

SWF Errors #102 & #103

What are ERRORS 101 AND 102 (Main Board and Overload) and how to resolve it.

Reasons and Solutions:

A. The most common occurrences of these errors are caused by having thread caught in the hook area, commonly referred to as a "Bird's Nest". Bird nesting typically occurs when the bobbin is not set properly: whether the tension is incorrect, the bobbin case is dirty, or the bobbin is not properly placed in the case.

Steps

- 1) Remove the excess thread from underneath the needle plate. To do this, you will probably have to cut away all of the nested thread with a pair of scissors.
- 2) Remove the bobbin and case from the rotary hook.
- 3) Remove the bobbin from the case.
- 4) Ensure the bobbin case is clean.
- 5) Once the bobbin case is clean, reinsert the bobbin and ensure the tension is correct.
- 6) Next, you want to make sure the pre-tension is adjusted correctly.
- 7) The last tension adjustment you want to make is to the main tension.

Why is thread not trimming on my multi head?

Error 103

An Error 103 indicates that the knives did not return to their start position. One or two possibilities caused this.

- 1) You had a birds nest occur on one of the heads and when the knife tried to do a trim, the silver knife under the needle plate was able to fully open and then could not go back under the black piece.

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2) Grease has accumulated on the plunger and will not recess back to its original position to be able to fire again on the next trim command.

All of the heads on a Multi Head Machines trimming assembly are connected together and are not independent. Let me explain how your trimming system works, that way you will have a better understanding how to correct this.

Remove the needle plates from the machine and you will find that under those needle plates are your knives for your trimmer. When the machine executes a trim the silver knife swings out from under the small black piece which has the SWF logo engraved on it, the silver knife then collects the upper thread and the bobbin thread and pushes it under the black piece which does all the trimming.

If you had a birds nest occur on one of the heads, then you need to swing the knife out from under that black piece and look for any thread or any debris caught under the black piece which would disallow the silver knife to fully seat under that black piece.

All the heads silver knives are secured to a linkage, which is attached to a thin chrome colored shaft in the back of the machine. When the machine issues a trim command, there is a smaller chrome colored shaft on the right hand side of the machine under the table, that gets fired upwards into a cam that has a groove cut out of it, This smaller shaft is called the PLUNGER, The plunger gets fired upwards by the Trim solenoid. The plunger once fired upwards into the cam then follows the groove as the cam spins, this is what makes the silver moving knife under the needle plate open, At the time the cam has made a full rotation, the plunger as it is called (Smaller chrome colored shaft) falls back into its steel casing, and readies itself for the trim solenoid to fire it upwards into that cam again on the next trim command.

Now as I have mentioned both silver moving knives are connected to a linkage on a thin silver shaft behind the machine and under the table. When the plunger gets fired up into the cam, both knives move in unison by way of them being connected to that thin silver shaft. If you were to follow that thin shaft to the right as if you were looking from the back of the machine, you will see a black component that will probably have an LED light attached to the top of it. This black component sort of resembles a tall black screw with some hex bolts on it.

Anyway this black component is part of the trim sensor, in that when the knife opens the black component moves to the left away from the sensor, when the knives close, this same component moves to the right as it is also attached to the same thin silver shaft that the silver knives are connected to. If the knives do not close all the way, then the black component will not be under the sensor above it. This would cause the error 103.

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Now this plunger fires upwards through an electrical pulse going to the trim solenoid, The trim solenoid then lifts the plunger and pushes it into the cam. As I mentioned once the cam has made a full rotation, the groove is lined up in such a way that gravity causes the plunger to fall back into its housing so that the trim solenoid can fire it back up into the cam at the next trim command. If there is grease on the plunger, than the plunger would not be able to take advantage of gravity to fall fully back into its housing so the trim solenoid can fire it up again at the next trim command. This would cause the thin silver shaft not to fully move to the right, which would cause the sensor to be out of position.

This is what you need to do to correct this:

- 1)** Remove the needle plates, and note the position of the silver knife. (How far it sticks out from the black piece that has SWF engraved on it)

- 2)** Go to the back of the machine, and locate the thin silver shaft under the table. Once you look under the table you will see a thicker silver shaft that has a ton of grease on it, this is not the shaft, look under the table towards the middle of the machine, you will see the thin silver shaft, you will also see the black arms that are attached to it perpendicularly. These are the linkages that connect the silver knives under the needle plate.

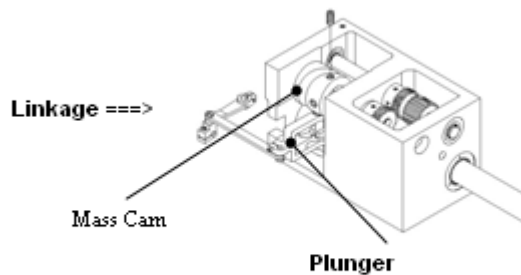
- 3)** Now grab the thin silver shaft and move it all the way as far as it will go to the left of the machine as you are looking at the machine from the back of it. You may have to use a bit of force as sometimes it is stubborn to move. But you will get it. Once you have done that go to the front of the machine, and you will note that the silver knives are now all the way open. Now is a good time to look under the black piece and see if There's any thread caught under it that may prevent the knives from closing all the way.

Also under that black piece you will see a very flimsy piece of metal that is sort of curled at the end facing the front of the machine. This is called the under thread presser, be sure that this piece is not bent upwards and is causing the silver knife not to close all the way. Let me know if it is or not. Anyway once you have cleared any thread from under that black piece, return to the rear of the machine and move that thin silver bar all the way back to the right, This will cause the knives to close all the way under the black piece.

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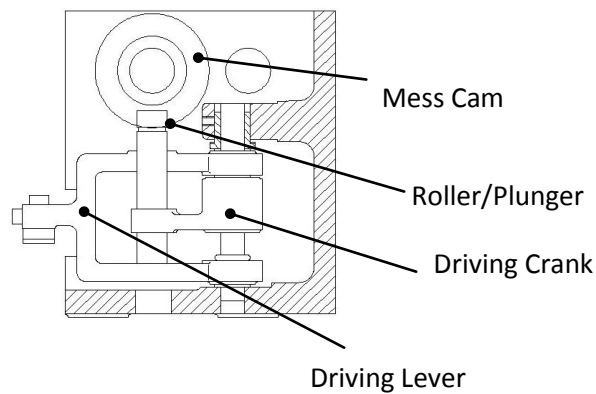
4) Now follow the thin silver shaft to the right, you will soon come to that black component which is the sensor, See if the black screw looking thing is lined up with the sensor just above it, Again it may have a red LED light that lights when the sensor detects this black component. Now we need to look at the plunger to clean off any grease that may inhibit the proper operation of it.

Keep following this silver bar to the right, and you will come to the end of it, where you will see that at the end, there is a short black thin linkage connected to it, follow this to the right and you will see that this linkage goes to another black arm, That black arm is attached to a small silver 3 inch shaft, This is the plunger and it vertical where the thin shaft we were following is horizontal. This plunger sits directly under a black cylindrical component which is the cam, you can probably see allot of grease on this cam. You also should see right above the top of this 3 inch silver shaft (plunger) is a groove cut out of the cam. This is the groove that the plunger fires up into.



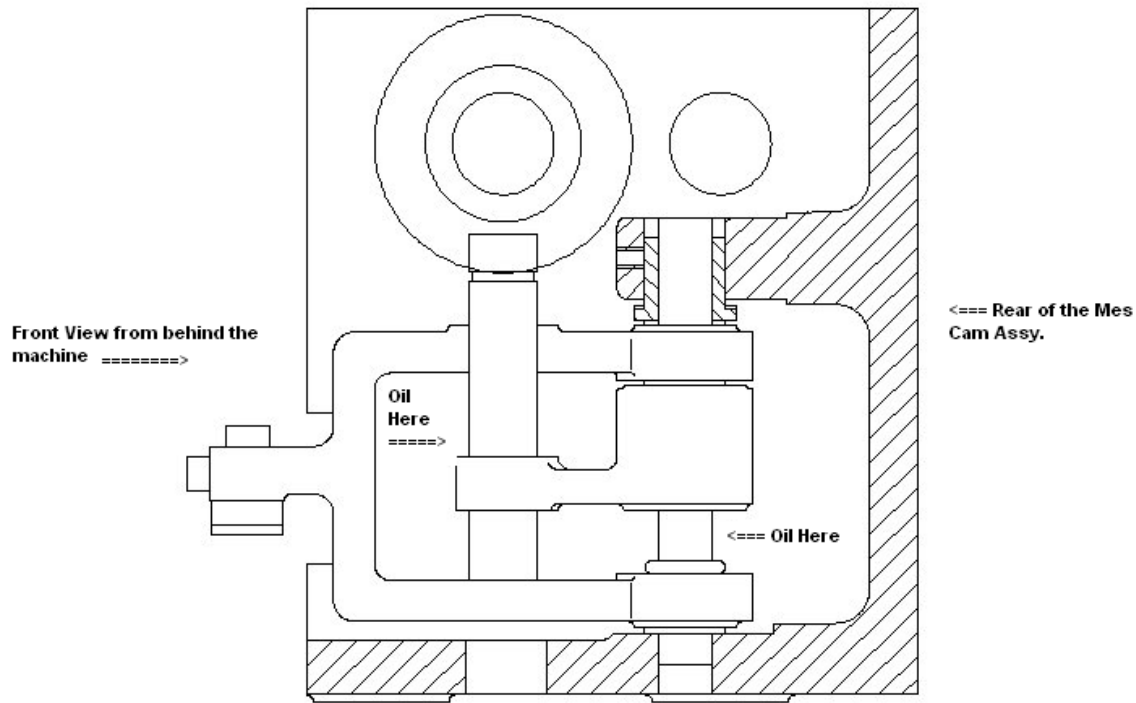
5) With a flashlight and a paper towel, remove any grease that is on the sides and top of the plunger. You may want to try to get some cue-tips to help get into the tight spaces. Also remove the grease from the groove of the cam above the plunger. To help you get all the grease out, power off the machine, and grab you 5mm Allen wrench and turn the main shaft on the side of the machine a bit to clear out the grease in the groove of that cam, Turn the main shaft a bit more to get to a new area of the cam to remove any grease. Once you have gone around one whole rotation on the main shaft wheel, (from 100 degrees (red Area) to 100 Degrees) And all the grease has been removed from the cam, it is necessary to oil the plunger which will help loosen any residual grease that may still be lingering on it.

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6) Oil the plunger liberally, and if you look further back behind the plunger towards the front of the machine you will see another obscure silver shaft that has a black arm attached to it, this is the shaft lever, and it assists the plunger in its lifting up when the trim solenoid fires it up. Make sure it is also free of grease and oil it well too. Now to the bottom left of the plunger you will see a black lever, If you push this lever down you will be able to lift that plunger up. You may have to use a screw driver to push that lever on the left side down as it is a tight fit. If you are able to manually lift the plunger up this way, do this several times to work the oil on the shaft. You should feel the lifting of the plunger get easier and easier.

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If you cannot manually lift the plunger than you can do it electronically by doing the following.

If you have an LED control panel which does not display the image you are sewing but only provides alpha-numeric information about the design you are sewing, do this.

- 1) Power on the machine, and make sure the main shaft wheel on the side is set to 100 degrees (Red Mark)
- 2) Press the button that has the SWF logo on it (M-Setting).
- 3) Locate the option for **MACHINE TEST** and press the **SET** button.
- 4) Scroll down to **TRIM TEST**, or **TRIM SOL. TEST**, and press the **SET** button.

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5) Press either the **START** button or any **GREEN START BUTTON** to fire the trim solenoid.

When you press the START button you will hear the trim solenoid fire the plunger up into the groove of the cam, and immediately after that you should hear a second clicking noise of the plunger obeying gravity as it falls back down to its resting position. Make sure you hear two distinct clicking noises. The first one is always louder than the second one, as the plunger is fired up into the cam electrically by the trim solenoid.

Press the START button several times to be sure you hear the 2 clicking noises. After about 15 tests, Go behind the machine a place some more oil on the plunger and to the shaft lever behind it, then go back to the control panel and hit the START button and test it again about 10 times.

For LCD type control panel find the trim test by doing this.

1) Press the **TOOLS** button. (It may also be MACHINE)

2) Select **MACHINE** and press **SET**, (If your control panel does not have TOOLS and you've selected MACHINE, then find MACHINE TEST and press the SET button)

3) Select **MACHINE TEST** from the list and press the **SET** button.

4) Scroll down and select **TRIM SOL. TEST** and press the **SET** button. (It may also be labeled TRIM TEST).

5) Every time you press the SET button or any of the green start buttons you will fire the plunger up into the cam.

Once you hear 2 distinct clicking noises then it is time to test the trim function. Turn off both heads by toggling off the switch under the red light on the heads. You will see the red head on indicator lights by looking just below the large tension knobs in the center of the head. Make sure the red light is out.

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Now perform a few manual thread trims, by either pressing the scissor icon on the control panel or press the START button.

Or if you have an LCD type monitor, you need to press the tools button and select MANUAL TRIM then select YES on the following screen.

As the machine does its trimming, you need to watch the silver knife as it opens and then closes. Check both heads to watch the knives move. Repeat the manual thread trim as many times as you need to be sure that the silver knives are moving properly now. If they do swing open and then close and you do not get any error 103 codes again, than you are done. Put the needle plates back on and turn the heads back on and continue sewing.

Why is my single head is failing to trim?

When a failure in trimming occurs, it can be from several possibilities, In this thread we will look at most if not all the potential possibilities that may cause this, and I will explain how to correct these one by one.

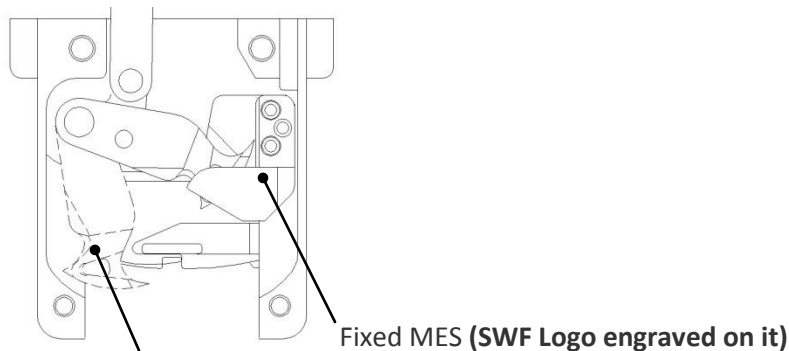
Possibilities of failed or intermittent thread trims:

- 1) You had a birds nest occur on one of the heads and when the knife tried to do a trim, the silver knife under the needle plate was able to fully open and then could not go back under the black piece.
- 2) Grease has accumulated on the plunger and will not recess back to its original position to be able to fire again on the next trim command.
- 3) The Moving Knife linkage has become disconnected from the shaft.
- 4) The fixed (non-moving) knife has become dull, or nicked or burred in a way that tears the thread every so often.
- 5) The under thread presser under the Fixed Mes, has bent up and disallows the moving knife to swing back under the Fixed Mes.
- 6) Trim solenoid has failed.

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Let me explain how your trimming system works, that way you will have a better understanding how to correct this.

Remove the needle plate from your machine, and notice under those needle plates is your knife assembly. When the machine executes a trim the silver knife swings out from under the small black piece which has the SWF logo engraved on it, the silver knife then collects the upper thread and the bobbin thread and pushes it under the black piece which does all the trimming.

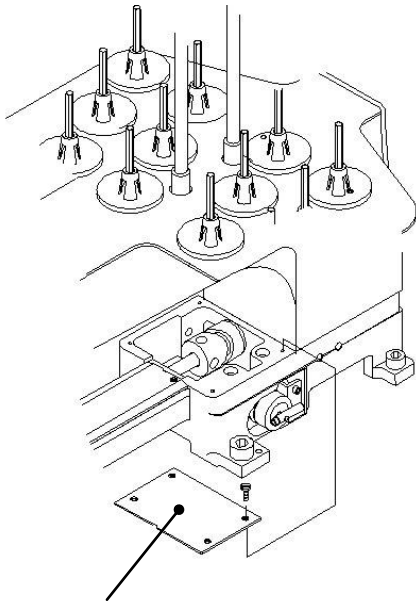


Moving MES

If you had a birds nest occur on one of the heads, then you need to swing the knife out from under that black piece with your fingers and look for any thread or any debris caught under the black piece which would disallow the silver knife to fully swing back under that black piece (fixed Mes). Normally removing this debris will solve the issue immediately. The next possibility is a sticky plunger.

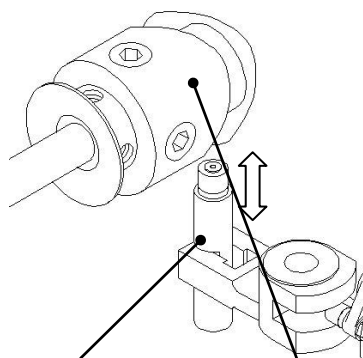
When the machine issues a trim command, there is a smaller chrome colored shaft (Plunger) on the left hand side of the trim cam which is located under that square silver plate, this plunger gets fired upwards into a cam that has the groove cut out of it. The plunger gets fired upwards by the Trim solenoid. The plunger once fired upwards into the cam then follows the groove as the cam spins, this is what makes the silver moving knife under the needle plate open. At the time the cam has made a full rotation, the plunger as it is called (Smaller chrome colored shaft) falls back into its steel casing, and readies itself for the trim solenoid to fire it upwards into that cam again on the next trim command.

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Remove this plate

Now this plunger fires upwards through an electrical pulse going to the trim solenoid, The trim solenoid then lifts the plunger and pushes it into the cam. As I mentioned once the cam has made a full rotation, the groove is lined up in such a way that gravity causes the plunger to fall back into its housing so that the trim solenoid can fire it back up into the cam at the next trim command. If there is grease on the plunger, than the plunger would not be able to take advantage of gravity to fall fully back into its housing so the trim solenoid can fire it up again at the next trim command. This would cause the error 103, as well fail to trim the thread.



Plunger

MES Cam

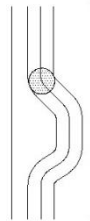
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This is what you need to do to correct this:

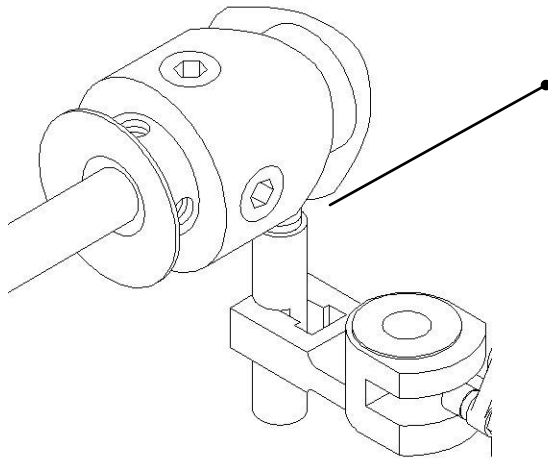
- 1) Remove the needle plate, and note the position of the silver knife. (How far it sticks out from the black piece that has SWF engraved on it)
- 2) Remove the square silver plate with the 4 small screws in it to expose the trim cam. This plate is further back from the needle plate.

Once the needle plate is removed inspect the knife block (the silver and black knife) under that black piece you will see a very flimsy piece of metal that is sort of curled at the end facing the front of the machine. This is called the under thread presser, be sure that this piece is not bent upwards and is causing the silver knife not to close all the way. Let me know if it is or not. Anyway once you have cleared any thread from under that black piece, inspect the trim cam. Inside of the groove of the trim cam you will want to remove any grease that may be built up in there, as well as around the trim cam itself. Turn the main shaft wheel slowly to remove all the grease from the circumference of that cam, just leave a thin coating on the side walls of the groove. This is to ensure that the roller bearing at the top of the plunger when fired up into the cam does not wear out.

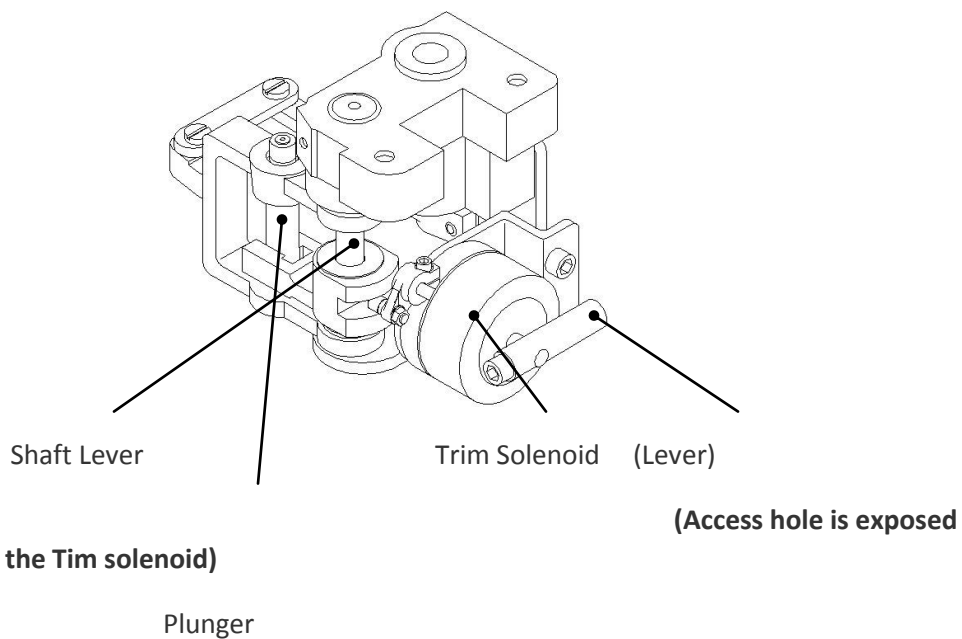
Now inspect the plunger, If you follow the trim cams groove around to the left and straight down as if you were looking under the trim cam, you will see what looks like a screw head, this is the top of the plunger, with a flashlight look to see if there is any grease built up on the top of it. Now with your machine oil place a good amount of oil on the top of that plunger and then fire the plunger up into the trim cam by following the directions below from the machines "Machine Test" functions. If by chance you see some grease at the top of the plunger you may want to try to get some cue-tips to help get the grease off.



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Now there is another component that you may have to apply oil to and it is called the shaft lever, the shaft lever assists the plunger in its lift into the trim cam. If this lever is dry or has grease onto it then it would also prohibit the successful movement of the plunger into the trim cam and may be the catalyst for the error 103. To get to it we must first remove the trim solenoid to gain access to be able to apply the oil. The trim solenoid only has two hex screws mounting it, but the hole in the frame where the trim solenoid is mounted, makes a perfect access point to apply oil to the shaft lever.



when you remove the Tim solenoid)

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- 1) Remove the back table from the machine. Go to the rear of the machine and on each side of the table you will find 1 4mm hex screw on both the right and the left, towards the center of the side of the table. Remove these screws.
- 2) Towards the inside portion of the table you will see a thin silver plate with 2 or 3 wood screws in it, there may or may not be a plate on each side. Remove these screws and slide off the plates.
- 3) Lift the table up from the back and slide it off towards the rear.
- 4) If you are looking from the rear of the machine, on one side you will see a computer board, look on the other side for a component that is brass in color and is domed in shape, at the top of the dome connected to it is a black tubular lever. This is the trim solenoid. This component is mounted by 2 4mm Hex screws. Remove these 2 screws and place them in a safe place so we don't lose them. Gently pull the trim solenoid out. This will expose an opening to where we can apply oil to that shaft lever.
- 5) Inside that access hole now made available by the removal of the trim solenoid, look for the black arms that are attached to a chrome shaft. The visible area of the chrome part will be very little as the black lifting arms cover most of it, but if you aim your oiler under the black lifting arms of the shaft lever, you will be able to get oil onto that shaft lever.
- 6) If you can reach inside of this access hole, see if you can manipulate the arms of the shaft lever to lift it and lower it to work the oil onto that shaft. If you are not able to, place the trim solenoid back into the hole, and press down on the tubular black lever on the top of the brass domed part of the solenoid, this will lift the shaft lever's arms, thus lifting the plunger up into the trim cam. Lift it up and down several times, and then remove the solenoid and apply more oil. When the movement is smooth and responsive to you manipulating the lever, remount the trim solenoid by securing those 2 hex screws.
- 7) Place some more oil on the plunger and then fire the plunger up about 20 times using the MACHINE TEST function described below.

To fire the plunger up into the cam electronically do the following:

If you have an **LED control panel** which does not display the image you are sewing but only provides alpha-numeric information about the design you are sewing, do this.

- 1) Power on the machine, and make sure the main shaft wheel on the side is set to 100 degrees (Red Mark)
- 2) Press the button that has the SWF logo on it.
- 3) Locate the option for MACHINE TEST and press the SET button.

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4) Scroll down to TRIM TEST, or TRIM SOL. TEST, and press the SET button.

5) Press either the START button or any GREEN START BUTTON to fire the trim solenoid.

When you press the START button you will hear the trim solenoid fire the plunger up into the groove of the cam, and immediately after that you should hear a second clicking noise of the plunger obeying gravity as it falls back down to its resting position. Make sure you hear two distinct clicking noises. The first one is always louder than the second one, as the plunger is fired up into the cam electrically by the trim solenoid.

Press the START button several times to be sure you hear the 2 clicking noises. After about 15 tests, Go behind the machine and place some more oil on the plunger and to the shaft lever behind it, then go back to the control panel and hit the START button and test it again about 10 times.

For **LCD type control** panel find the trim test by doing this.

1) Press the TOOLS button. (It may also be MACHINE)

2) Select MACHINE and press SET, (If your control panel does not have TOOLS and you've selected MACHINE, then find MACHINE TEST and press the SET button)

3) Select MACHINE TEST from the list and press the SET button.

4) Scroll down and select TRIM SOL. TEST and press the SET button. (It may also be labeled TRIM TEST).

5) Every time you press the SET button or any of the green start buttons you will fire the plunger up into the cam.

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Once you hear 2 distinct clicking noises then it is time to test the trim function. Turn off the head of the machine by toggling off the switch under or above the red light on the head. You will see the red head on indicator lights by looking just below the large tension knobs in the center of the head. Make sure the red light is out.

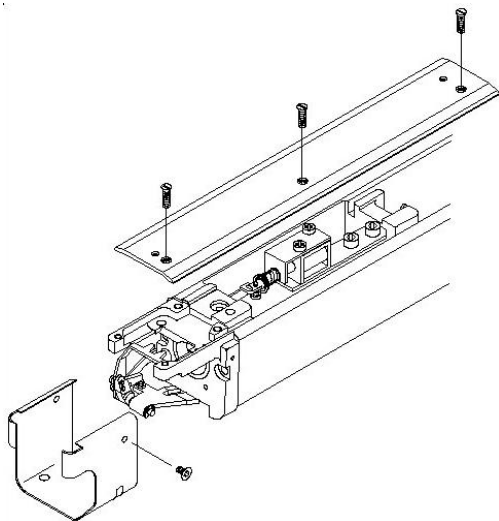
Now perform a few manual thread trims, by either pressing the scissor icon on the control panel and then press the START button.

Or if you have an LCD type monitor, you need to press the tools button and select MANUAL TRIM then select YES on the following screen.

As the machine does its trimming, you need to watch the silver knife as it opens and then closes. Repeat the manual thread trim as many times as you need to be sure that the silver knife is moving properly now and there are no overload messages. If they do swing open and then close and you do not get any error 103 codes again, than you are done. Put the needle plates back on remou8nt the table in the back, and turn the head back on and continue sewing.

Moving Knife Linkage has become disconnected:

Underneath the bed-arm you will find this long flat black linkage which connects the moving knife to the shaft at the rear. To check its connectivity remove the three screws for the bed-arm cover.



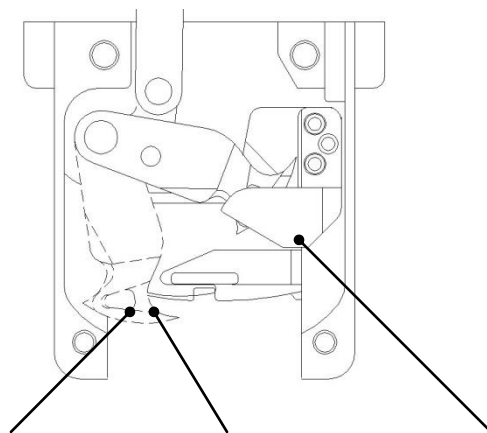
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Check to ensure that both ends are secured to their pegs. One peg can be found on the rear of the moving knife, and the other can be located by removing that square metal cover plate further back from the bed-arm cover that covers the Trim Cam (see above).

The Fixed MES has become dull or nicked :

Removal of the needle plates as mentioned above will expose the trimming knives of your machine. Remember when we talked about how your machine creates a trim, is by the silver (moving Mes) action as it swings under the Black knife (fixed Mes) and the sharp edge of that fixed Mes cuts the thread, if the leading edge of the fixed Mes becomes dull or nicked or if there resides a gap between the moving and the fixed knife, failure in thread trimming will occur.

To check for issues, run your fingernail carefully along the edge of the Fixed Mes and see if you can detect and burrs or nicks, Secondly slide the silver moving knife out from under the black piece and see how they interact. On the flat top side of the silver moving knife is an oval cut out. At the moment the oval cut out is about 1/3rds of the way under the Fixed Mes, there should be friction between the two components.



Triangle Tip

Oval Cut out

Leading edge of Fixed Mes

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If you find that this is not the case, then your knives have become out of adjustment. Place a piece of thread about an arms length in front of the moving knife in front of the curve, and gently move the moving knife towards the black Fixed Mes, slowly pushing from the outer side of the moving knife, push the knife under the Fixed Mes. At the moment the tiny triangle on the back of the moving knife meets the leading edge of the Fixed Mes, the thread should cut. If it does not then the throw of your moving knife will have to be adjusted.

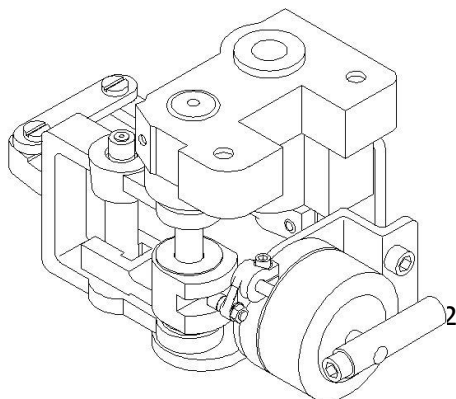
Under Thread Presser Bent:

Under the black Fixed Mes, is a flimsy piece of metal called the under thread presser, it's purpose is to apply tension to the bobbin thread prior to trimming. If you've suffered a birds nest recently, and the moving knife tried to shove a portion of that birds nest under the fixed Mes, the wad of thread may cause the under thread presser to bend upward, prohibiting the moving knife from sliding all the way under the fixed Mes, thus a trimming failure. If this happens a quick fix is to use a needle nose pliers to tear away the under thread presser, and then continue embroidering until you can replace that part.

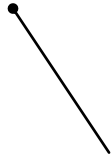
Trim Solenoid has failed:

The trim solenoid is an electrical component that when fired lifts the plunger up into the trim cam, allowing the plunger to follow along that groove etched out of the trim cam. When this occurs the plunger moves the linkage under the bed arm forward, opening the moving knife and then at the end of the groove the knife pulls under the fixed Mes creating a trim to have occurred. If the trim solenoid does not fire, there is no way for the plunger to fire up into the trim cam which would indicate that your moving knife would not move.

Follow the instructions above for testing the trim solenoid from the machine test function of your control panel. If you hear no clicking noises at all, or if you remove the back table and do not see the lever on the trim solenoid move when testing the trim solenoid. Then this would indicate a failed trim solenoid and it will have to be replaced.



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Trim Solenoid and lever.