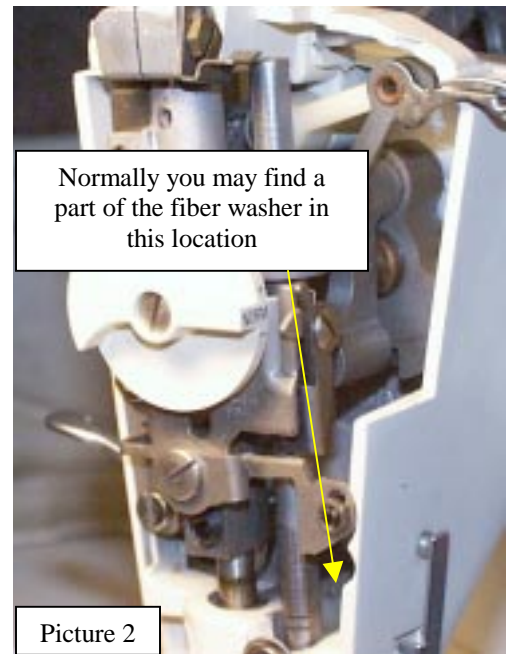
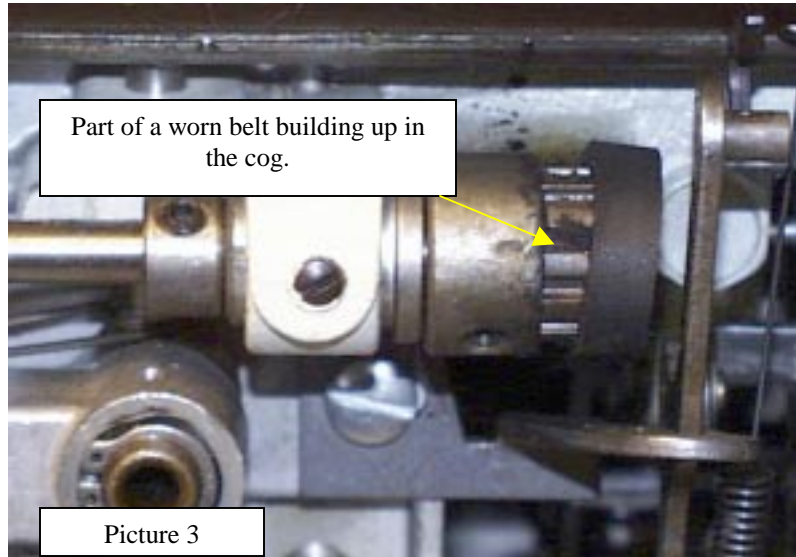
While you have the machine apart, that is if you haven't put it back together just yet, lets check for a few commonly broken, or worn parts. Some of which are simple to install, and others will require tearing the machine down quite a ways, if not to almost a bare frame.

1. Retaining Collar, quite commonly it is cracked, if not broken completely into. First indication is the main shaft, or Hand Wheel moving in and out while doing the zigzag stitch. Touch & Sew's came with several types of retaining collars. The one below being the most common used. See Picture 1, item A
2. Next check to see if there is a gap on the left side of the Retaining Collar. Reference item B in Picture 1. You may have to see if you can move the Hand Wheel in or out by hand to check for it. If there is minor movement, it could be the fiber washer that belongs behind the counterweight is broken. You may also find parts of it lying in the base of the machine by the lower end of the Needle Bar. See Picture 2 on next page.

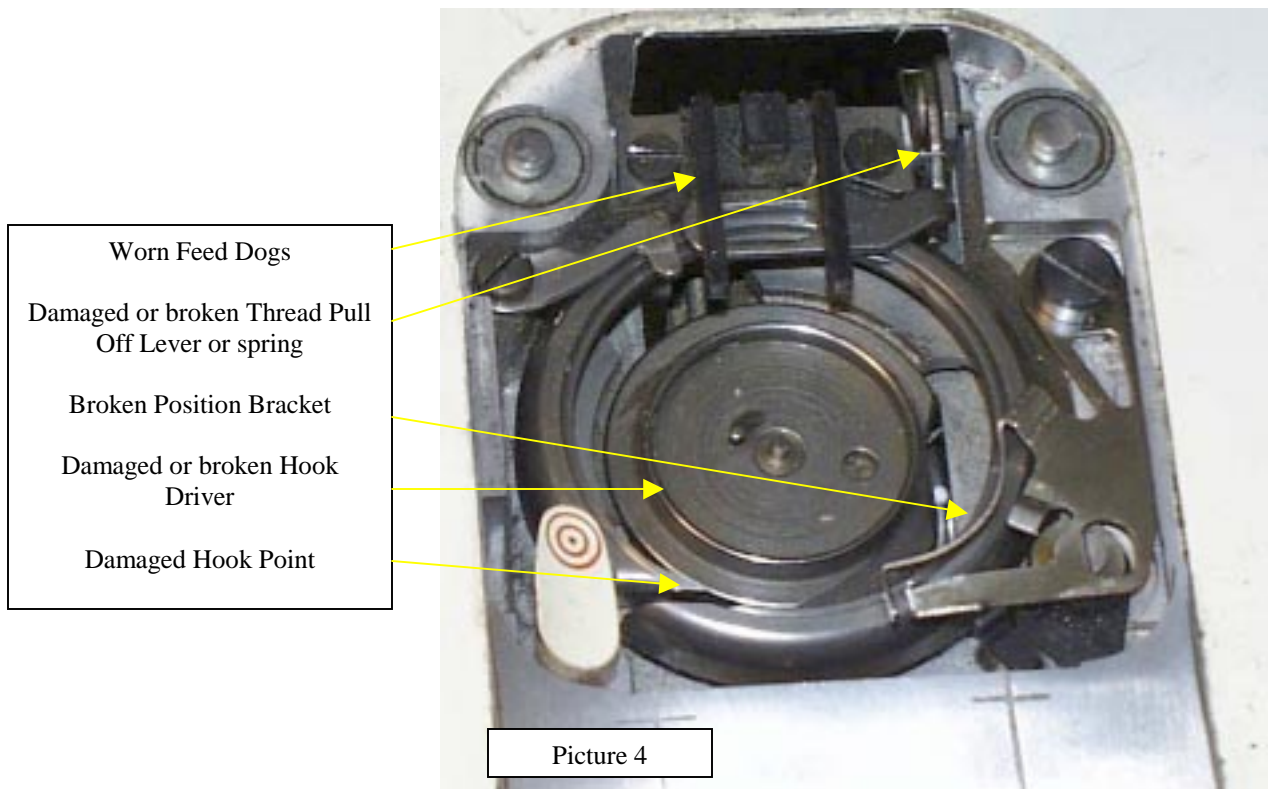


Areas of Inspection for Worn or Broken Parts (continued):

Another spot to check is the Timing Belt. A badly worn timing belt is noticeable by turning the machine by hand, and feeling a tight spot, and the machine is always skipping stitches, breaking needles, and just does not run smoothly. You can check for this with the machine on its back. See Picture 3. Gently work the belt to one side of the cog, and check for parts of the belt stuck in the cog itself. This will call for replacement, no way around it really.



3. The Hook and Bobbin Case area is subject to all kinds of problems. Worn or damaged Feed Dogs, broken Position Bracket, needle nicked Hook, broken Hook Driver or Thread Pull Off. See Picture 4. We'll get into all of this later in the book, but just be aware of these items. If you find a damaged part, see the Contents for the pages dealing with adjusting and replacing these parts.



These are just some of the very basic areas that problems exist. Taking the little extra time to check them out will save you major frustrations and expensive repair bills if treated early on. Course some these replacements may be out of your scope, and best left to an experienced mechanic.

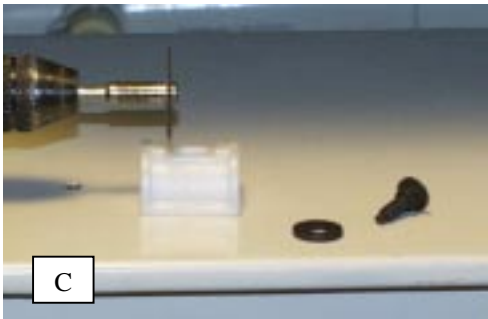
Minor Parts Replacement:

This section will deal with minor parts replacement, such as the Retaining Collar, Feed Dogs and some of the items I pointed out in the previous section. As for the Timing Belt, that is one of those items best left to a professional, but there is a section in this manual that'll tell you how to do it. Major repairs are not for the light hearted, or those that like to force parts when they don't come apart, but each section will give provide tips on how to successfully tear the machine down, a put it back together again. With that all said, lets start off with some simple items.

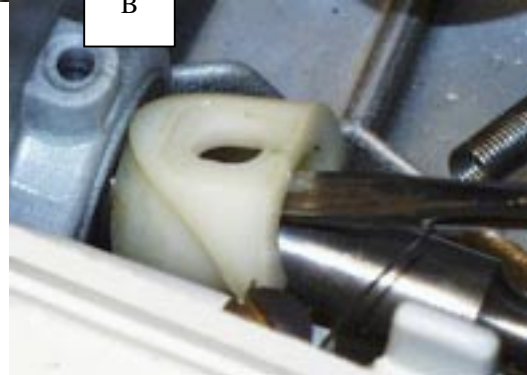
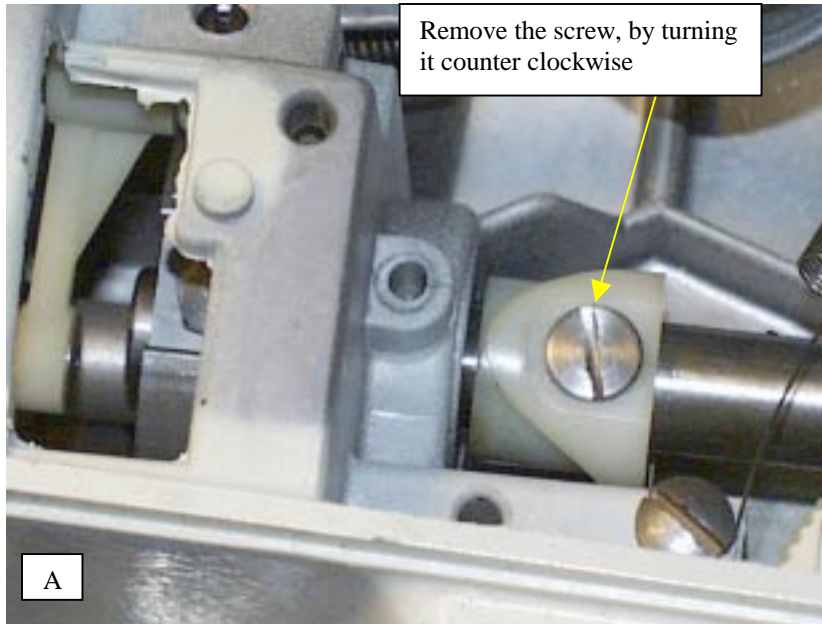
Retaining Collar Replacement:

1. As in the Basic Service section, we need the Top Cover and Face Plate removed. [Refer to steps 4 and 5 of Basic Service](#)
2. Remove the screw, and if only cracked, gently insert the small, or larger screwdriver on the left side of the Retaining Collar and gently pry it upwards from the main shaft. Pictures A & B
3. Prepare the new part for installation. Again remember there are different types of collars, the one shown has an eccentric adjust washer. You may have purchased a genuine collar, which will not have the eccentric washer. Depending on where the shop orders its parts from, I've found some after market parts may need a little retrofitting. In other words, they don't always fit right, and need some modification. In this case, my replacement Retaining Collar did not fit the washer correctly, so I had to file the opening slot sides to allow the washer to fit flat against the Retaining Collar itself. Using my Moto Tool, or a flat ignition file will work; I cut away at the flat side where the washer has to sit. Very careful now, just so the washer fits. Picture C & D.

[Back to fiber washer if coming from there.](#)



Common Part Numbers
382904 – Retaining Collar
382904S – Screw & Washer



Retaining Collar Replacement (*continued*):

4. We have our eccentric washer fitted, and ready to install. Picture D.
5. Now, as mentioned above, depending on the type of Retaining Collar you ended up with, the installation and adjustment applies to all types.
6. Snap the new Retaining Collar into place on the main shaft.
7. Pull the Hand Wheel outward as far as possible, and slide the new collar up against the frame housing.
8. Make sure that the flat spot on the shaft is facing up. Picture E.
9. Install the washer and the new screw that it came with. If it's the original type, or did not have the washer, you can use the original screw you took out. Picture F.
10. Adjust the washer just so it is snug against the left side of the collar, and tighten the screw. You may need to use your small needle nose pliers to hold it in place while tightening the screw.
11. Check for Hand Wheel movement and readjust if necessary.
12. Add a drop of oil to the new part.
13. Put the Face Plate and Top Cover back on, and you should be ready to sew. Of course assuming nothing else is wrong.
14. Now if the washer is as far as it will go, and you still have free play on the Hand Wheel, I'd suspect the Fiber Washer is broken, or missing.

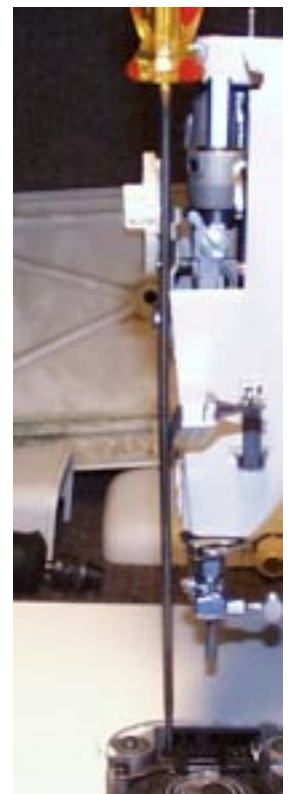
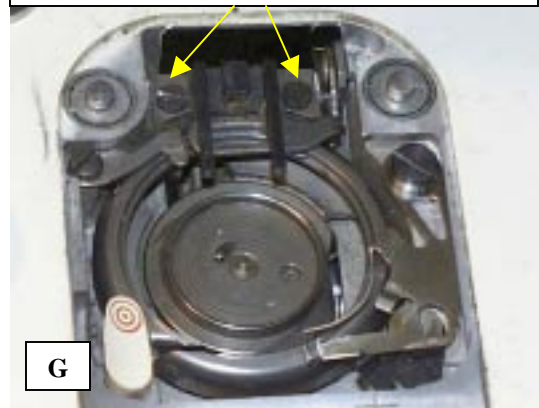


Feed Dog Replacement:

1. Like the Basic Service, we'll need the Face Plate, Top Cover and Needle Plate removed. [Click here](#) to refer to sections 4 & 5 of the Basic Service guide.
2. Also remove the Bobbin Case and Bottom Pan. Click here to refer to the [Bobbin Case](#), or here for [Lower Pan](#) removal at the bottom of the same page as the Bobbin Case. Click here to return to [Thread Pull Off Finger](#).
3. Once all the parts are removed, loosen the two screws that hold the Feed Dogs in place. Let me give you a little tip on this. Use the small long bladed screwdriver for this, the blade of the screwdriver should fit the screws securely, as we wish to avoid any slippage of the screwdriver. If you really put pressure on it, and you slip, you could damage other parts in this area, so be careful. The screws can be very tight at times. A little quick snap will normally loosen them. By a quick snap, I mean give the screwdriver just a short and quick firm snap, while not attempting to make a full turn of the screwdriver. That should crack them loose. Picture G. I think by looking at the pictures, you should get the general idea of how to approach the screws.

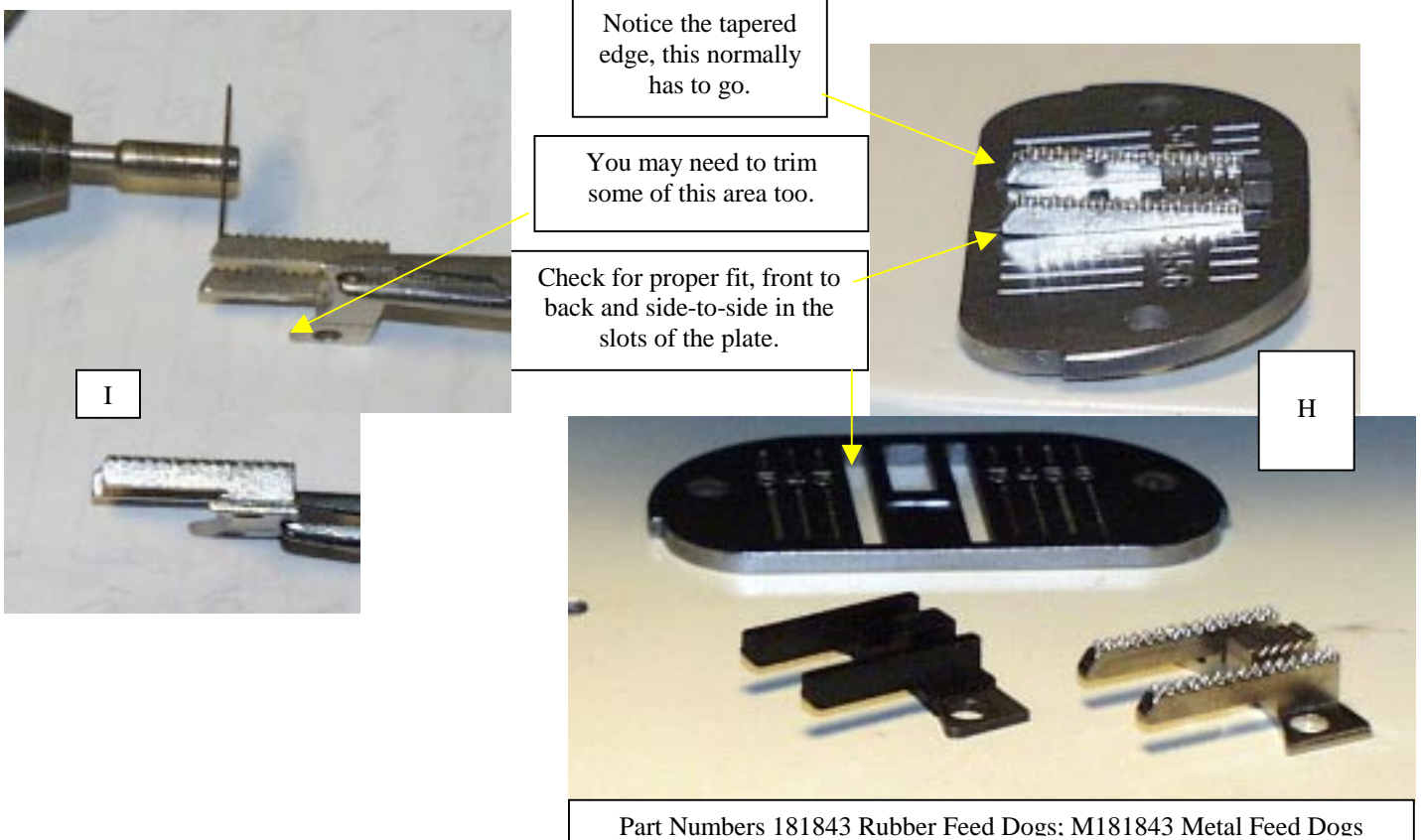


Loosen these two screws by turning counter clockwise, and then remove completely.



Feed Dog Replacement (continued):

4. Before we install the new set, be they the original rubber or metal type, lets make sure they fit the Needle Plate properly. Place the new Feed Dogs inside the plate as if they were on the machine. Check for front to back movement, as well as side-to-side movement. If they fit into the Needle Plate to snugly, you'll have problems with them moving the Needle Plate while sewing. This we do not need. Picture H.
5. If you purchased metal Feed Dogs, pay attention to the front of the Feed Dog. Notice the tapered edge? This also has been known to cause problems. In short, they are too long, and when you're sewing, they will hit the front of the Needle Plate and cause it to move up and down. Fasten them into the machine, and set the stitch length all the way to 6 stitches per inch, or the longest stitch the machine will perform. Turn the Hand Wheel a few times and observe the plate as the Feed Dogs start to rise out of the plate. If there is any plate movement at all, you'll need to trim the front of the Feed Dog off. I know this sucks, but again we are dealing with after market products, and not genuine Singer Parts. If you need to trim them off, this is where the Moto Tool really comes in handy, but see item 11 first. You may also need to trim part of the front of the mounting plate off. It may protrude to far out, and catch the Thread Pull Off Lever. And finally, if that all isn't enough, you may need to elongate the mounting holes to achieve proper alignment. We'll fine-tune it shortly. Using the cutting wheel, trim off the very front of the tapered edge, and then smooth them out with the polishing stone. And do use a pair of pliers to hold them with, as they will get hot while cutting them. Here's another tip for you, you may wish to have a small glass of water nearby to dip them in while cutting to keep them cool, as to not burn them and soften the metal due to overheating. Use easy pressure while cutting, you don't need to be aggressive, the wheel will do the work. Also please note, that if you get too aggressive with the cutting wheel, it will break on you. Again, safety comes first, so wear safety goggles to protect those eyes. Oddly enough, I've had those cutting wheel stick me in the forehead, not bad, but either way, be careful. If you don't have the Moto Tool, have the repair shop you purchased them from trim them down. If they installed any and insist it isn't a problem, I personally would question their thoroughness to detail, as I haven't really seen any aftermarket feed dogs work correctly. I have seen some shops shorten the length of the stitching to adjust for the extra length of these units though. Do yourself a favor, and measure the length of them against the old pair you took off. And if you have a bench grinder in the household, that'll work fine also. Even a drill with the Moto Tool attachments will work. Refer to picture I for cutting of the tapered edge, and finished work.
6. Once we have ensured they fit the Needle Plate properly, you can fasten them back onto the machine. However, do not tighten them up just yet. Leave them snug, but loose enough to move by hand. We need to align them properly in the plate before tightening them down. Even after tightening, they may move on you, and readjustment is necessary. So as mentioned, just keep them snug enough to not move around while lifting the plate on and off to access the two screws.



Feed Dog Replacement (continued):

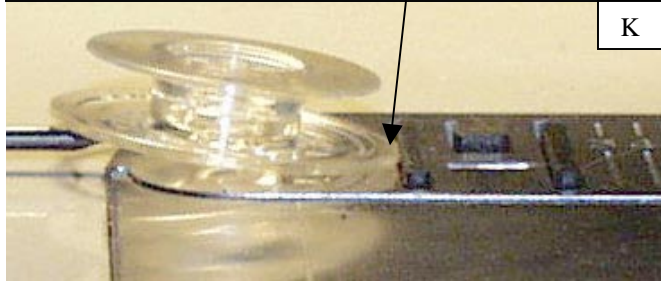
7. When we do finally fasten them down securely, don't get over aggressive. These are fragile little screws, and if you snap one off in the feed bar, your, well need I say more. You might find a feed bar in a shop that is parting one of these units out, but I wouldn't hold my breath on it. If you do break one, let me know, as I may be able to locate one for you. I scrapped out quite few machines that were beyond repair. Basically they had been dropped and the frame was bent beyond repair, or even broken. I gave, or sold, most of those parts to a buddy of mine in my old hometown, and he may still have some of that stuff lying around. Why didn't I keep it you ask? I moved to the South Pacific, and didn't wish to haul all that stuff half way around the world. See picture J.
8. Now, lets check the overall height of the new Feed Dogs. The proper height is roughly set with the thickness of the top of the bobbin. Pretty precise tool isn't it? With the bobbin tipped at an angle, compare the thickness of the top of the bobbin to the height of the Feed Dog. The Feed Dog should be the same height from end-to-end, and on both sides See picture K.
9. Setting proper height adjustment. This is a simple task. Set the machine on its Hand Wheel side. Picture L.
10. Using a 5/64 Allen wrench, loosen the setscrew in picture M, and using the long small bladed screwdriver, turn the eccentric screw until proper height is achieved, and retighten the setscrew. Just snug now, don't overdo it.



J

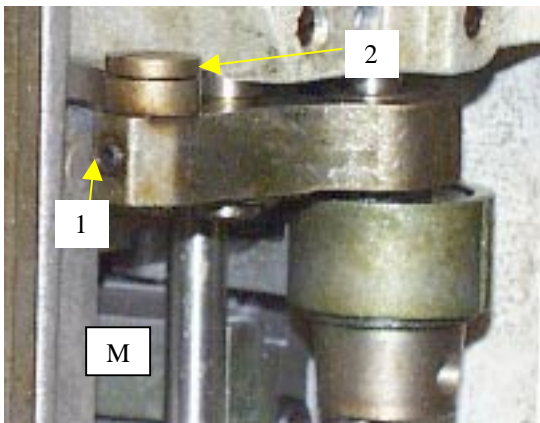
Make sure you have good alignment side-to-side, and front to back. The Feed Dogs should not come in contact with the Needle Plate at any time during their movement.

When the Feed Dog is at its highest point, they should be no higher, or lower, than the thickness of the top of the Touch & Sew bobbin. Hold the bobbin at an angle to check



K

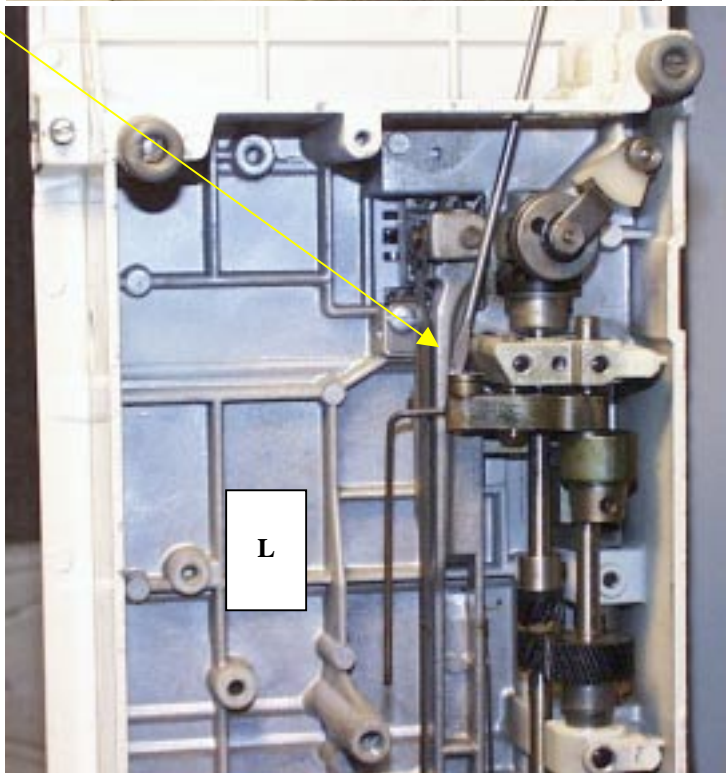
Loosen this setscrew (1) with your 5/64 Allen wrench, and adjust the height with this eccentric screw (2).



1

2

M

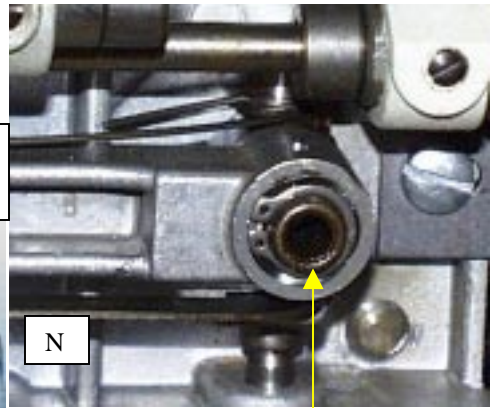


L

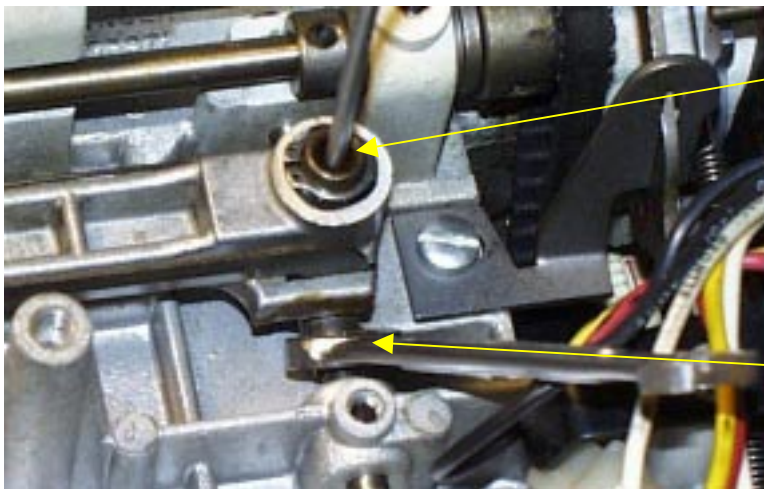
Feed Dog Replacement (continued):

11. Other “fine-tuning” adjustments are available, but seldom required, unless you acquired a really out of shape after market metal feed dog, and I’d suggest returning them, before you cut them up. Try them out first to see just how bad the alignment may be to achieve.
12. Fine-tuning side-to-side adjustments, again seldom ever required, but I have seen case’s that it was necessary. Place the machine on its back, and loosen the setscrew as indicated in picture N. Using a 5/16 ignition wrench, adjust the pivot to achieve center alignment of the Feed Dogs in the Needle Plate.

Side-to-side adjustment. Ensure feeds are in the middle of the Needle Plate slots.



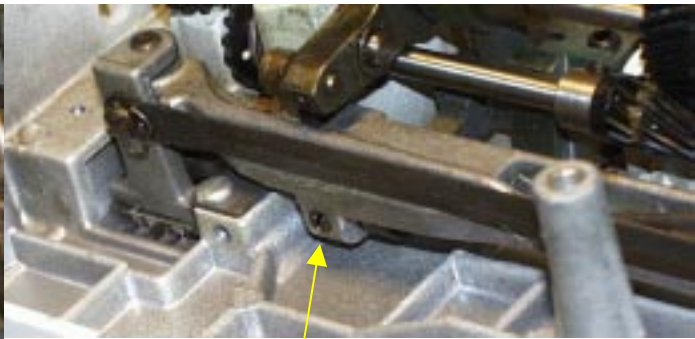
The locking screw for this adjustment is located inside this hole. Using the small flat bladed screwdriver, reach inside and just loosen the screw. It may be tight, so use that old snap action to loosen it.



Side-to-side adjustment. Loosen the setscrew, and with the 5/16 wrench, adjust the pivot until the Feed Dogs are aligned in the center of the Needle Plate.

13. Front to Back Feed Dog position in relation to the Needle Plate is adjusted at this location. Again, this is very seldom required, but we’ll cover it anyway. Turn the Hand Wheel just until the Feed Dogs start to drop. At this point turn the eccentric until the Feed Dogs are at the most backward movement position. Give it a couple of spins and watch the Feed Dog movement to locate the most rear movement position. I have had to do it when performing a complete teardown. When I say complete, I mean take every single moving part apart. These cases’ are normally when the machine is gumming up, and most of the parts are bound up due to improper oil type usage. Believe it or not, I’ve seen them oiled with Crisco, and you talk about a mess. The entire machine has to be torn down, part-by-part, piece-by-piece.

Make your forward to back adjustment with this eccentric screw. It’s buried inside the feed bar.



Loosen this setscrew, again you may have to apply the old snap method to it.

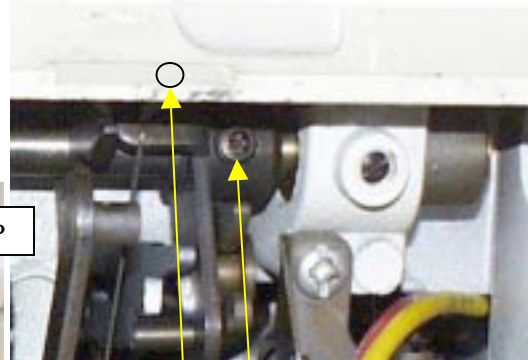
Feed Dog Replacement (continued):

14. Finally, adjusting for that perfect 6 stitches to an inch, or ensuring our stitch length control is providing the actual number of stitches the dial says it is. First lets check to see just how far off we might be. Put the Needle Plate, and Presser Foot on. Insert a size 14 or 16 needle, and place a piece of paper under the presser foot. Set the Presser Foot down as if you're going to sew, and set the Stitch Length Control Dial to 6. Turn the Hand Wheel towards you, and make 7 perforations in the paper. No more, no less. Using an accurate measuring tape, see if the first penetration and the last penetration are exactly one inch in length. If the two end penetrations line up with the one-inch settings, you have exactly 6 stitches to an inch, and no adjustment is required. Refer to picture O.
15. To adjusting the length setting, if the machine is producing more or less than 6 stitches to an inch. Refer to picture P for adjustment locations. Loosen the two setscrews as indicated in picture P, and adjust the length shaft until you achieve 6 stitches to an inch. Move the shaft only slightly for each try, and snug down one screw, the setting is rather sensitive. Move the shaft about a 1/16 of a turn, or less, for each attempt. This adjust can be very frustrating for a novice.

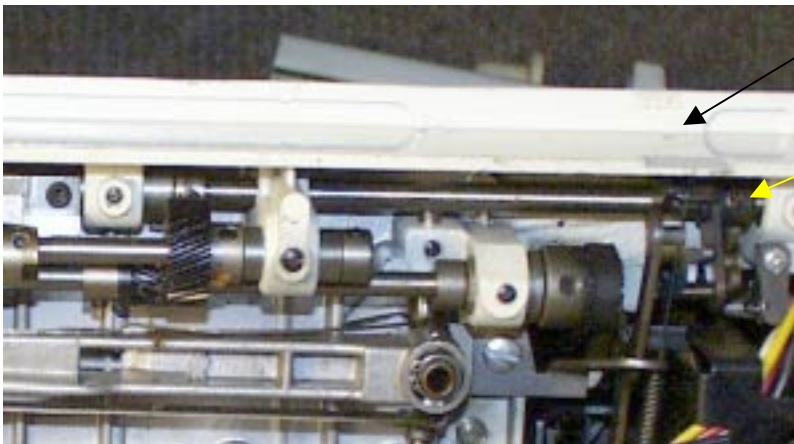


For changing a simple set of Feed Dogs, you'd think that would be easy.

And overall it is really. Like I've said, the last few adjustments are seldom necessary. But if they are, hang on.



Adjustment shaft area, and adjustment entrance

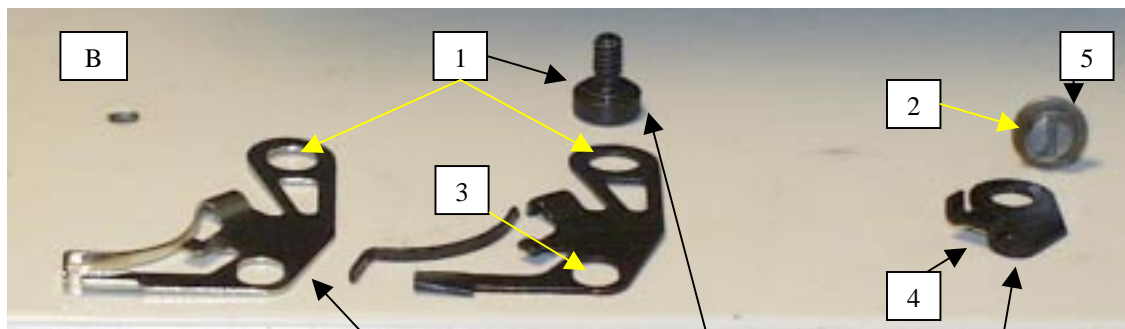
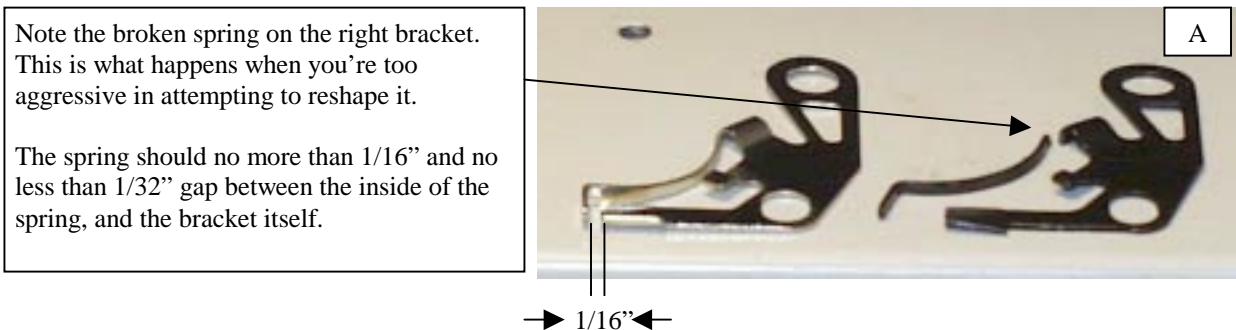


Locking setscrew positions, and adjustment control. Two left lines Black and Yellow indicate setscrew positions, one accessible through the bottom of the machine, the other through the base casting. There is a slot in the shaft, which can be reached from a hole in the side of the machine

Position Bracket and Position Finger Adjustment:

Click [here](#) to return to index.

1. The Position Bracket is a common area for troubles. Many times I've seen the spring broken off, and this allows the Bobbin Case to come off the Hook Railing. It'll cause thread jamming, tangling and all other kinds of problems. If not taken care of promptly, and you continue to use the machine in this condition, you run the risk of damaging the Hook, Hook Driver and Bobbin Case. And that gets costly.
2. A good Position Bracket, along with a broken one is shown in picture A. Check the spring to ensure it is intact, and has the proper clearance between the spring and the bracket itself. You can get away with attempting to reshape the spring, but be extremely careful. Being too aggressive with it, and you'll break it right off. I know, I've done it plenty of times. Also notice that one is silver, and one is black. Normally the black one is either a good aftermarket, or genuine Singer replacement bracket. The original Singer bracket had an entirely different shape. If your bracket doesn't appear to be this shape, good chances are that your machine is still equipped with the original bracket. If it's in good shape, don't worry about it too much, but if it's damaged, I'd replace with the newer style. The silver one I just received, and it needed work to even fit into the machine properly. Must be good old aftermarket stuff again. The screw mounting hole was too small for the original screw, and the adjuster hole didn't fit around the eccentric adjusting stud. Reference picture B.
3. The Position Finger is also an important part of the Bobbin Case retaining system. It hardly ever needs any adjustment, unless of course someone has fooled with it, or it was necessary to remove it in order to remove the Hook.

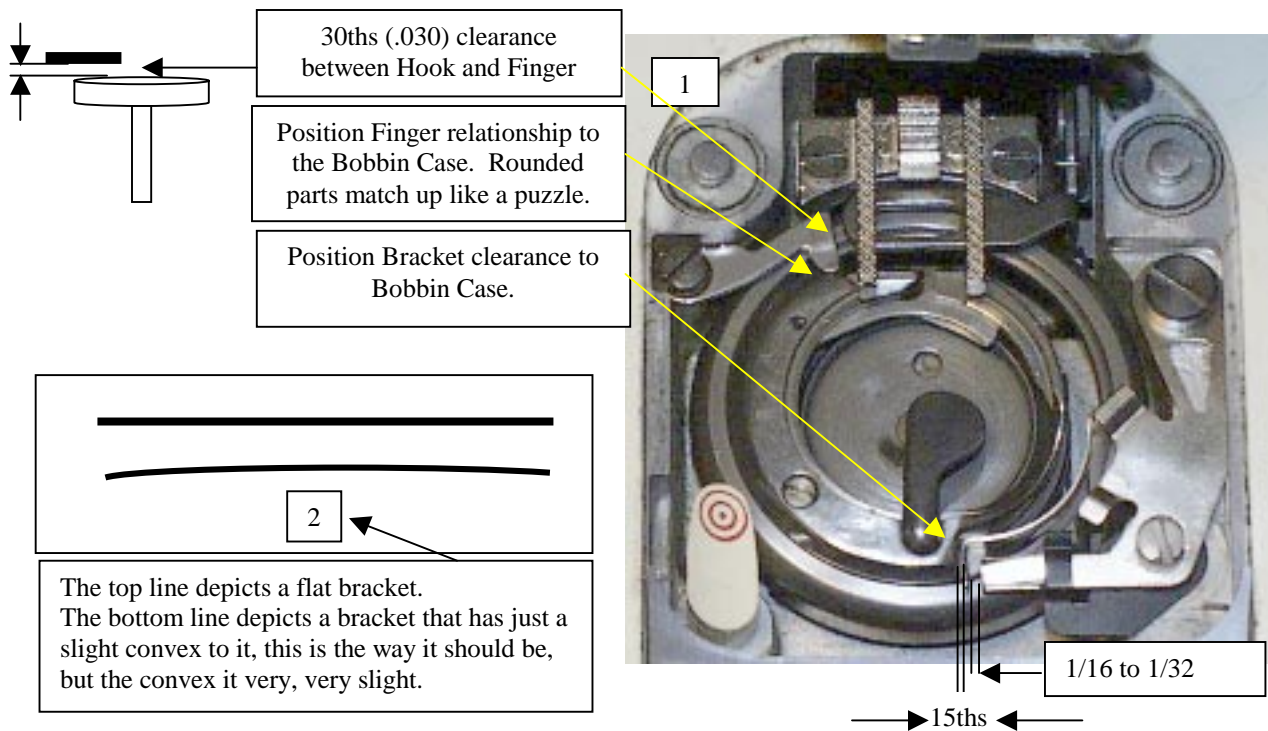


Common Part Numbers – [382437](#) Position Bracket; [141820-803](#) Hinge Screw; [172987](#) Retaining Bracket

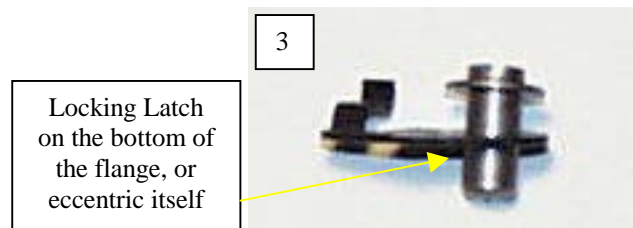
Notice the shoulder on the fastening screw; it has to fit inside the mounting hole properly (1). Also the adjusting eccentric stud (2) must fit properly inside the adjust hole of the bracket (3). Item (4) is the Position Bracket locking latch, and its primary function is to hold the bracket down and keep it from jumping up. Also be aware that not all eccentric studs are like the one shown. The early models do not have the extra lip area as shown above (5), and not all machines had the Locking Latch either (4). So if yours doesn't, don't worry about it. However you should be able to obtain the Locking Latch from a reputable dealer, and I would recommend installing one. Originally when it was first introduced, it came as an entire kit.

Position Bracket and Position Finger Adjustment (continued):

- Picture (1) below shows the correct position of the Finger in relationship to the Bobbin Case. If adjustment or removal is necessary, be very, very careful. The screw that holds the Position Finger in place is a left hand thread, and it is very easy to break it off in the machines casting. I can not caution you enough when dealing with this part, or its removal. To remove the screw, **turn it clockwise only**, and again, you may have to give in the old snap routine talked about in the section before the [Contents Table](#), and as a brief refresher, it is mentioned in the [Feed Dog](#) section. As a note, some Position Fingers have a washer underneath them, and some do not. If yours doesn't, then ensure that when the Finger is snugly in place that it does not come in contact with the Hook. The gap between the Finger and the top of the Hook should be at least 30ths (.030) of an inch. For you metric people, its .762mm, either way this is where they function the best. To high, and the Bobbin Case will slip underneath it when turning the machine backwards by hand.
- Picture (1) below also shows the correct position of the Position Bracket. The gap between the Bracket and the Bobbin Case should be approximately 15ths (.015) of an inch, metrically speaking. 381mm.

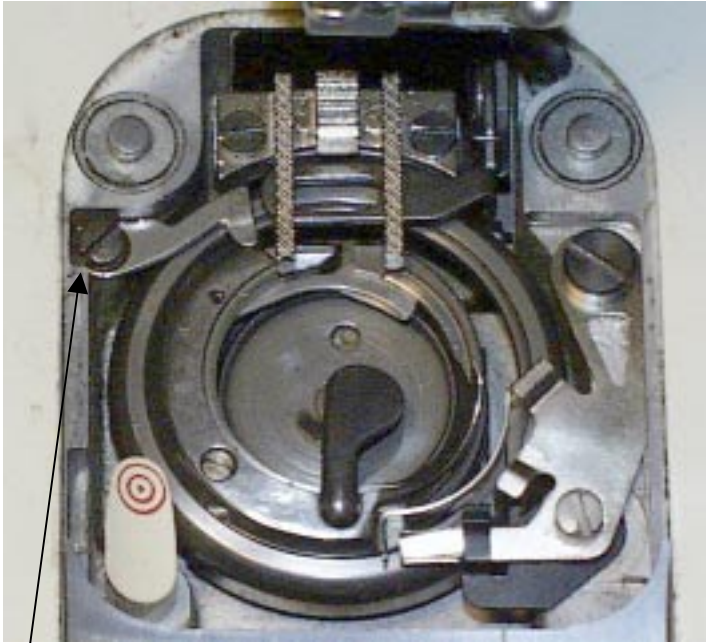


- Also the Position Bracket should have a little bit of convex shape to it. If it's perfectly flat, then it has no self-resistance in holding itself down, again another reason to have the Locking Latch. The silver bracket I got was flat as a pancake and required just a little tweaking, or shall we call it reshaping. That's what Singer Company taught me, we never bend a part, we reshape it. See picture (2) for an illustration of what I'm talking about.
- Picture (3) shows the correct assembly of the eccentric stud and locking bracket. For those with the flange on the eccentric stud, the Locking Latch goes on the bottom. For those without the flange, the Locking Stud still goes on the bottom of the eccentric stud.



Position Bracket and Position Finger Adjustment (continued):

8. Adjusting the Position Finger is a little tricky. It requires two screwdrivers. One to hold the bracket in place and the other to start snugging the screw down with. While holding the Finger in place to the relationship of the Bobbin Case, start to gently tighten the screw. Just snug at first, then give it the old snap, but a light snap, to lock into place. As you start to tighten the screw, the Finger will attempt to back away from the Bobbin Case, this is why we need the second screwdriver to hold the Finger in place.
9. Your properly adjusted system will look similar to the picture below.



Use the larger screwdriver to tighten the screw with. Remember this is a left hand thread, so tightening is counter clockwise

Use the small bladed screwdriver to position the Finger into place with.

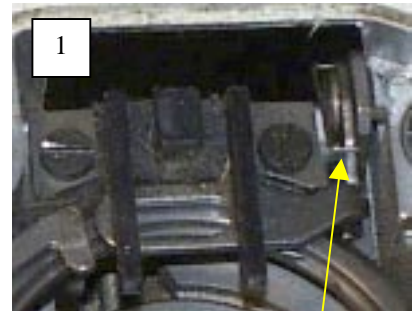
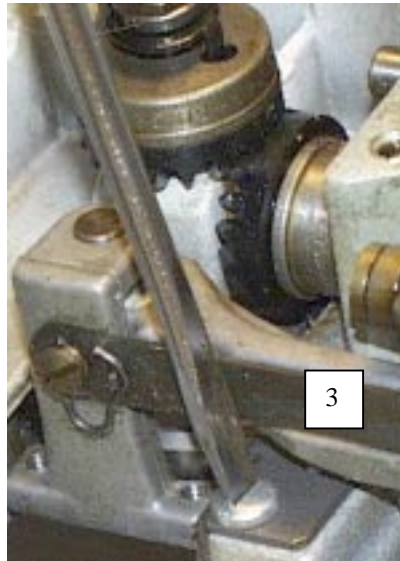
Area of note: On some of the Freearm models, 770, 778 and 776 for example. The Finger Position Screw hole may have been drilled and threaded all the way through the casting of the machine. So if it did get broken, extraction was made through the base of them machine. I don't recall a single Flat Bed model being this way. So if you break the screw in a Flat Bed model, I'd take it immediately to my favorite mechanic and hope he/she can extract it without causing further damage to the casting of the machine. I have seen them drilled out and put back together with a regular screw and nut to hold it together, but the chances are it'll work itself loose and become a problem area. Hence the left hand thread, it will not work itself loose during the course of normal sewing.

Thread Pull Off Finger:

1. The Thread Pull Off Finger, or some may call it the Thread Pull Off Lever. This part plays a very important roll in the machines function of sewing correctly. If it is damaged, or the spring is broken, you'll have all kinds of problem, but mainly you'll have Bobbin Case jamming. This unit rides up and down with the Feed Dogs as they move up and down.
2. Lets examine this part closer. Check to see if the spring is intact, reference picture (1), (2) or (4) below. To remove this part, you'll need to remove the Feed Dogs. Click here to reference [Feed Dog removal](#). Lay the machine on its back and locate the screw as shown in picture (3). Sometimes it may be easier to set the machine in a position as shown in picture (5), but make sure the Face Plate and Top Cover are removed. Don't leave the machine in this position unattended, it may fall on its back.
3. Picture (2) shows the unit removed from the machine.
4. Picture (3) shows where the screw is to remove the unit. As before, this screw may require the old snap routine to remove it. Turn it CCW (counter clockwise)



Common Part Number
174237



Check this spring, it must be functioning correctly. If it is broken, or the unit is gummed up, and doesn't move freely, you'll have problems.

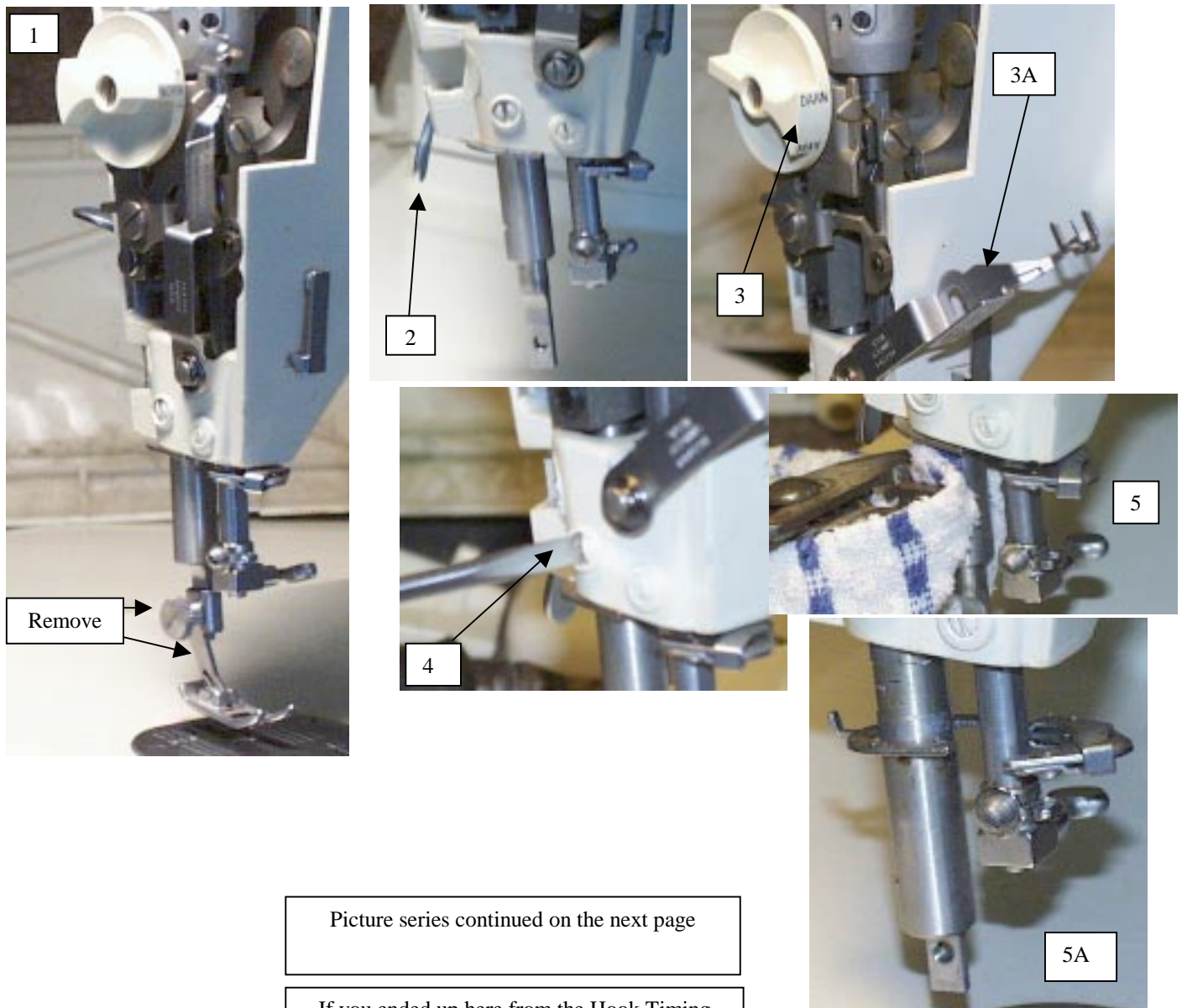


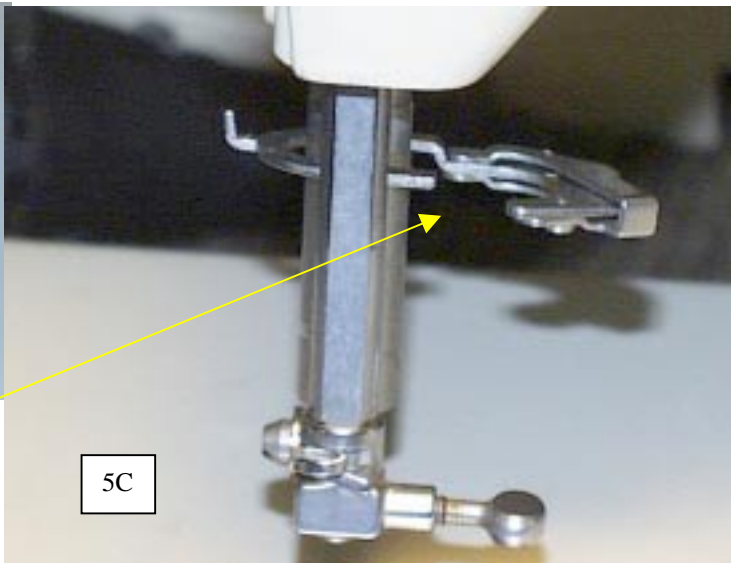
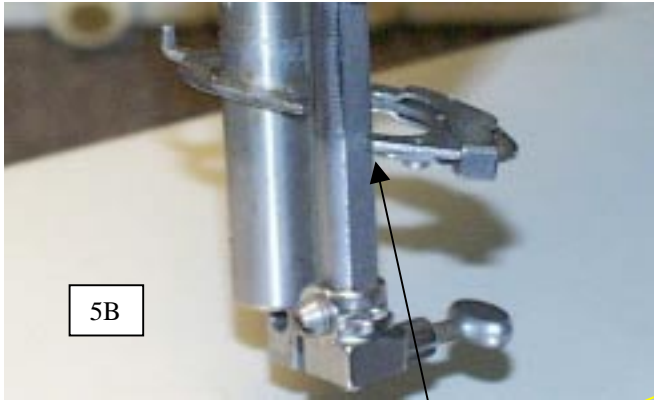
5. If the Pull Finger appears as shown in picture (4), somewhat collapsed, or no spring to it as shown in picture (2), I'd say the spring is missing, or broken. To the right of the Finger, in picture (4), is a good spring. If the spring is broken, or missing, I don't believe you'll be able to purchase this part by itself. But I believe the entire part is available, it may be an aftermarket one, and as with any aftermarket part, check for proper fit. If you have trouble fitting the new part, perhaps you can remove the spring from the new part, if they are the same type, and install it on the old original part.
6. Reverse the order to re-install the part, and check for proper movement by gently pushing the Finger downward. Make sure it returns to an up position without any hesitation, picture (6). Don't forget, you'll need to re-align the [Feed Dogs](#) again.



Lower Thread Guide:

1. This part is generally full of lint and should be inspected, and cleaned out. And sometimes they are broken off, but are very easy to replace.
2. Remove the Presser Foot and Thumb Nut Screw. Picture (1).
3. Lower the Presser Bar, picture (2).
4. Set the Pressure Dial to Darn, or Zero, picture (3)
5. Move the Needle Threader out of the way, picture 3A, if equipped, and hadn't all ready been removed
6. Loosen, but don't remove, the pinch screw as show in picture (4), by turning it CCW (counter clockwise)
7. Work the Presser Bar Guide down until the Lower Thread Guide can be turned CCW and slide off the Bar Guide. If the Bar Guide hasn't been removed for some time, or ever, you may need to use the pliers, or channel locks, with a rag to work it loose. It can be difficult, so do not squeeze it to tight, you'll mar up the Bar Guide with plier marks. See picture (5) and related picture (5A – 5D) series.
8. Using a tension screwdriver, remove the screw shown in picture (6). This can be a tough little buggger to get out. What ever you do, do not hold the part in your hand and attempt this. If you slip, you poke yourself with the screwdriver. Lay the part down on the bench and then go after the screw. You may need to use that old snapping routine again, which can be a little tough with a small screwdriver, but you'll get it.
9. Slide the guide part back, and check for lint build up in this area.
10. Assemble in reverse order, and tighten the pinch screw.



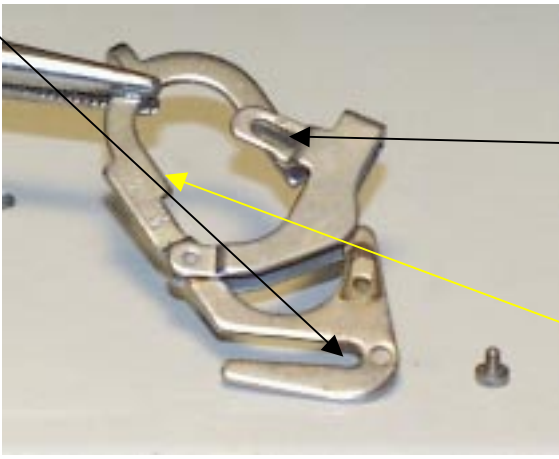


Start working the Thread Guide around the Needle Bar, until it has cleared the Needle Bar. Slide the Thread Guide off the Presser Bar Housing, by moving it to the left.

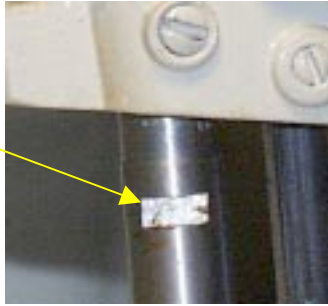


Loosen the screw as shown in picture 6. Remember, it can be a little tough to get out, but use some of the old snapping routine on it.

Examine these areas for lint, rusting, or heavy oil staining, and clean as necessary.



When you put it back together, slide the slot back as far as it'll go to give the maximum opening the Thread Guide can achieve. The less thread drag we can achieve in this area, the better. Also notice the groove in the Presser Bar Housing, the Lower Thread Guide has to go back into this slot upon reassembly. Did you notice in picture 5D?



Before you put it back together, lets check out the Presser Bar while we have this far apart.
Continues on next page.

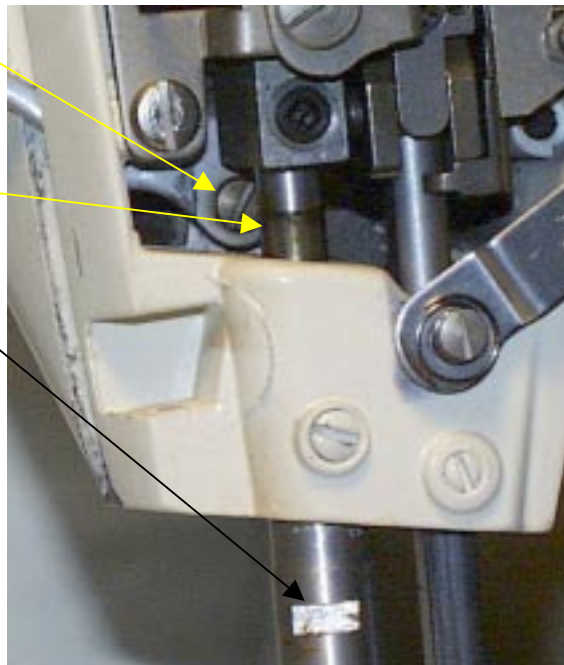
Presser Bar and Lifter Inspection:

1. We're only going to check a couple of items here. One being the screw that holds the Presser Bar Lifter, as it commonly comes loose, and will prevent the Presser Bar from dropping all the way when the screw has backed it self out far enough.
2. Also, if you've been having problems with a sticky Presser Bar it may be gummed up with heavy oil staining. Lets clean it out as best possible. If it requires additional disassembly, it'll require removing the Basting Stitch Lock Position Bracket, which we're not going into just yet. If you need to take it apart, reference the Basting Stitch Adjustment section.

Check this screw and see if it is good and snug.

Check for heavy oil staining all along the Presser Bar, and clean with a parts dip, or carburetor spray, by using a Q-Tip or other cleaning swab.

Notice the groove, or slot, cut into the Presser Bar Housing. The Lower Thread Guide has to fit into this area.



Cam Retention Spring:

1. Lets cover some basics on the Cam Retention Spring. It's primary function, to hold the Cam securely on top of the Cam Stack. See picture (1).
2. On the 750, 758, 770, 778 and 755 models, this spring could be subject to getting broken.
3. To remove the spring, undo the Cam Retention Spring Screw, as shown in picture (1) on the next page.
4. Check the fingers of the spring and ensure all three (3) are intact. See picture (2) on the next page.
5. When re-installing, make sure the Cam Spring fits properly around the shoulder of the Cam Stack Post. I don't see this item in the parts catalog I have, so it may not be available from your local sewing machine dealer. But he may have a used one lying around, that or you'll have to order from a dealer that orders parts from Singer itself. Sorry, I don't have a part number for this item either.
6. While we're at it, lets take a look at the different types of Cam Stack Posts. Notice one has a metal top, and the other has a plastic top. If you have to remove this item, which we will later in the manual, be careful not to break the plastic one. This is another part that I do not see in my catalog, but again, your local dealer may have one lying around of a torn down Singer Touch & Sew. As a note, even ones from any 600 series Touch & Sew, or Slant-O-Matic 500, 503, or even a 401, 403 will fit. But to be on the safe side, search for one out of a 700 series Touch & Sew first.
7. You'll notice that the 756, 776, and other non Touch & Sews may, or should have, this little spring. All it does is lock the top Cam into place, and prevents it from popping off during sewing. If the Cam Retention Spring is ok, you really may not need this item. So if it's missing from your machine, and you don't have a problem with the Cam jumping off, don't give it too much of a worry. However if you should need it, search out those used parts guys, or order from your Singer Dealer. Pictures shown on next page.

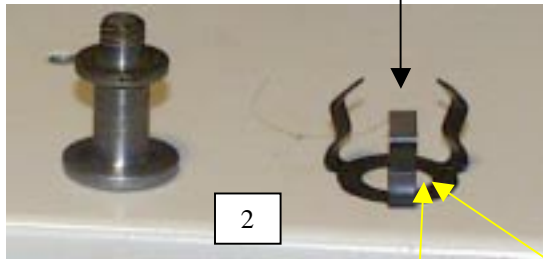
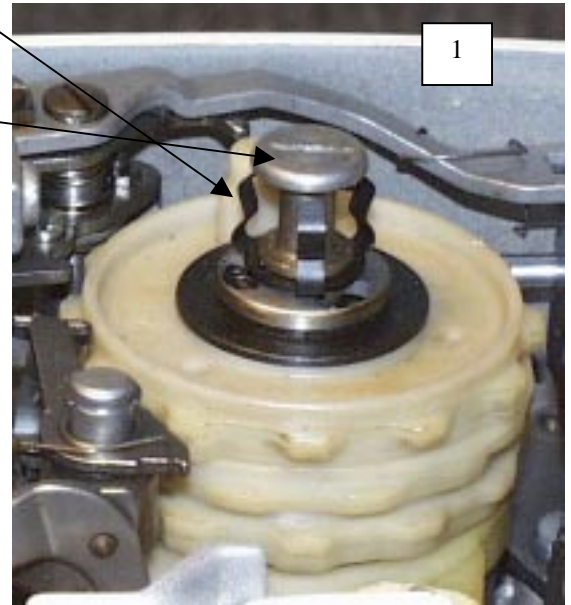
Cam Retention Spring (continued)

Cam Retention Spring as mounting in the machine.

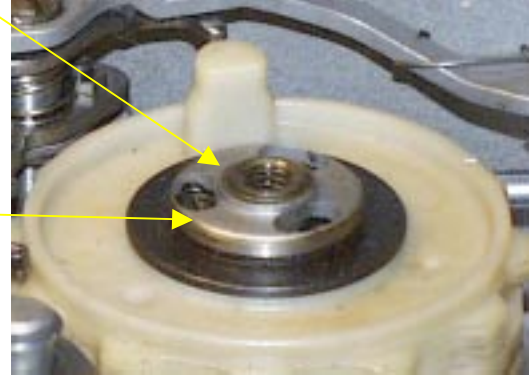
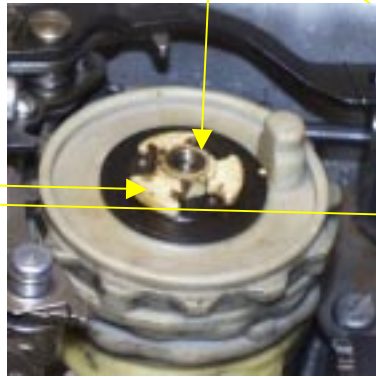
To remove, loosen this screw, by turning it CCW.

Ensure the spring has 3 fingers on it, as shown below.

Spring should fit Cam Post properly

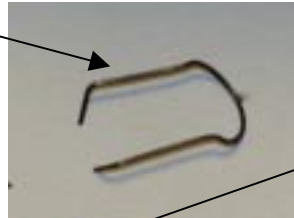


The picture on the right is that of a 756, and the right is a 750. Either machine may be equipped with this style of Cam Stack Post Shaft. The plastic one is commonly found in the newer series, and the metal of course in the old series.



This little spring is commonly found in the 756, 776 series. These models did not have any extra add on cams. Only the 750, 758, 770, 778 and 775 had extra cams that allowed you to perform extra add on patterns. These models came with White and Black cams. The white being stretch stitches, and the black being other decorative, or utility stitches.

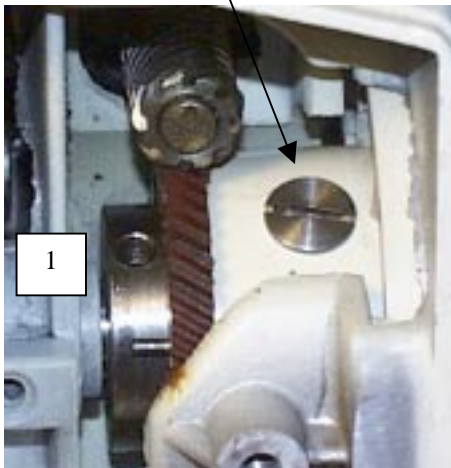
Notice its location.



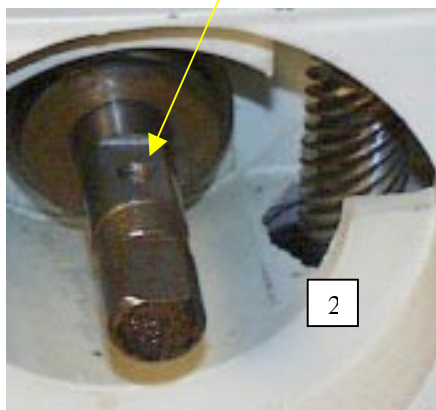
Motor Gear and Clutch Spring:

1. The Clutch Spring, Main Shaft Drive Gear, Hand Wheel and Motor Gear are other areas that I've seen worn out. Primarily due to improper lubrication, or lack of. I've seen the metal motor gear destroyed, but yet the fiber main shaft gear intact without a flaw. You'd think it be the other way around, the metal would out last the fiber part, but not so. When lubing these parts, I'd recommend a silicon based lube, or genuine motor gear lube, but I found that the silicon, or even Teflon products work best. A very light coat of grease lube is required, don't get crazy with it. If you over do it, all it does is make a mess of the surrounding area, trap dirt and eventually destroy the motor gear. Under no circumstance use a graphite type lube in this area, or on any other gear or part. Graphite lubes are great, but may cause this area to wear more rapidly.
2. Remove the Hand Wheel Screw as shown in picture (1).
3. Slide the Hand Wheel and Clutch Spring off the Main Shaft, picture (1), by pulling it to the right of the machine. If the Clutch Spring doesn't come off with the Hand Wheel, no big deal. Flat spot
4. Notice once you have the Hand Wheel off, there is a flat spot on the Main Shaft, reference picture (2). When you put this unit together, the Hand Wheel Screw must seat on this flat spot. Also note that some Hand Wheel Screws may have a black rectangular spring that goes between the screw and the Hand Wheel. Not all models had this spring, but if yours does, put it back on as it came off.
5. Check the Clutch Spring and ensure it isn't broken, picture (3), both tabs should be intact, and the spring should not be broken. If it is you'll need part number 172299-003. This spring was used in all 600, 700 series machines, and in the 401, 403, 404, 500, 503 models. So finding one shouldn't be too much of a problem. Again, your local repair shop may have one from a torn down machine.
6. Pay attention to the Main Shaft Gear also, it has a beveled area on one side. This bevel must go back on against the Hand Wheel. This collar is also used to adjust the amount of free play the gear has. A gear to tight will not allow the clutch spring to work properly, and one to loose will cause motor and gear chatter. Picture (4).

Remove this screw, by turning CCW. Remove the Hand Wheel by pulling in this direction. →

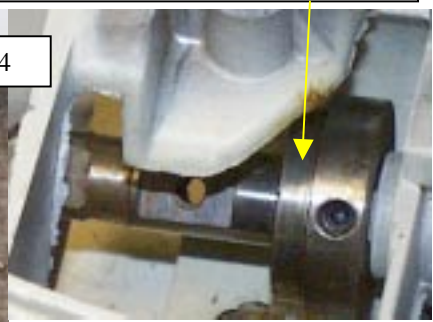


Note the flat spot on the Main Shaft, the screw must seat here when installing the unit together.



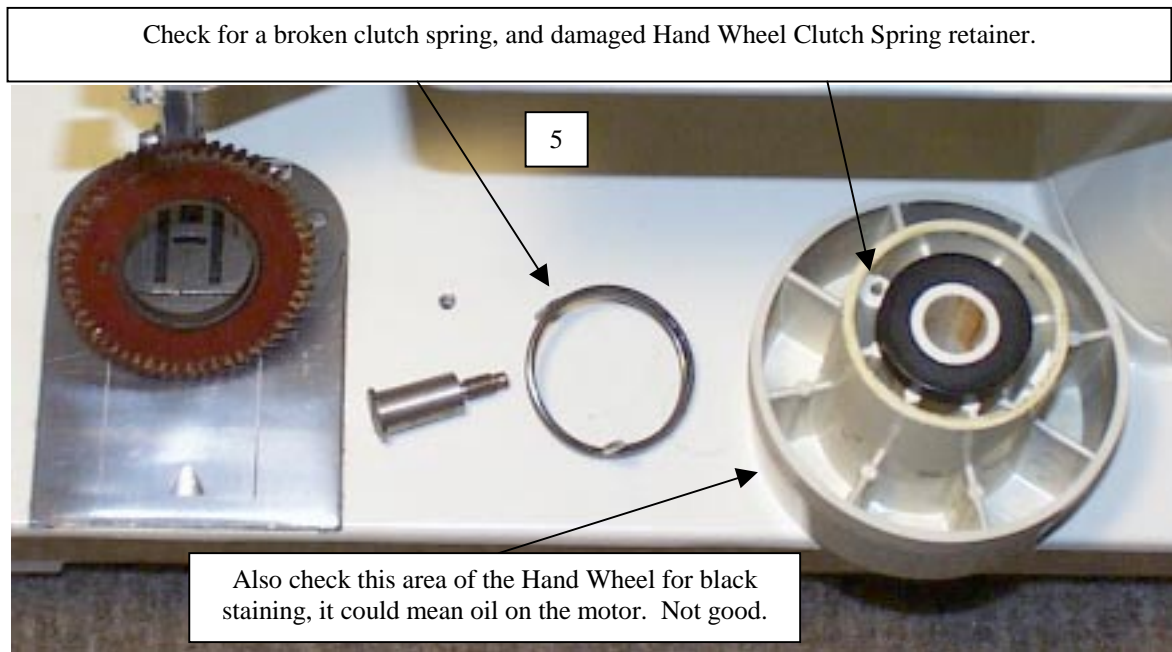
Note the bevel on one side of the Main Shaft Gear, it has to fit against the Hand Wheel, this allows some clearance for the clutch spring to spin inside the fitted area.

Main Shaft Gear part number - 172312



Motor Gear and Clutch Spring (continued):

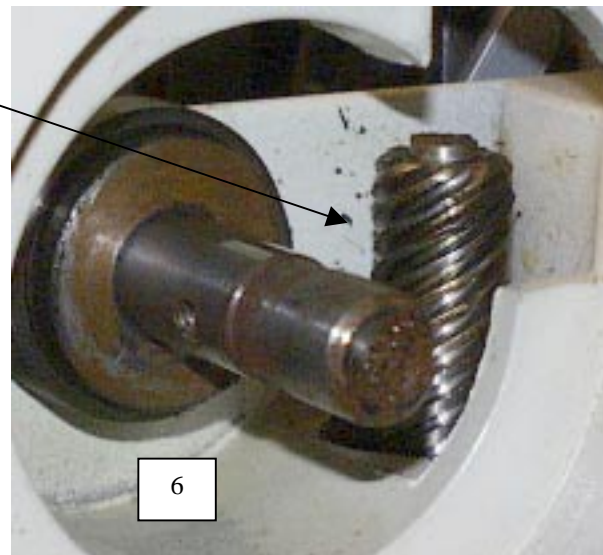
7. Picture (5) shows the all the parts contained within this unit. Another item to pay attention to is the Hand Wheel.
8. Note the little round hole, one of the tabs of the clutch spring fit into this hole. If the hole is cracked, or broken, you may need a new Hand Wheel. Again, I don't have a part number for this item, but as always, check your local dealer for one. Any 600 series will fit also, only difference is the color. All 600 series are of a bluish color, so if you don't mind it'll work. And check for black staining around the Hand Wheel in this area, it is indication of oil on the motor, and this will end up doing major damage to the motor if left unattended. We'll cover it later on, or you can reference the Motor Tuning area.
9. Did I mention the Motor Gear yet? Sure, it was referenced in bullet 1. Check it for smoothness and consistency in the shape. A beveled gear means a worn gear, and it should be replaced. Sorry, no part number, but as always, check with your local dealer for a replacement. And again, any 600, 700 or 500, 503, 401, 403 will fit. Picture (6).



The Motor Gear should be consistent in shape. Any major tapering, or beveling, means a worn gear, and it must be replaced.

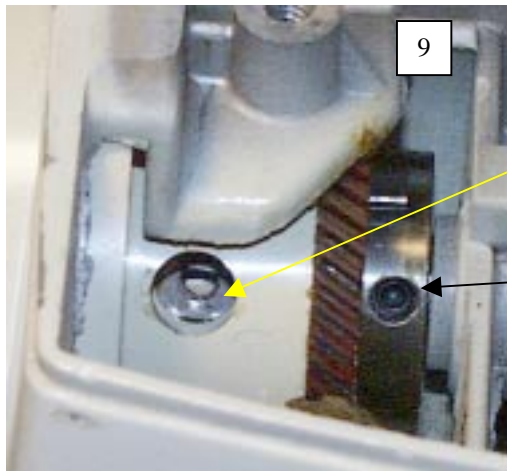
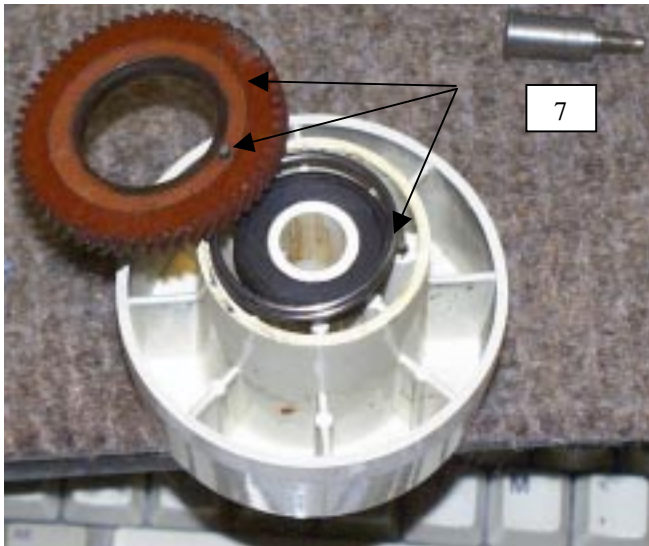
Example:
A good gear is somewhat like this: |

A bad gear will resemble a shape like this:)



Motor Gear and Clutch Spring (continued):

10. Reassembly. This requires a nice tight close up shot. Place one tab of the spring in the Hand Wheel, and the other end in the Main Shaft Gear, picture (7), and ensure the Main Shaft Gear bevel is facing the Hand Wheel. Picture (7) shows it going in backwards. So if yours is like this, turn the gear over. I did this on purpose so you would pay attention to it.
11. And once all the parts are aligned, as in picture (8), you can slide it onto the Main Shaft. Again, notice the gear on backwards, don't put it on this way ok.
12. Once slide back onto the Main Shaft, ensure the Main Shaft flat spot is visible. Then put in the mounting screw. Picture (9).
13. Once all assembled, it should resemble picture (9), but with the screw installed.



Ensure you can see the flat spot on the Main Shaft. If not, turn the Main Shaft until it is showing through the Hand Wheel hole. It doesn't need to be perfect, when we tighten the screw, it'll center up by itself.

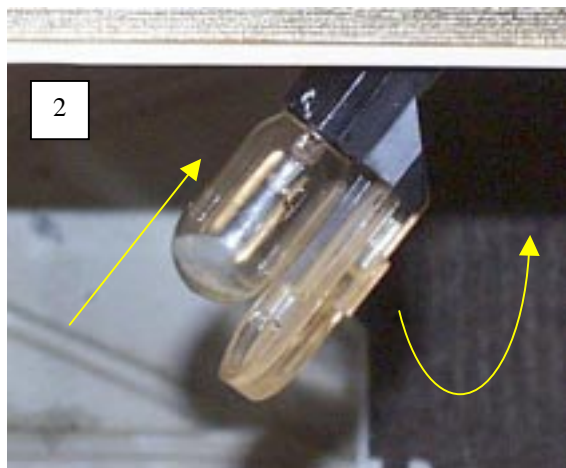
Adjust free play if the motor gear turns the second you turn the Hand Wheel back and forth in a short rapid changed of directions. The motor gear should have a little slippage, or free play.

14. The free play for the motor gear is adjusted with the metal retaining collar, picture (9). If the motor gear does not have any slippage, the collar must be loosened and adjusted to allow for minimal slippage. Using a 3/32 Allen wrench, just loosen the setscrew, wiggle it just a touch and retighten. Check motor gear for slippage. When you turn the Hand Wheel in both directions, the motor gear should be just a little loose to allow the clutch spring to do its job. There should be no visible gaps between any of the parts either. To loose, and the motor gears will wear, and too tight, the machine will make this growling noise in the gear section.

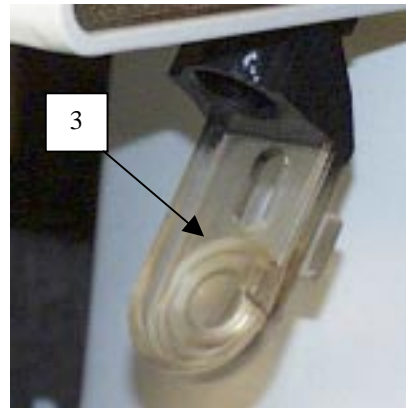
Light Bulb Replacement:

[Return to Table of Contents](#)

1. To change the light bulb, locate the light lens. Picture (1).
2. Pull the light lens down, and push the light bulb inwards and give it a twist counter clockwise. Picture (2).
3. Install in the reverse order. Note, use only light bulbs approved for sewing machines, or have a rating of 15watts. Believe it or not, I've seen auto bulbs, Christmas lights stuck in these units. Also look for any discoloration of the plastic lens area. Pretty good indication that the wattage may be too high.

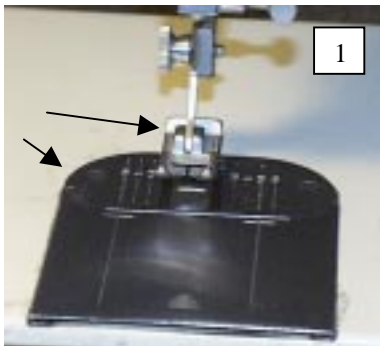


1. Locate light socket lens and pull downward
2. Push bulb inward and give a twist counter clockwise
3. Inspect lens for discoloration

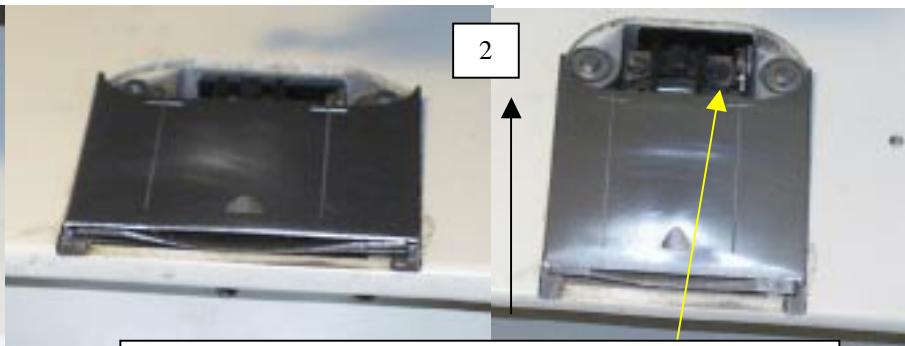


Slide Plate and Slide Plate Spring:

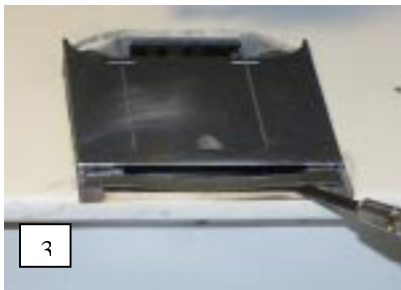
1. To remove the slide plate, first remove the needle plate and presser foot. See picture (1).
2. Slide the plate forward until it is free from the hold down spring. You'll need to lift the front up over the feed dogs. See picture (2).
3. To re-install the slide plate, place the plate up against the spring, and using a small tension type screwdriver, gently lift one side of the hold down spring and position the spring in the slide plate guide, repeat for the other side. See picture (3).
4. To replace the slide plate spring, loosen the screw by turning clockwise. This is a left hand thread. See picture (4).
5. Insert the horseshow part of the spring around the holding screw, and gently lift the left side up onto the bed frame. See picture (5).
6. Center the spring on the frame, and gently apply pressure to the spring by pushing it downwards, and tighten the holding screw. See picture (6).
7. Check for properly alignment by slide the plate back and forth a couple of times. It should slide rather freely.
8. Check for proper slide plate pressure resistance. If the spring doesn't have enough holding pressure, the slide plate will feel loose, and will come back off easily.



Remove these items



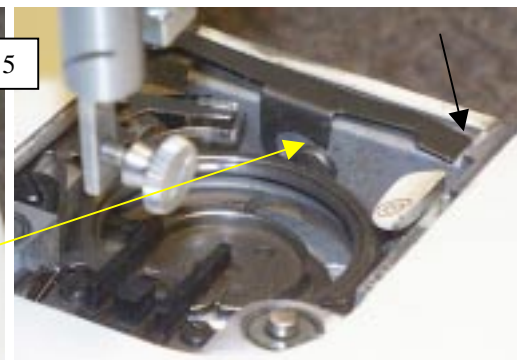
Slide the plate forward, or towards the back of the machine. Lift the front of the plate over the feed dogs and remove.



Loosen this screw, turn clockwise



Place the horseshoe around the holding screw. Lift the plate onto the frame, and tighten the holding screw.



Push the spring downwards and tighten the screw.

Adjustments – Minor to Major:

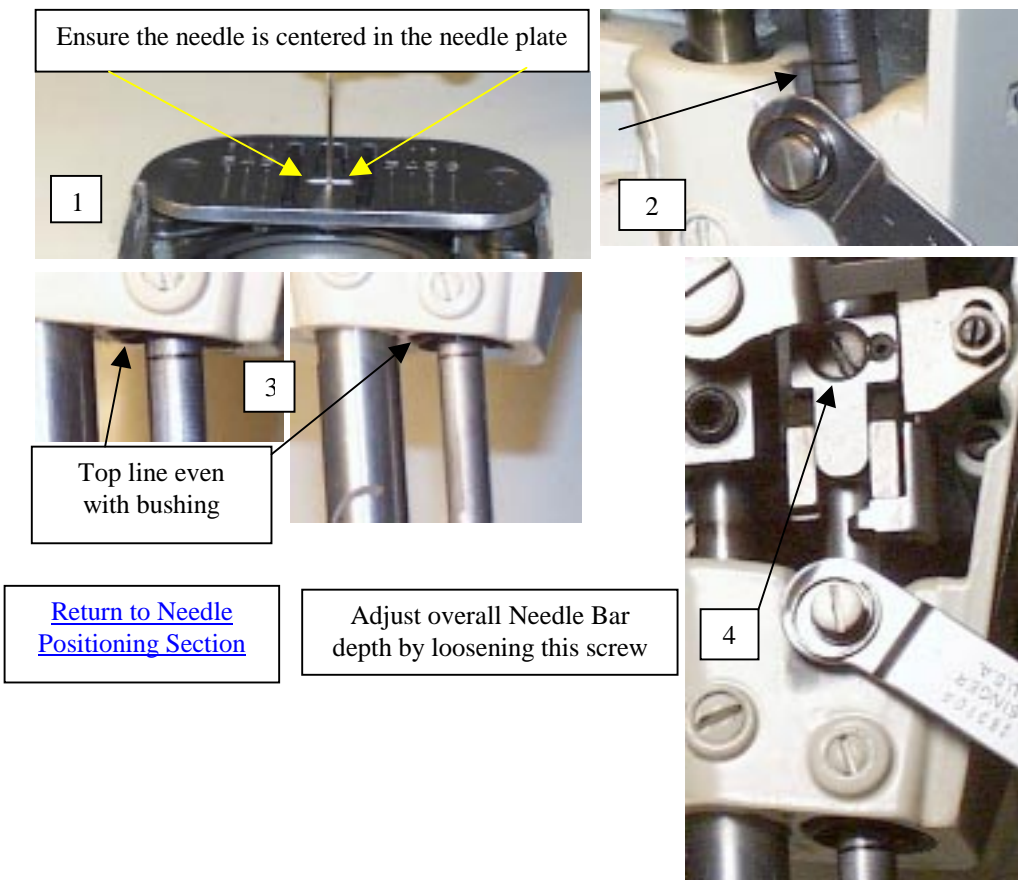
In this section will do some basic adjustments like set the timing, adjust the tensions, check the feeding and needle positions. All of which will be done in the major parts replacement sections again. But to avoid having to read page after page, we'll cover the simple adjustments, without tearing the machine apart.

Timing the Hook to the Needle:

This is one of the most common problems, the machine gets out of time. This is due to a worn Timing Belt, or a Needle Bar that has slipped out of adjustment. Normally due to a pretty hardy thread jam. This results in skipping (or dropping) stitches, poor tensions or breaking thread, just to mention a few of the problems it creates. I'd also like to take just a minute to inform you that Singer used two different size setscrews in the Timing Cog. The earlier models have Allen screws that require a 5/64 Allen wrench, and the later models used screws that require a 3/32 Allen wrench. My demo model here has the 5/64 screws, and one is rounded out. Meaning I can not get a good grip on the setscrew to get it loose. Someone has over tightened it, and rounded the hex ends out, or caused the screw to split into, so the wrench does nothing but spin around. When I came across units with this type of screw, I always pulled the cog off, drilled it out, and tapped it for the 3/32 screw. So, if you find you have this problem, you have two choices, take it to a shop for a retrofit, or if you have a drill and tap, drill and tap it yourself. I'll cover this procedure in the major parts replacement section, as all we want to do here is time the machine. You should also notice that I've removed some parts to help show the pictures better, for example, I've removed the Lower Thread guide as shown in pictures 3 and 5. You don't need to do this, but if it helps, refer to [Lower Thread Guide](#).

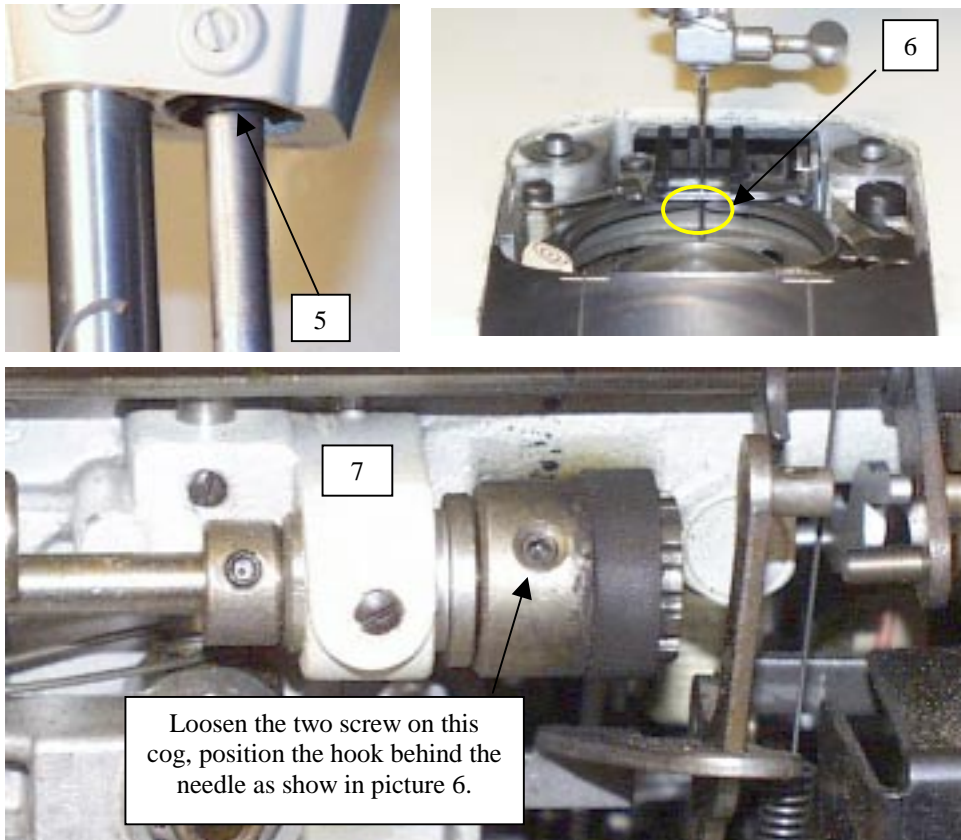
Ok, lets check the timing. Several components make this up, the Needle Bar, [Needle Bar Bushings](#), and the Hook.

1. Make sure the needle is centered as much as possible in the needle plate. This is best done with the straight stitch plate. It can be off just a little bit, but as long as it is as close to center as it can get. Using a size 14 needle, check for center. If it is way out of center, then refer to centering the needle. See picture (1).
2. Check the overall Needle Bar depth. It's pretty common for it to be at the incorrect position. The total depth should not exceed the lower Needle Bar bushing. The Needle Bar has two lines inscribed on it. See picture (2).
3. Turn the Hand Wheel toward you, or otherwise counter clockwise, until the Needle Bar is at its lowest position. Just before it starts its upward movement. The top line should be even with the lower Needle Bar bushing. See picture (3).
4. To adjust the correct depth, loosen the Needle Bar pinch screw, set the Needle Bars top line so it is even with the bushing, and tighten the pinch screw. See picture (4).



Timing the Hook to the Needle (*continued*):

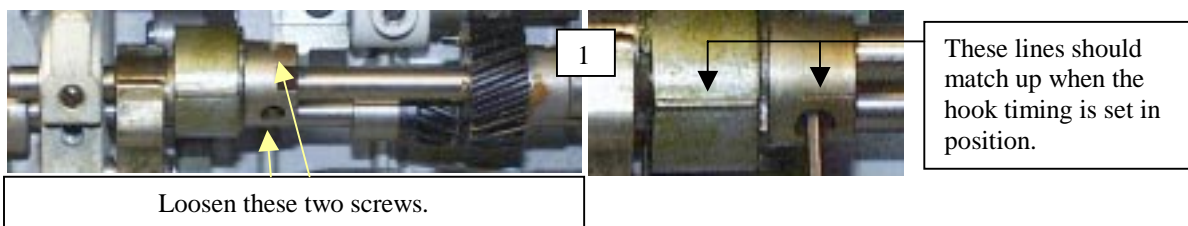
5. Once you have the overall depth correct, turn the Hand Wheel towards you again until the lower line is even with the bushing. Place the lower line in the same position that the top line was just at. See picture (5).
6. At this position the point of the hook should just be starting to go behind the needle. See picture (6).
7. Should this require adjustment, loosen the two setscrews in the Timing Belt Cog, and position the point of the hook just behind the needle, or just starting to enter the needle as shown in picture (6). See picture (7). Please note, make sure when your turning the Hook, that the Feed Dogs are in the down position and not up for feeding the fabric.
8. Just snugly tighten the two setscrews in the cog and check the timing. Turn the Hand Wheel 3 to 4 full rotations, and confirm the timing. Repeat steps 5 thru 7 if necessary, and reconfirm.



Feed Dog Timing:

To often when someone has timing the Hook of the machine, they fail to make sure the Feed Dogs are in the lower position. Should you find that your machine is attempting to feed the fabric when the needle is in the cloth, it's a good bet that the machine was timed with the Feed Dogs in the up position. Now, if you just did the steps above to time your Hook to the Needle, and didn't get the Feed Dogs in the correct position, not to worry. We can correct it without having to retime the Hook.

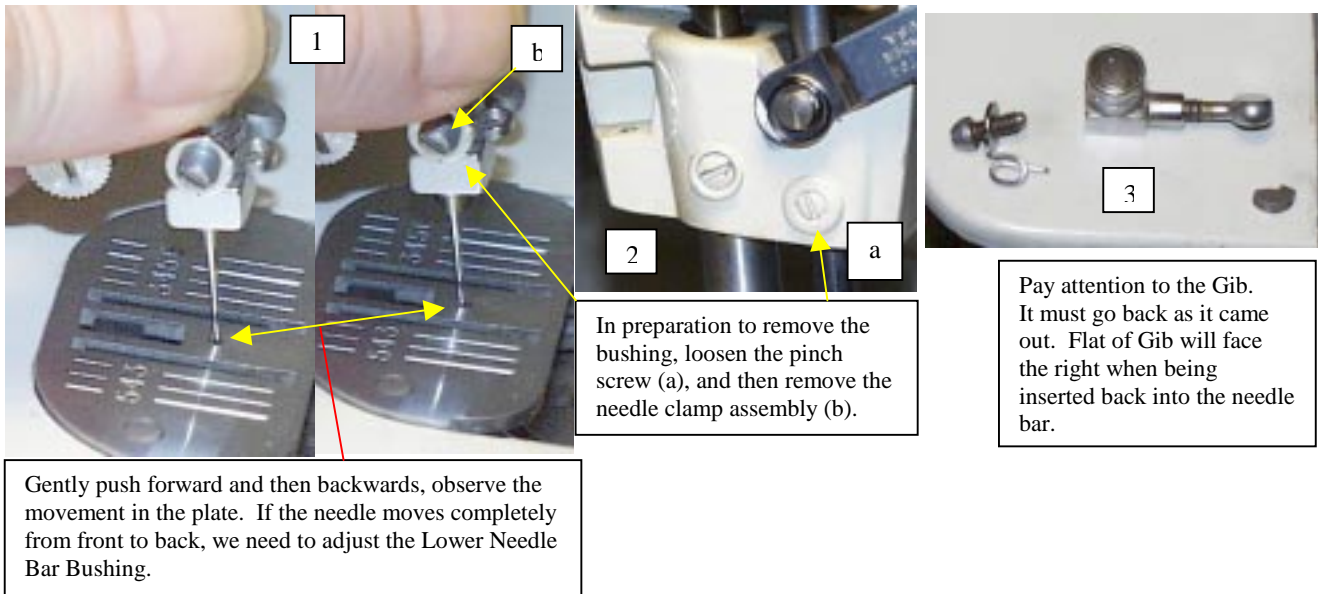
1. Loosen the two 5/64th setscrews as shown in picture (1) below. You'll have to turn the machines Hand Wheel a little to get to both screws, much like you did in the above steps.
2. Once loose, reposition the machine as if you're checking the Hook Timing. Just like in picture 6 above in the Hook Timing Section.
3. At this point, turn the Feed Cam until the two lines match up with one another.
4. Tighten the first screw, then the other.



Center Needle Position and Bushing Adjustments:

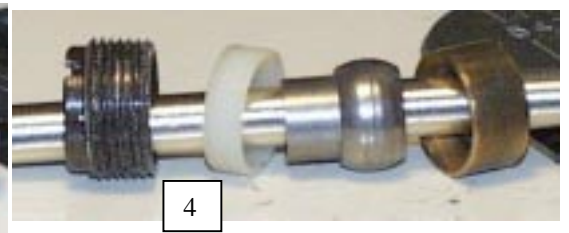
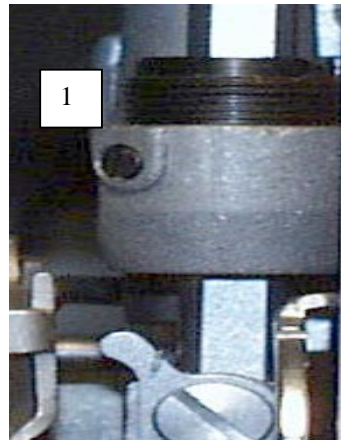
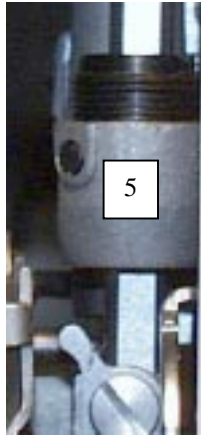
In the Hook Timing Section we talked about ensuring the needle is properly positioned in the Needle Plate. This can be a tricky adjustment, as we need to watch for several things when performing this adjustment. When making this adjustment, we alter the zigzag positioning, and the hook to needle clearance. All of which will need to be rechecked, and perhaps adjusted. But once we adjust the zigzag centering, we may throw the needle center position off again. With a continued fine tuning, all items will come into harmony. It just takes patience and a sense of what looks good. But lets take it step by step, and we'll end up with a properly positioned needle. It's best to use a size 18 needle when making this adjustment, but a size 16, or even 14 will get the job done also.

1. First off, we'll need the following items, and prep for the adjustment:
 - a. Straight Stitch Needle Plate
 - b. Size 18, 16 or 14 needle, 18 preferred
 - c. Remove the presser foot
 - d. Remove the Bobbin Case
 - e. Remove the Side Cover, or Door
 - f. Remove the Top Cover
2. Before we start the adjustments, lets check our Needle Bar Bushings for free play. See picture (1). Gently grasp the Needle Bar, and see how much movement you have by pushing the needle bar forwards and then backwards. As you see in picture (1), we have what I feel is considerable movement, the needle moves pretty much to the front of the needle plate hole, and back to the rear of the hole. Now, lets not forget, the older the machine, the more ware you'll have in some of these parts. Even after cleaning the parts, and readjusting, you may have needle travel from the front-to-back in the needle plate. If you do, then don't give it much concern, as in some cases we will not achieve zero movement. And actually, zero movement is very difficult to achieve anyway. At least we've cleaned the parts, and are satisfied that we have full movement without any chance of binding due to oil gumming up the parts and restricting the overall movement of our Needle Bar when doing the zigzag stitch. You may wish to skip to step 18 anyway, and bypass this adjustment. I'm only covering it, as we are going to look at every critical part inside the machine, and check its free play, and ability to move freely when sewing.
3. Loosen the Lower Needle Bar Bushing pinch screw, as shown it picture (2)(a).
4. Remove the Needle, and Needle Clamp assembly screw, as shown again in picture (1), item (b).
5. When removing the Needle Clamp unit, pay attention to the Gib that is inside the clamp. See picture (3). It is very important the we put this back exactly as it came out. Otherwise, the machine will not clamp the needle correctly, and during sewing, the needle will come out of the Clamp unit.

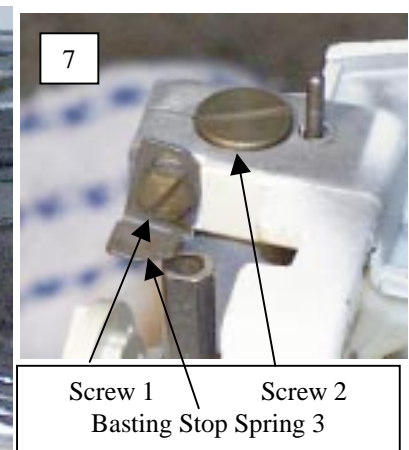
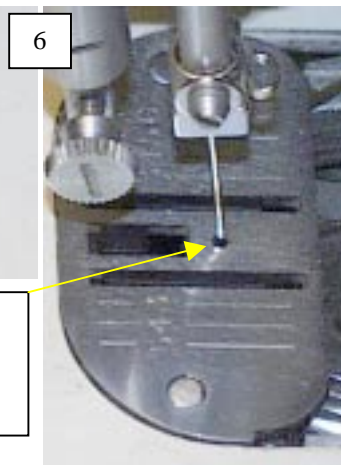
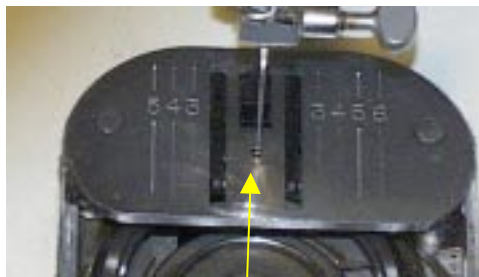


Center Needle Position and Bushing Adjustments (continued):

6. With the machine on it's back, or standing up on the hand wheel. Use a small screwdriver and gently tap out the bushing. It turns CCW as it unscrews. (Fig. 1)
7. Bushing as it unscrews. (Fig 2)
8. Bushing parts laid out in order of removal. (Fig 3 & 4)
9. Ensure all parts of clean, and free of any oil stains. Be sure to use only a soap and not any solvent on the plastic bushing part.
10. Re-assemble, and just snug the black bushing cap into place. Do not over tighten, as this will cause binding, and the needle will not move side to side properly.
11. Repeat the for the top bushing unit. (Fig 5)



12. Once you have it all re-assembled, we can adjust for center needle position.
13. Re-assemble needle clamp and gib unit. Again, pay attention to the gib when putting it back into the needle bar. (Fig 3 on previous page)
14. With the needle in the machine, turn the Hand Wheel towards you to the point to where the needle has just entered the needle plate.



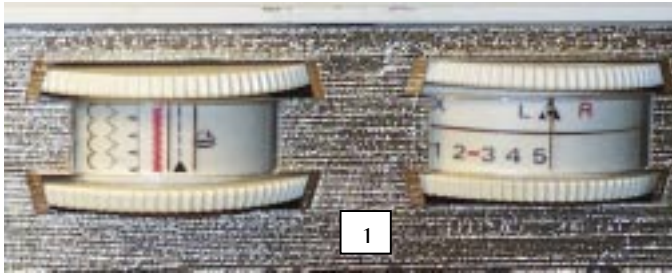
Check side-to-side, and front-to-back. As you can see, this needle is riding at about the 4 o'clock position, and towards the front of the plate.

Screw 1
Screw 2
Basting Stop Spring 3

15. Lets check for side-to-side, and front-to-back position. See picture (6). Front to back will determine the hook to needle clearance, and side to side will affect our zigzag performance within the needle plate. If I recall, the Singer manual calls for the needle to be at the 2 o'clock, or 4 o'clock position. I prefer dead center. This gives us just a hair more for when we're pounding away at those Levi jeans with a size 18 or 16 needle that's about the size of small nail.
16. Lets start with the rotation adjustment first, and if necessary, we'll fine tune with the other adjustments. In picture (7) we'll make our rotation adjustment. Loosen screw 1, and turn the eccentric screw 2, and achieve dead center front-to-back first. Pay attention to the basting stop spring position 3, we want this to remain as is for now. Note, not all stop springs are in this exact position, so observe yours and see that it remains in its original position. We will adjust the Basting unit later.

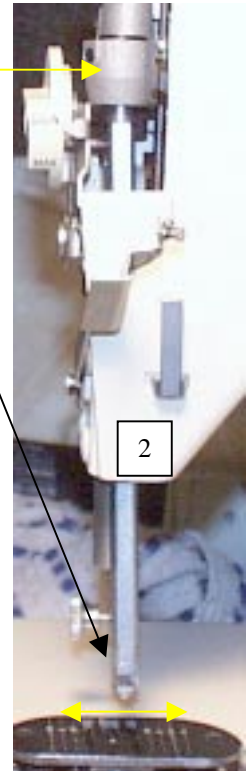
Center Needle Position and Bushing Adjustments (continued):

17. Another item to check once this is done, is how much free play do we have in the Lower and Upper Needle Bar Bushings. Too much play, and keeping our adjustment accurate during sewing will be hard to achieve. My model here has excessive movement. Meaning once adjusted, I can physically move the needle towards the front or back of the plate. Turn the Hand Wheel a few times towards you in complete rotations, position the needle back in the plate, and see how far you can move it forwards and backwards. If you achieve a fair movement front-to-back, we have too much play in the lower bushing. The lower bushing was mentioned in the [Hook to Timing Section](#) and on the previous page.
18. Once adjusted, our needle will ride centered in the needle plate, and have ease of movement when performing any zigzag stitch functions.
19. Lets check the overall movement by hand. Place the machine in straight stitch, and turn the width dial to 5. (Fig 1 below)
20. Move the needle bar by hand from side to side, and check for smooth operation as it returns to the right side. (Fig 2)



Move the needle bar to the right by hand at this location, and let it go.

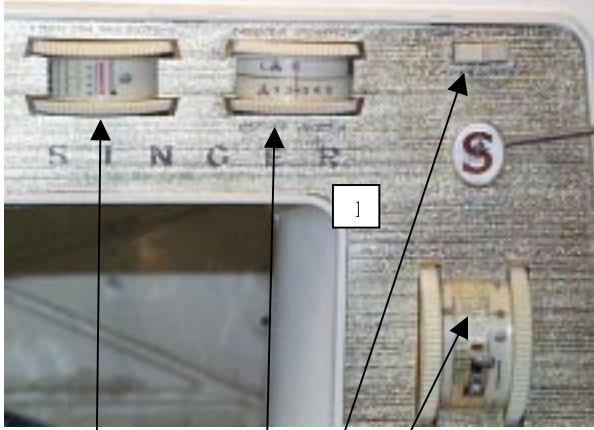
Ensure the needle bar is making a full smooth sweep across the bottom by the needle plate. No needle is necessary, and you should have the needle bar in the down position. The clamp should be re-assembled, which isn't shown in this picture.



Buttonhole adjustment:

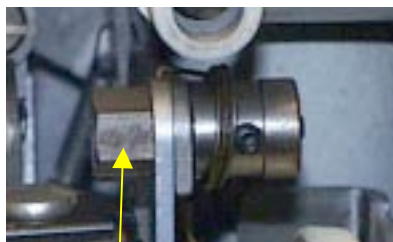
Adjusting the buttonholer isn't really difficult, but the adjust is very sensitive. Moving the adjusting eccentric too much will throw the buttonhole so far out of whack, you'll want to pull your hair out while attempting to get it correct. So make your adjustment turns very minimal. First we'll adjust the legs of the buttonhole. We want each leg to match the other for proper right and left side stitching. Meaning both the rear feeding, and forward feeding of the buttonhole sides will match equally. Next we'll adjust the turns of the buttonhole, so we achieve nice round corners.

1. Place all the dials to the buttonhole function. Normally all the settings will go on the red indicators. However, at this time set the stitch length dial to 6, and the buttonhole dial to the "Off" position. Also leave the power switch to the "Off" position as well.
2. Remove the front cover by removing the "Singer" emblem, gently work your way around the emblem while prying the emblem off. Its main holder is at the base of the emblem. (Fig 1)
3. Using a small screwdriver, slip it into the hole where the emblem was, and gently lift the panel outwards. Hold the reverse lever down while doing this, so the panel will clear and slip over the reverse lever.



Zigzag Stitch, Right Needle Position, 21/2 Width
Power Switch Off, Stitch length to 6, and Buttonhole dial in Off position.

4. Locate the adjusting eccentric, shown in the left picture below, and use either your Moto tool, or other method to inscribe a line in the eccentric and buttonhole feed rod. This will give you a starting point to go back to should you turn it too much. Adjust the eccentric by turning it up or down, very very little now, until you achieve a balanced buttonhole. The legs should be equal. Note: test sewing is required with the front panel left off. Now set the stitch length dial to buttonhole, and turn the buttonhole dial to step 1, make first half of buttonhole, then the second half. Compare the legs, and adjust as necessary.



Adjusting Eccentric
Turn gently up or down

Inscribe a line here
Reference point

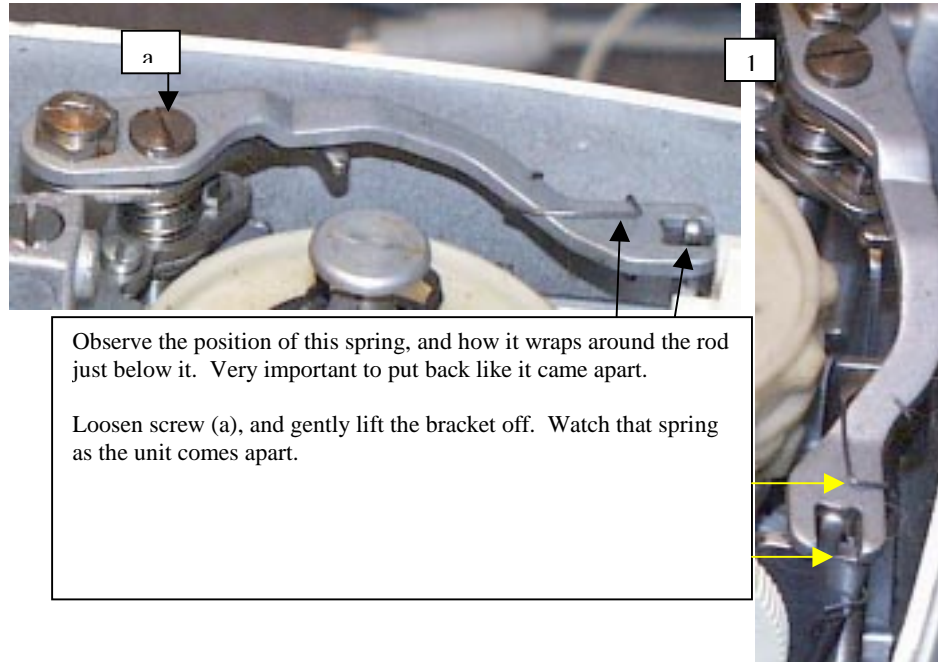
Adjust Eccentric

Balance legs

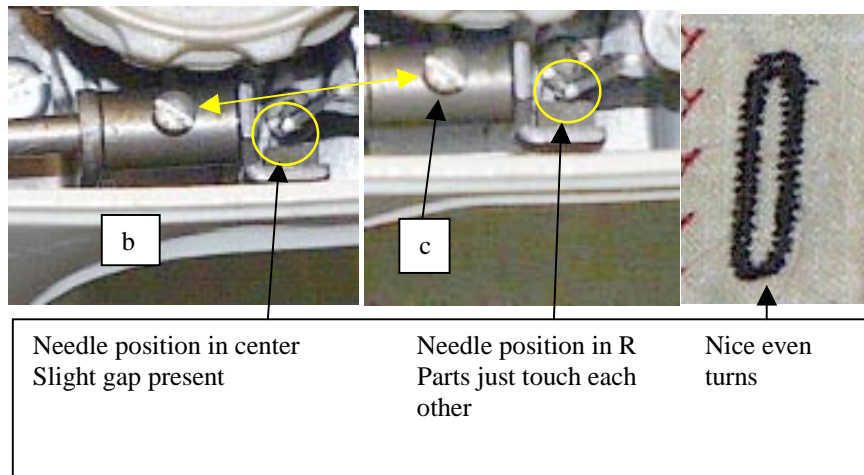
Buttonhole adjustment (continued):

Adjusting the buttonhole turns for nice round turns.

1. Before you take anything apart here, I want you to pay close attention to the spring that is wrapped around the bracket and the rod unit just below it. See pictures (1).



2. Make sure the needle position dial is set in the “Center” position. Observe the gap between the parts in figure b.
3. Set the needle position dial to “R”, or on the “red – right position for buttonholes”. As soon as the needle position is set to the right position, these two brackets just touch. No gap should be visible. This is what controls the turns of the buttonhole. If adjustment is necessary, loosen the screw in figure c, and adjust until you achieve a nice rounded turn. Most machines should make a fairly nice turn at this point, but fine tuning may be necessary due to other parts being just slightly worn, or slightly out of adjustment, but fall within the specs of adjustment.



Adjusting the Flexi Stitch:

Most Touch & Sews have an external dial for adjusting the balance of the flexi stitch. But a few models do not, so an internal adjust may be necessary.

See picture (1) for those with the dial, the dial is on the right, and is located underneath the lid that lifts up where the thread goes on at, and where you insert the add on cams.

Models that I recall having an external adjust:

750, 758, 770, 778, 771, 775, 755

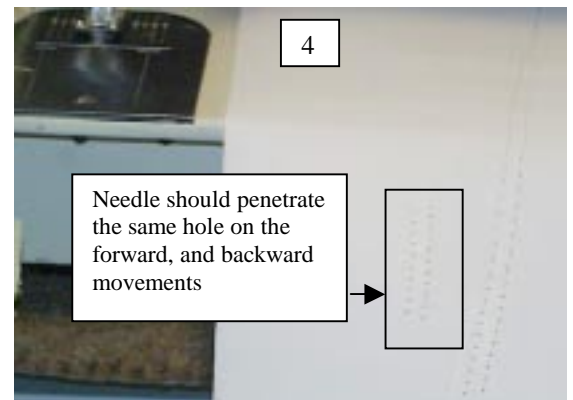
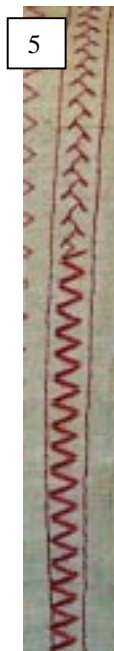
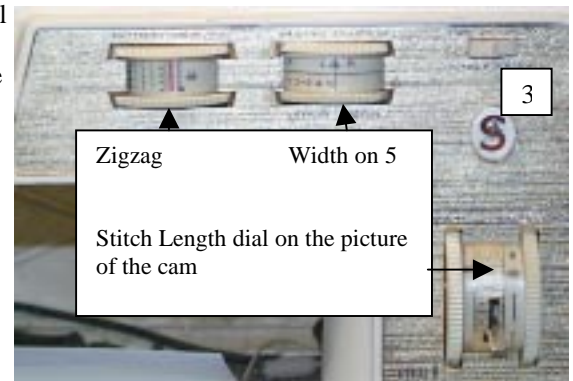
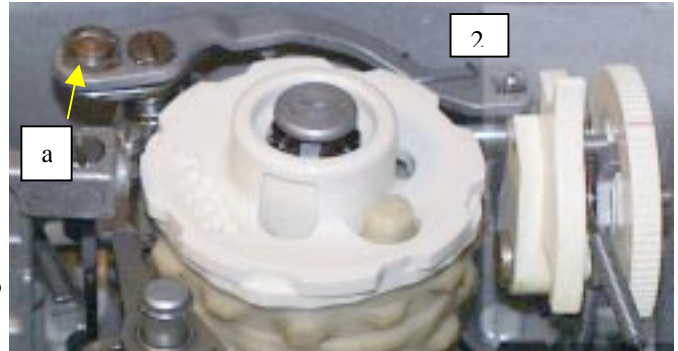
Models that do not have the external adjusting dial:

756, 776, 774, 724, 717, 714

To adjust any of the machines above, follow the outlines below. On those with the external dial, set the dial to the middle position, then balance the stitch. This will provide better control, and provide for a zero starting point. Before adjusting any of these machines, ensure that the feeding system is properly balanced first, and that the feed dogs are in good shape. Making this adjustment, and then going and adjusting the feed length will throw this adjustment out. I'd make this perhaps one of the last adjustments to the feed system. After completing this adjustment, go back and double check your buttonhole turn. It may require fine tuning of both to achieve pure harmony between the two.



1. Use Cam number 51, the feather stitch cam, for this adjustment
2. Ensure the balance dial, if equipped with, is set to the middle position. This can be achieved by putting the top back on, and locating the middle position. Or you may move the dial as far as it'll go to the back, then to the front, and position it in the middle of it's travel points.
3. Set the machine to zigzag, width to 5, and the feed length dial to the picture of the cam. (Fig. 3)
4. Using a piece of paper, and a size 14 needle, run the machine on slow and watch the needle penetrations. Adjust the eccentric until the needle is entering the same holes on the forward and backward feeding movements. (Fig. 4)
5. Loosen the locking screw, on top, and using a 3/8 open end wrench, turn the eccentric to balance the stitch. Turn the eccentric very slightly, this is a sensitive adjustment. (See fig. 2, item a)
6. Once balanced, your stitch results should match those shown in picture (5).

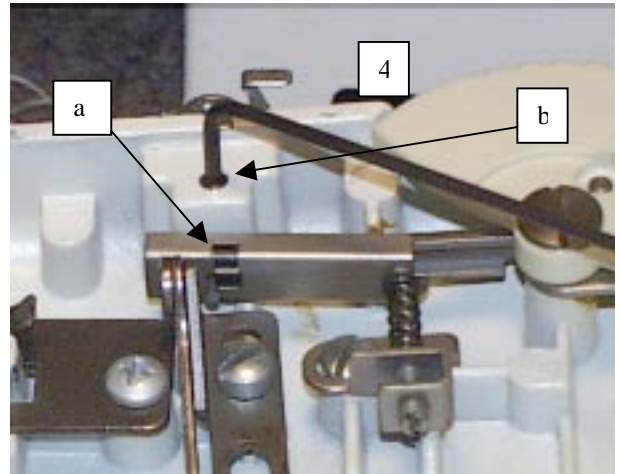
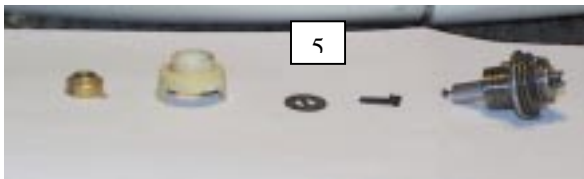
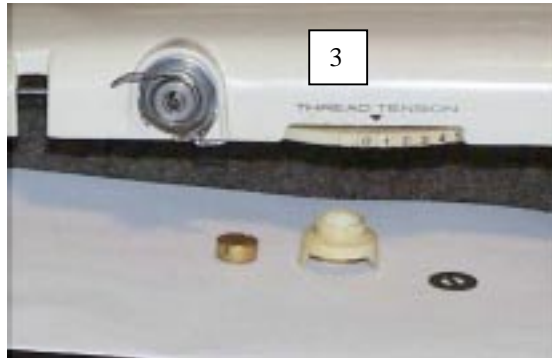


Top tension repair and adjustment:

On the web page, www.geocities.com/tf43, you'll find a tension repair and adjustment guide, unless I've moved the page to a new location, or have removed the file. If I've moved the page, I'd hope that I'm able to leave a redirect on the old site to the new one. If not, you can email me at tf43@yahoo.com and I can give you the new site, or file location. But to help, I'll redo that section here anyway.

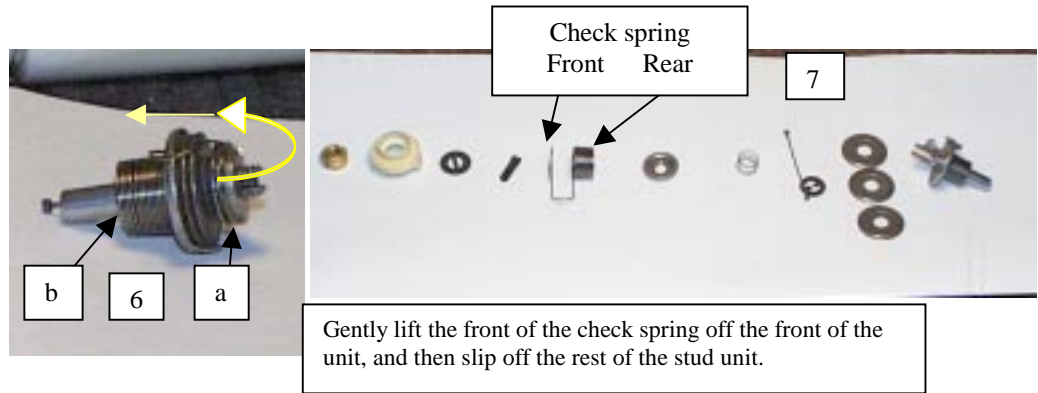
As mentioned in other sections, be sure to lay your parts out in the order they come off. This will help avoid confusion when you re-assemble the unit.

1. With the top removed, set the tension dial to zero. (Fig 1)
2. Using your round nose pliers, or similar tool, loosen and remove the lock nut by turning it CCW. (Fig 2)
3. Remove the plastic tension cap and black washer. (Fig 3)
4. Remove the tension releasing pin lock clip by lifting it straight up. (Fig 4, item a)
5. Using a 5/64 Allen wrench, loosen the setscrew. (Fig 4, item b)
6. Remove the tension unit. (Fig 5)

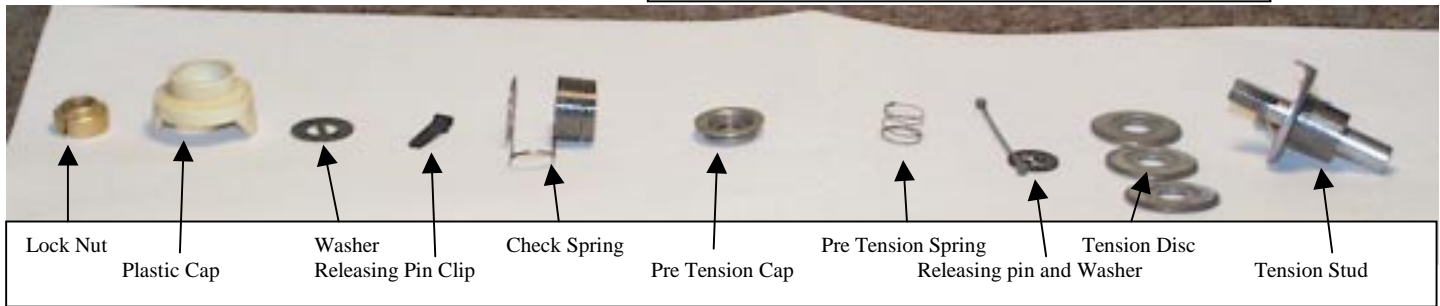


Top tension repair and adjustment (continued):

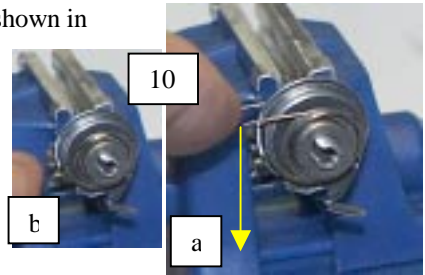
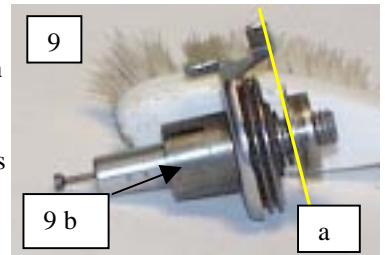
7. Very carefully, remove the check spring from the tension unit. This is achieved by gently pulling the front part of the spring off and over the back side of the unit. Then by slipping the large coil end off of the tension stud. (Fig 6, items a & b, and Fig 7) Be real careful not to bend the spring in any manner.
8. Disassemble the rest of the unit, and lay out as shown in (Fig 7).



Gently lift the front of the check spring off the front of the unit, and then slip off the rest of the stud unit.

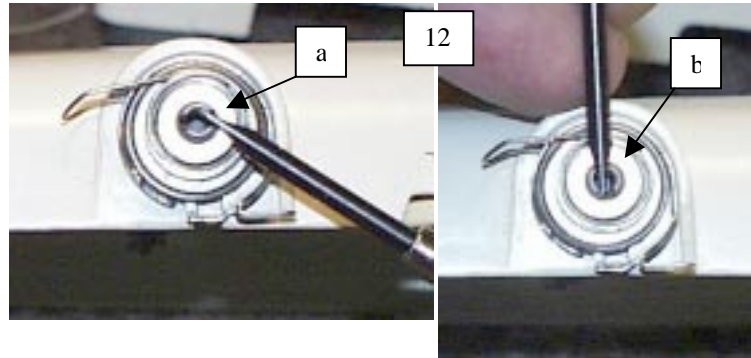
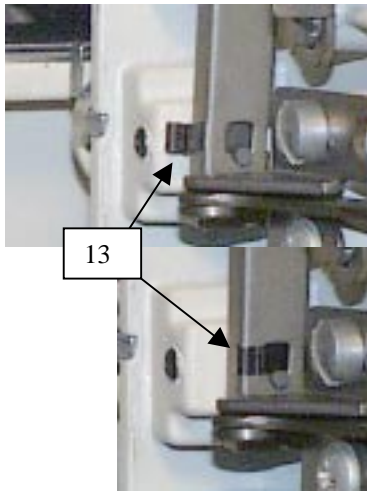
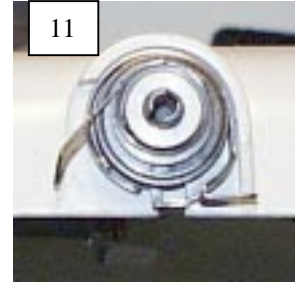


9. Check and ensure the check spring is in good shape, and isn't bent out of shape
10. Some units have a plastic unit that holds the large end of the check spring. Check and ensure this part isn't broken into, or cracked. If it is plastic, it is possible to glue some of the units together, and salvage the part. See figure (9 b for metal type, and 9 c for plastic type). If the plastic is split into, you'll need another stud unit, or a complete tension unit. Most shops that I know of don't sell just the stud unit. But perhaps your local shop may have a torn down unit that they are parting out.
11. Check the tension disc for rust, lint, or oil stains. The discs should be smooth and free of any roughness. Figure (8) shows a disc with a bit of rust, and oil staining. Again, ensure these discs are clean and smooth. Use a mild solvent, the gray polishing wheel with the Moto tool, or 800 to 1200 grit sandpaper to clean them up. **Tip:** If using sand paper, rub the sand paper on some other object first to wear the sand paper down. We don't want any scratches on these items.
12. After cleaning all the parts, re-assemble to the point as shown in figure (9).
13. Adjust the pre-tension cap so it is fairly even with the thread guide as shown in figure (9 item a).
14. We want to ensure the spring has free movement. Holding the unit in one hand, turn the stud unit to apply a little pressure to the spring. Figure 10 shows the tension unit being held with a small vice. Well, it's a little hard to take pictures and hold the unit with both hands, but I think you should get the idea. The spring should move freely up and down. See figure 10
15. Push the spring downwards, figure (10 – a), to about the point shown in (10 – b), and then release the spring. It should return to the top point without any hesitation.

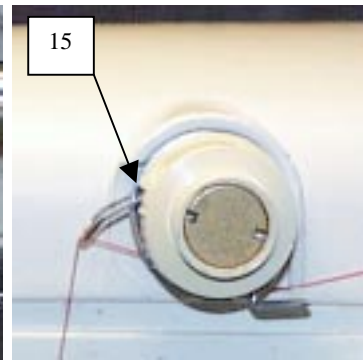


Top tension repair and adjustment (continued):

16. Put the unit back into the top cover, but don't tighten it just yet. (Fig 11)
17. Using a small screwdriver, or other small object, turn the stud CW until the spring just makes contact with the top lid casting, as shown in figure (12, item a).
18. Then turn it ¼ turn more CW, and tighten the setscrew. This sets the check spring to the correct tension pressure. (Fig 12, item b)
19. Position the tension releasing pin into the little cupped area, and slide the lock clip into place and snap it down. (Fig 13)



20. Now we want to set the overall check spring travel. This is very important, and must be adjusted properly. If not, it is possible that it could cause skipping stitches, breaking threads, and a stitch that is always out of balance. To adjust the unit, put the top cover back on the machine, insert a needle into the needle clamp, and thread the machine on up. Insert a pre-wound bobbin in the machine, and no it doesn't matter at this point if the threads are the same type, or color. Turn the machine several times towards you by hand to start a uniform stitching action.
21. Turn the hand wheel again and stop just as the eye of the needle starts to enter the fabric. See (Fig 14).
22. At this point we want to adjust the white tension cap to the point so the check spring is resting on the cap edge. See (Fig 15). Tighten the lock nut at this point. Turn the machine several more times and double-check the overall travel of the spring. The spring should stop all travel after the needle eye has entered the fabric.



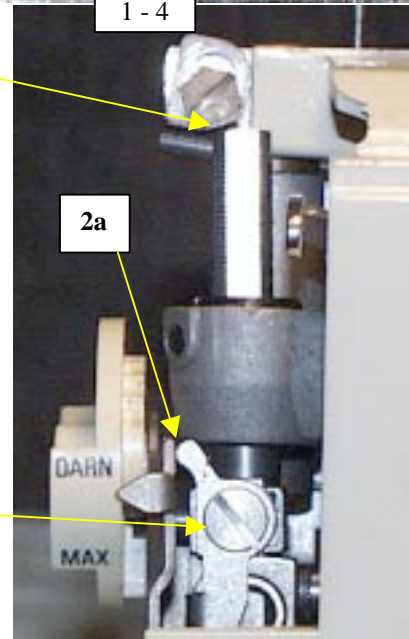
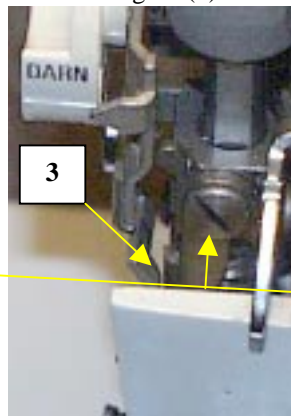
High Speed Basting Stitch Adjustment:

Not all units are equipped with this feature, so if yours isn't, just skip this section.

For this feature to work properly, the [fiber washer](#) that goes behind the main shaft counter weight must be in place. In the past, I've seen to many repairs shops leave the washer out, and attempt to adjust this unit, but believe me, it just will not function correctly if that washer is missing. It'll chatter, take extra stitches when it shouldn't, and most certainly will not work at high speed. Now most of you may have never even used this feature, and find hand pinning things together much easier. Either way, I feel it is very important for that washer to be in place. If just for the simple fact that it keeps metal from rubbing against metal, and wearing out the main bushing in the machine. Once that happens, you might was well off the machine for parts. So if the washer is missing, lets get that washer in place first. One nice thing is, most after market manufactures have come up with a snap in replacement, rather than the stock Singer washer, which is a complete ring and requires removing the main shaft from the machine. Go to the major parts section, [and replace the fiber washer](#) first, then come back to this section and adjust the basting unit. Also be patient here, this isn't that simple of an adjustment. You'll be adjusting 3 items at once to bring into pure harmony. But we can always hope that the unit will work properly once the washer is in place. If none of the 3 adjustments have been tampered with, there is a good chance that it will be ok. I'd suggest trying it out first before making any adjustment at all. I also don't have any spec's on what the clearances should be, this is rather adjust by feel and function, as all machines differ slightly in this area. And yes Singer did cover it in the master manuals with specs, but I always found it to be just a little different each time, and besides, I don't have the specs anymore anyway.

To adjust, follow these steps:

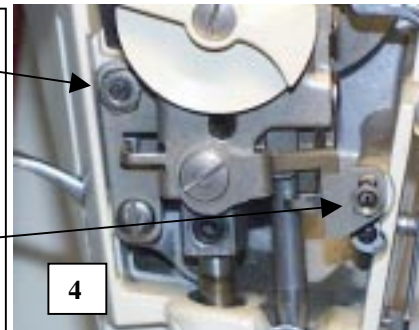
1. Make sure it is set on "straight stitch".
2. Set the machine in "right needle position".
3. Set the width dial to "5".
4. Set the presser bar pressure to "darn".
5. The lever should just start to touch the bracket where the "(darn) or presser bar pressure dial" is mounted on, but have very minimal clearance, no more than .005, and less is best. See figure (2a).
6. Also with the needle bar at its highest point, the stop spring should just have about .010 clearance (10thousands).
7. Now turn the hand wheel towards you until the units lower part is adjacent to the lower part of the bracket. See figure (3a). This clearance will be around .005, and no more than .008.
8. Adjustments for step 5 and 7 are shown in figure (4).



Note: This part is adjustable also. Rarely it needs adjustment, unless the unit is gummed up with oil and does not move freely.

Adjust step 5 (2a) here. Loosen lock nut and turn screw slightly to achieve clearance.

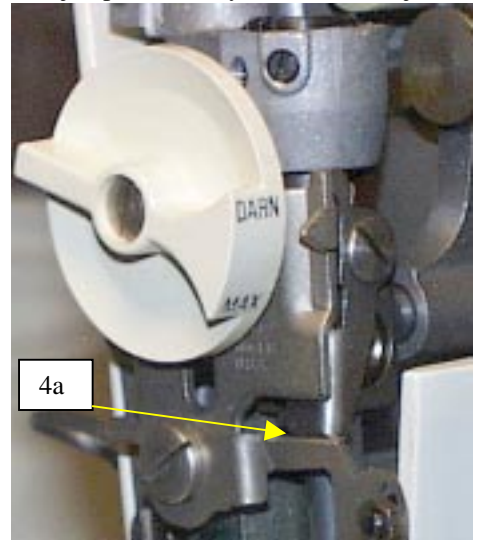
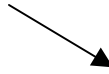
Adjust step 7 (3a) here. Do the same. Loosen the lock nut and adjust for clearance.



High Speed Basting Adjustment (continued):

9. Now set the stitch pattern to the Basting Stitch, and watch that the lever snaps over to the left a bit more. And also watch that the lever now just sets on top of the lower bracket. See figure (4a)
10. With all the adjustments being correct, the basting stitch function will begin to work as smooth as silk, and will continue to do so at high speed. Run the machine without any thread or needle, and watch the performance of the function as the needle just takes a stitch every now and then. If it chatters, or jumps erratically, continue to adjust the clearances until it is nice and smooth in performance.

I know this is a tough adjustment for the novice, but again, with some patients, you'll get it working just fine. With all the adjustments just right, the unit will resemble this picture.

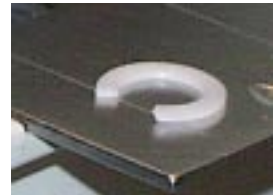


Major Parts Replacement:

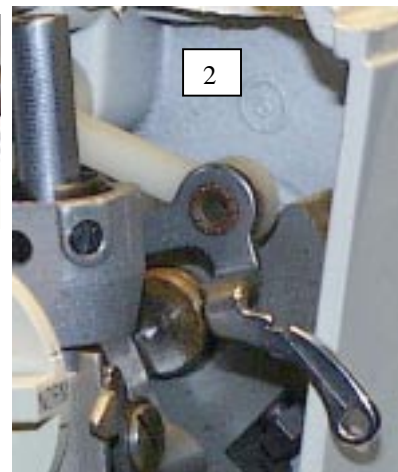
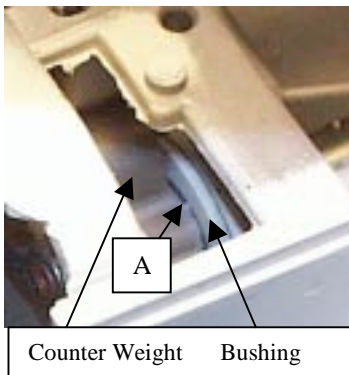
In this section of the manual we'll cover major parts replacement, starting with the easier parts, and work our way through to the most difficult parts. Some areas will require some special tools shown above in the tools section, and a great deal of patience. If you're not the mechanically inclined, I recommend you take your machine to a professional service center, which has a really good Singer knowledgeable repairman. There are shortcuts, and I've seen quite a few of them put into use. However the end results are a machine that continues to breakdown causing you nothing but pure grief, and considerable funds to have repaired again and again. So let's do it right the first time. If possible, when replacing parts, attempt to purchase genuine Singer parts. There are a great deal of aftermarket parts out there, most of which do work just fine, but require a little fine tuning. You may have noticed that in the previous sections as we replaced some minor parts. And let us also remember to practice safety; don't do something stupid with your hand tools. Ok, are you ready? Let's go for it.

Main Shaft Fiber Washer Replacement:

With the new after market washers that snap into place, this repair is a snap. (See picture on the right). If your local shop doesn't have the snap in washer, and has the genuine Singer washer, then skip on down to the timing belt section, as we'll have to remove the entire main shaft in order to replace it. And if you're that far into the machine, I'd replace the timing belt anyway. Unless you've recently had a timing belt installed that is, and I guess that the washer was replaced also, that is if the shop does the job properly. To determine if the washer is broken, most commonly you'll find half of it, or at least part of it, lying down inside the needle bar area behind the face plate area. Open the face plate, remove the top, and look inside to see if you see any half round plastic washer. Or if the machine all of a sudden developed a knock when doing zigzag stitching, and the hand wheel can be pushed in and out a little, I'd suspect the washer is missing. It's sort of hard to determine if no parts are lying in the area above, but let's take a look anyway and see if we can see the little critter. It's located just between the main shaft bushing and the counter weight as seen in figure (A).

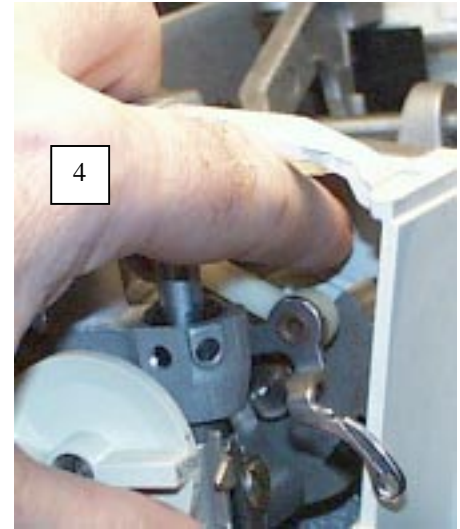
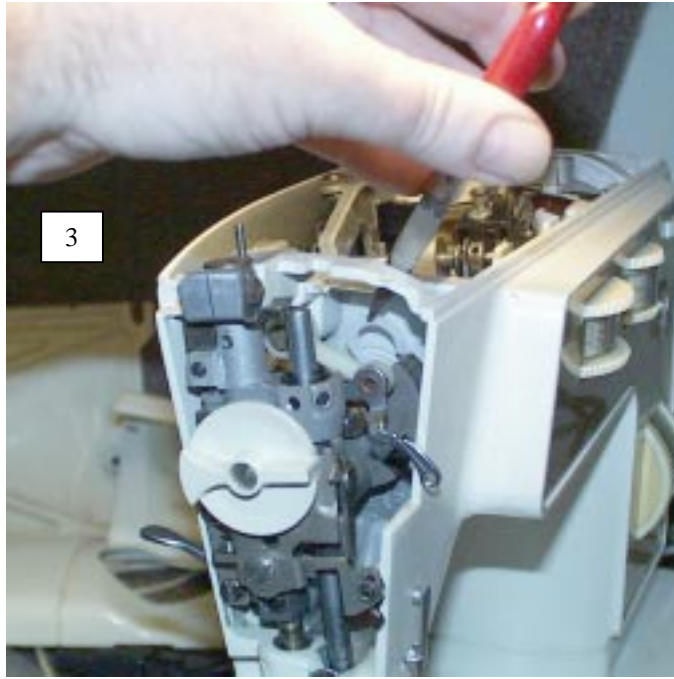


1. Remove the retaining collar, as seen in figure 1, and referred to on [page 11](#) earlier in this manual.
2. Position the take up lever so it is on a downward movement and out of our way. (Fig 2)



Main Shaft Fiber Washer Replacement (*continued*):

3. Get your new washer ready to go by grabbing it gently with a small pair of needle nose pliers. (Fig 3)
4. Work it around the main shaft, and then reach in and push on into place with your finger. (Fig 4)
5. Reinstall the retaining collar, as laid out on [page 11](#).

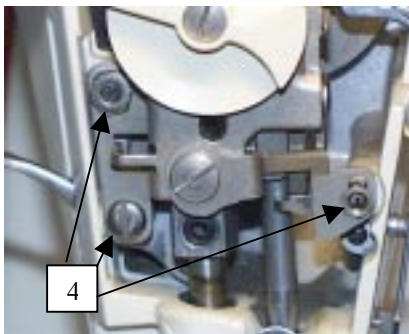
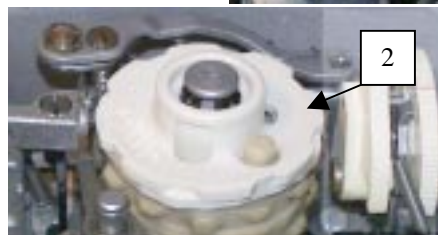
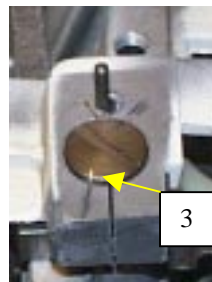


Drive Belt Replacement:

This is one of the hardest repairs to complete, next to repairing a broken buttonholer that is. So far, in previous sections, we've removed the hand wheel, needle bar and front plastic panel. To replace the timing belt, we need to remove the following parts:

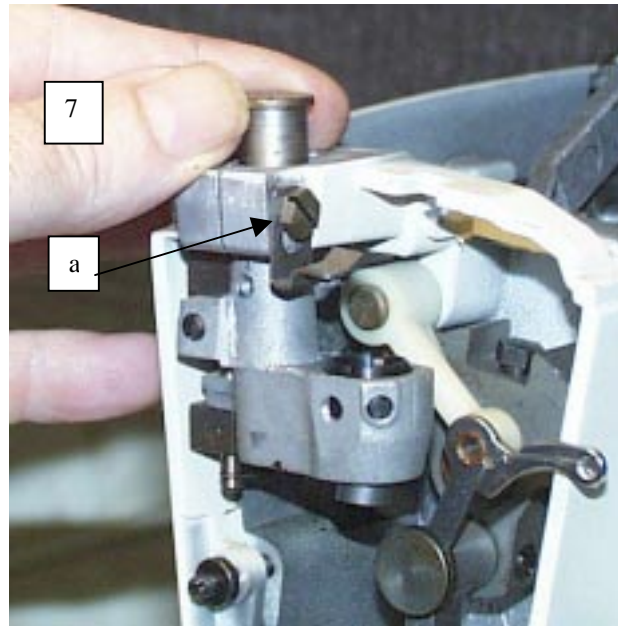
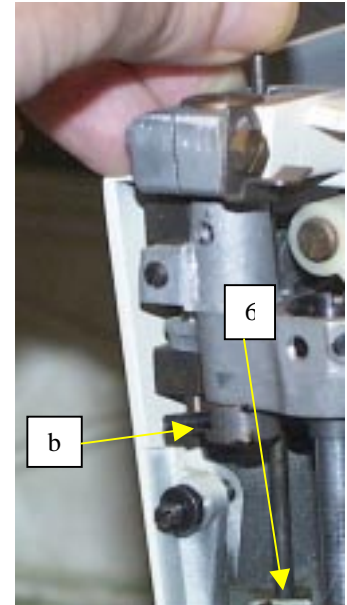
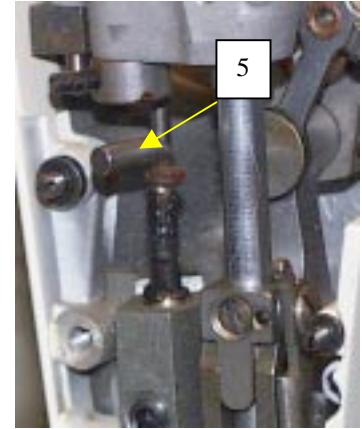
- Front Plastic Panel
- Needle bar assembly
- Cam Stack

1. Remove the top cover, face plate and bottom pan cover.
2. Remove the front Emblem by gently working it off by prying it from the top downward. Behind the emblem should be a panel fastening screw, remove that as well.
3. Set the stitch length to 6, and hold the reverse lever down. Then gently insert a small screwdriver in the slot where the emblem was, and work the panel off the front of the machine.
4. Remove any add on pattern cam you may have installed (fig 2)
5. Scribe a line in the needle bar eccentric with your Moto tool, using a cutting wheel. If you don't have the Moto tool, use some other means to scratch a mark that will not wash, or wipe off. This mark will need to be used to realign out needle bar when we reassemble the unit. (fig 3)
6. In figure 4 below, remove the two nuts, and screw that hold the pressure dial unit on. When removing the two nuts, be careful that the two screws that the nuts are on move, or turn. If they do turn, don't give it to much mind, as we're going to have to check the basting adjustment when we put it back together. Just try to not let them turn too much, it'll make the adjustment easier later.

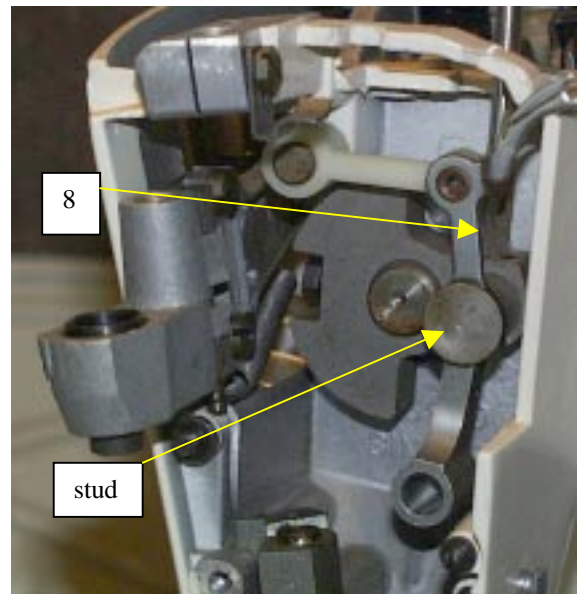


Drive Belt Replacement (continued):

7. Now the pressure dial unit is removed, remove the pressure bar regulating extension pin. (fig 5)
8. Before removing the tension releasing pin, pay attention to its location, then pull it straight upward to remove. (fig 6)
9. Next, loosen screw (a) and then loosen screw (b) in figure 6. The screw in figure 6 will require a 5/64ths Allen wrench. Remove the needle bar eccentric pin by working it upward. (fig 7) You may find these parts a little difficult to remove if they are oil stained, and gummed up. Use a little solvent or other degreaser to help assist in this. Just make sure to not get it on any paint or plastic parts.

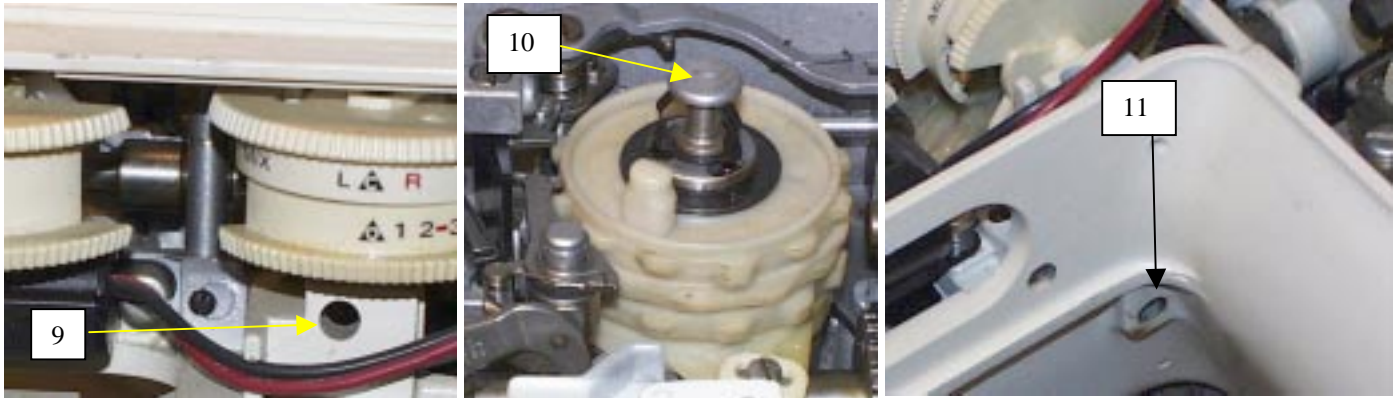


10. Remove the take up lever by turning the hand wheel to position the main shaft counter weight to this position. Insert the screw drive down through the top and loosen the setscrew that holds the take up lever stud in place. (fig 8)



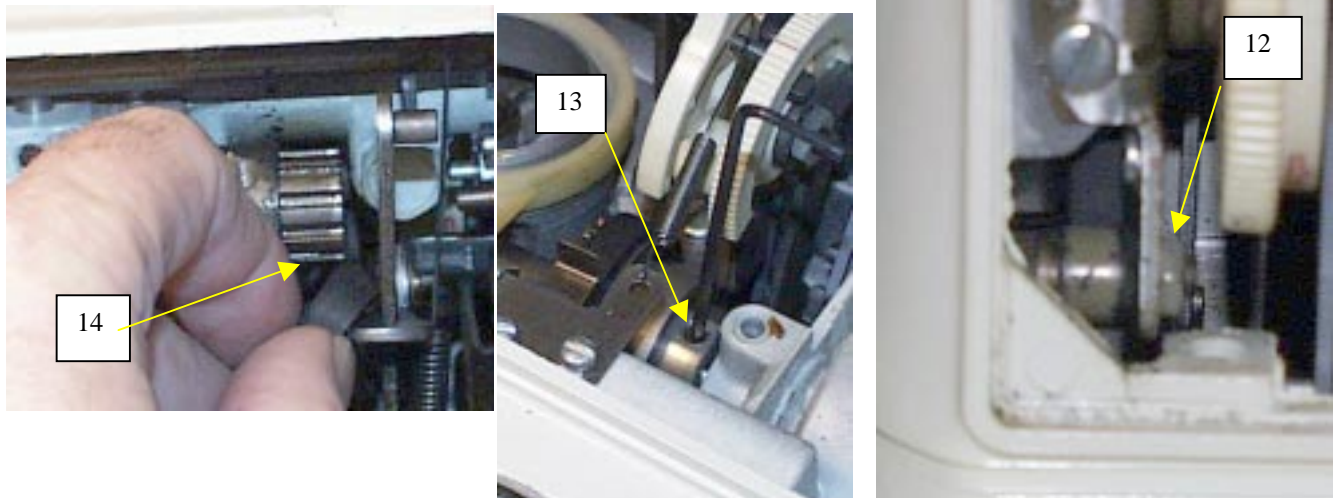
Drive Belt Replacement (*continued*):

11. Now that the needle bar end is pretty well cleaned out, we need to remove the cam stack.
12. Locate the pinch screw through hole (a) in figure 9, and loosen about 3 turns worth.
13. Once the setscrew is loose enough, but not all the way out now, it'll be difficult to put back in if you removed it all the way. You'll need a small magnetic screwdriver or launcher to reinstall it. Start working

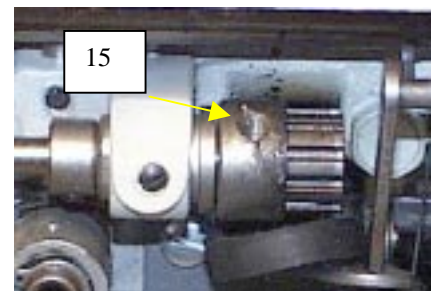


the cam stack eccentric pin loose and pulling it upward (fig 10). To help, you'll find a hole underneath the frame where the eccentric pin comes through (fig 11).

14. Loosen the drive belt tension stud nut (fig 12).
15. Using either 3/32nds, or 5/64ths Allen wrench, remove the screw that holds the belt cog to the main shaft (fig 13).
16. Remove the belt from the lower drive-timing cog. This will relieve any tension that is still being applied to the top main shaft, and make its removal easier (fig 14).

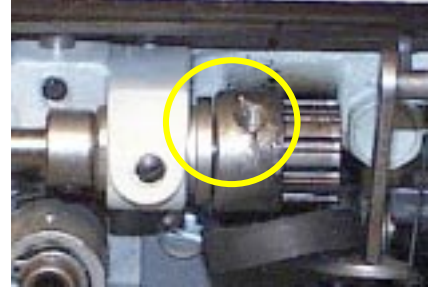


17. Once the belt is off the lower cog, and you have the top shaft removed from the machine, you can remove the drive belt and insert the new one. Reassemble in reverse order.



Repairing a damaged lower timing cog:

Now I'm going to have to change some direction here, as I ran into a minor problem with my timing cog setscrews. Later series 700's used 3/32 Allen screws, while some of the earlier models used 5/56ths. See figure 15 for timing screws. And sometimes you may find that one of the setscrews has been rounded out, and your Allen wrench will not loosen the screw. This is where the Moto tool is a must. Using the cutting wheel, I cut a screwdriver slot into the screw, as well as part of the cog. That's ok, at least I have a slot in the screw now that will allow me to extract it. You may find that you will need to use a small hammer and small punch to tap the little bugger loose with. Using a screwdriver doesn't always work, even though you have the slot cut into it. Once it's loose, go ahead and remove it and throw it away. We're going to have to drill and tap the cog for 3/32 setscrews. To repair this, we'll need to remove the motor, and get the cog out of the machine. This will all be continued, and I'll redo the timing belt in the beginning of that section as well. Cleaning up a document this intense, meaning file size and such, is just more than I can handle right now. Either way, I hope your enjoying this manual so far. Please bear in mind, it is my first in a series, and I've learned quite a bit more on how I should assemble something of this nature.



Please refer to the next section, [700SeriesRepairS2](#), for the rest of this manual.

Regards,
Terry

Hi Folks,

Welcome to Section 2 of the manual. In this section, we will finish off the timing cog repair, replace the timing belt, and repair/rebuild the buttonholer. For the buttonholer, it'll only cover replacing the 2-step dial. In most instances, I've seen users push the dial backwards, and all this does is tear the teeth off the dial. Which will render one side of the dial useless, as the dial does have two working sides. Meaning, there are two-step 1's, and two step 2's on the dial. So, if you're one of those that pushed it backwards, or upwards instead of only downwards, chances are you've wiped out one side of the dial, and have a buttonholer dial that just sits in one place and does not continue to click on over to step 2. The overall end results are, your buttonhole does not make the complete turn on step 1, or does the same on step 2, and requires that you manually click the dial forward a little to complete the turn.

I'll also throw in what ever I think I might have missed in Section 1.

Links to the repairs are all displayed in blue, I hope, or at least underlined and will show the mouse as a hand pointer. But to make it easier in this section, I'll list links at the beginning of the pages. I've learned a little more about putting this type of document together, and I hope you'll find it easier to use than Section 1. Do be sure to print out the parts schematic if you can, you'll find it rather useful.

Well here it is, July 9, 2004. I started this manual last year sometime, don't recall just when now. But on an average, it has taken about two hours per page to complete. Just to note, a real good Singer Touch & Sew repair person (note not repairman), should be able to complete an entire tear down, tank cleaning, and reassemble in about 2 hours. Well, that's what it would take me anyway...grinning. Hope you all enjoy this manual, as it'll be a very long time before I attempt another full one like this. I will have to be retired to give something like this the attention it deserves, and not have it take over a year to complete.

Table of Contents:

Table of Contents:.....	2
Major Parts Replacement (<i>continued from Section 1</i>):.....	3
Timing Cog Repair:.....	3
Timing Cog Repair (<i>continued</i>):.....	4
Timing Cog Repair (<i>continued</i>):.....	5
Drive Belt Replacement:.....	6
Drive Belt Replacement (<i>continued</i>):.....	7
Drive Belt Replacement (<i>continued</i>):.....	7
Drive Belt Replacement (<i>continued</i>):.....	8
Drive Belt Replacement (<i>continued</i>):.....	9
Drive Belt Replacement (<i>continued</i>) along with a sticky Pattern Selector:.....	10
Drive Belt Replacement (<i>continued</i>):.....	11
Drive Belt Replacement (<i>continued</i>):.....	12
Drive Belt Replacement (<i>continued</i>): Cam Stack Adjument.....	13
Buttonholer Repair:.....	14
Buttonholer Repair: (<i>continued</i>).....	15
Buttonholer Repair: (<i>continued</i>).....	16
Buttonholer Repair: (<i>continued</i>).....	17
Buttonholer Repair: (<i>continued</i>).....	18
Buttonholer Repair: (<i>continued</i>).....	19
Buttonholer Repair: (<i>continued</i>).....	20
Buttonholer Repair: (<i>continued</i>).....	21
Buttonholer Repair: (<i>continued</i>).....	22
Items Not Included In Section 1:.....	23
Bobbin Winder Replacement & Adjustment:.....	23
Bobbin Winder Replacement & Adjustment: (<i>continued</i>).....	24
Hook Removal:.....	25
Additional Bobbin Winder Adjustment Information:.....	26
Notes:.....	28

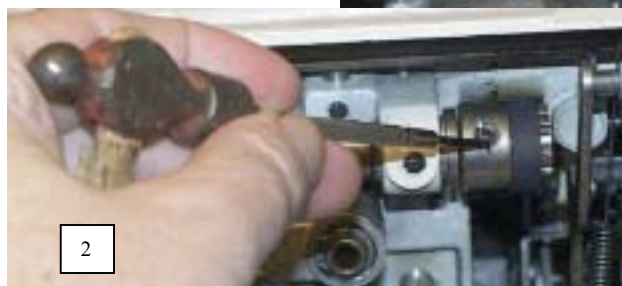
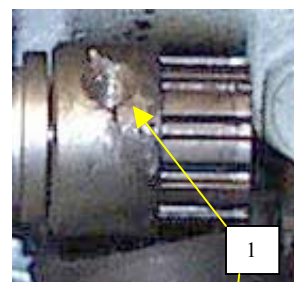
Major Parts Replacement (continued from Section 1):

Timing Cog Repair:

As we started to talk about in Section 1, I ran into a problem with my Lower Timing Cog. Also called a “Rotating Hook Drive Shaft Belt Pulley”, part number 174282-001, and found on [page 23](#) of the schematic. My machine has one of the cogs that use the smaller 5/64ths setscrews, and one is damaged. The Allen head is rounded out, and my wrench will not break it loose. Hence, I’m unable to time the machine until I have repaired this damaged part. Now, it is a very good idea to go ahead and enlarge the cogs setscrews to the 3/32nds size. This will provide a better grip on the drive shaft, and less chance of it slipping time. Plus the larger screws are easier to work with. Either way, we need to remove this cog, and repair it, or replace it. You may find it easier to check around with your local sewing machine shops, and see if they have any torn down Singer Touch & Sews, and are willing to sell you this part. But ensure you’re getting the one with the larger setscrews. If you choose to tap the cog, you’ll need a 10-32 NF (10-32 = thread size & NF = National Fine) Tap. It isn’t really necessary to drill the holes to the larger size, as the cogs metal is soft enough for a tapered Tap to resize and cut the new threads correctly. However, I’ve found it a good rule of thumb to go ahead and drill the item first, so if you do, you’ll need a #21 drill bit, which should be about a 5/32nds drill bit. Only reason being is, when we go to install the new belt, more often than not, you’ll find that the setscrews are inaccessible when you go to set the hook timing. So if you drill the holes out, go ahead and drill all the way through the cog, making a new hole on the opposite side, and tap all the holes for the larger setscrews. And before I forget, these screws should be available from you local dealer as well, but if not, perhaps your local hardware store will have them. You want a 10-32 Allen screw, with a hex head size of 3/32nds, one quarter inch (1/4) in length. Go ahead and purchase 4 of them, they’re cheap enough, and if you make 4 holes in the cog, go ahead and use them all. But let me note something very important; do not purchase screws that have a pointed tip. You want some that either have a flat point, or are equipped with tiny little teeth. A pointed setscrew will dig into the shaft when you tighten it up, leaving an impression in the shaft, which will make it very difficult to retime. Each time you go to move the position that indentation in the shaft will cause the setscrew to crawl back to the original position. And, it’ll become very difficult to remove the cog if necessary.

[Table of Contents](#)

1. First we need to remove the old damaged setscrew. To achieve this, use the Moto tool and cutting wheel to cut a screwdriver slot in the setscrew. (Figure 1)
2. Using a small hammer, as shown in figure 2, and a very small punch, or very sturdy small screwdriver, start tapping the screw loose until you can get it to come out easily. Tap in a counter clockwise motion, and for goodness sakes, don’t go after it with huge amounts of force. You could bend the shaft the cog rides on. Just gentle little tapping motions will work the thing loose. If you must, then drill it out. But if you do have to drill, remove the other screw and get a good idea of just how far you need to go. We certainly don’t wish to drill right into the shaft either. In my 20 years, I’ve never seen one refuse to come out. Just be patient, it’ll come loose. If necessary, cut a bigger groove in it with the cutting wheel.
3. Once you have the setscrew removed from the cog, we need to remove the cog from the shaft.



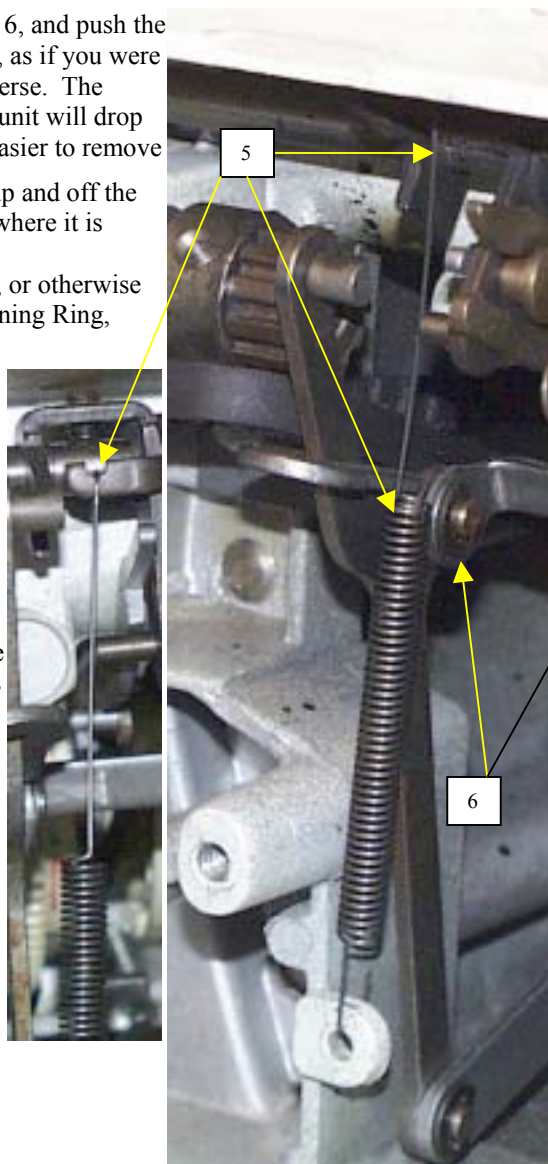
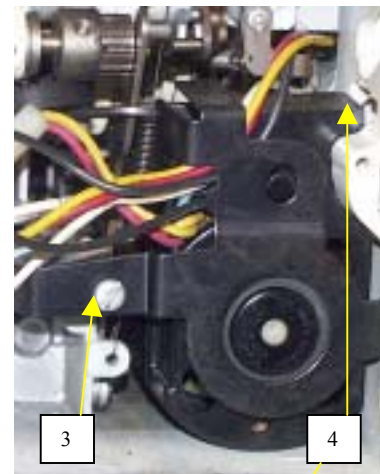
Timing Cog Repair (continued):

4. Remove the motor bracket, by removing the screw shown in figure 3, and work the bracket off the motor. Work the wires down and out of the bracket.
5. Once you have the bracket off, be careful not to loose the rubber base mount. This item helps cushion the noise from the motor. It is also fitted into the bracket, so if it comes off the motor, not to worry, the fitted end goes into the bracket hole. Work the motor out of the machine, by rocking it sideways, and pulling down on it. If necessary, use the screwdriver, and from the top of the plug housing, gently start prying it downward. Just be careful and don't overdo the pressure and crack the housing. See figure 4 for prying position.
6. Now that the motor is removed, and can start removing the necessary components to remove our timing cog.
7. Remove the reverse pressure spring, figure 5. To assist in this, have the

stitch length dial at 6, and push the reverse lever down, as if you were going to sew in reverse. The spring and bracket unit will drop some, and it'll be easier to remove

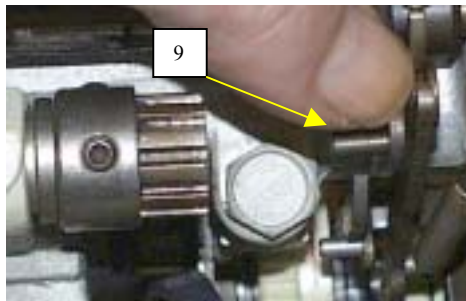
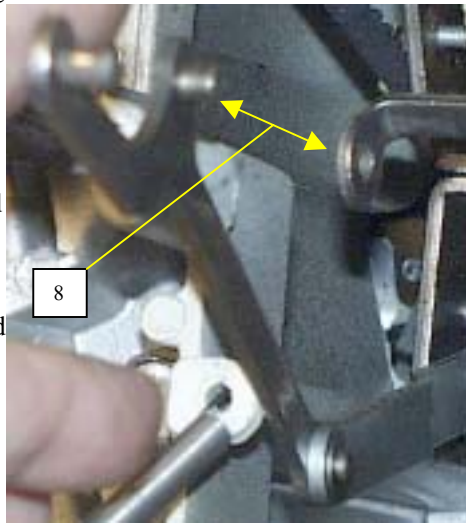
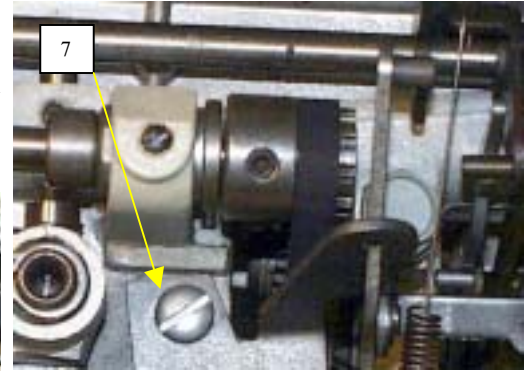
the spring. Lift it up and off the upper bracket slot where it is hooked in.

8. Remove the C-clip, or otherwise known as the Retaining Ring, from the Feed Driving Arms upper connection, figure 6. When removing the C-clip, be careful, they have a tendency to go flying across the room. These parts can be found on the schematic on pages 15 & 18.



Timing Cog Repair (continued):

9. Now that we have the clip off, lets remove the guide bracket. Remove the screw shown in figure 7, and remove the guide from the machine.
10. Separate the upper connection, and move the Feed Driving Arm out of your way. Figure 8
11. With one hand, turn the hand wheel, and start removing the belt from the lower drive cog.
12. Push the part shown in figure 9 down and out of the way. While holding it down, slid the drive cog off the shaft, and remove from the machine.
13. If you choose to, go ahead and drill the cog all the way through one of the existing holes, and completely out the other side. If you don't wish to drill, skip to step 14.
14. Once the cog is drilled out, we can tap it with new threads. If you drilled it all the way through, start the tap and continue till it comes out the other side of the cog. Figure 10. **Note:** To ease the process, use a little oil on the Tap, and work it back and forth as you cut the new threads. In other words, once the Tap starts getting harder to turn, turn it a couple times clockwise, then turn it one time counter clockwise. This frees up the cutting debris and allows for smoother tapping operation.
15. We'll leave the machine like this, and replace the belt.



[Return to Main Shaft, Timing Belt Section](#)



Drive Belt Replacement:

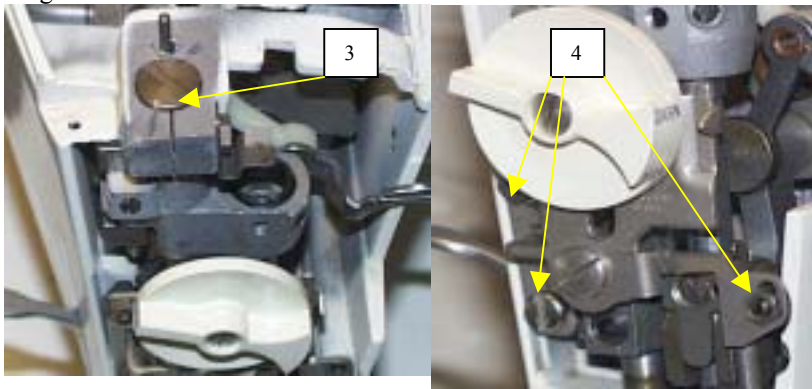
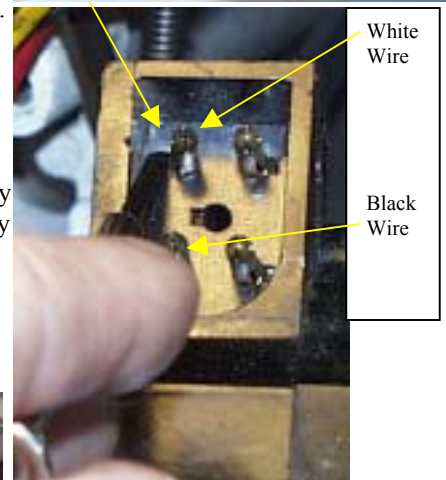
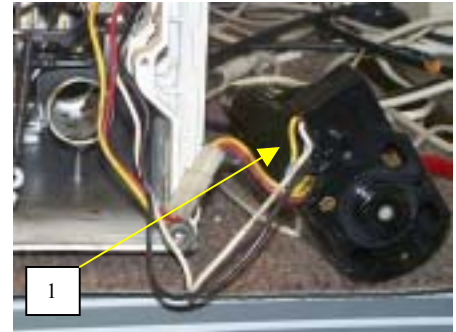
If you all ready replaced the belt from Section 1, then you may wish to just skip this section. However, if you found Section 1 a little difficult, or lacking information, lets repeat the procedure now. This is a major job, and involves lots of other parts and adjustments, so it'll skip around somewhat.

You'll need to remove the following parts, if not all ready done:

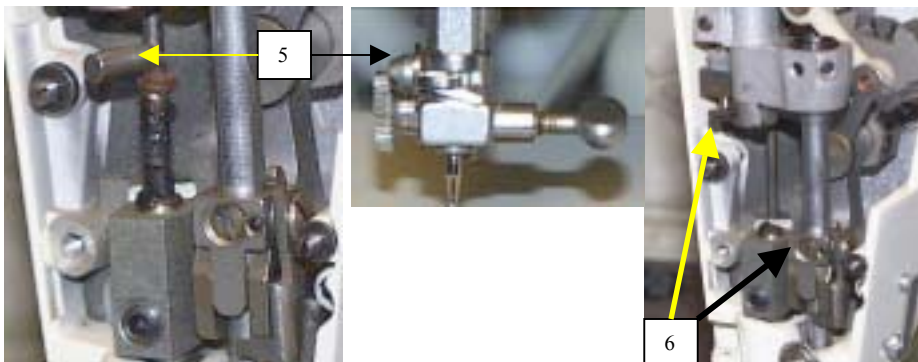
[These parts are found in the schematic on pages 5 & 7.](#)

- Arm Top Cover
- Face Plate
- Control Panel
- Bed Cover (Bottom Pan)
- Remove the Presser Foot
- Remove the Needle Plate, page 9 of the schematic.

1. You may want to slide the motor back into the machine. Or you may wish to remove it completely.
2. To remove it completely, unplug the harness with the red and yellow wires.
3. Inside the area where the cord plugs into the motor, you are able to depress the little catch pins on the terminals, and slide them out of the motor housing. The white wire goes to terminal P, and the black wire to terminal L. Those are normally marked on the backside of the motor where the wires go into the housing. Figure 1.
4. Ok, motors out of our way. But let's repair the terminal pins so they'll stay put when we put them back in the motor. Using a small screwdriver, gently lift the part back up that you depressed. Figure 2.
5. Ok, on to the rest of the belt removal.
6. Set the Presser Bar Dial to "Darn".
7. Using the Moto tool, inscribe a line in the Needle Bar Eccentric Pin. Figure 3



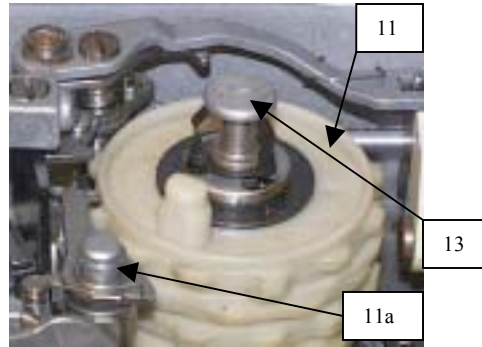
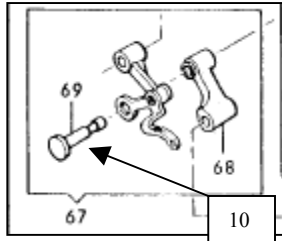
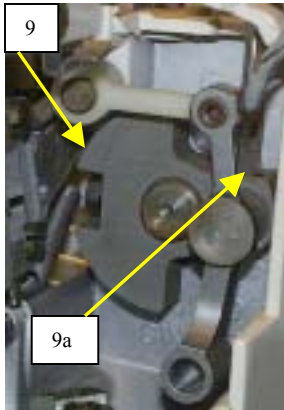
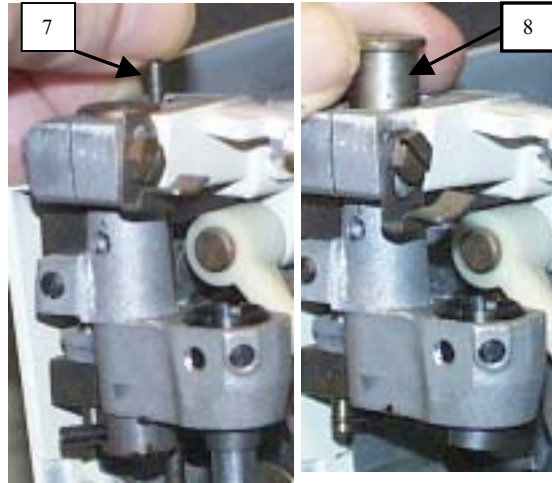
8. Remove the screw and two jam nuts that hold the Presser Bar Pressure Dial on. Figure 4.
9. Remove the Pressure Pin. Figure 5. Then remove the Needle Clamp unit.
10. Loosen the Needle Bar pinch screw, figure 6's black pointer, and remove the Needle Bar by pulling it out through the top of the machine.



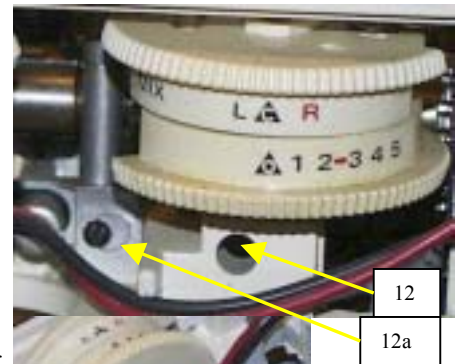
11. Loosen the setscrew that holds the Eccentric Pin in place, figure 6's yellow pointer. The item you inscribed a line in, in figure 3. Pay attention to its location, as it has clear the Presser Bar Dial Bracket on re-assembly, and has to be accessible for later adjusting. The Allen wrench size is 1/16th.

Drive Belt Replacement (continued):

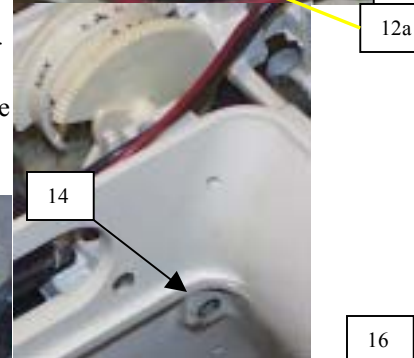
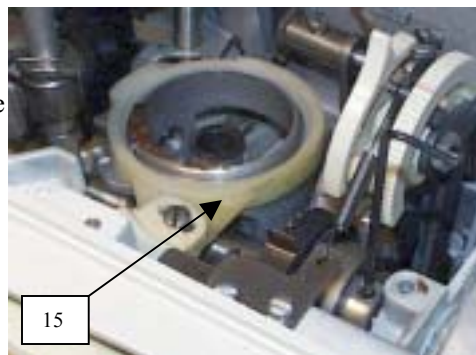
12. Remove the Tension Pressure Releasing Pin, Figure 7, by just pulling it out.
13. Remove the Eccentric Pin, figure 8. You may have to work it back and forth to get it out. It'll also help to apply a little pressure and hold the Needle Bars upper guide in place while removing the pin.
14. Position the Take Up Lever, as shown in figure 9, to this position, and loosen the setscrew in the Main Shaft Counter Weight. Figure 9a.
15. Work the Take Up Stud out of the Counter Weight, part 69 in figure 10, and remove the entire Take Up Lever unit.
16. Now we're ready to remove the Cam Stack, or as the schematic refers to it, the Disc Stack. Figure 11. And the Cam Stacks Pattern Follow Post. Figure 11a.



17. To remove the Cam Stack, insert the screwdriver through the hole shown in figure 12, and loosen the setscrew that is located in behind the access hole.
18. For now, leave the Add On Pattern Clip in place, figure 13. Start to work the Eccentric Pin out of the Cam Stack by pulling it upwards. It'll help to hold the Cam Stack down while doing this. Also, underneath the machine arm, is an access area to help push the Eccentric Pin out. Figure 14.
19. Once the Pin is out, remove the Cam Stack. This can be made easier by pushing the Pattern Selector Dial inward, as if you were going to change from Straight Stitch to Zigzag. This takes the pressure off the Cam Follower, figure 17, and will allow the Cam Stack to be removed without too much difficulty.
20. Once the Cam Stack is removed, try not to let this part slip out of place, as it can be a little tricky getting it back in

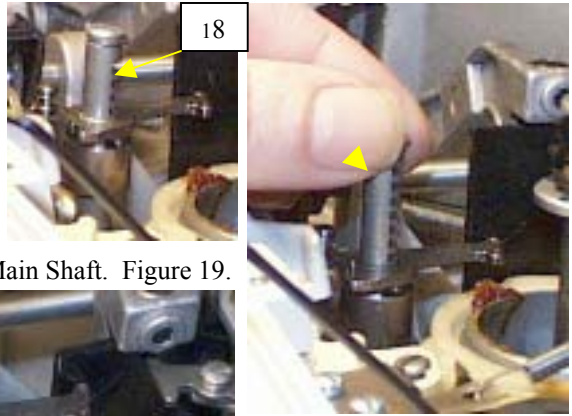


properly. Figure 15. It is recommended that you put the Eccentric Pin back in place without the Cam Stack for now. Figure 16.

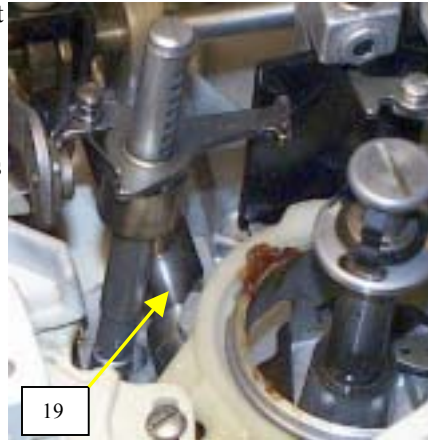


Drive Belt Replacement (continued):

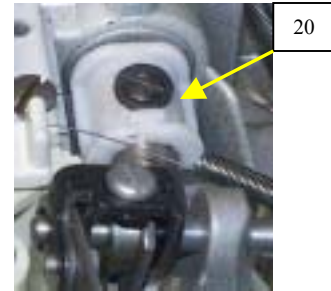
21. Now loosen the setscrew shown in figure 12a, and lift the Cam Follower and Post Unit out. Previous page. It'll help to work it out a few notches at a time. Push the Pattern Dial in, slide the follower down on the post, and lift it upwards a bit more till it clears the machine casting. Figure 18



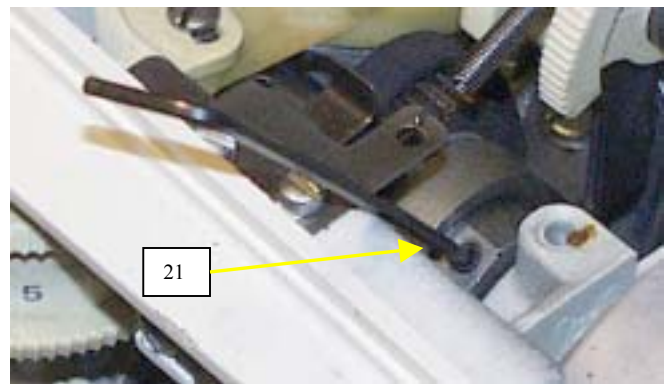
22. Pay attention to the way the spring is wrapped around the post, just in case it pops off the Cam Follower. Now just let the post rest in a position so it clears the groove in the Main Shaft. Figure 19.



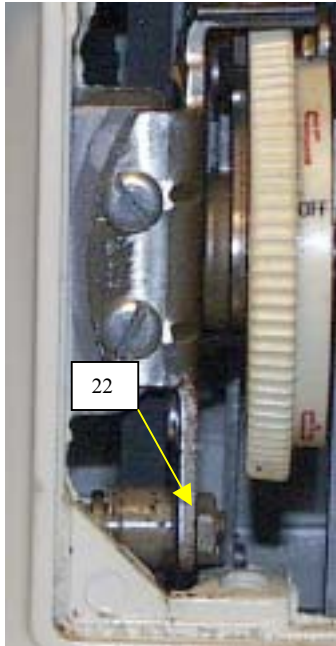
23. Remove the Retaining Collar, as laid out in [Section 1](#), starting on page 11. Figure 20



24. Remove the setscrew in the Upper Timing Belt Cog. Figure 21.



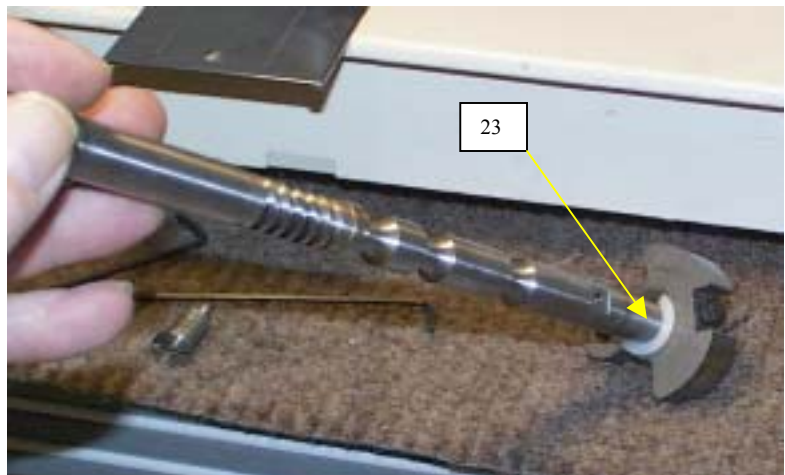
25. Loosen the Jam Nut on the Timing Belts Idler, and work it forward. Figure 22.



26. [Remove the Hand Wheel](#), as laid out on page 26 in [Section 1](#).

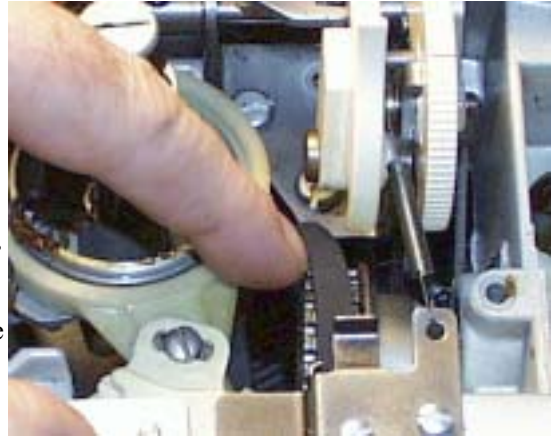
27. Before working the Main Shaft out of the machine, from right to left, be sure to remove the Timing Belt from the Lower Cog. Refer to [the Cog Repair Section](#) on page 4 in this manual section.

28. Now that we have the Main Shaft out, remove any oil stains, and take a look at the Fiber Washer. Now would be a great time to install a new one, if you haven't all ready. Figure 23, [refer to Section 1](#), and page 43.

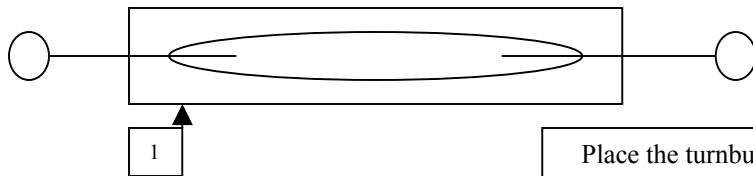


Drive Belt Replacement (continued):

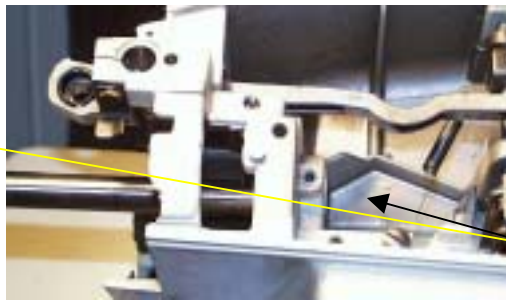
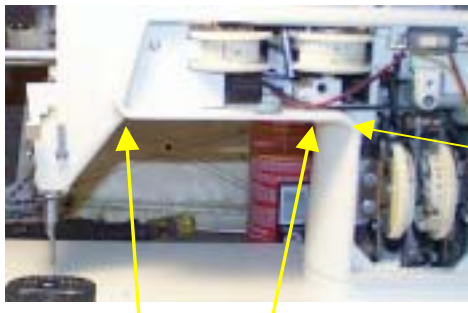
29. Work the old belt up through the top end of the machine, or lower end, which ever you find easier. I prefer the top end. Either way, push the top belt cog to the side, and start working it out of the machine. Thread the new belt in; in the reverse manner you just pulled the old one out with. Ensure it is around the upper cog, so the Main Shaft will pass through it. Nothing worse than getting it a little back together, and come to find out, you missed getting the Main Shaft through the belt, but rather on the outside of it.



30. Reinstall the Main Shaft, giving it a little drop of oil where it rides in metal. Then once you have it all the way in place, give it a few spins by hand. It should be very easy to spin around. Now, if you feel it binding, or sticking at any point, make sure you cleaned off any old oil stains, and check the inside of the bushings where the shaft rides, and ensure they are clean also. Now I've seen machines that have a tight spot, even after everything checks out. This is normally due to the Main Shaft Bushings just not being quite true in alignment with the shaft itself. This could be caused by dropping the machine just enough to spring the frame, or perhaps due to shipping, and never being setup properly. If yours sticks a bit, don't worry about for now, as we'll fix that later on. But if it's a major bind, we better check it out. I have seen machines that were dropped, and they would barely turn. But here's what we do. Now, I didn't bring my tool with me to American Samoa, so all I can do is tell you about it. While the machine is still in this state of being torn down, you'll need a brass rod, about 6 inches in length, and no more than a half-inch round. This will require another trip to the hardware store, as you'll need an item called a "Turnbuckle". A Turnbuckle, for those who don't know what it is, is a unit that has two threaded sections that either expand, or tighten up when you turn the center section. It looks something like figure 1. It should be no more than 1 1/2 inch in length, with a travel of the thread unit of about 1 inch. You'll also have to fabricate some flat ends for it. I would place it between the needle plate, and the lower needle bar bushing. Cover the machine with some very damp rags, and start to warm up the inside of the aluminum frame with a small butane (propane) torch, and start to push the frame of the machine back into alignment. Now, heating up the machine was just my way of speeding the process up. You don't need the torch, but just take some time and careful efforts to start to bring it back into some sort of alignment. I'd give the turn buckle one full turn, and then using the brass rod, tap the machine in the base section over by the needle bar end where the main shaft bushing is located. Normally when a machine is dropped, it'll spring the frame in the horseshoe area, and the main goal is to just get it back so the main shaft spins. Fine-tuning the main shafts ability to spin freely comes later.



Place the turnbuckle in this area.
r thread guide.



Tap the machines casting in these areas, and hopefully it'll start to come around. The yellow line would indicate tapping on the inside of the frame, not the out side. Right around the casting bends

A dropped machine will spring in these two areas. Depends on how it landed. But with some gentle tapping and lots of patient, you may get it back in working order. I always had pretty good luck with it, but it takes time. A turn on the turnbuckle to spread the frame, and a few taps to help it spring into shape, and repeat until the main shaft will turn. I think you get the idea, but if you don't, than email me, and I'll expand on it more.

Drive Belt Replacement (continued) along with a sticky Pattern Selector:

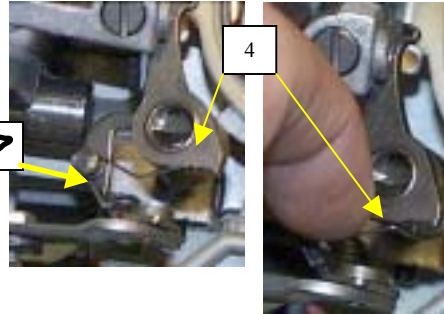
31. Anyway, lets put our machine together. Enough about a bent frame.
32. Now if the pattern selection has been sticky, or hard to position, now's a good time to clean up the Cam Stack post, and Cam Follower. Otherwise, skip to step 37. Get the Post in a position as show in figure 1.



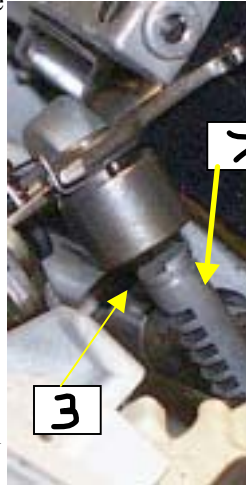
33. With the needle nose pliers, push the C-clip off the post shaft. Figure 2
34. Push the pattern selector in, and work the post down through the cam follower unit it has separated from the post. Figure 3.



35. Notice the spring position in figure 4, then using your finger, gently push the spring away from the follower. Slide the follower of the position carrier guide.



36. With it all cleaned up, ensure the follower slides up and down without restriction. Figure 5.



37. Insert the main shaft back into the machine, left to right this time. Figure 6.

Watch all these parts carefully as it comes apart. It isn't hard, but can be tricky to get back together.



38. And as mentioned above, give it a couple spins, and just a little oil were metal meets metal.

39. Put the Cam Follower Post back in and position the follower guide in the 2nd slot from the top. Figure 7. Also, be very sure the flat spot on the top of the post is facing the back of the machine.

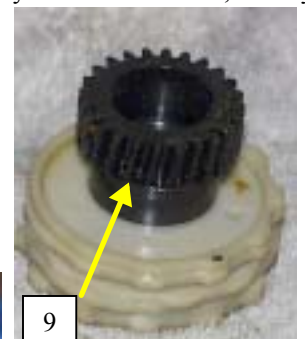
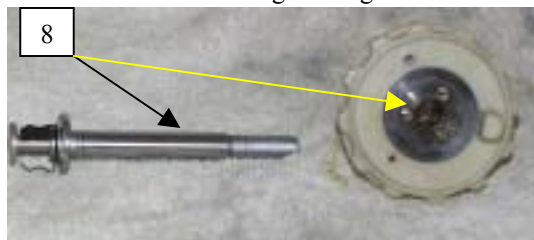


40. Clean up the Cam Stack Eccentric shaft, and using a Q-Tip, clean out the inside of the Cam Stack. We wish to make sure these two parts work smoothly together. Figure 8.



Post flat spot

41. Also make sure there are no cracks in the Cam Stack worm gear. Figure 9. If the one you have is cracked, see if you can locate a new, and replace it by removing the 3 screws in the top of the Cam Stack. Will time, or phase it in later on. You'll need part number 381577 Disc Driving Worm Wheel. What a name for a part, I like Cam Stack Gear better.

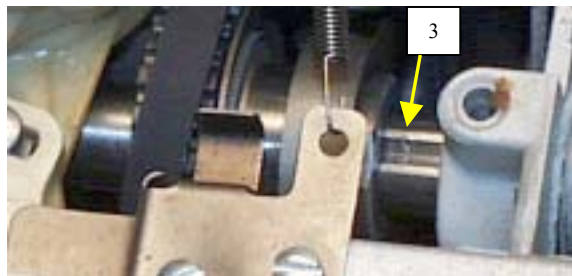
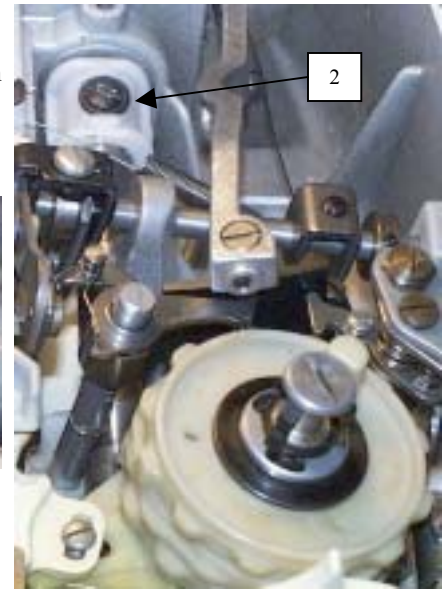
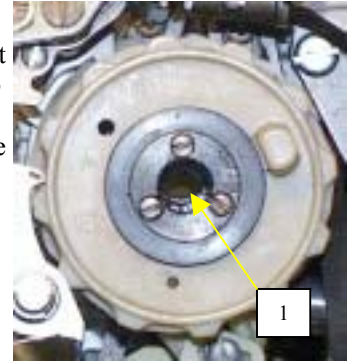


42. Now I want you to pay attention to the Cam Stack Shaft, it is eccentric. So position it with the screw end facing the front of the machine when you reinstall it.



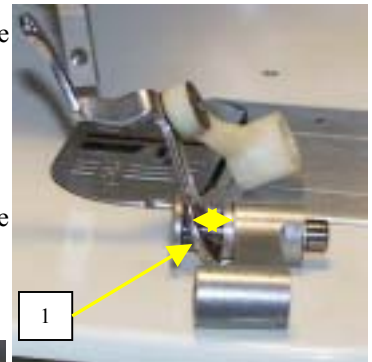
Drive Belt Replacement (continued):

43. Before you install the Eccentric post, look down through the Cam Stack, and see how much you can see all the way through to the other end. This will just help get the unit back together as you push the eccentric back into place. Figure 1. And do give a drop of oil along the Eccentric Shaft.
44. Reinstall the Retaining Collar, as laid out in [Section 1](#), page 11. Figure 2. Ensure that you have none to very minimal free play in the Main Shaft, and that it continues to spin rather freely without any binding.
45. Reinstall the Hand Wheel, as laid out in [Section 1](#), page 26.
46. Reinstall the upper drive belt cog setscrew. But before you do, locate the V in the Main Shaft, and find the impression left from the original location. Figure 3. Ensure you install in the same location. This will ensure a proper belt alignment from top to bottom.
47. Reinstall the Timing Belt onto the cogs. Once done, turn the machine several times by hand towards you, and ensure the belt isn't attempting to climp off the cogs. Either upper or lower. The belt should ride evenly on both cogs.

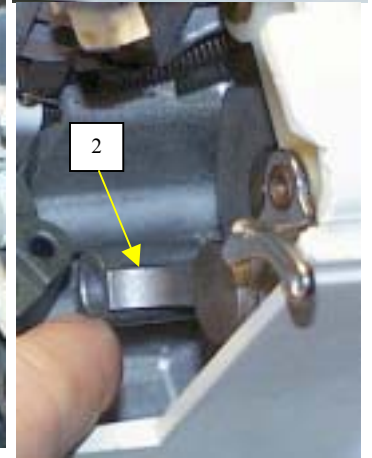
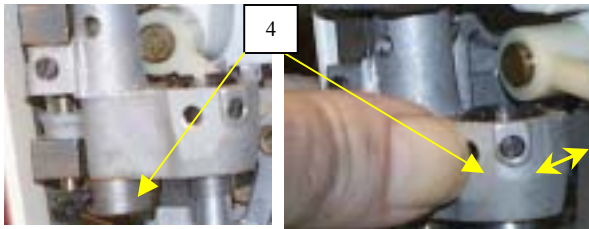
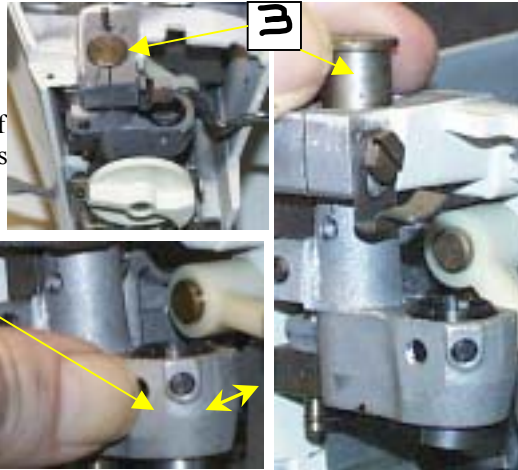


Drive Belt Replacement (continued):

48. We're ready to reassemble the Take Up Lever section. Before installing the Take Up Lever, ensure that you assemble it correctly. The Take Up has to fit around the lower crank unit properly. Figure 1.
49. Once the Take Up Lever is in place, ensure that the lower crank has free movement. To check this, tilt the machine forward, lift the crank and release it. It should drop without any problem, and come to rest of the machines front casting. If it hesitates in any manner, loosen the pinch screw and readjust. At the same time, we don't want it sloppy loose either. Figure 2.
50. Now install the Eccentric Stud, and realign the marks I hope you made on it, to the marks on the machines casting. Figure 3.



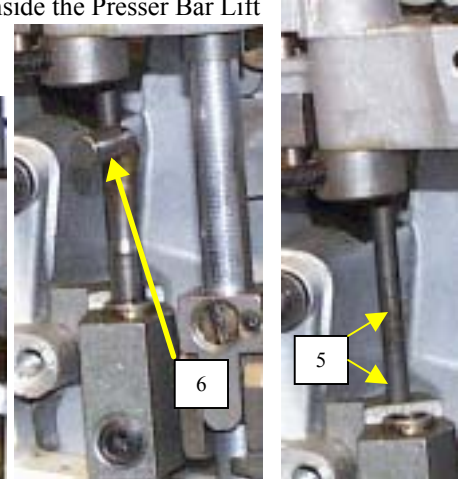
51. Reinstall the Eccentric Stud retaining collar, figure 4, left, and then check for free movement, figure 4, right. Be sure to position at about 10:00 if looking straight down at it. This will be needed to install the Presser Bar Pressure Dial.



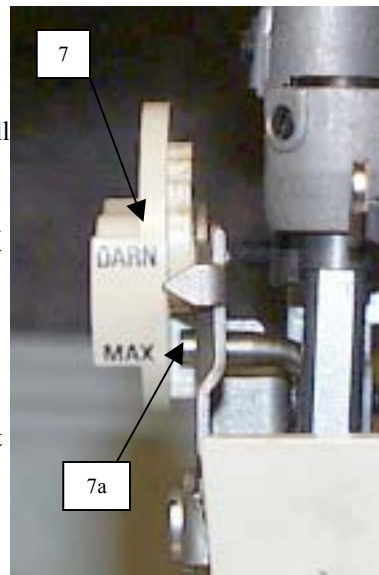
52. Now ensure that the Upper Needle Bar Carrier has sufficient free play. Push it towards the inside of the machine, and release it. In other words, push it from left to right, and let it go. It should just snap back to the left. Figure 4, right.
53. Next, install the Tension Releasing Pin. Figure 5. Make sure it fits inside the Presser Bar Lift Lever Guide.

54. Now install the Presser Bar Pressure Pin. Figure 6.

55. Reinstall the Presser Bar Regulating Dial, figure 7, and ensure the Pressure Pin passes through the bracket housing. Figure 7a. If it isn't right, you will not be able to regulate the Presser Bar Pressure.



56. Install the Needle Clamp, Gib and Thread Guide unit. Figure 8. Pay attention to the Gib, it must go into the needle bar as seen in figure 8. The little flat part of the Gib facing to the right back, just as seen. As a note: Singer said it would be almost impossible to get the needle in backwards with this type of clamp. Well, so much for that. If you unscrew the needle clamp screw to far, you could do it. The idea is to just loosen enough to remove the needle. The design of the gib, meaning its shape, when assembled correctly, will prevent the needle from being inserted backwards.

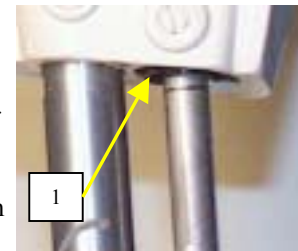


7a

8

Drive Belt Replacement (*continued*): Cam Stack Adjument

57. Ok, we have the Needle Bar Section back together, and you should go ahead and set the overall Needle Bar depth as laid out in Section 1, page 31. But just as a refresher, see figure 1. The top mark on the Needle Bar should line up even with the Lower Needle Bar Bushing.
58. Ok, lets go ahead and adjust our Cam Stack for proper position. We had to wait until the machine was somewhat re-assembled. Loosen the pinch screw, as mentioned in [step 17, on page 7](#). Turn the Cam Stack Eccentric clockwise until the Cam Stack gear tightens up against the main shaft. Then turn counter clockwise just until you have very little free play. You should be able wiggle the Cam Stack just a little bit. Turn the main shaft a few times and check for any additional tight spots that may have been created by inserting the Cam Stack. At the same time, you don't want it to loose either. This will cause zigzag stitching problems, along with other decorative stitches and utility stitches being out of balance. Will check the cam timing later on when the machine is together and ready to sew.
59. Now overall, a perfect Cam Stack will have no noticeable wiggle when you attempt to turn it by hand. Again, turn the Hand Wheel a few times towards, just to ensure you don't have any noticeable tight spots.
60. Go ahead and tighten the Timing Belt Idler. Set just tight enough so the belt will not attempt to ride up and over the lower cog gear. Final adjustment can be made one the machine is running.
61. Go ahead and retime the Hook to the Needle, as referred to in Section 1, starting on page 30. Also make sure your Feed Timing is correct, as referred to in Section 1, starting on page 31. We just want to make the two lines are together before setting the Hook Timing. At this point, you should have it in time and able to also make another check on the Timing Belt tension. Check the Idler again for any adjustment. As a note on the setting of the Needle Bar depth. When lining up the top mark, do so when the needle is moving in the downward motion, and not upward. The takes up any excess free play you may still have in the overall motion of the needle bar. Another thing is to observe the amount of free play the Needle Bar has. Too much, and achieving true timing will be difficult to do. This will cause skipped stitches, and thread breaking. You can fine-tune it with the Take Up Crank adjustment. Previous page, item 2, step 49.

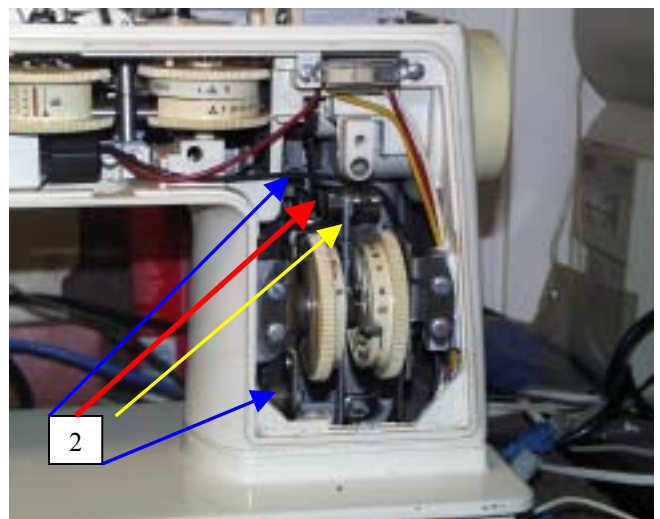
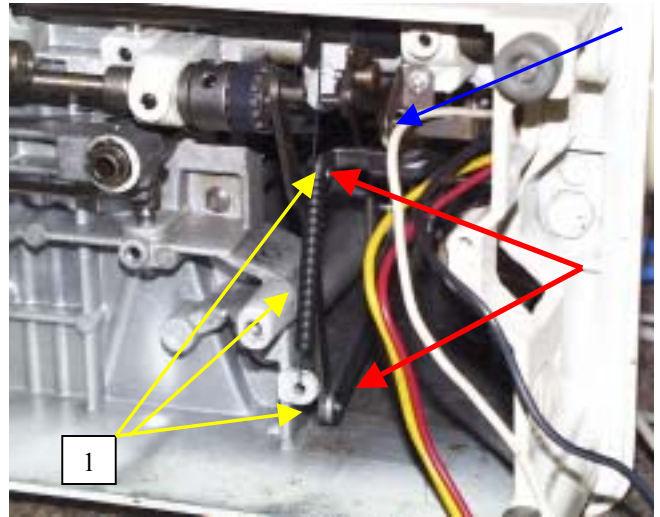


Buttonholer Repair:

The buttonholer is a very tricky unit to work on, let alone getting it out of the machine. First one I ever did, I didn't get it right either. I ended up ordering a complete unit back then, as I just couldn't figure the thing out. But of course I later on mastered them, and rebuilt that first unit several months later. So if you don't get it the first time, keep after it. I mentioned in the preface, that we'd only change the dial. We'll go ahead and cover the reverse lever too. And just to add, my next trip to the states, I'm going to recover my little True Arch Applicator tool. This is the handiest thing to have in our toolbox, but we can fix it without one, as it was a special tool I had to order from Singer. When you go to re-install the two clips, you'll see what I mean. And I've never found one since, but surely they are out there. Perhaps a real good tool shop, or hardware store might have them. I'd ask around for a C-Clip installation tool, the folks may know what you are looking for, and I'd take one of the clips to the store with me, just to get the right size. Anyway, lets get on with it. **And pay attention to how this all comes apart; lay your parts out in order, and keep grouped together in units.**

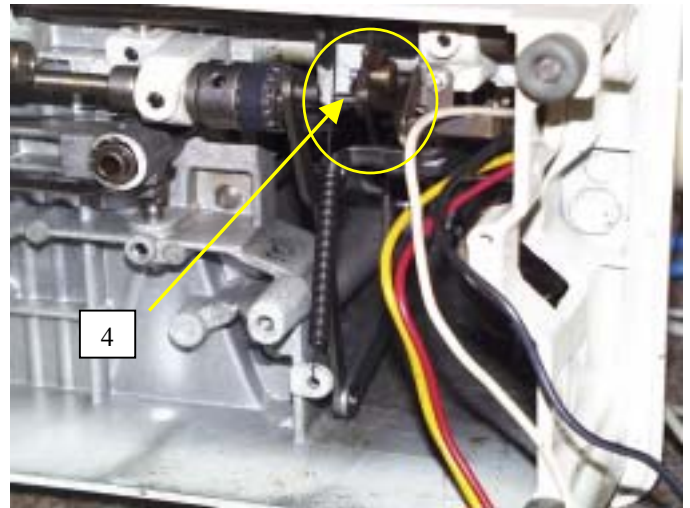
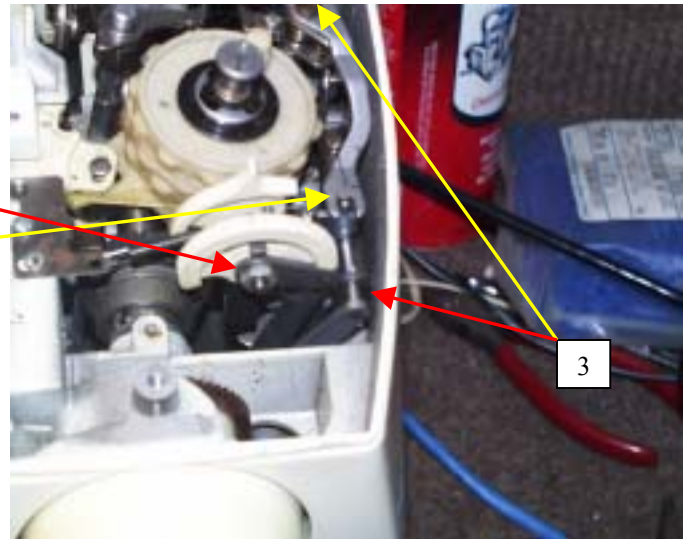
Note: Page 37 Section One deals with adjusting the buttonholer.

1. First remove the two clips as shown in Fig 1. These are in the bottom end, and you will need to remove the motor. Also remove the spring. You'll need to remove the motor to get to the clips, and you'll find it easier to remove the clips by using a small bladed screwdriver with some length to it, and coming in through where the motor plug was, see red arrows.
2. Remove the spring, as shown by the middle yellow arrow. This is easily done, by placing the stitch length dial to 6, and pressing down on the reverse lever.
3. Then remove the spring as shown by the blue arrow. Do pay attention to where they fasten too. As always, lay the parts out in the order they came out, and you may find it useful to somewhat re-assemble them while lying on the bench, or work surface. Just to remind you of how they go back together.
4. Remove the bar that was held on by the two clips, but do pay attention to how it was installed.
5. Next we'll remove the Feed Driving Rod, or per the parts schematic, the Buttonholer Zero Stitch Adjusting Lever, page 15, part 174290. However, before you remove it, scribe a line in it with a Moto tool, as referenced in Section 1, page 37. See Fig 2.
6. Remove the spring from the Feed Driving Rod. Then using a 1/16th Allen wrench, loosen the setscrew, and remove the eccentric stud. See red arrow.
7. Then remove the screw located behind the rod, see blue arrow. Referenced on page 19, item 82.
8. Loosen the Drive Belt Tension unit. Bottom blue arrow.



Buttonholer Repair: (continued)

9. Now from the Top End, remove the screw just shown at the top of Fig 3, yellow arrow.
10. Then remove the C-Clip, red arrow on the right. Then remove the nut shown by the red arrow on the left.
11. Then remove the part 52, reference on page 15 of the parts schematic. Yellow arrow on the left of the photo. It just lifts out, but do pay attention to how it is put in the machine before removing, as it has to go back in just so, so.
12. Now you can remove the four screws that hold the buttonholer to the machine, and start to work it out of the machine. This is a little tricky, as you'll need to maneuver this way, and that way to get it out. Wish I could give you a real in-depth of how to, but just work it gently till you have it out of the machine.
13. As you remove the buttonholer, pay attention to the reversing lever rod, as shown in Fig 4. It is critical when putting back together.
14. Working the unit upward, and tilting forward, will clear some items. Then drop the unit down towards the bottom of the machine a little, and the top rods will clear the main shaft. Just keep working it, it will come out. Like I said, this is tough, and tricky to do.



Buttonholer Repair: (continued)

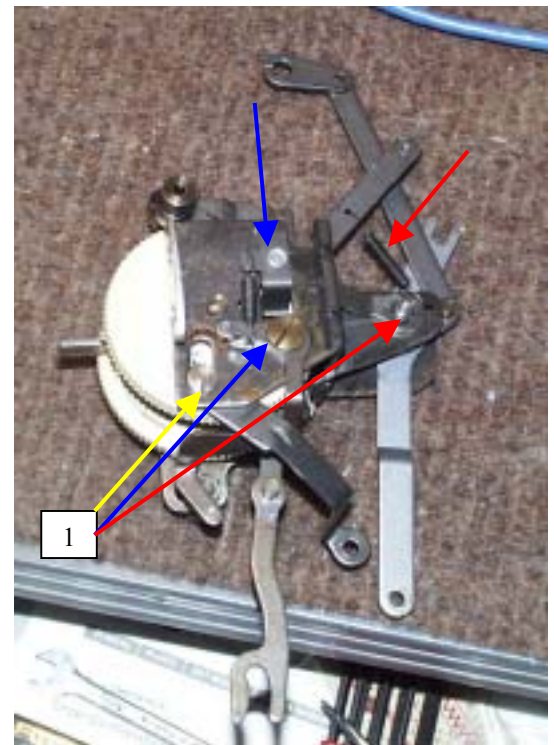
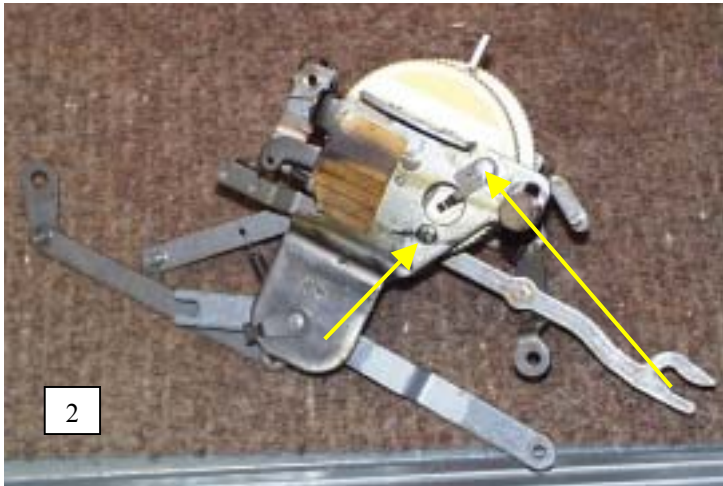
Ok, now we have the buttonholer on the bench. And I cannot again stress enough, look at this item, before we dive into it. Matter fact, if you can, take some pictures of it. I now recall why I debated with myself to include this part, as this can be the most difficult thing you will attempt in one of these machines. And then, perhaps you'll find it fairly simple, but I wouldn't bet on it. Ok, enough commentary. One thing I'm going to check in to, is if this dial is still even available, and if so, perhaps I can send you a completely rebuilt unit, with exchange. Then you may not have to hassle doing this yourself. Just a thought, in case you find yourself way over your head all of a sudden.

Anyway, lets go after this item now.

Our goal here is to replace the two common parts that may be broken in this unit. The reverse lever, and the two-step buttonholer dial. Now, the two-step dial should never really break, but if you ever turned it backwards, it is a good chance that you may have damaged the teething that ratchets the dial around, and you'll notice that the buttonholer dial does not actually make a complete cycle. Now, if you did strip one part of it, no problem really, as the dial has two complete cycles. A little inconvenient, but still functional, you just have to go the section of the dial that is still working. Of course unless you really messed up, and have rotated the dial backwards on both cycles. Anyway, here we go.

And again readers, this part can be very difficult to re-assemble, so do pay attention to what you have going on. It does require your full attention. **Lay the parts out in order of removal, keep them grouped together as a unit. And look at the silly thing before taking it apart.** Have I said that enough yet?

15. Just a reminder, lay your parts out in order of removal. Keep the screws with the part removed. Remove the feed cam follower. Fig 1, yellow arrow.
16. Now remove the buttonholer engaging lever and spring. Along with the feed dial friction unit. Fig 1, blue arrow.
17. Remove the C-Clip and the spring from the feed driving mechanism. Fig 1, red arrows.
18. Turn the unit over. Fig 2. And remove the buttonhole dial position spring (you may wish to scribe a marking line on this first), and dial shield position screw. Fig 2, yellow arrows.



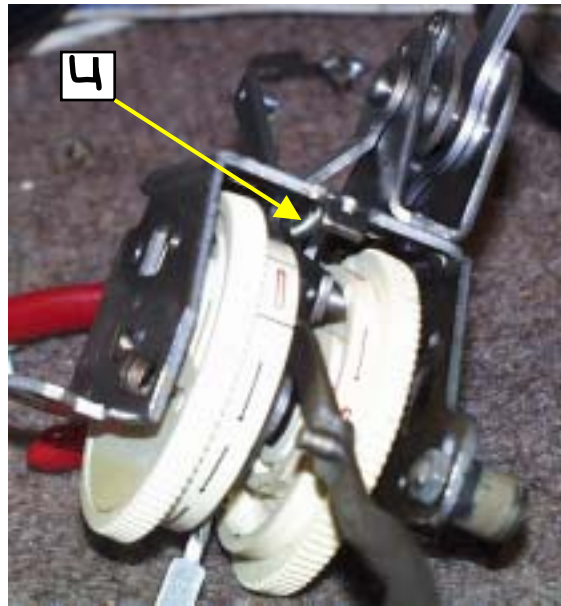
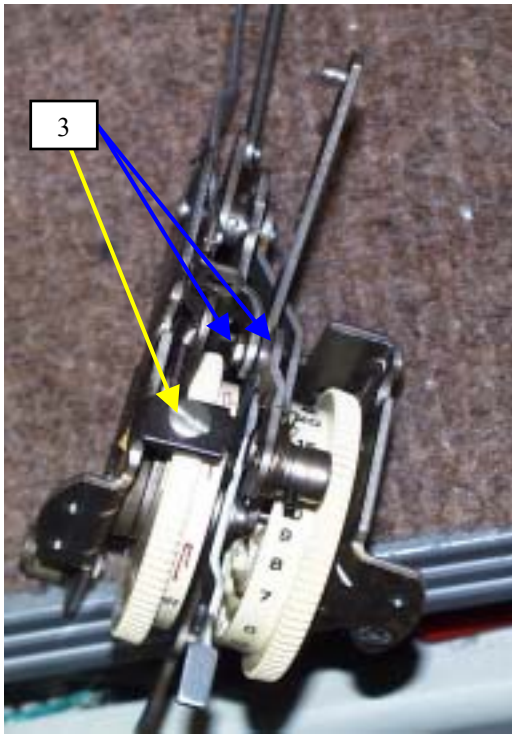
Buttonholer Repair: (continued)

This is where a bench vise comes in real handy, but if you don't have one, that's ok. It may just be a little more difficult to handle. And do be careful not to poke yourself with a screwdriver.

19. Next we need to remove the buttonhole dial friction spring. Fig 3, yellow arrow.

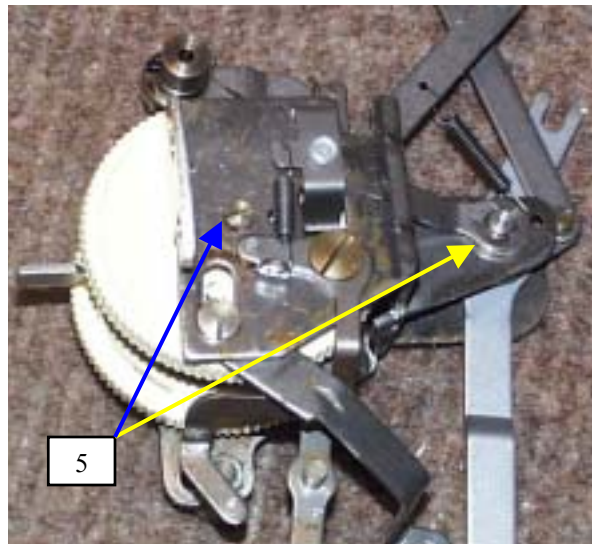
20. Then remove the screw and nut as shown by the blue arrows, Fig 3.

21. On the bottom side of the unit, we also need to remove the reverse lever tension spring. Fig 4, yellow arrow.



22. Now remove this lever, and work it up and over the reverse lever unit. And this will allow you to finish removing the item in figure 3, above. It is tricky, put just work the parts around until you have them out of the buttonholer unit. Underneath this lever, is also a ring, be sure not to loose it. It'll be visible as soon as you have the lever off.

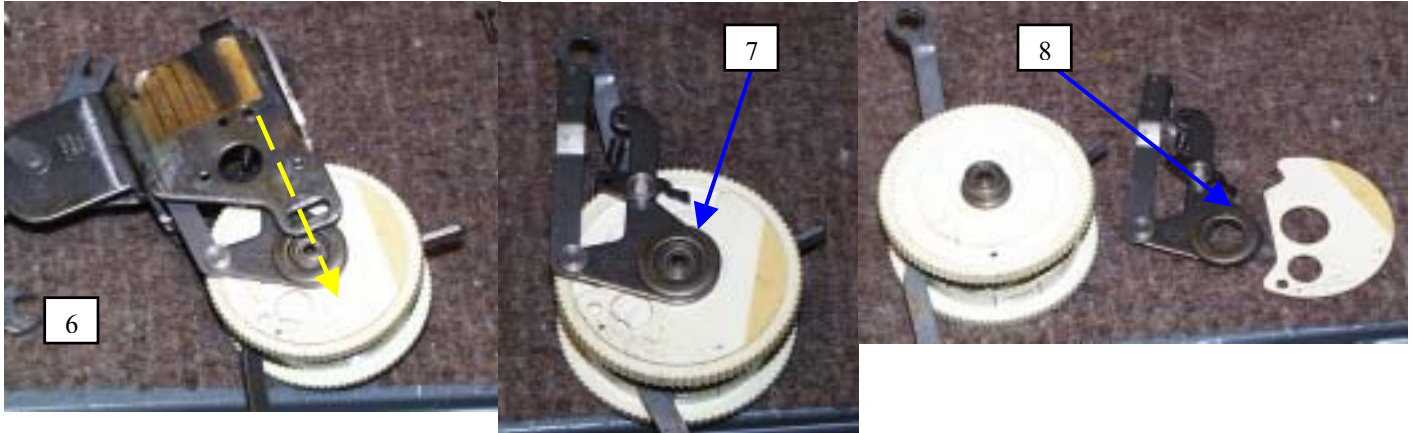
23. Ok, we are pretty much ready now to remove the dial section from the bracket housing. On both sides of the bracket housing, there are two screws that hold the unit in the bracket. Remove these two screws, and watch the parts fall.... just kidding. Fig 5, blue arrow is one of the screws; the other is on the opposite side of the bracket. With the reverse lever facing you, lay the unit on its right side. The dial section will come through the bottom of the bracket unit. Remove it slowly, as we don't wish to have the ratchet section fall off.



Buttonholer Repair: (continued)

24. As mentioned above, work the dial section down out of the bracket. Fig 6, yellow arrow.

25. Remove the buttonhole dial ratchet mechanism, and buttonhole dial shield. Fig 7 & 8, blue arrows.



26. Turn the unit over, as shown in Fig 9, and start removing the C-Clips, yellow arrow

27. Figures 10 – 13, show the remainder of the unit disassembled.

28. Figure 12, now has you to the reverse lever, should that require replacement. The Singer part number is: 172599-001, according to the multi 700 series schematic. Brewer also uses this number, according to my catalog. Other numbers may be: 172599-656, from the 750E3 schematic. But I think you'll find 172599-001 most common now.

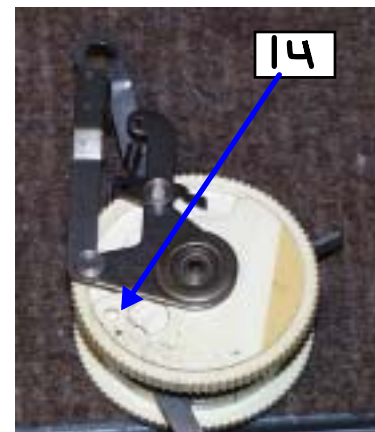
29. The buttonhole dial is number: 174430-656, and may be a dealer item only, if even available now. I'm not sure if it is anymore to tell you the truth, but am checking into it.



30. Assemble unit in reverse order. Like mentioned before, lay the parts out in order, and watch how it comes apart. Little late to be saying it again, but if you didn't, don't say I didn't tell you so. I'll walk you through some of the highlights of re-assembly, and I'll try to detail it as much as I can on the following page. I said it was tough, and without a bench vise, you'll need 3 extra hands at times.

31. When installing the shields, Fig 14, ensure the shield stop screw fits into the small hole.

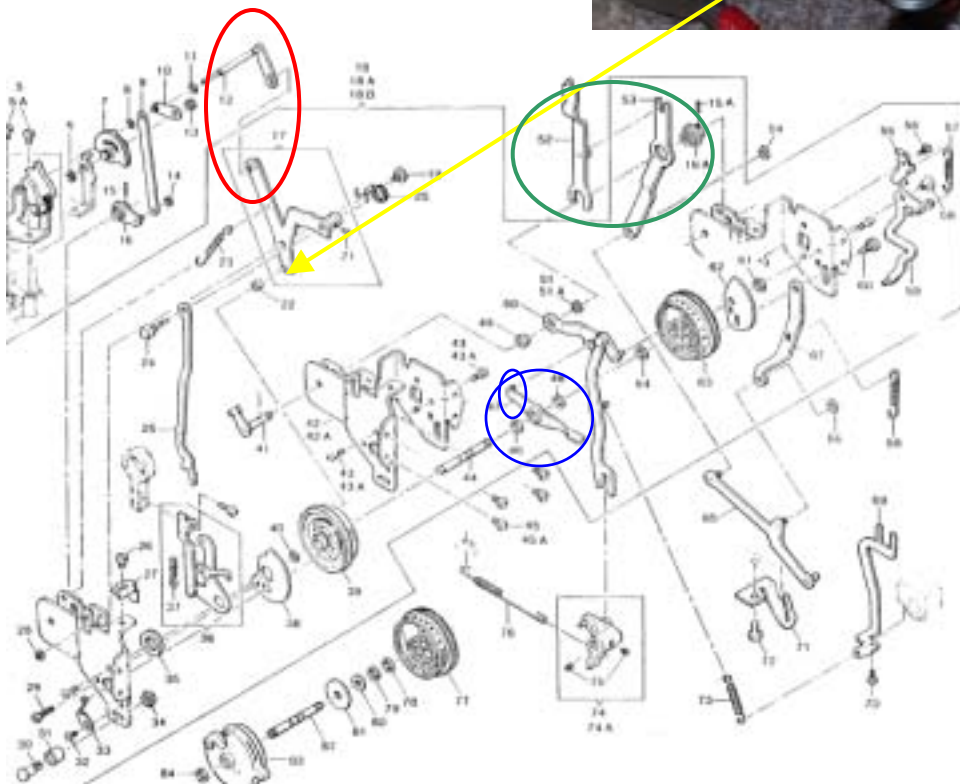
32. Back in Fig 11 & 12, ensure the reverse lever engages the reverse arm, note Fig 11 yellow dash arrow.



Buttonholer Repair: (continued)

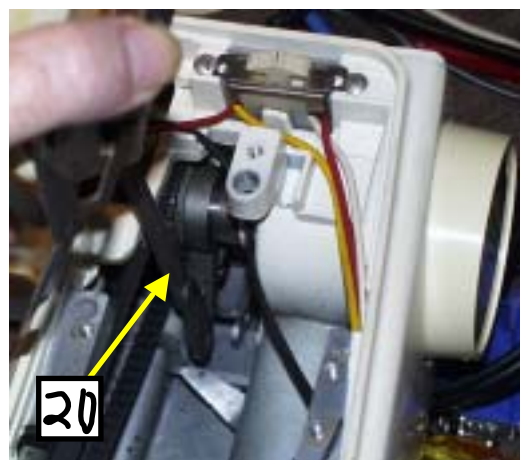
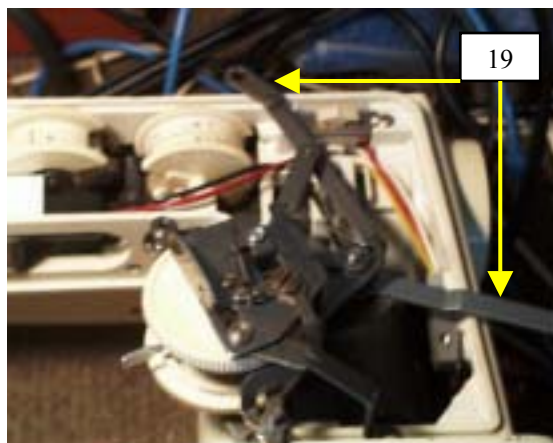
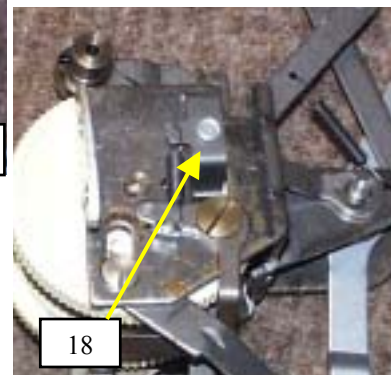
Below I've included a schematic of the buttonhole unit. I'll attempt to point out some of key points of re-assembly.

33. Refer back to Fig 7; ensure all the levers are facing upwards as you slide the dials back into the bracket housing.
34. When putting the Reverse Lever parts back in, you may find it easier to leave out the return spring. The spring hooks around the tang of the reverse lever, item 47 below, small blue circle with the larger blue circle. Now if you don't get it, or yours didn't have one, don't sweat it just yet. We can install it once the unit is together. And we do have another fairly heavy spring later on that will help pull the reverse lever into place. Also make sure that the reverse lever and reverse bar are meshed. They will come apart during reassembly, but easily put back into place once inside the unit. Reference Fig 15 – 17 on next page. Or Fig 11 on previous page, dashed yellow line.
35. Watch items 17 & 22, and make sure number 22 didn't fall off somewhere. It's the roller that will ride inside the buttonhole dial. Also depicted by the yellow arrows.
36. When you go to mount the unit, you may find it a little easier to the reverse lever parts up and out of the way. Make's it a little easier to start the screw in the hole, and then fiddle with a small needle nose plier to get the nut in place so you can start threading the unit. It is tricky. Indicated to the right by the blue circle.

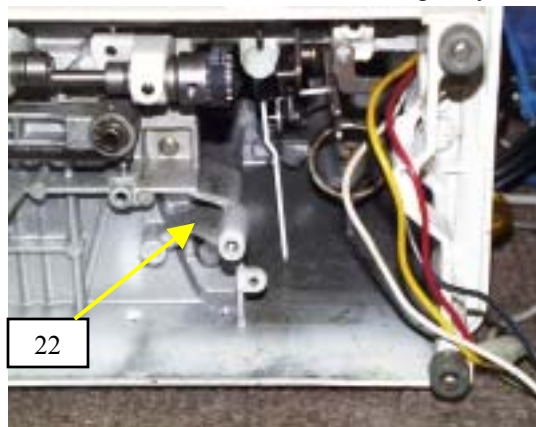
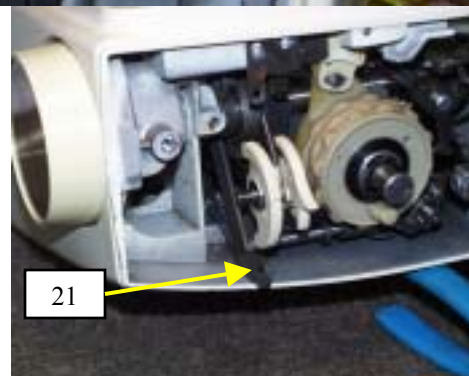


Buttonholer Repair: (continued)

37. When installing the length dial friction unit. Tighten the screw until contact is made with bracket, then an additional $\frac{1}{4}$ turn on screw should be about right. If your stitch length dial crawls during sewing, you'll need to tighten it just a bit more. Thing is, you can't get to it once inside the machine. After you adjust, turn the length dial and check for firmness. At the same time, you don't want it so tight it becomes hard to turn.
38. If you haven't given up yet, or if it has now been a week since you started this mess, you should be about ready to install in the machine.
39. You'll start to put the bottom of the unit into the machine first, but watch the levers, as they will grab the frame casting and will need a little help in clearing stuff as you install the unit into the machine. Fig 19, yellow arrows, these two levers will give you a little trouble, but my moving them around to clear items, the unit will drop into place.

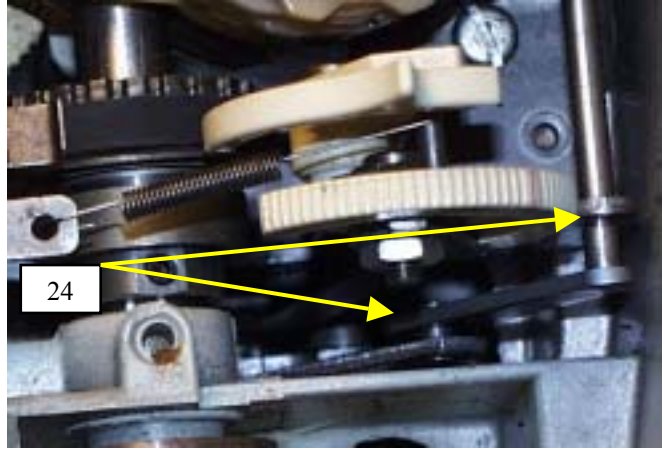
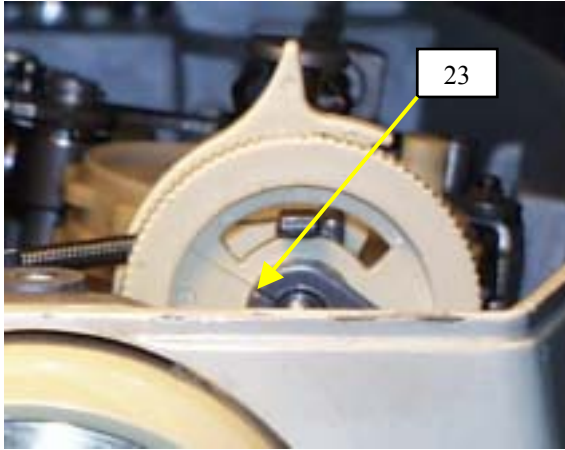
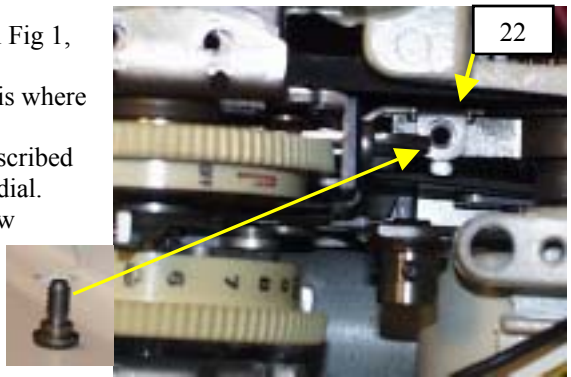


40. Once the bottom levers are going into the machine, you'll need to work the balance lever in underneath the main shaft, and have it coming out towards the back of the machine. Fig 20 & 21, yellow arrow.
41. You'll also need to watch this lever, as it'll cause some grief also, but again, just move it around, and all will be fine. Fig 22, yellow arrow.

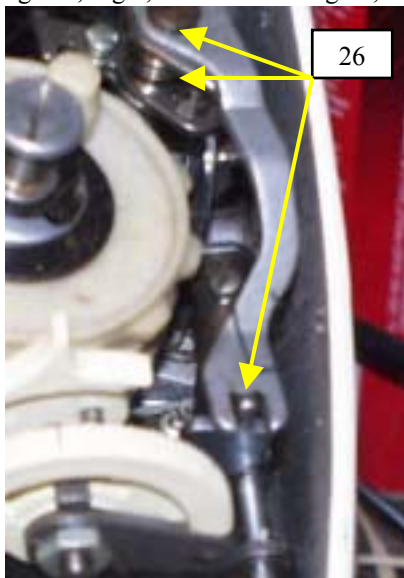
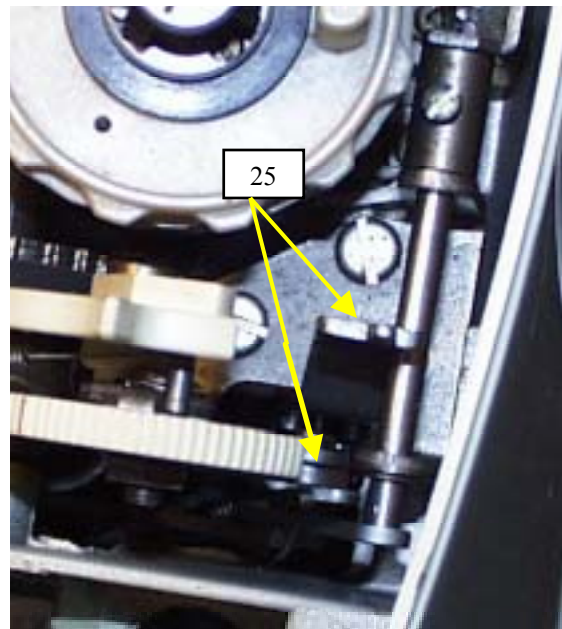


Buttonholer Repair: (continued)

- 42. Another area to pay attention to is the final bolt down of everything. One of these items to really watch is shown in Fig 1, yellow arrow. Notice the two tabs fitting into the block.
- 43. Make sure you set the shoulder screw properly also. This is where a screw launcher comes in real handy.
- 44. When you fasten the rod from Fig 21, please note the line scribed in the rod. That'll match up with the line molded into the dial. This is the balance dial for the flexi stitches. Fig 23, yellow arrow.
- 45. Slip the buttonhole turn lever into place, and reinstall the C-Clip. Fig 24, yellow arrows. The tang fits into the slot. Reference items 12 & 17 in the schematic on page 19, the red circle.

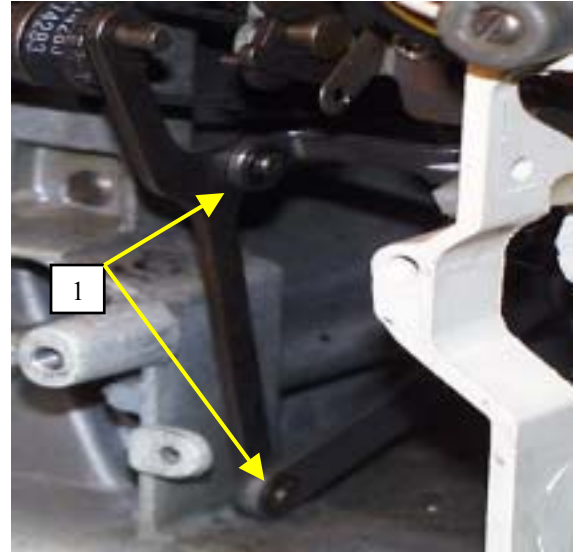
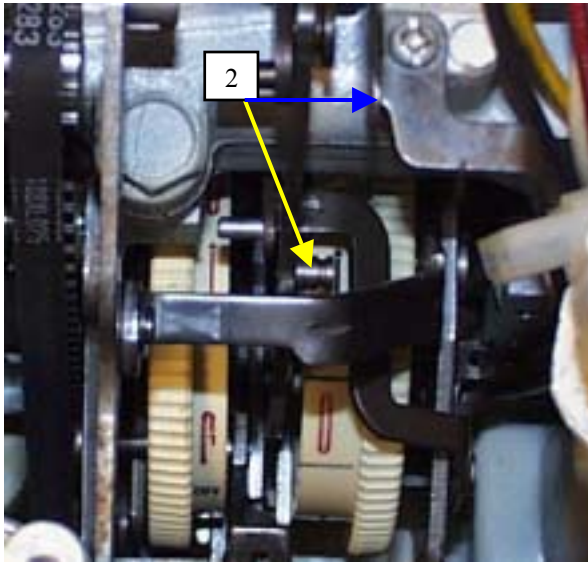


- 46. Reinstall the flexi drive rod. Fig 25, yellow arrows. Now part of this unit was reference in bullet 41; that lower rod that kept getting hung up on the frame of the machine. Now you get to install the top part of it. Remember it just lifted out? Not so simple going back in, well, it can be difficult anyway. But by using one hand, reposition the item in 41, ensure it is on the collar to the right, then drop the top part into place. Also reference the schematic, item 52 & 53, on page 19.
- 47. Now reinstall the spring and flexi drive arm, reference on page 15, Fig 3, and below in Fig 26, yellow arrows.

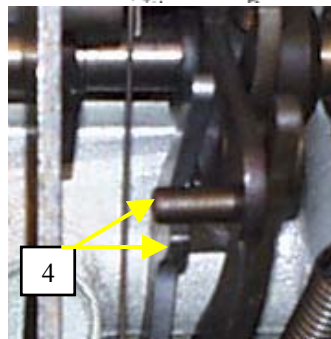
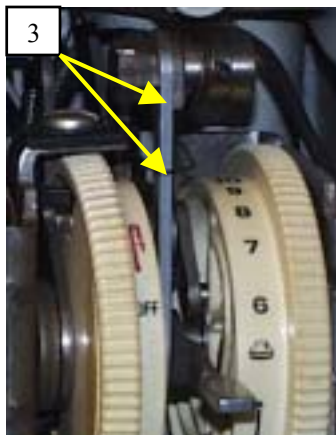
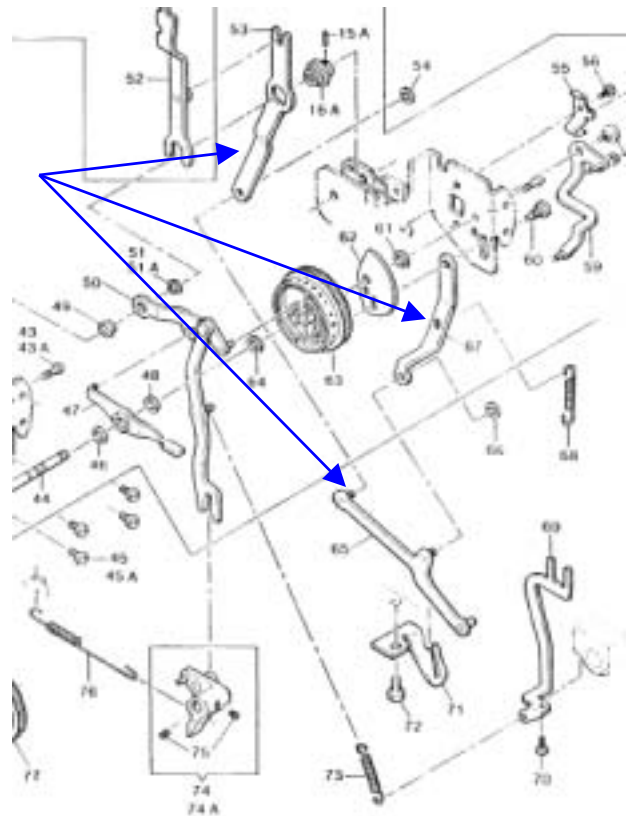
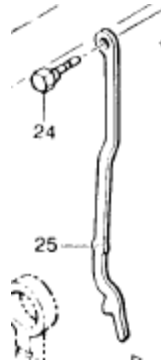


Buttonholer Repair: (continued)

48. Now we can install the lower rods. This is where that Tru-Arc applicator sure came in handy. But we can do with some needle nose pliers, and an occasional hunting expedition, as the spring will surely shot off across the room to unknown places. Fig 1, yellow arrows. Also reference parts 53, 65 & 67, blue arrows, in the schematic section below.
49. Spring replacements. We have 2 springs that need to go back on now. Item 73 in the schematic, this is always fun. But hook it firmly on the item shown in Fig 2, and fasten the lower end to the bracket. Fig 2, yellow arrow, then blue arrow.



50. Now reinsert item 25, and relatch the spring that as shown in Fig 3, yellow arrows. Also be sure it is in position as shown in Fig 4. It should latch the rod on the right when the buttonholer is engaged. Two yellow arrows.



51. Reinstall the motor, go back to Section 1, and adjust your buttonholer for leg even-ness and for making nice round turns.

Items Not Included In Section 1:

Bobbin Winder Replacement & Adjustment:

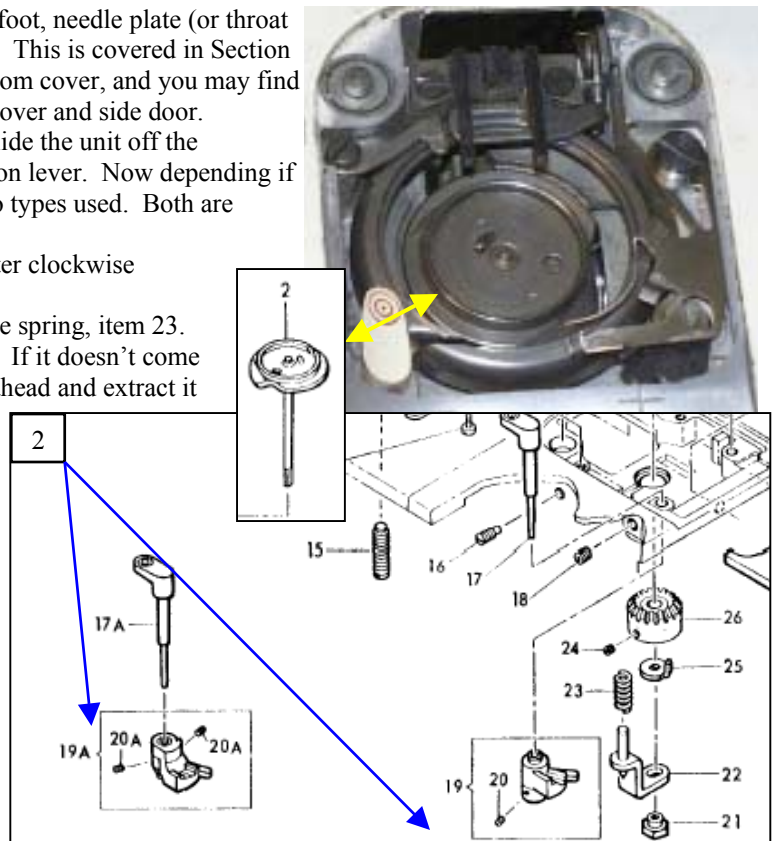
One of the most common problems with any Touch & Sew is its automatic bobbin winder. They can do a number of things that will cause the sewer grief. One of the most noticed items is that thread will somehow manage to get underneath the winder (or hook driver, as we shall call it), and the unit will not properly reseal itself after disengaging it from the winding mode. This will usually cause the unit to jam, or the top thread will catch underneath the bobbin case numerous times. The list goes on and on. Anyway, let's take a look at this item, and ensure it is properly set up. One word of note though, all Touch & Sew bobbins will have "white" colored circles on them. If you have black circles, it is more than likely for a Futura, or Athena model machine, and they will not work in any Touch & Sew. Let me also just chat about the bobbin itself. Old worn bobbins should be discarded. The most common problem with the bobbin is that the center post on the bottom of the bobbin, will protrude below the lower part, and this will cause the top thread to catch underneath also. In short, ensure you are using a bobbin that is good condition. You will need a depth gauge to perform this section.

1. As seen in Fig 1, the bobbin is a two-part item. The bobbin does unscrew to allow for removing the thread easily. The part subject to the most stress, and prone to failure is the center post in the top half. Reference by yellow arrow. This part will stretch out over time, and start to protrude below the bottom half. Reference blue arrow.



The best way to determine if the bobbin is faulty, is to lay it flat on the machine, and see if it wobbles any. And of course visual inspection works also. Put the bobbin together, and run your finger across the bottom, if you feel the center post has extended below the bottom half to any degree, throw the top half away. Why just the top half? Well you also need to inspect the bottom half for chips, nicks, or other imperfections that could cause sewing problems. You might end up with a good bottom half from one bobbin, and a good top half from another. So why not save half of it, and make a good bobbin out of two bad parts. Just a thought. I think that covers the bobbin well enough.

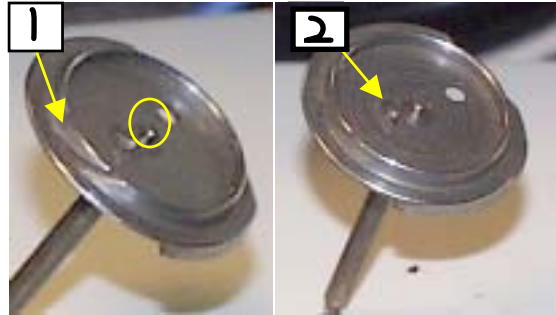
2. The bobbin winder, or rotating hook bobbin driver, as it is called. I'll just refer to it as the hook driver for simplicity, is shown to the right, yellow double arrow. Let's go ahead and remove it from the machine, inspect it, clean it up, and reinstall it. Now if yours is working ok, leave it alone. The old saying comes to mind, "if it isn't broken, don't fix it".
3. Go ahead and remove the needle, presser foot, needle plate (or throat plate), and bobbin case from the machine. This is covered in Section 1, page 8 of the manual. Remove the bottom cover, and you may find it easier to work on by removing the top cover and side door.
4. Loosen the setscrew in the lift cam, and slide the unit off the activation lever. And remove the activation lever. Now depending if your machine is a Free Arm, there are two types used. Both are shown below in Figure 2, blue arrows.
5. Remove the nut, clockwise loosens, counter clockwise tightens, so don't break it. Fig 2, item 21.
6. Remove item 22, Fig 2. And watch for the spring, item 23. It is located in the casting of the machine. If it doesn't come out with the lifting bracket (item 22), go ahead and extract it from the machine. If you don't somewhere along the line, it will fall out, and you'll wonder where it went.
7. Remove item 25, the hook driver positioner. A much better suited name than it is given.
8. Place the machine's stitch length to 6 stitches an inch, and rotate the hand wheel until the feed dogs are as far back as they can go. Now remove the hook driver, item 2. Now you may find it necessary to go ahead and remove the feed dogs, but in most cases, the hook driver will slip past the feed dogs. Feed dog removal, Section 1, page 13.



Bobbin Winder Replacement & Adjustment: (continued)

Clean the unit all up, and ensure no threads are wrapped around the underneath part. Note that some of these units will have a little plastic washer, don't loose it, and don't damage it during cleaning. Others may not, so if yours doesn't, don't worry about it.

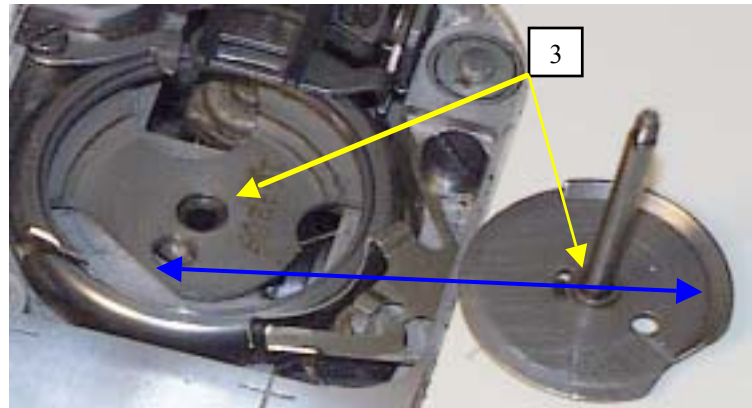
9. We want to inspect the thread cut off, and ensure it isn't broken, or damaged. Yellow arrow, Fig 1. It should appear as shown. Now I don't know of a way to sharpen it, and ideally it is pretty much maintenance free.
10. We also want to inspect the driver tab that engages the bobbin. Yellow arrow, Fig 2. Just ensure it isn't broken, or has been bent downward. Generally, it should just fine. Also inspect the bobbin-centering pin. Yellow circle. Ensure it hasn't been flattened out. This part will insert itself into the center post of the bobbin when winding.



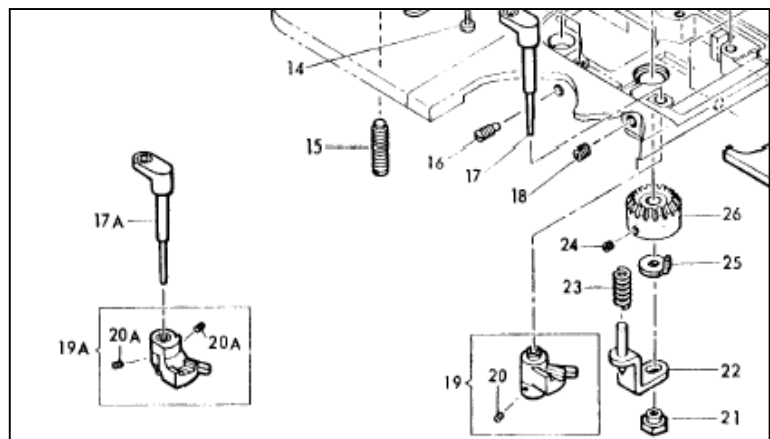
11. As mentioned before bullet 9, ensure no thread is wrapped around the shaft, and you don't have any thread, or lint stuck inside the hook area. Fig 3, yellow arrows.

12. Go ahead and clean up the other bobbin winder parts. Then inspect for thread underneath the hook. If you need to remove the hook, go ahead and skip to that section, and we'll return to this part for installing the hook driver.

13. Note before you install the hook driver, that it only fits back into the machine two ways, but only one is correct. And that is with it seated down as far as it'll go. Note the items shown by the blue arrows, it fits this way correctly.



14. Reinstall the spring, item 23
15. Reinstall the positioner, item 25. Do not that the hook driver has a notched area that this part must fit onto properly before tightening up the nut.
16. Reinstall item 22
17. Reinstall item 21, the lock nut. Don't wrench it down, just good and snug.
18. Ensure the unit moves up and down freely. Do this by pushing up on item 22, where the lift cam, item 19, or 19A would fit.



19. Reinstall item 17, or 17A. Also ensure the part is broken, or have any cracks in the plastic. If so, replace it now.

20. Reinstall item 19, or 19A. Also ensure the part is broken, or have any cracks in the plastic. If so, replace it now. The crack is most noticeable in the plastic sleeve. If it is cracked, adjustment will not remain accurate, and you will have bobbin winder failure. Just install the lift cam on the lever, until it just starts to make contact with item 22.
21. Now for the tricky part, and you do need a depth gauge here. Lets adjust for proper lift height, and more than likely you'll have to repeat it a few times before it is right. Set the depth gauge to approximately 5/64 to 3/16 of an inch. Place the depth gauge as shown, and activate the lever.

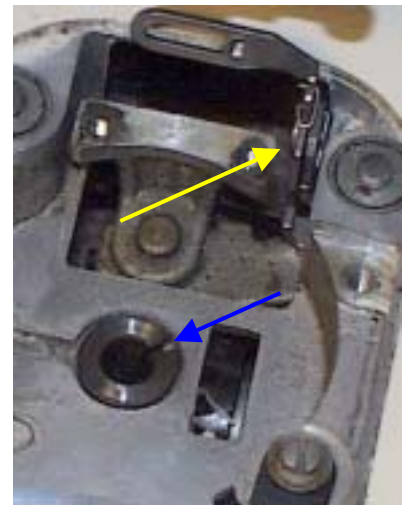
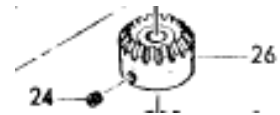
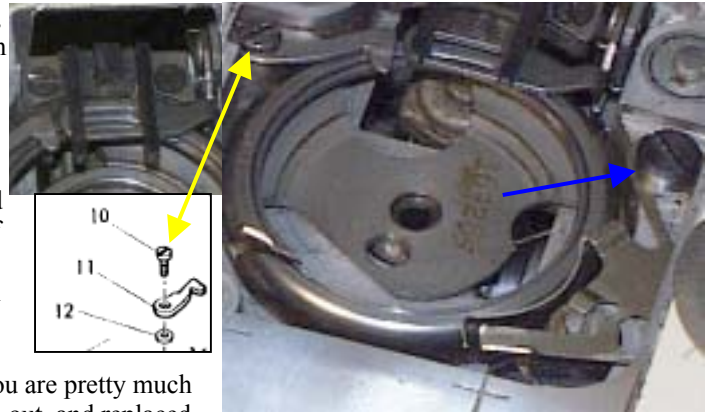


The hook drive will just make contact with the depth gauge. Adjust until you achieve the proper lift. If you have it correct, and all the parts are in good condition, along with either a good bobbin, or new bobbin – preferred, it will wind correctly at the point. The depth gauge has to lay flat across the surface of the hook. The picture shown is from a 600, on the 700, you'll need to position the gauge across the other way, by the lever and thread pull off. I'll add the Bobbin Winder document that was provided as a standalone document, at the end of this manual. Go ahead and return the Hook Removal Section, next page, bullet 11.

Hook Removal and Reinstallation:

If you are coming to this section from the hook driver section above, we will be removing the feed dogs, position finger, and hook gear. If not, refer to the hook driver section, and remove those parts now, then return to this section when you get to bullet 12 in the hook driver removal section.

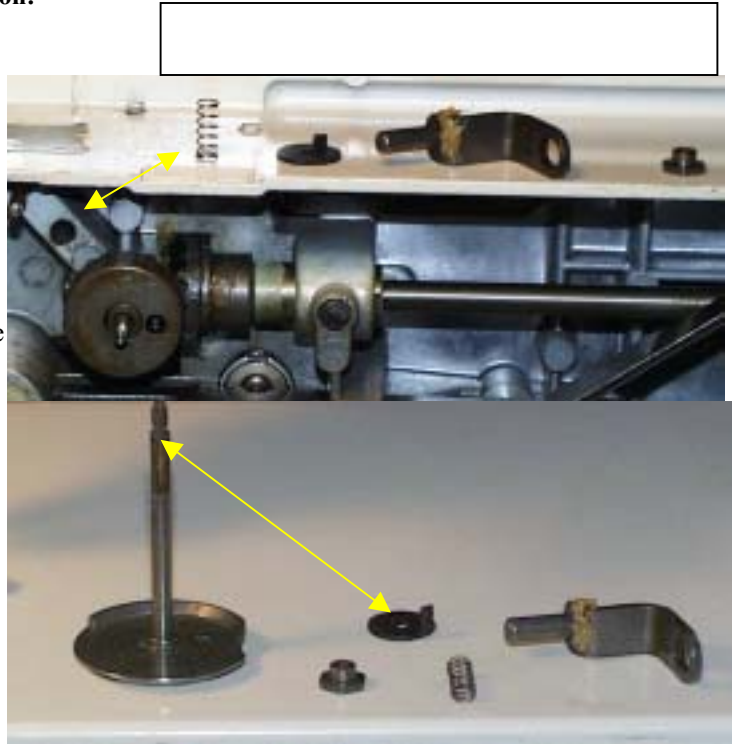
1. Remove the position finger, item 10 to the right, yellow arrows. But please note, this is a left hand thread. To loosen, **turn the screw clockwise**. If you don't, you'll break it off, and find yourself in deep trouble. If you do break it, don't fiddle with it. Take it to a shop with a really good repairman that will be willing to remove it. It normally can be done, but if it is really stuck in the machine, you are pretty much out of luck. I stress this, as I've seen them drilled out, and replaced with a screw and nut on the bottom, and they generally work themselves loose, hence, the reason for it being a left handed thread. It stays in place during the normal cycle of sewing. Ok, I'm not going to dwell on it. But other word about it. If it isn't broken off to deep inside the casting, I have used my Moto tool, with a cutting wheel, and re-notched a screw slot in the remaining part. But if the break is to deep in the machine, you'll cut the threads up. Now on the Free Arm models, you are in luck. The hole is drilled all the way through the machine, and you can extract it from the bottom side. The Flat Beds, sorry, no hole folks, not any of the models I've ever seen.
 2. When removing the position finger, some units will have a little washer with it, as shown by item 12 above. If yours doesn't, don't worry. Some just came with it, others didn't.
 3. Remove the feed dogs; reference Section 1, page 13.
 4. Remove the position bracket. Turn the screw counter clockwise to remove. Blue arrow above.
 5. Lay the machine on its back, and now loosen item 24, to the right, the setscrew in the hook gear. Just loosen it, no need to remove it. Now remove the hook gear, item 26, and slip the hook out of the machine.
 6. Check for thread wrapped around the bottom of the hook, and around the hook bushing.
 7. Ok, now I want to just chat about the hook bushing a bit. In the most of the Flat Bed models, this unit is eccentric, and the slot should be facing about 1 o'clock. Free Arm models, this unit is beveled, and will rock back and forth. Either way, this is so you can fine-tune the needle to hook clearance. You first set the needle position as described in Section 1, page 32. Then you use this adjustment to fine-tune the rest of the clearance. But again, the slot has to face about 1 o'clock. If it isn't, you'll have other problems down the line. Just ensure it is between 12 and 3 o'clock. Reference blue arrow in the photo to the right.
 8. As covered in Section 1, page 20, this would be a good time to inspect the thread pull off unit, and the pressure spring. Yellow arrow.
 9. After cleaning up the parts, and giving them a little drop of oil. Reassemble in reverse order
 10. Return to the hook driver section, this manual, page 24, bullet 13, to reinstall the hook driver and adjust, then return to this section to finish off. Sorry to have you move around the manual so much, but I can't see repeating instructions if they are all ready covered elsewhere. Look at this way, paper conservation if you print this out.
-
11. Ok, you're back from the hook driver, so lets finish the machine off.
 12. Reference Section 1, pages 30 & 31 for timing the hook. But do note, that hook shaft has a flat spot on it; ensure this is where you reposition the gears setscrew.
 13. Reference Section 1, page 12 for feed dog replacement.
 14. Reference Section 1, page 31 for feed dog timing.
 15. Reference Section 1, page 17 for position bracket and position finger adjustments.



Additional Bobbin Winder Adjustment Information:

Adjusting the bobbin winder on most later 600 & 700 series:

1. Make sure all the parts are in tack and not broken
 - a. Coil spring
 - b. Hook Driver Lock tab
 - c. Lifter
 - d. Lock nut
2. Place the hook driver inside the hook and ensure it is placed in the proper position. It should lay flat on the hook unit



3. Install underneath parts.
 - a. The coil spring goes inside the hole as indicated in the top photo (part a).
 - b. The hook driver lock tab is next. Make sure it fits on the hook driver shaft correctly. The driver shaft has a little cut out that it must fit onto.
 - c. Install the lifter
 - d. Install the locking nut, and snug tight
4. Place the cam lifter on the activation lever shaft
5. Tricky part – adjust so when the activation lever is activated (pushed to the left to wind a bobbin) that it raise's the hook driver no more than 5/64 to 3/16 inch. Adjust as necessary.



TOOL REQUIREMENTS

It really helps to have a depth gauge

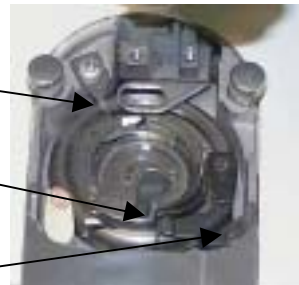


Also required tool – 1/16 Allen wrench
Flat bladed screw driver, small and medium, both with shafts about 10 to 12 inches.



Adjust bobbin case free play:

1. Position Finger should fit the bobbin case, as if they match together
2. Black Position Bracket should have about 15ths (.015) of an inch free play
3. Adjust position bracket eccentric as needed, which is located on the front bed of the machine, just in front of the position bracket eccentric stud.



To adjust the height, place your depth gauge on top of the hook. The rise is as described above. You do have to remove most of the parts inside the hook area to get your gauge on top of the hook.



Notes: