APQS Maintenance Manual

APQS 800-426-7233

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Daily Machine Maintenance

Check Oil Wicks

Tools needed:

Paper Towels
Machine Oil
WD-40®
Air Compressor or Canned Air

Time to complete:

Approximately 10 minutes

Your APQS machine does not require daily oiling. To avoid getting oil on a quilt, you may wish to check the oiling wicks before you load a new quilt on the machine, and any time the machine has been setting idle for a long time.

Oil Wicks on top of machine.

Oil residue on fingertip = NO OIL NEEDED

Rub your finger across each of the 4 oiling wicks; it should be wet with oil. If any wick is dry, add one to two drops of oil to that particular wick.

Use your finger and rub it across each one of the 4 oiling wicks. It should be wet with oil. If it is not, simply put one to two drops of oil on that particular wick. Check each of the four wicks separately. Each wick will absorb oil differently; you won't need to oil each one every time.

Avoid over-oiling your quilting machine. Some signs of over-oiling include excess oil accumulating on the needle bar or hopping foot, oil dripping from the light bar or out the side of the machine, or oil spots on the quilt. Take time to wipe the needle bar and hopping foot before quilting, and do not leave the machine parked on top of a quilt overnight or for an extended period.

Clean and Oil the Hook

Important: Clean and oil the hook regularly. Every time you change a bobbin, remove lint from the bobbin case and hook area (see complete instructions below). Between each quilt project, thoroughly clean the hook area with the procedure outlined below so that you can have trouble-free quilting.

With every bobbin change:

Some types of threads, particularly cotton, produce a lot of lint. Lint buildup in the bobbin case or hook area can cause tension changes and poor stitch quality. Excess lint can also become dirty and could even be quilted into the quilt. To prevent lint buildup, remove lint from the bobbin case and hook area with compressed or canned air. Unlike domestic sewing machines, using compressed air is recommended instead of a brushor vacuum – it will do a better job and will not hurt the machine.

Check for excess lint in the bobbin case/hook assembly area whenever a bobbin is changed.

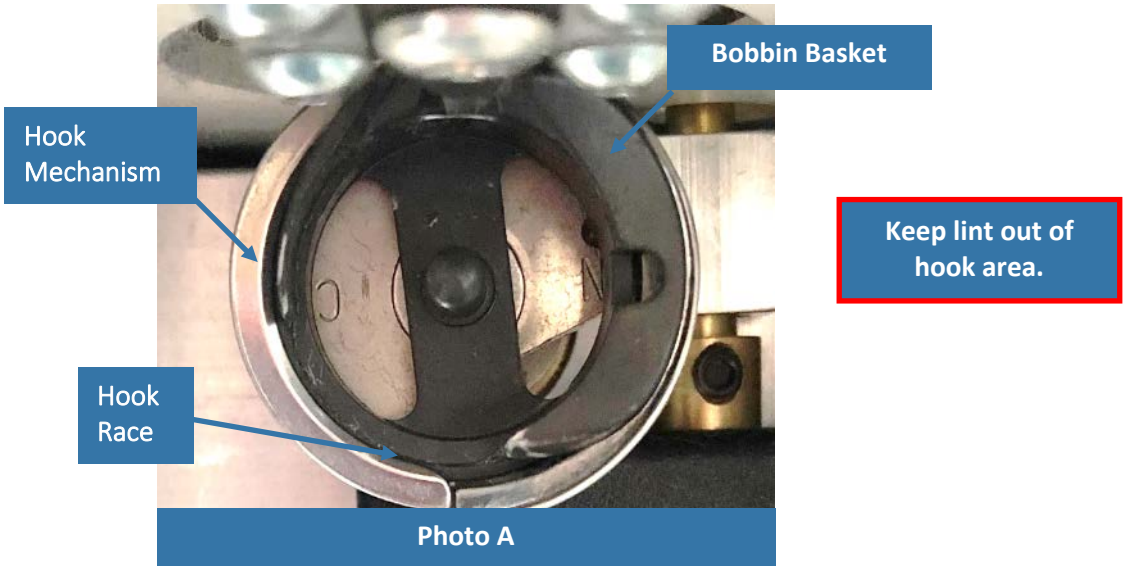


Photo A

Between each quilting project (or sooner if necessary):

Place a small rag or paper towel on the carriage under the hook area to catch excess oil and lint. Remove the bobbin case and unthread the machine from the front, past the take-up lever.

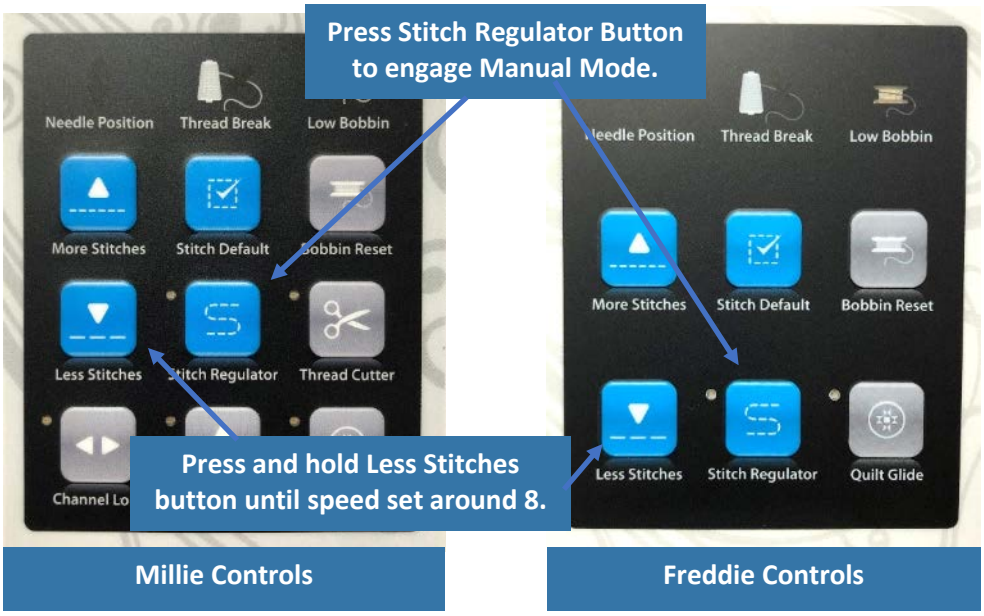
Paper towels laid over carriage.

Pull thread from needle back through this guide.

Working from the front side of the machine, brush lint from the hook and hook area (or use compressed air).

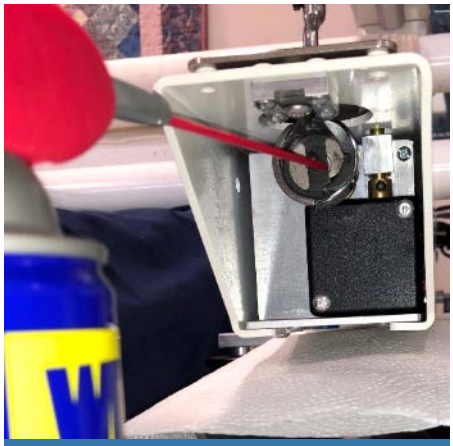
Check to make sure that the rag is out of the way of the hook assembly.

Since your machine defaults to stitch regulated mode at power up, you'll need to press the Stitch Regulator button on your front cover to be able to use manual mode. Then, press the "Less Stitches" button to slow the speed to around 8. Now start the machine in manual mode pushing the toggle switch away from the white dot on any handle.



Millie Controls | **Freddie Controls**

With the machine ***running***, pray the hook area generously with WD-40 to flush out lint particles that may be inside the hook race. The "race" is the area between the bobbin basket (the dark part of the hook assembly where the bobbin case nestles in) and the hook (the silver part that moves around the bobbin basket in a counter-clockwise motion) – see photo on page 90. Allow the machine to run 10–15 seconds to throw off the excess WD-40.



Hook Assembly "WD-40 Bath"

SAFETY NOTE: Do NOT use a rag to remove lint from the area while the machine is running!

Keep your hands away from the rotating hook assembly while the machine is running!

Stop the machine by tapping the toggle button on any handle again.

Use compressed air to blow out any excess WD-40, and carefully wipe out any additional excess product using a separate rag. *Be sure to keep your hands away from the handles to prevent accidentally starting the motor, or use the master switch on the machine to turn off power when working in the hook area.*
Note: WD-40 is NOT a lubricating agent. Oil must be applied to the hook after cleaning with WD-40.

Check to see that the rag is still in place under the hook area and is out of the way of any moving parts. Now apply one to two drops of oil to the hook assembly as shown in photo below, between the dark-colored bobbin basket and the silver hook mechanism.

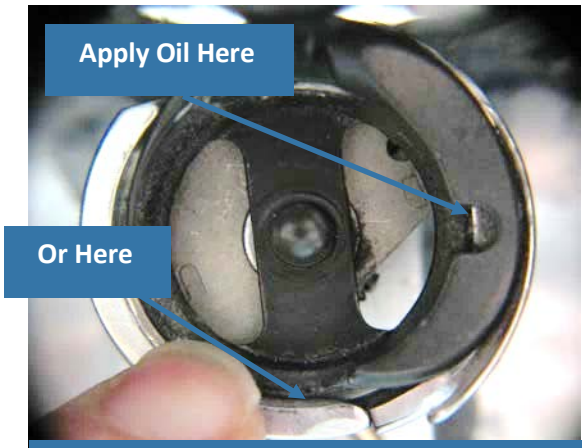


Photo B

Either turn the flywheel by hand a few revolutions or push the toggle switch towards the white dot on any handle to move the needle up and down a few times to help distribute the oil around the hook assembly.

Keep the rag out of the way of moving parts and start the machine again by pushing the toggle switch away from the white dot on any handle to start the machine in manual mode. Allow the machine to run for 10–15 seconds so that the oil can be distributed in the hook assembly.

Turn off the machine by pushing the toggle switch away from the white dot on any handle again and wipe off any excess oil in the area using a separate rag. Remove the rag from below the bobbin area. Re-thread the machine, insert a bobbin and bobbin case, and sew on a scrap piece of material to remove any excess oil and make any minor upper tension adjustments.

If you notice the machine getting noisy during normal operation, the hook assembly may be dry and needs oil.

General Machine Maintenance

Fuses

Main Fuse Location and Replacement (ALL APQS Machines)

APQS machines use a fuse to protect its circuitry in case of a power surge or other problem. In the event of a machine jam, the fuse will blow to avoid any larger problems that might occur.

The main fuse for APQS machines is located between the power cord and On/Off switch along the top of the machine. To access the fuse, use the steps below.

Remove the power cord from the side of the machine and look closely at the area just below the power switch. You'll see a small "drawer" area where the fuse is located.

Main Fuse Location

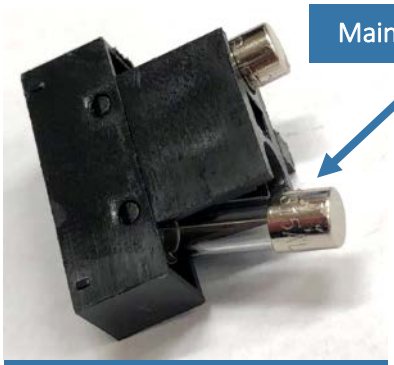
Main Fuse Location

To access the fuse, place a flat blade screwdriver in the groove on the bottom of the drawer and gently pry the
door open.

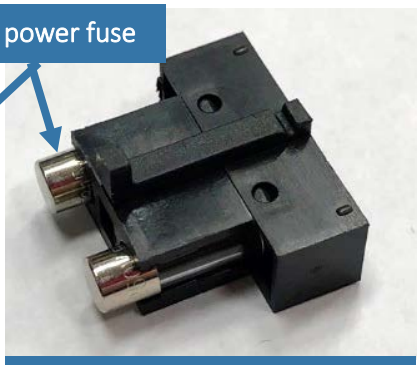
Slot for screwdriver to remove fuse

Use screwdriver to pry fuse drawer out of power

The fuse currently protecting the machine is exposed. If this fuse blows, a spare fuse is included in the fuse holder next to the active fuse. Use it to replace a burned-out fuse. Purchase additional fuses from APQS, or a well-stocked electrical supply store. Ask for a 3.15 amp 250 volt SLOW BLOW 5mm x 20mm fuse. The fuse MUST be “slow blow” which makes it more difficult to find at hardware or home improvement stores.



Top of fuse drawer.



Bottom of fuse drawer.

Fuse closest to front of machine is main power fuse.

Remove the spare fuse and clip it into the end of the fuse holder. Reinstall in the machine.

Position fuse drawer with flat side up.

Push drawer in until it clicks.

Before restoring power to the machine. take a few minutes to ensure the machine can cycle the needle up and down by turning the flywheel by hand. If the bind or jam has not been cleared before the machine is powered up, the replacement fuse will also blow.

If the fuse replacement process does not allow the machine to turn on, you may have blown the fuse that protects the circuit board. This fuse is located under the top covers of the machine. It is the same size fuse as the main fuse – a 3.15 amp 250 volt SLOW BLOW fuse. The replacement process for this fuse begins on the next page.

Circuit Board Fuse

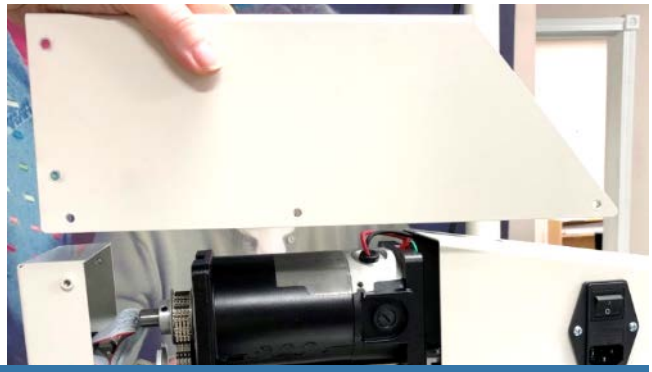
You will also have a fuse that is under the top covers of the machine that is for the circuit boards. On Millie and Freddie, this fuse is located on the Bobbin Counter Circuit Board. To access this fuse, both of the machine's top covers will need to be removed.

Begin by removing the 5 screws on each side that hold the motor cover onto the top of the machine. Three screws on the power cord side of the machine will have plastic clips for the power cord attached to them. Keep these clips in a safe place – they will be needed when reassembling the machine. The screw for the thread guide will also have a gold washer.

Remove these 5 screws on thread path side of machine.

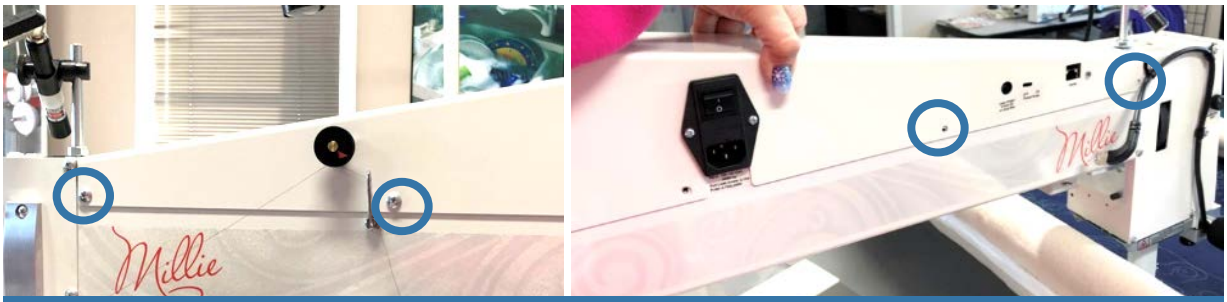
Remove these 5 screws on power cord side of machine.

Once the screws have been removed, lift the motor cover straight up to remove it from the machine, and set it off to the side of the machine. There are no wiring connections on this cover to disconnect.



Once all cover screws have been removed, lift top cover straight up and off the machine.

Next, remove the screws from the top cover on the front of the machine.



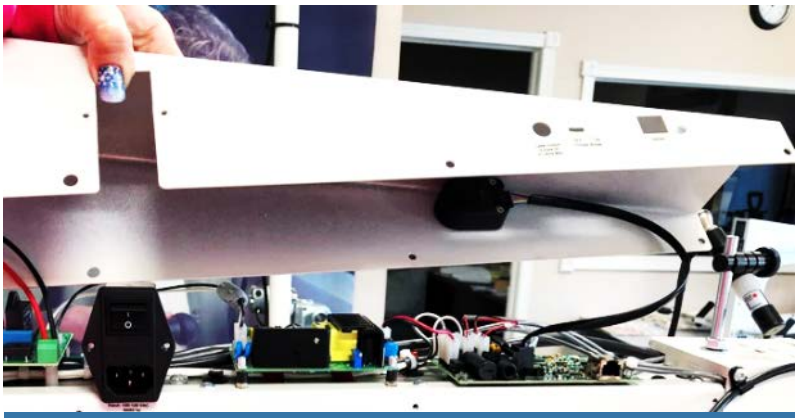
Remove remaining screws in top cover.

You will also need to remove the 2 small Phillips screws that hold the power cord module in the machine.

Remove both screws for power module.

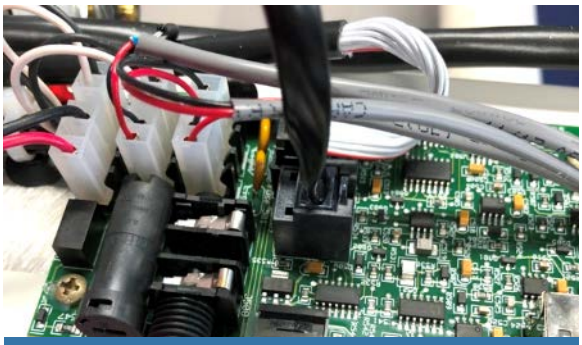
Once the screws have been removed, lift the top cover up while holding onto the black box that the power cord plugs into. This box is attached to the top of the machine so it will stay in position as you remove the top cover.

Lift cover straight up to clear power module.

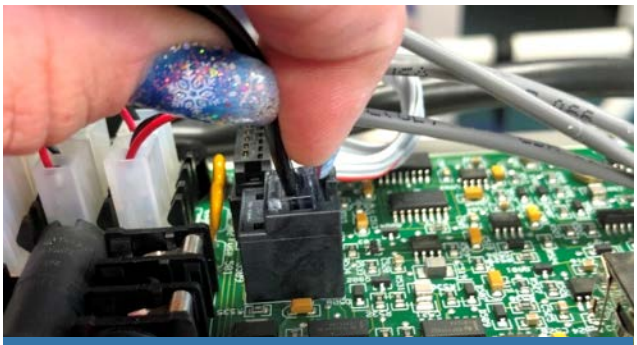


Wire connection for thread break sensor in center of circuit board.

The top cover is connected to the machine with one cable. The cover can just hang off the side of the machine by this cable, or if you feel more comfortable, you can disconnect this cable from the circuit board. Push the plastic tab towards the cable, and then pull the cable out of the connector.



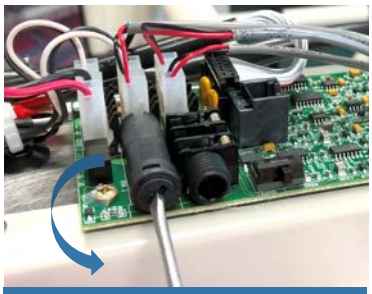
Wire connection for thread break sensor in center of circuit board.



Disconnect cable by pushing plastic tab towards cable and pulling upwards.

Using a flat blade screwdriver, turn the inside cap ¼ turn to the left while pushing in slightly – this will allow the fuse holder to come out of the machine.

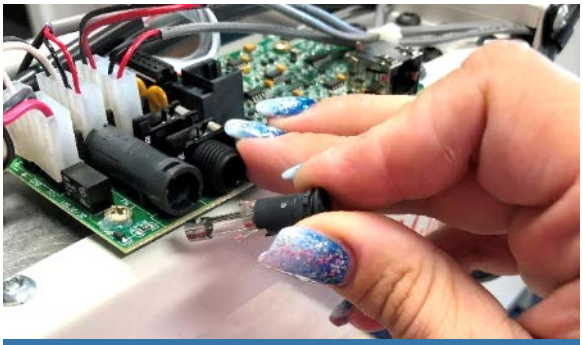
Fuse holder for circuit boards.



Turn fuse holder ¼ turn to the left to remove.

Pull the fuse holder out of the circuit board. It is a 3.15 amp 250 volt SLOW BLOW 5mm x 20mm fuse (not the fast-acting type, or use a 4 amp if the 3.15 is not available), and can be purchased at The Source (used to be Radio Shack) in Canada, or at Radio Shack in the United States. Some well-stocked auto stores or hardware stores may also carry the fuse, or you can order it directly from APQS.

Grab edge of fuse holder to remove.



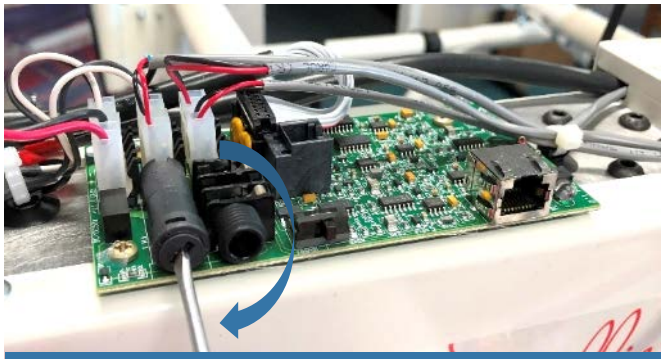
Fuse holder removed from circuit board.

Replace the bad fuse with a new one and reinstall the fuse holder into the machine. When putting the fuse holder back into position, the metal clips should be bent away from the fuse in the holder as shown in the photo below. When reinserting the holder into the machine, gently compress the spring just enough to get the clips to clear the opening, but do not compress them too much or the power won't be able to transfer through the fuse.

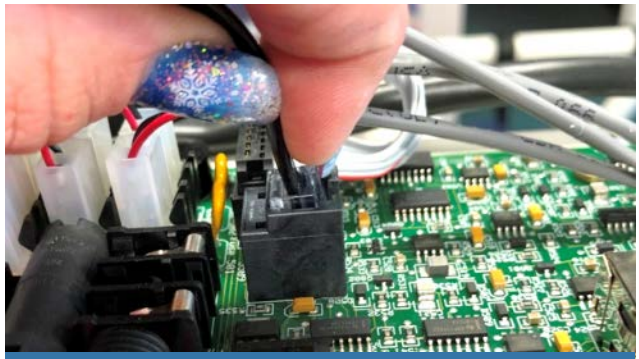
Fuse holder removed from machine.

Squeeze metal side clips to hold fuse in position for reinstallation in board.

Using flat blade screwdriver, turn the fuse holder ¼ turn clockwise while slightly pushing in on the fuse holder to lock it into position. Reconnect cable from top cover and replace the covers using these instructions in reverse.



Lock fuse into position by pushing slightly while turning ¼ turn clockwise.



Remember to reconnect cable to thread break sensor before reinstalling cover.

Fuse Replacement (CSA Models)

Machines shipped to Canada have electrical safety requirements mandated by the Canadian Standards Association (CSA). One of these requirements is a separate fuse for the motor on your quilting machine.

Any time the motor is under a bind – a needle jam, thread wrap, etc., this fuse will normally blow first. This fuse is located under the top cover of the machine. When this fuse has blown, all other functions of the machine will still continue to work except any that involve the motor itself, like needle up/down and start/stop. You will still have LED lights and all other indicators, but will not be able to run the machine. To replace this fuse, follow the steps below.

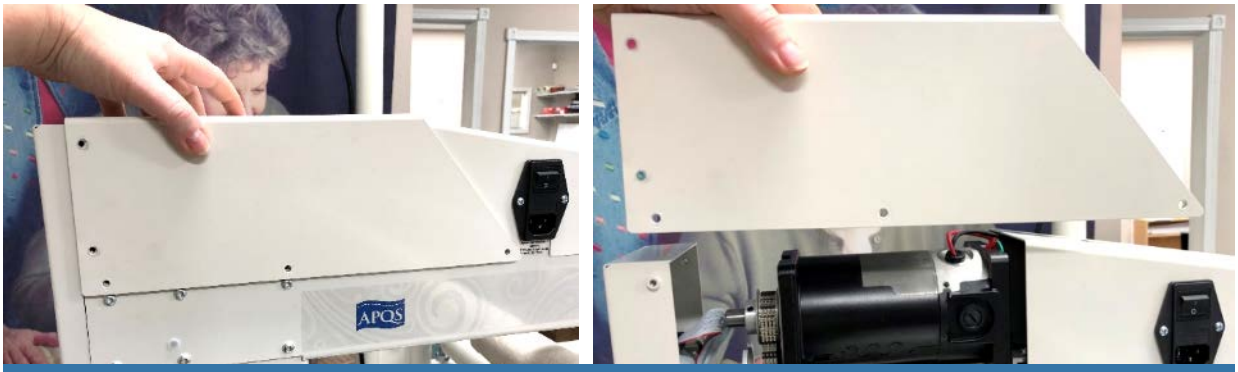
TURN OFF MACHINE AND UNPLUG POWER CORD FROM MACHINE HEAD BEFORE STARTING!

Begin by removing the 5 screws on each side that hold the motor cover onto the top of the machine. Three screws on the power cord side of the machine will have plastic clips for the power cord attached to them. Keep these clips in a safe place – they will be needed when reassembling the machine.

Remove these 5 screws on thread path side of machine.

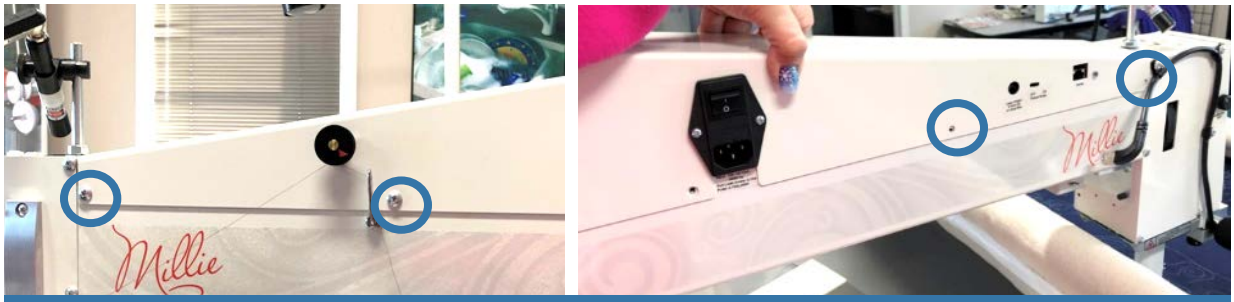
Remove these 5 screws on power cord side of machine.

Once the screws are loose, lift the top cover straight up to remove it from the machine, and set it off to the side of the machine. There are no wiring connections on this cover to disconnect.



Once all cover screws have been removed, lift top cover straight up and off the machine.

Next, remove the screws from the top cover on the front of the machine.



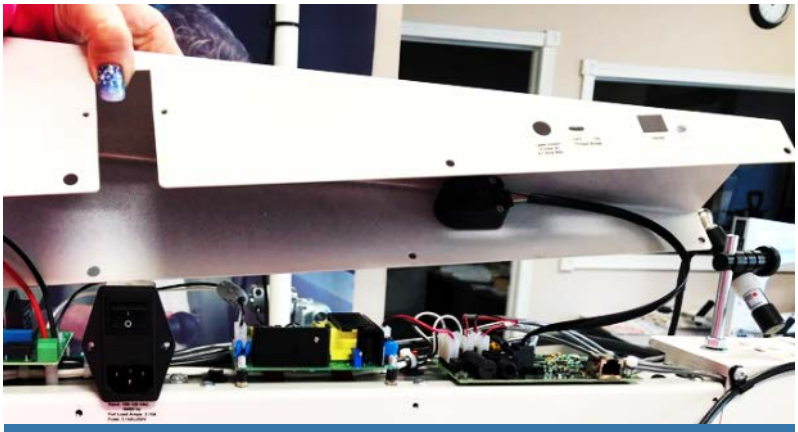
Remove remaining screws in top cover.

You will also need to remove the 2 small Phillips screws that hold the power cord module in the machine.

Remove both screws for power cord module.

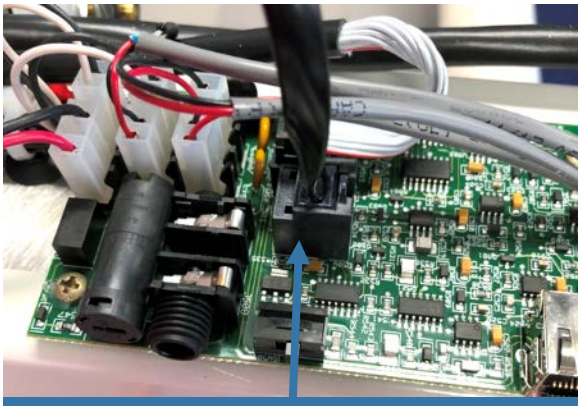
Once the screws have been removed, lift the top cover up while holding onto the black box that the power cord plugs into. This box is attached to the top of the machine so it will stay in position as you remove the top cover.

Cover clearance around power cord module.

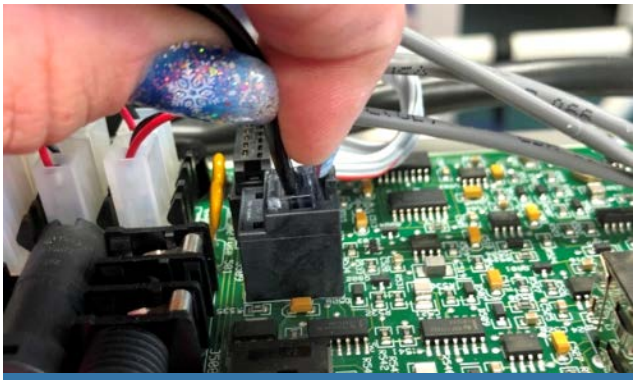


Lift cover off machine to expose circuit boards. Note wiring connection for thread break sensor from cover to board.

The top cover can hang off the side of the machine without disconnecting the cable that connects it to the circuit board. Or, if you feel more comfortable, you can easily disconnect the cable. Push the plastic tab towards the cable, and then pull the connector out of the circuit board.

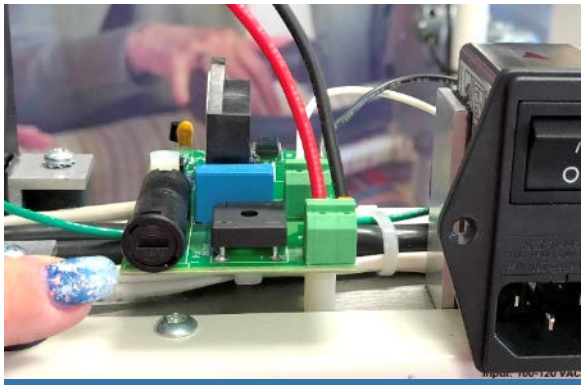


Wiring connection in center of board.



Unplug by pushing tab towards cable and pull upwards on cable.

On the power cord outlet side of the machine, there is a fuse holder between the motor and the power cord outlet. This is the fuse required for CSA standards to protect the motor. It is a 3.15 amp 250 volt SLOW BLOW 5mm x 20mm fuse (not the fast-acting type) (or 4 amp if the 3.15 is not available), and can be purchased directly from APQS or a well-stocked electronics store.



CSA Motor fuse located on transformer board.

Turn ¼ to left to remove holder.

Using a flat blade screwdriver, push in slightly and turn the inside cap ¼ turn to the left – this will allow the fuse holder to come out of the machine. Replace the bad fuse with a new one and reinstall the fuse holder into the machine. Follow the instructions in reverse order to replace covers.

Remove fuse holder from machine.

Fuse holder with fuse removed.

Hopping Foot Height Verification

The hopping foot height is set at the factory for today's popular thin battings.

This height is 1/64''about the thickness of a business card. The foot will "hop" up and down as the machine stitches so that the fabric is not pushed and bunched by the foot. Some circumstances may require you to raise the foot slightly, such as stitching through heavy fabric like denim, polar fleece, upholstery fabric, etc. Thick batting may also require raising the hopping foot, as well as quilts with bulky seams or intersections.

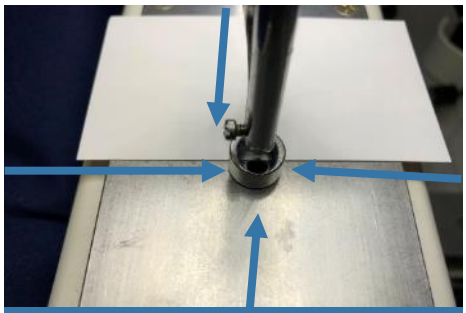
Hopping Foot height is measured as distance between bottom of foot and needle plate when at lowest position.

Testing and adjustments need to be made with the needle bar in the LOWEST position. Use the flywheel on the front of the machine to lower the needle completely. Note that the hopping foot also lowers.

Using the toggle switch on the handles will NOT get the hopping foot at its lowest position.

Check the hopping foot height by sliding a single business card under the foot – do not use a card that has a shiny coating, as it will be thicker than a standard "card stock" business card. It should slide easily under the foot without binding but should not have a lot of "play" between it and the throat plate. Remove the card and re-test from all directions – from the back to the needle, from the front to the needle, etc.

Testing hopping foot height with business card.



Test from all directions.

If an adjustment needs to be made, follow the process beginning on the next page.

Hopping Foot Height Adjustment

Tools needed:

Business Card (standard card stock – not plastic coated)
Flat Blade Screwdriver with long handle – 3/16'' wide shaft, 3/16''wide tip – also known as "Cabinet Tip"
Flashlight

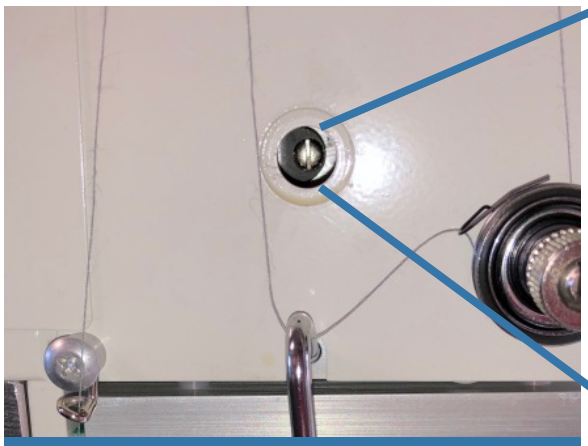
Time to complete:

Approximately 5 minutes

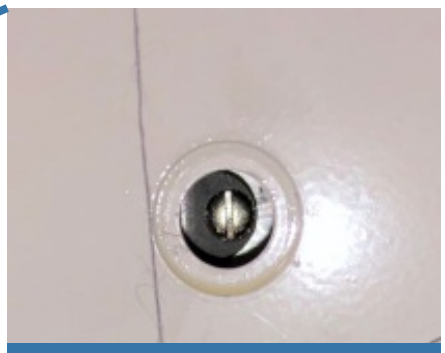
To access the hopping foot clamp, remove the black plastic cap on the right side of the machine near the tension control unit.

Adjustment screw access cover.

Use a flashlight to locate the hopping foot clamp screw. This screw will be easily accessible when the hopping foot is at its LOWEST position only.



Use flashlight to see clamping screw.



Hopping foot clamping screw.

Insert a flat blade screwdriver into the access hole and engage the blade into the hopping foot locking clamp screw. *NOTE: You may find it easier to remove the front LEFT panel of the machine on the opposite side of the head before adjusting the hopping foot. This allows more light into the sewing head, making it easier to see the clamp screw. Or you may try shining a flashlight beam into the long vertical slot where the "take-up lever" travels up and down (just next to the access hole). This also illuminates the interior of the machine, making it easier to see the clamping screw.*

Use screwdriver to loosen clamping screw for hopping foot.

Make sure the needle is in the lowest position before proceeding.

Loosen the clamping screw by turning it to the left.

Turn screwdriver counterclockwise to loosen clamping screw.

You'll now be able to raise or lower the hopping foot as needed. Let the foot rest on the card, and make sure that the needle is centered in the foot's opening.

Position foot to rest on business card.

Tighten the clamping screw by turning it to the *right* while holding the hopping foot in position centered on the needle.

Tighten clamping screw while holding hopping foot in desired position.

Foot not centered on needle.

Foot centered on needle.

Turn the flywheel by hand and observe the foot as the machine progresses through a "stitch sequence." If any additional adjustments are needed, be sure to make them with the needle in the lowest position. Make the adjustments just a bit at a time; for example, try folding a business card and placing it under the foot, or place a dime under the foot (away from the needle, of course) for a bit more clearance.

Replace the black plug into the access hole.

Place a sticky note or other reminder on/near your machine to remind you to return the foot to normal operating height (set the hopping foot so that the clearance is the thickness of a business card) when you are finished with your special project. If you forget, you will have loopy stitches and bird's nests on the back of your quilt.

Replace access hole plug.

Stitch Encoders
Carriage Encoder – Deluxe Non-Bliss Table

When do I adjust the encoder on my carriage?

Adjust this encoder if you notice long or skipped stitches without needle holes when moving left to right or when the rubber encoder wheel does not make solid contact with the larger M&M Carriage Wheel.

Long stitches moving horizontally without needle holes.

Tools Required:

Rubbing Alcohol and cotton swabs for cleaning wheels (if necessary)
7/16” Combination Wrench

Time to Complete:

Approximately 10 minutes

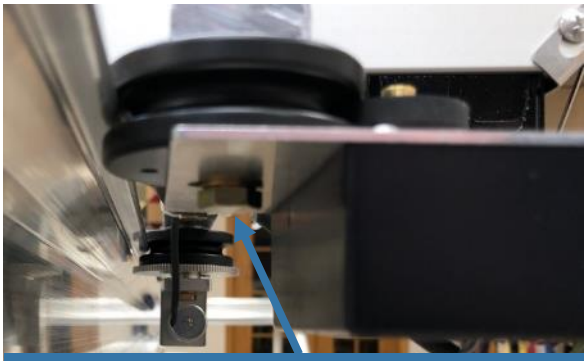
First, make sure your encoder wheel and carriage wheel are free from any oxidation buildup. You can use rubbing alcohol to clean both wheels.

To test the encoder wheel position, hold the carriage stationary, and try turning the rubber encoder wheel separately.

Testing resistance between encoder wheel and carriage

You should feel “rubbing” or resistance when turning the rubber wheel by itself. If the rubber wheel moves freely, an adjustment should be made.

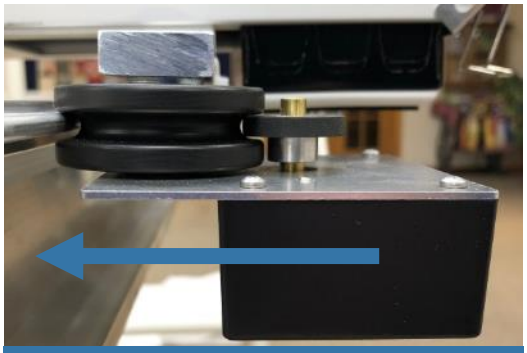
Using a 7/16'' wrench, loosen the gold mounting bolt that holds the encoder on the carriage axle. You don't have much room to work, but once the encoder box starts to spin, then you can swivel it out of the way so you have more room to access the bolt.



Mounting bolt for carriage encoder box.

Loosen mounting bolt with 7/16" wrench.

Once the encoder box is loose, push it closer to the table; this will move the encoder wheel in tighter to the carriage wheel.



Push box closer to table and hold in place while tightening the bolt.

Once the position is set, then tighten the gold mounting bolt again, holding the encoder box in place. Check the encoder wheel positioning before tightening the bolt completely.

Carriage Encoder – Bliss Table

Tools Required:

Rubbing Alcohol and cotton swabs for cleaning wheels (if necessary)
#2 Phillips Screwdriver with long handle

Time to Complete:

Approximately 10 minutes

It is easiest to make the Bliss encoder adjustment from under the carriage. Position the machine at one end of the table. Lift the pantograph table top half that is under the machine, and slide it over the top of the other half, or remove it entirely from the table. This will allow you to access the underside of the carriage.

Access Bliss Encoder from under table by removing half of table top.

The photos to the right show the encoder assembly before it is mounted in the carriage. These photos can help you locate the encoder wheel itself, and clean with a cotton swab and rubbing alcohol. Oxidation will not build up as much on this wheel due to the steel roller running on a steel rod, but dust and lint will still build up, making the encoder wheel slip.

Millie Encoder Assembly

Freddie Encoder Assembly

These photos show the encoder wheel when looking under the carriage from the back of the table, and as seen from the underside of the carriage.

Encoder wheel

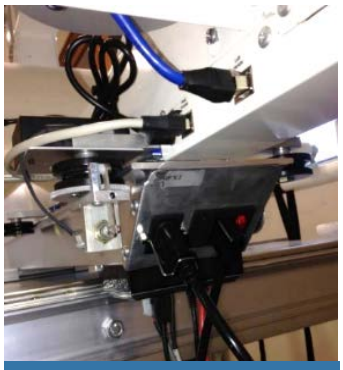
Encoder Box Adjustment Screw

Once you have located the encoder box under the carriage, the mounting screw on the right side of the encoder plate has an adjustment slot. The photo below left has had the screw removed to show the adjustment slot – you will not need to remove the screw to make the adjustment! Loosen this screw, then push down on the upper right corner of the encoder box, which will move the rubber encoder wheel tighter to the silver wheel. Tighten the mounting hardware while holding light pressure on the encoder box.

Adjustment slot in

Downward pressure to adjust

For customers with Quilt Path, there will be wiring connections on the outside of the carriage, but the access to the encoder wheel adjustment would be the same – from the underside of the carriage.



Quilt Path Carriage

Head Encoder – All Tables

When do I adjust the encoder on my sewing head?

Adjust this encoder wheel if you notice long or skipped stitches when moving both forward and backward, or if the encoder wheel does not make good contact with the larger wheel. BOTH Standard Models and Bliss Models may require adjustment of the head encoder wheel at some point.

Tools Required:

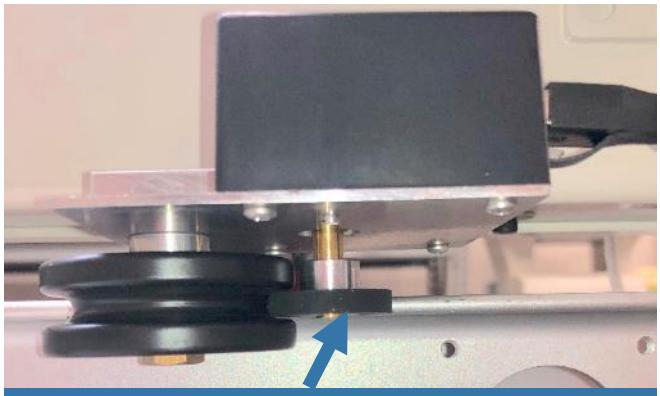
Rubbing Alcohol and cotton swabs for cleaning wheels (if necessary)
7/16'' Combination Wrench or Socket

Time to Complete:

Approximately 10 minutes

First, make sure your encoder wheel and carriage wheel are free from any oxidation buildup. You can use rubbing alcohol to clean both wheels.

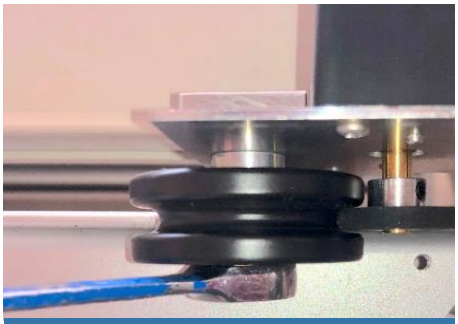
To test the encoder wheel position, hold the machine head stationary, and try turning the rubber encoder wheel separately.



Test resistance between encoder wheel and head wheel by holding carriage stationary and turning rubber wheel independently.

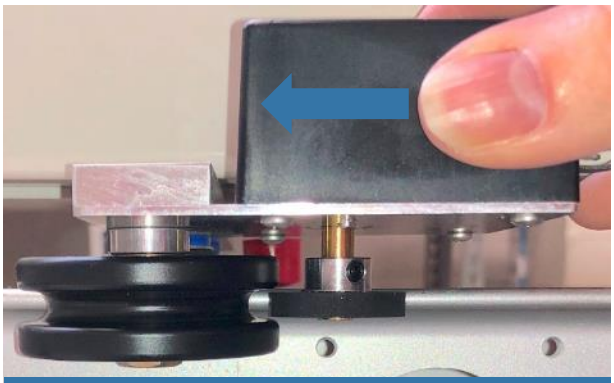
You should feel "rubbing" or resistance when turning the rubber wheel by itself. If the rubber wheel moves freely, an adjustment should be made.

Use a 7/16'' wrench to loosen the gold bolt.



Use 7/16'' wrench to loosen bolt.

Once the bolt is loose, push the box towards the front of the machine, which will move the encoder wheel closer to the larger wheel (see photo below).



Push box towards front of table to adjust position of encoder wheel.

Tighten the bolt slightly, and re-test the tension between the two wheels. You should feel a fair amount of tension between the two wheels. Once you have the position you desire, tighten the gold bolt securely.

Motor Brushes

Check the motor brushes about once a year.

Tools needed:

#2 Phillips Screwdriver
Flat Blade Screwdriver
Paper Towels
Air Compressor or Canned Air
Vacuum

APQS Parts:

Motor Brush set – 3106-01 (US & Canada)
Motor Brush set – 3106-02 (CE – 220v motors)

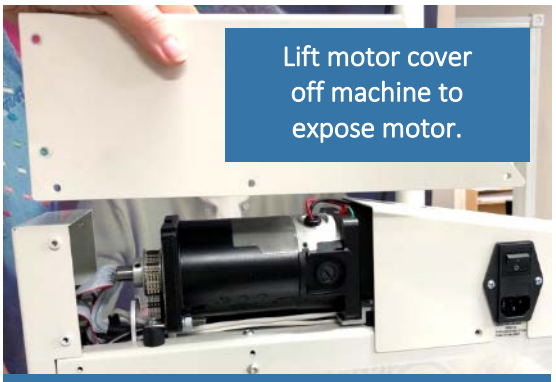
Time to complete: Approximately 10 minutes

IMPORTANT: Disconnect power to the machine before proceeding!

Accessing Motor Brushes

Remove 5 screws on each side of machine as shown below. Lift off the top cover. (The procedure is the same for Millie and Freddie machines.)

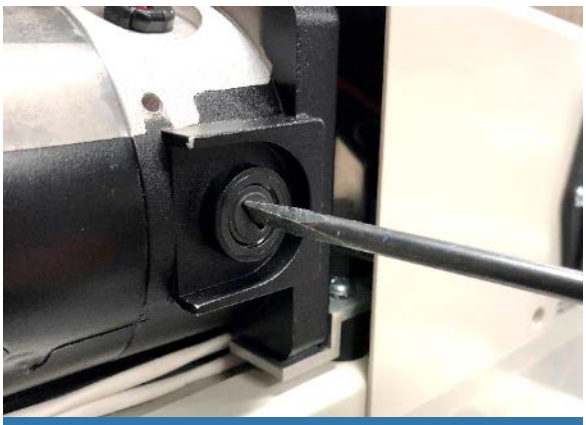
Motor Cover



Removing Motor Cover

Use a flat blade screwdriver to remove the brush caps on both sides of the motor.


Locate Motor Brush Caps


Removing Motor Brush Caps

Use a small screwdriver to gently remove the gold-colored piece and pull the entire brush assembly out of each side of the motor (see photos below).

Motor Brush Assembly

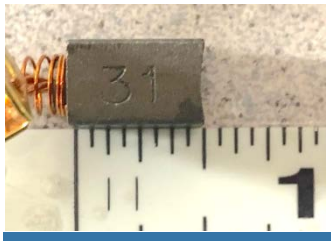
Removing Motor Brush Assembly

Note that the "brush" has a concave end. The brush must be inserted in the same way it was removed. Its concave shape matches the curvature of the motor housing. You may notice that there are numbers imprinted in the motor brush itself – the numbers are not important – however, making sure the curve at the end is inserted properly is very important.

Curvature in end of motor brush

Motor brush close-up

A new motor brush is about ½-inch long when measured from the base to the longer side of the curved end as shown below. A slight amount of wear is normal. If the brush is less than 3/8-inch long it should be replaced.



Measuring motor brush length

With both motor brushes removed, use compressed air to blow out the motor. Blow the air through one of the brush holder openings, and at the same time use a vacuum hose positioned over the other brush holder opening. Turn on the vacuum while you blow out the motor dust. This will help prevent the carbon dust that has accumulated in the motor from getting blown into the air. If you don't have a vacuum available, cover the other opening with a damp paper towel to catch the carbon dust.

Place new brushes into the brush holders on the motor, making sure to insert them with the curvature of the brush matching the curvature of the motor. The gold-colored piece on the end of the brush will fit into the indentations on the inside of the brush holder either vertically or horizontally.

Correct motor brush alignment.

Incorrect motor brush alignment.

Replace the two plastic caps over the motor brushes, making sure that the groove for the screwdriver is facing outwards. When replacing the plastic caps, do not over-tighten them – just tighten them until you feel resistance. The caps are made from plastic, and they can get brittle over time – over-tightening them will cause breakage of the brush cap.

This side of brush cap goes inside the motor.

Correct brush cap position.

Replace the top motor cover. Tighten each screw securely.

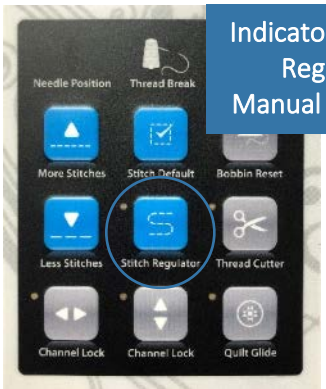
Needle Up/Down Speed Adjustment (Needle Positioner)

Your machine goes through a "break-in" period during which the electronics loosen up. At some point you may find the needle takes an extra stitch or more after you've stopped the sewing motor. Use this information to adjust your needle up-down setting back to a single stitch.

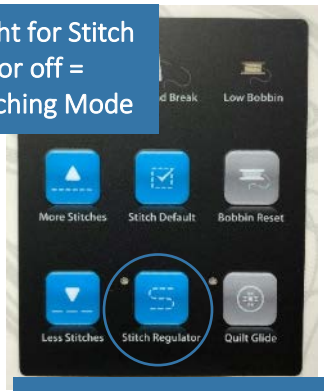
Remove the bobbin case and bobbin, and unthread the machine beyond the take-up lever on the side so that no thread can get tangled in the hook during this adjustment. Before making the adjustment, the machine needs to be warmed up; run in the manual mode for 10–15 minutes.

Unthread machine past take-up lever.

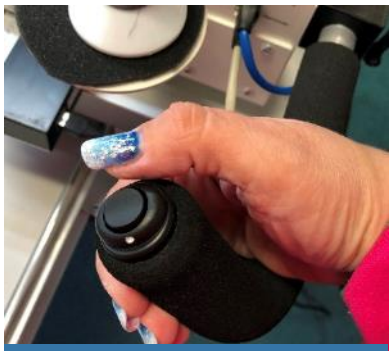
Press the Stitch Regulator button on the Smart Touch Pad to enable you to run the machine in manual mode. Once the Stitch Regulator light is off, push the toggle switch away from the white dot on any handle to start the machine running in manual mode.



Millie Smart Touch Pad

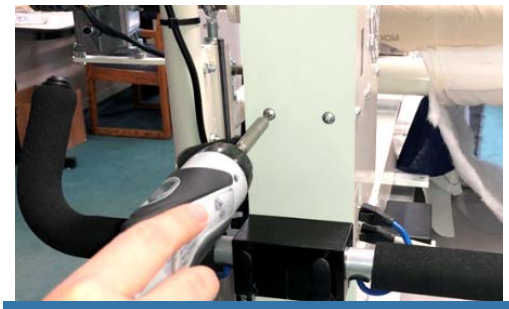


Freddie Smart Touch Pad



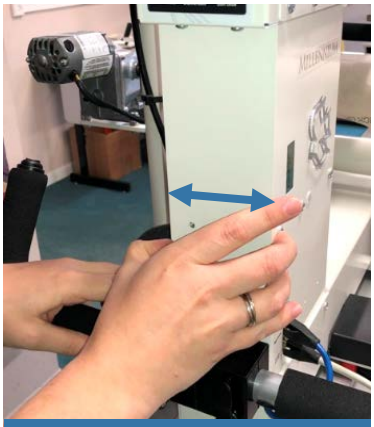
Push toggle switch away from white dot to start motor.

While the machine is warming up, you'll need to remove the back plate on the machine. Use a #2 Phillips screwdriver to remove the screws that are above the rear handle mount on the back of your machine.



Remove 2 Phillips screws holding the rear plate onto the machine.

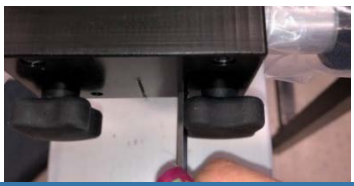
Once the screws are removed, the cover should slide towards the right or left side of the machine. You will need to keep it as square to the machine as possible to clear the other machine components. If it feels like it doesn't want to move easily, you may need to loosen two other parts of the machine to give the plate room to move.



Slide rear plate to left or right side while keeping it square to the machine.

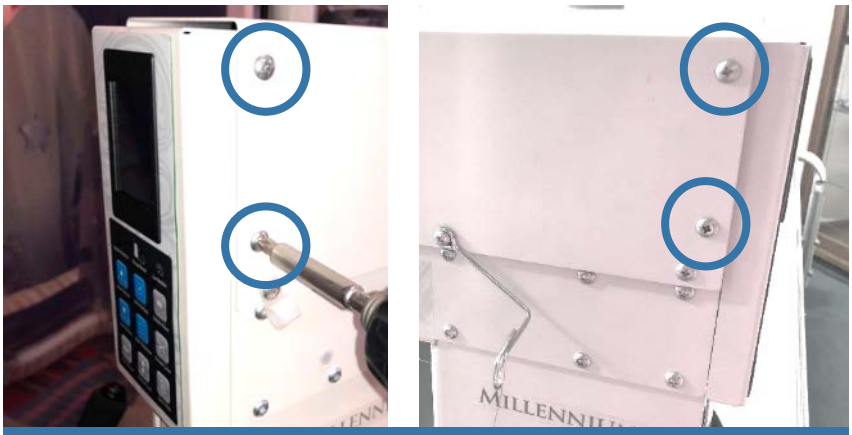
The first thing to loosen would be the mounting bracket for the rear handles. Use the 9/64 Allen wrench that was supplied with the machine to loosen the two mounting screws – 1 full turn counterclockwise should be enough.

Locate mounting screws access in rear handle



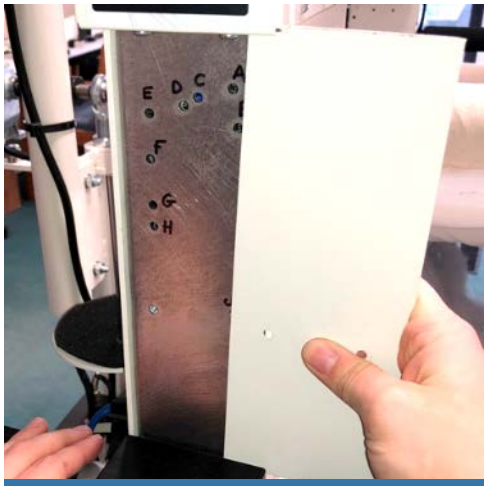
Use 9/32 Allen wrench to loosen screws one full turn counterclockwise.

The next would be the rear cover that houses the Smart Touch Pad and the stitch length gauge. There are 2 screws on each side that will need to also be loosened 1 full turn counterclockwise.



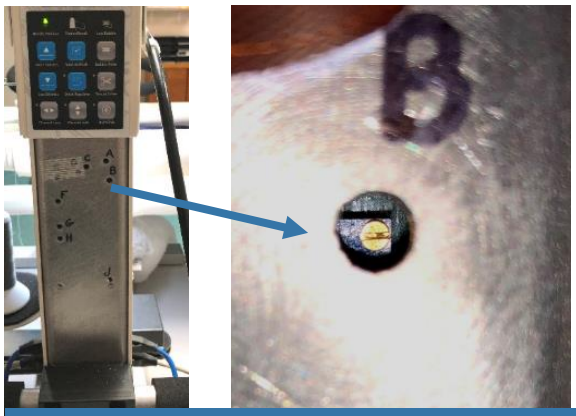
Loosen 2 screws on each side 1 full turn counterclockwise.

Now that those two components are loose, you should be able to slide the cover off the side of the machine.



Slide plate to side and remove from back of machine.

The access holes in the back plate are lettered for the calibration process – be sure you are ONLY working with the "B" adjustment point. With a flashlight, look inside the "B" adjustment access hole and locate the adjustment screw.



Locate "B" access hole in back circuit board cover.

The direction you turn the screw will depend on whether the needle is over-cycling, or having problems completing a cycle. Ideal time lapse for the needle up/needle down is one full second from position to position.

- **If the machine is over-cycling,** turn the screw to the left – *counterclockwise*. Start with half a rotation.
- If the machine is taking **more than one full second** to complete a cycle, turn the screw to the right, or *clockwise*.

Continue to adjust the speed of the needle up/needle down until the "one full second" time lapse has been achieved.

Once the adjustment has been made, reinstall the back plate and tighten the screws securely, but do not over-tighten them.

Reinstall rear plate using 2 Phillips screws.

Tighten screws securely – DO NOT OVER-TIGHTEN!

Remember to tighten rear cover and handle mounting bracket if you have loosened them previously.

Remember to tighten any other cover screws or the rear handle mounting brackets that may have been loosened so the rear plate could be removed.

Tension Assembly Maintenance

Routine Cleaning

Tools needed:

Paper Towels
Rubbing Alcohol or Lacquer Thinner
WD-40
Air Compressor or Canned Air

APQS Parts:

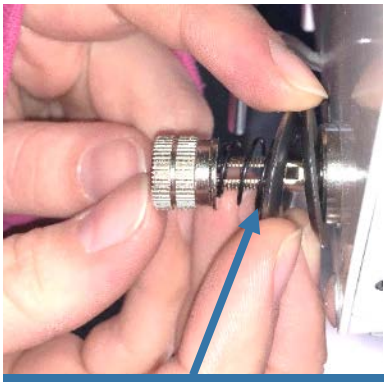
Check Spring – 3067-01
Tension Control Complete – 2043-01

Time to complete:

Approximately 5 minutes

Remove lint between tension disks

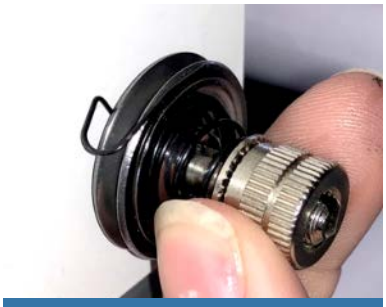
During daily quilting, use compressed air to blow out any lint that has accumulated between the tension disks. With your fingers, pull on the outermost tension disk, and blow the air between the two larger disks of the tension control unit. This will help avoid any problems with lint buildup that can cause tension problems.



Pull on outer tension disk and blow air between disks..

Clean buildup between tension disks

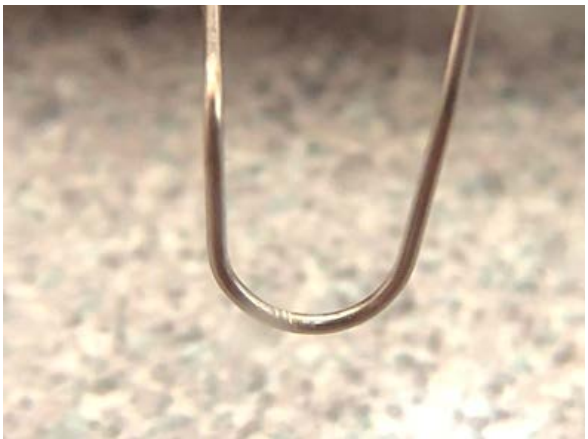
You can also remove the outer parts of the tension assembly to access the disks themselves – clean the disk with rubbing alcohol or lacquer thinner to remove any buildup.



Remove outer components to clean pressure disks.

To avoid any problems re-assembling the tension control, lay the pieces down on a clean piece of paper or plain fabric in the order you have removed them. The photo below shows each piece laid down on paper as they were taken off and their general shape. This will help the re-assembly process after cleaning the two large pressure disks.

The only wear part that may eventually require replacement is the check spring. It may start to get a groove in the area where the thread passes over it. To complete this replacement process, you will need to remove the entire tension unit from the machine. **It is not accessible by removing the outer components shown above.** That process begins on the next page.



Groove worn in check spring.

Tension Check Spring Replacement

Tools needed:

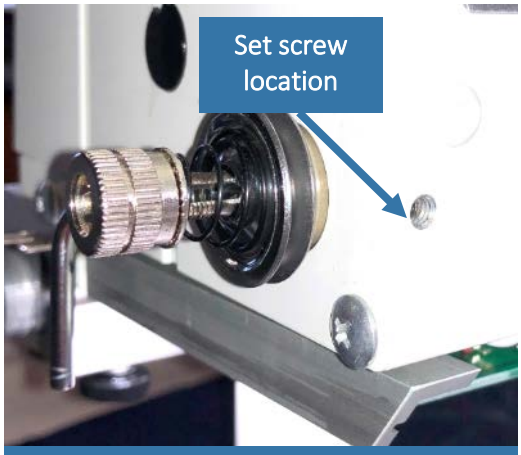
Paper Towels
WD-40
Air Compressor or Canned Air
5/64'' Allen Wrench
Flat Blade Screwdriver

Time to complete:

Approximately 15 minutes

Removing Tension Control

To remove the tension control unit, insert a 5/64'' Allen wrench in the access hole behind the tension control unit. Loosen the set screw at least 2 full turns counterclockwise before trying to remove the tension control unit.



Locate set screw access.

Loosen set screw.

Once the set screw is loose, grab the tension control unit and pull it out of the body of the machine.


Removing tension control unit.

If the tension control does not easily come out of the machine, you may need to loosen the screws that hold the side cover on the machine. The cover can shift with vibration of the machine, and cause binding on the tension control. You will also need to loosen the 3-hole thread guide above the tension control.

Loosen all cover screws.

Locate the small screw at the back of the tension control unit. Loosen this set screw, but do not remove.

Set screw holding center shaft.

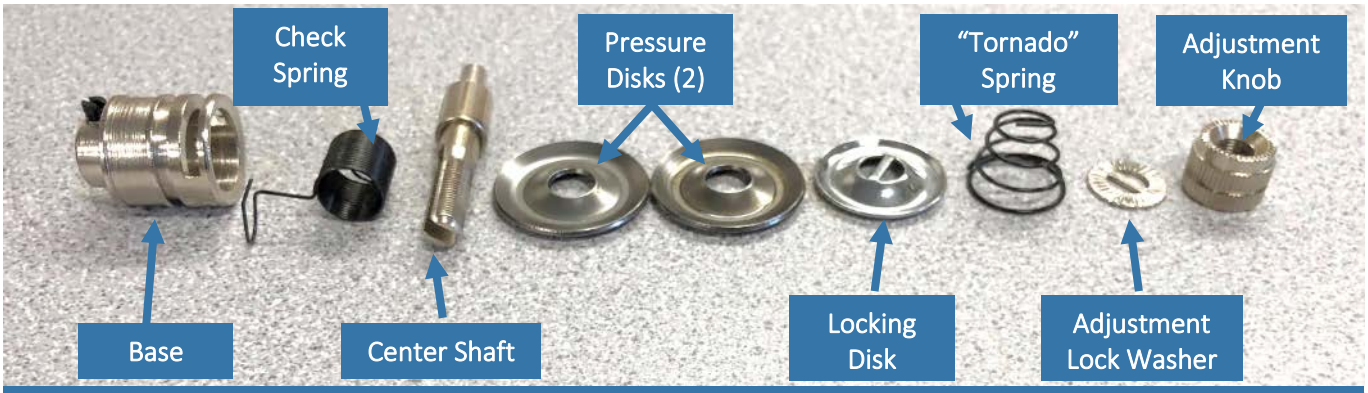
The collar with the check spring installed will then separate from the shaft with the tension disks (see Photo A below).

Carefully work the old check spring out of the collar as illustrated by Photos B and C below. If you grab the part of the spring that the thread runs over, and push inward and upward at the same time, the spring will start to come out of the base, as shown in Photo B.

Photo B

Photo C

Once the check spring has been removed, you will need to remove the outer parts of the tension control for a thorough cleaning. Clean disks with rubbing alcohol, and inspect for any spots of oxidation or rust that may have developed – if any are noted, the entire tension control unit should be replaced. The base of the tension unit should also be cleaned to remove any oil buildup or lint.

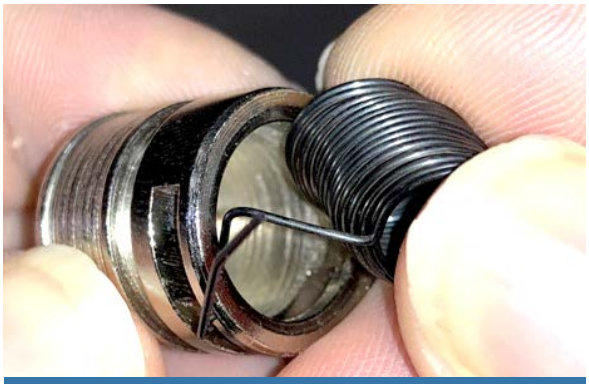


Tension Control Components

To install the check spring, begin by hooking the "U" shaped end arm through the slot in the base.

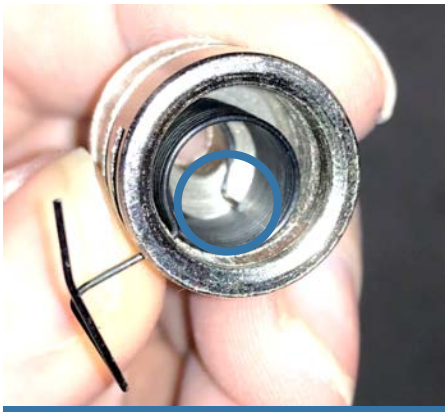
Hooking end of spring through slot.

Then, turn the spring around so that the coiled portion is facing the base. Gently slide the bottom of the coiled portion towards the base, and let the spring drop down into the base.



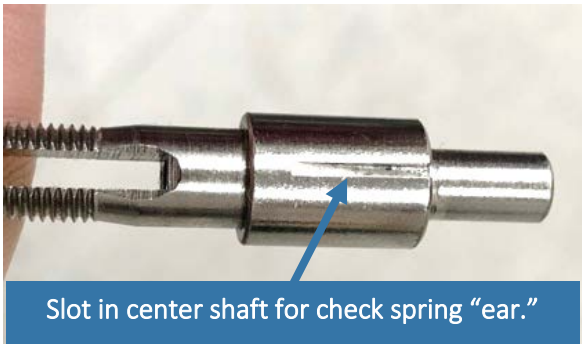
Slide bottom of spring towards base.

Take note of the small ear sticking up from the check spring on the inside of the tension control base. This ear must fit into a slot located on the center shaft of the tension control.



End of check spring coil “ear.”

Locate the slot in the center shaft.

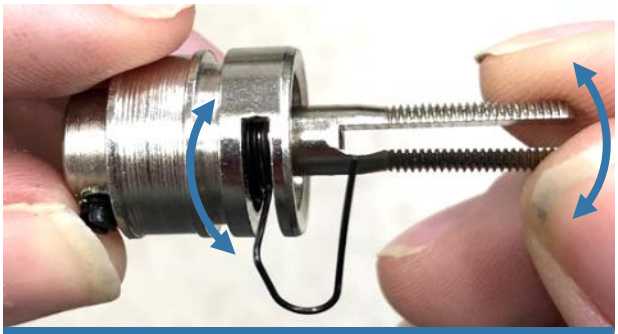


Slot in center shaft for check spring “ear.”

Slip the two pieces together, making sure the ear in the spring gets caught in the slot on the shaft. If you hold the base and rotate the center shaft while putting gentle pressure on the center shaft towards the base, the spring arm will snap into the slot.

Insert center shaft into base.

While holding the outer collar with your left hand, and twisting the shaft with your right hand, you should see the check spring move with the shaft.



Rotating center shaft to ensure spring “ear” engagement into slot.

Rotate the center shaft section so that the check spring just touches the stop on the upper end of the slotted portion of the collar.

Check spring starting point viewed from top.

Check spring starting point viewed from base end.

The photo below shows *incorrect position* DELETE UNDERLINE of the check spring – it is at the *bottom of the slot.* It must be able to move downward in the slot, and should be at the top of the slot when correctly placed.

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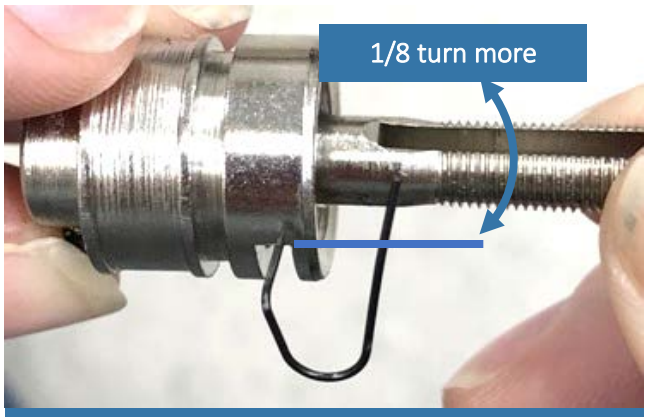
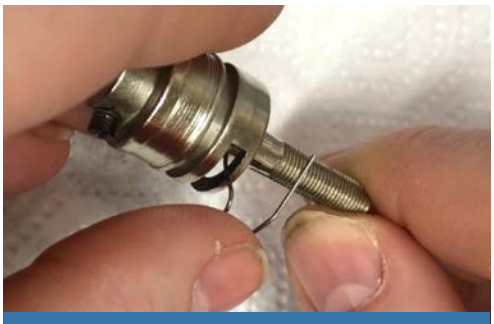
INCORRECT SPRING STARTING POSITION.

After the spring contacts the top of the slot in the base, rotate the shaft about 1/8 of a turn more to create tension on the spring.



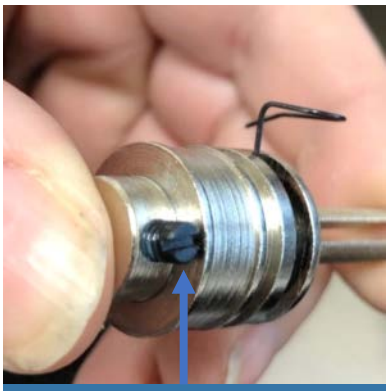
Rotate 1/8 turn past where check spring touches top of slot.

While holding the base and shaft center in place, pull the spring downward with your finger and make sure it snaps back against the top of the slot when it is released.



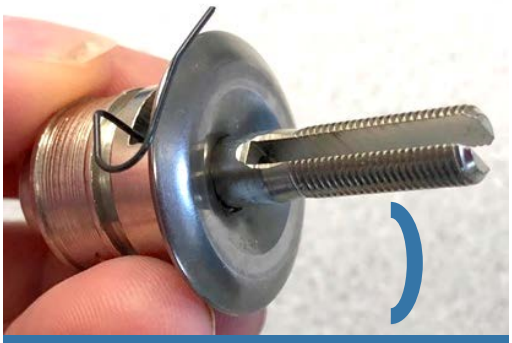
Testing spring tension.

Hold everything in position and tighten the small set screw on the base of the collar.



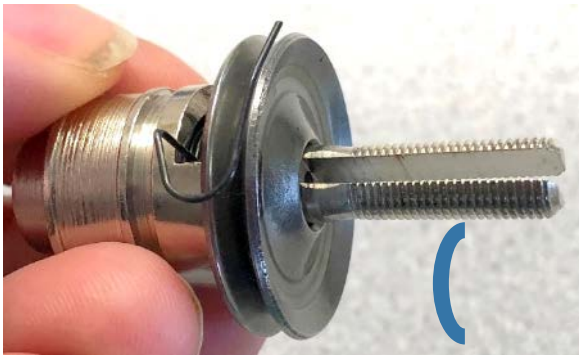
Hold tension base and center shaft while tightening set screw.

Once the tension on the check spring has been set, you can then reinstall the tension control outer components. Begin with the first pressure disk, with the curved edges going towards the tension control base.



Inner pressure disk edges curved towards base.

Next, add the second pressure disk, this time with the curved edges facing away from the tension control base.

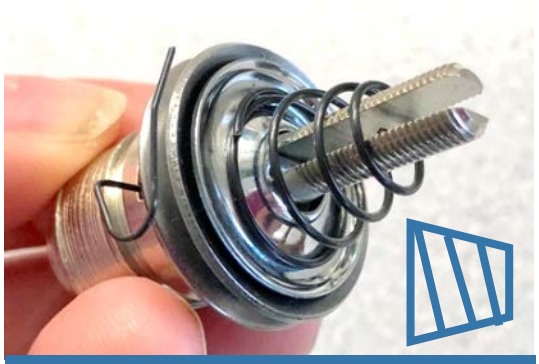


Outer pressure disk edges curved away from base.

The smaller locking disk with the bar in the center goes on next, with its edges also facing away from the tension control base. It will nest inside the outer pressure disk.

Locking disk with edges curved away from base.

The next piece to go on is the 'Tornado' spring – the larger end goes towards the tension control base.

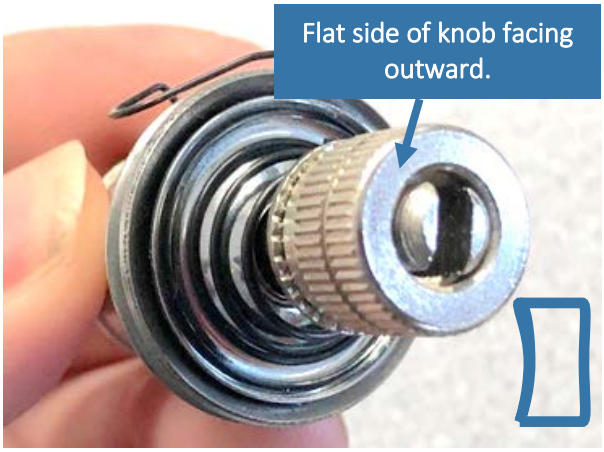


"Tornado" spring installed.

The adjustment lock washer will go on next. This washer has a slight cup to it – you will install IT so the edges are curved towards the tension control base. This ensures that the locking ridges will hold the adjustment knob in position.

Adjustment lock washer installed.

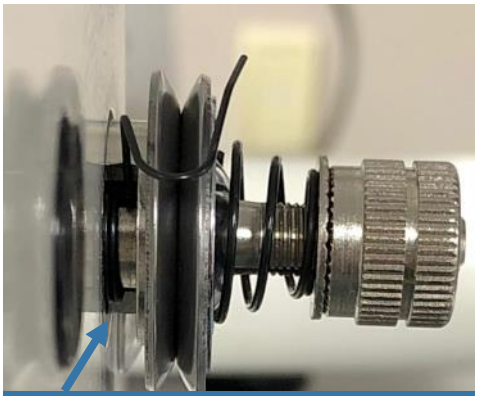
The last component to be installed is the tension adjustment knob. One side is flat, while the other side has ridges. The ridged side should be installed so it faces the tension control base – this ensures the ridges lock on the ridged surface of the adjustment lock washer.



Reinsert the tension control unit into the body of the machine. Rotate the tension control so that the U-shaped part of the check spring (the part the thread lays in), is in about the "10 o'clock position."

Bottom of check spring at 10 o'clock position.

Do not push the tension control too far into the machine or the check spring will rub against the side cover and will not function correctly. It is ideal to have the opening for the check spring in the tension control base to be visible outside of the side cover, as shown below.



Opening in tension control base for check spring visible outside of side cover.

Re-tighten the ALLEN screw. Check that the spring moves freely up and down in its slot between the tension disks and the side of the machine.

Tighten set screw to hold tension control unit firmly.

Bobbin Thread Cutter – Millie & Millie 30
Routine Cleaning & Adjustments

Clearing Lint Buildup from Blades

Tools needed:
#2 Phillips Screwdriver – short handle
Flat Blade Screwdriver – small tip
Air Compressor or Canned Air

Time to complete:
Approximately 5 minutes

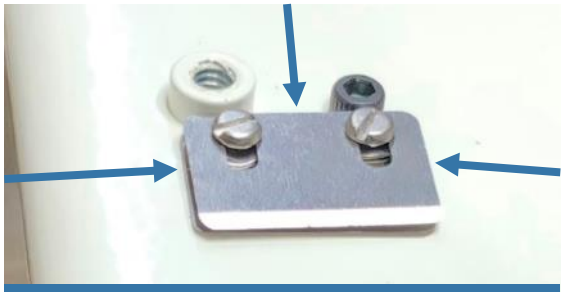
The most common reason for thread cutter malfunction is lint buildup between the cutter blades. Use compressed air to blow lint out from between the cutter blades; lint can get caught between the blades or between the wave washers and affect the cutting ability of the blades.

To access the cutter blades, you will need to move the needle plate off to the side of the machine. Remove the two screws closest to the front of the machine, and the left rear screw. Loosen the right rear screw, but do not remove it.

Swivel the needle plate off the right side of the machine, and tighten the screw to hold the plate off to the side of the machine. This process will avoid possibly reinstalling the plate backwards later on.


Needle plate swiveled off right side of machine to access thread cutter blades.

Once you have access to the thread cutter blades, use compressed air and blow between the blades themselves from the back towards the front, and on each side. This will ensure the lint that is between the blades is completely removed. You can also use a small pin or a business card and slide it between the blades to dislodge any lint that may be stuck.



Use compressed air to clean between blades from all sides.

Blade Tension/Pressure Adjustment

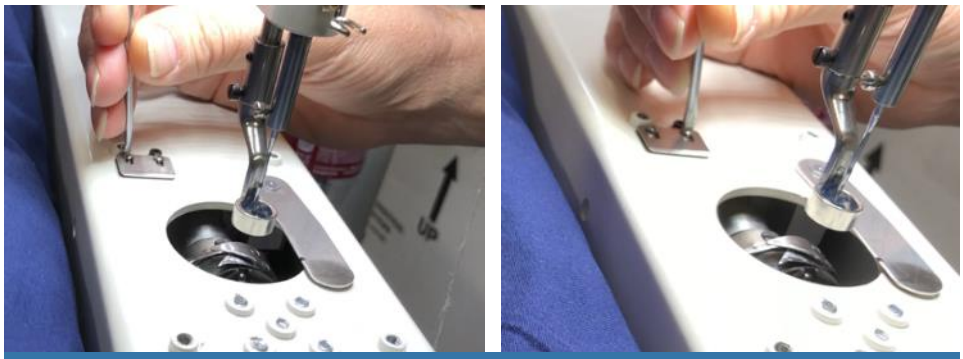
Minor adjustments to thread cutter blades can be made by tightening the screws that hold the cutter blades down. These adjustments should not be made until the blade area has been cleared of any lint, as tightening them with lint between them will flatten the washers.

If you have not already moved the needle plate out of the way, remove the two front screws and the left rear screw on the needle plate. Loosen the right rear screw, and swivel the needle plate off to the right side of the machine. Tighten the screw to hold the plate out of the way.

Remove these 3 screws.

Swivel needle plate off right side of machine.

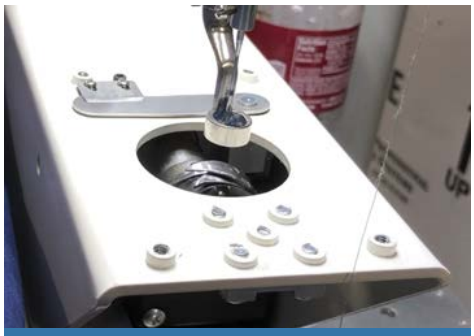
Using a small flat blade screwdriver, gently turn both brass screws 1/8 turn clockwise to tighten the tension on the blades.



Tighten both screws 1/8 turn at a time to adjust blade pressure.

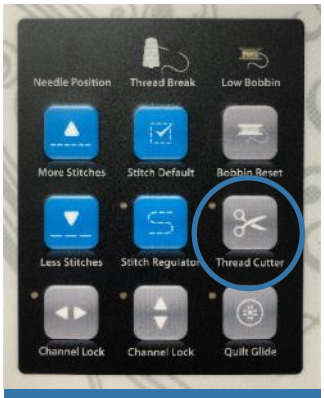
Manually move the puller arm away from the cutting blades, and then back into the blades to make sure the puller arm will still go between the blades.

Manually move puller arm.



Testing blade tension.

Pull the bobbin thread up through the throat of the machine, and hold the thread tail on the front edge of the machine. Cycle the thread cutter to test the blade tension. If the thread is not completely cut all the way through, turn the screws another 1/8 turn clockwise.

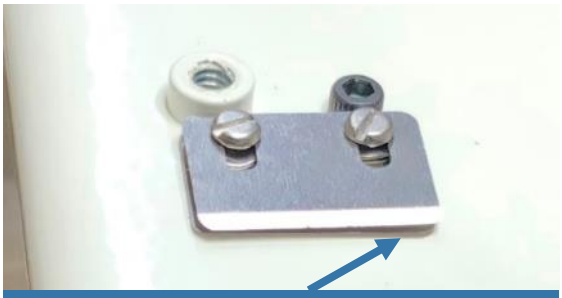


Millie Smart Touch Pad

If the blades are adjusted too tightly, the puller arm will not be able to fit between the blades. In this case, it will stop at the cutting edge of the blades without going between them, or it will move over the top of the blades. If that is the case, loosen both screws slightly (counterclockwise), and test with bobbin thread again.

Puller arm caught on edge of cutting blades.

If it still won't cut, take a close look at the spacing of the cutting blade themselves. There should be even spacing between the blades on both sides. If one side looks a little lower than the other, slightly tighten the screw on the opposite side.



Blade higher on right side – slightly tighten screw on right side or loosen screw on left side of blades.

Puller Arm Bend Adjustment

Another possible issue is if the puller arm gets bent out of alignment with the blades. The puller arm is hand-bent at the factory to ensure it will go between the blades. If for some reason the puller arm has been bent out of place, you can make a slight adjustment to the blade by hand. The puller arm will move fairly easily by hand – push the puller arm into the hole in the throat of the machine and push down to bend the free edge downward.

Push leading edge of puller arm into opening on throat of machine.

Push down on leading edge if it is too high to clear cutting blades.

Pull up on leading edge if it is too low to clear cutting blades.

The goal is to get the blades and the puller arm to align properly, so there is even pressure and spacing from side to side.

Correct alignment of puller arm and cutting blades..

If the blades and puller arm are aligned correctly, but you are still not able to complete a successful cut of the thread, it may be time to replace the wave washers.

Wave Washer and/or Cutting Blade Replacement

Tools needed:

#2 Phillips Screwdriver – short handle
Flat Blade Screwdriver – small tip

APQS Parts:

Wave Washers x 6 2200-01 (most common)
Thread Cutter Blade x 2 2210-01 (less common)

Time to complete: Approximately 10 minutes

At some point, you may not be able to adjust the thread cutter so it cuts your thread. It is most likely **not** because the cutting blades are dull – it may be because the wave washers have flattened out. The wave washers allow the blades to spread apart and allow the thread to be pulled into the blades but keep enough pressure on the blades so they can cut even the thinnest threads. This can also happen if the blades are tightened too much, or if lint buildup gets packed between the washers. The process to replace the wave washers begins below.

If you have not already done this in a previous step, you will need to move the needle plate off to the side of the machine so you can work on the thread cutter.

Remove these 3 screws.

Swivel needle plate off right side of machine.

Once you have accessed the thread cutter blade assembly, use a small flat blade screwdriver to remove the screws that hold the blades and washers to the throat of the machine.

Remove 2 screws holding blade assembly on machine.

You will have 2 cutting blades, and 6 wave washers in the blade assembly.

Cutting Blades

Wave Washers

To reinstall the cutter blade assembly, begin by putting the first blade onto the screws with the flat side facing up, as shown below.

First blade on screws flat side up.

Put 3 wave washers on each screw, as shown below.

Add 3 wave washers to each screw.

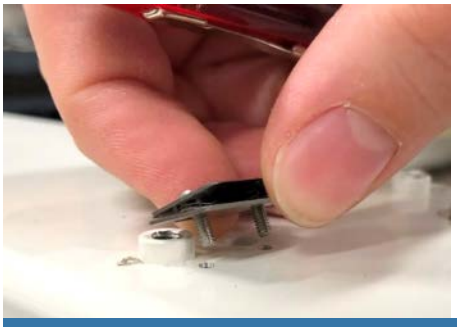
Then, add the second thread cutter blade, this time with the flat side down, and the beveled side up.

Second blade installed with beveled side up, flat side down.

Carefully pick up the blade assembly, and turn it over so you can line up the screws with the holes in the machine.

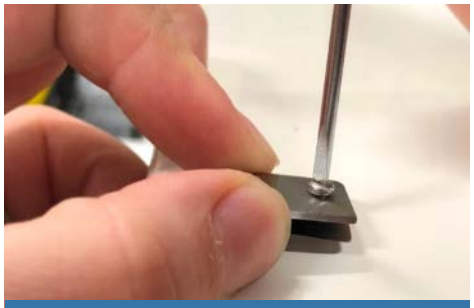
BE VERY CAREFUL – THE CUTTING EDGE OF THE BLADES IS VERY SHARP!

Hold assembly together.



Position blade assembly over threaded holes in machine.

Carefully start the screws into the threaded holes of the machine while holding the blade assembly securely. Once both screws have been started, you can let go of the blade assembly, and let it settle on the machine.



Start both screws while holding blade assembly.

Tighten screws just until they touch the blades.

Manually push the leading edge of the puller arm until it rests between the cutting blades.

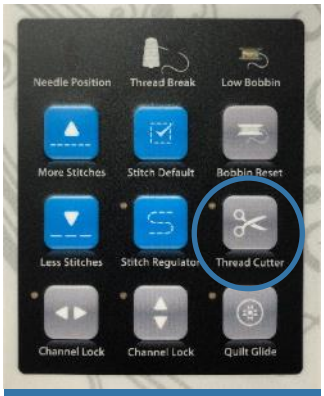
Move puller arm to blades.

Puller arm positioned between blades.

Slowly tighten the screws just until you feel resistance with the blade assembly, and then turn ¼ more.

Tighten screws until resistance is felt, then turn another ¼ turn more.

Cycle the cutter by pushing the thread cutter button on the Smart Touch Pad to test blade clearance.

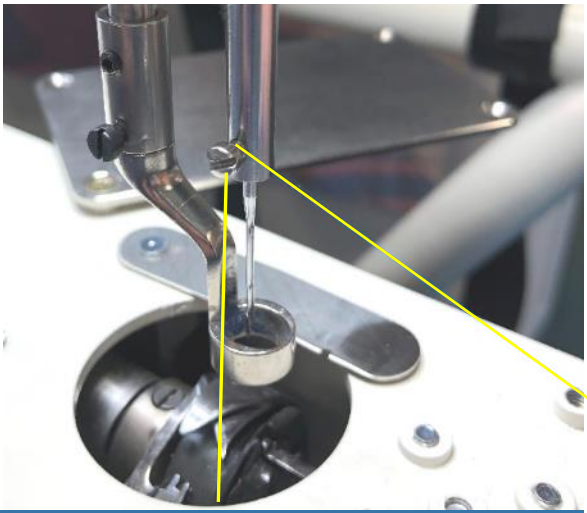


Millie Smart Touch Pad

If the puller arm does not go between the blades, you may need to slightly tighten or loosen the two screws – do not tighten more than ¼ turn at a time. Doing so may flatten the wave washers and require starting the process over again.

Once the puller arm movement is adjusted, pull your bobbin thread up through the hole in the throat of the machine, up over the needle bar screw, and hold the thread firmly on the leading edge of the machine so that the thread is taut. This will ensure the puller arm will "catch" the thread and pull it to the cutter blades correctly. Cycle the cutter, and test the cutting abilities. Continue adjusting the blade tension until you have completed a successful cut at least 3 times.

When adjustments are completed, move the needle plate back into position on the machine, and reinstall the 3 screws that were removed previously. Securely tighten all 4 screws.

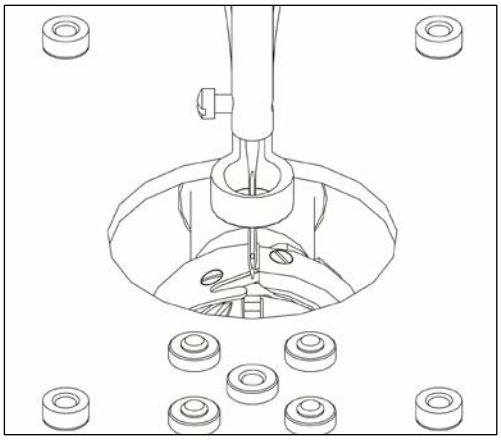


Thread path for cutter testing.

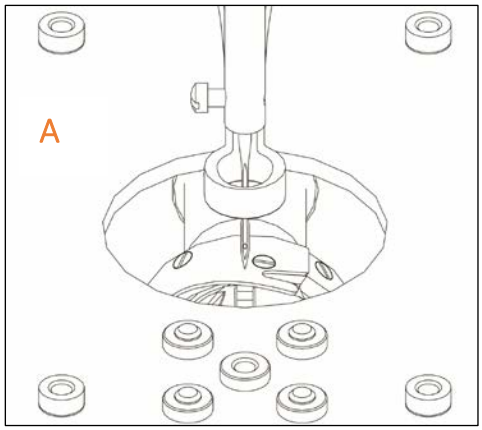
Timing Belt Adjustment

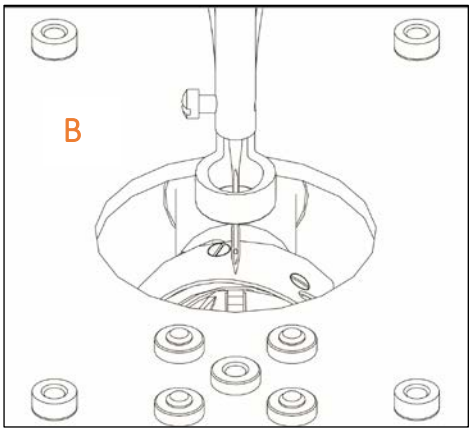
Note: Re-timing your machine is a last resort. Your quilting machine will not just “go out of adjustment” on its own. Jamming the machine with a broken needle, hitting a guide ruler with the needle bar or getting a cleaning rag stuck in the hook assembly are usually the only ways the timing can be affected. Breaking thread or looping problems are generally NOT related to faulty timing.

Before you look at re-timing, you will need to verify the hook rotation to see if the hook is rotating properly and to see if the needle touches the hook assembly as it is moving down. This would indicate that either your timing belt requires an adjustment or that your machine may need to be re-timed. Always check the Timing Belt before re-timing the machine.

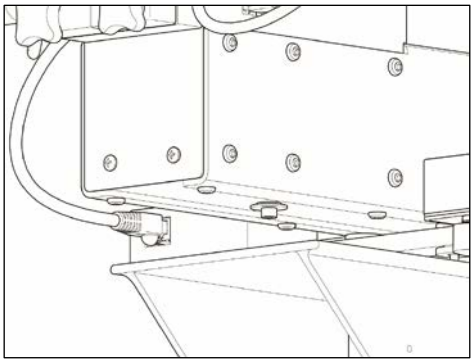


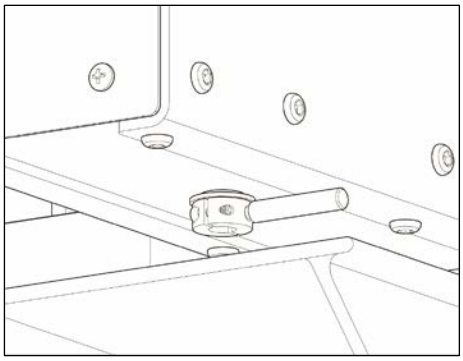
1. Remove the needle plate so you can view your hook assembly as shown.
2. The image above is where your needle should be in relation to the hook assembly.



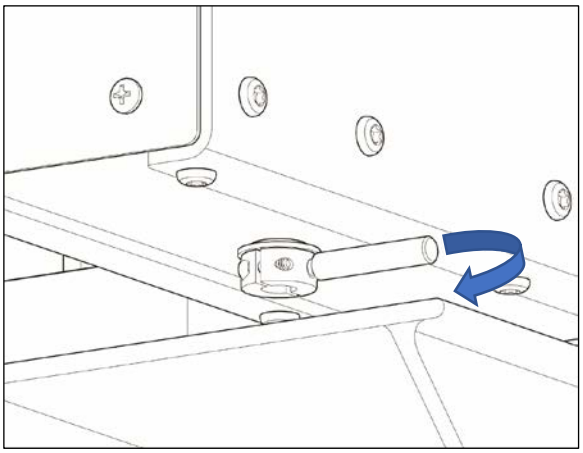


3. If the needle touches Hook Assembly sooner than it should (before thumb), your machine needs a belt adjustment.
4. Image A shows the timing belt to be one tooth off and needs to be adjusted by “one tooth.”
5. Image B shows the timing belt to be two teeth off and needs to be adjusted by “two teeth.”

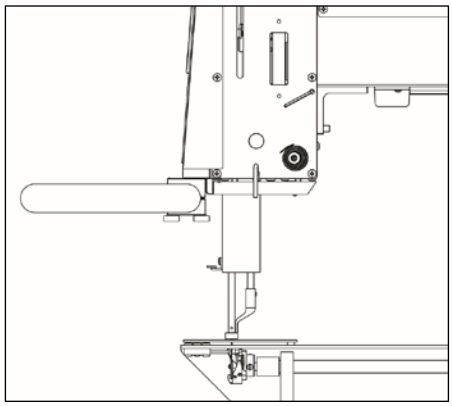




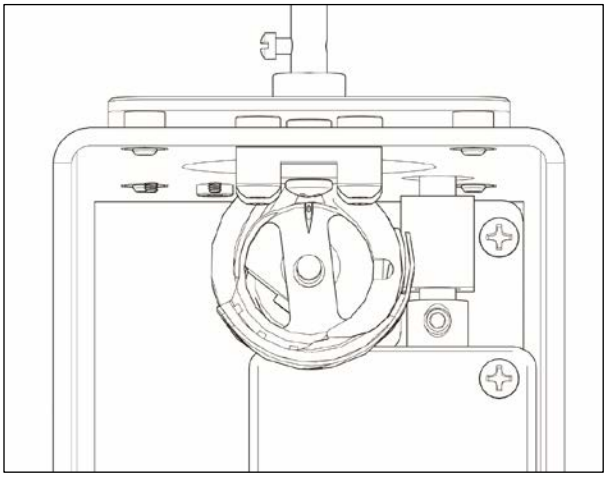
1. The first image shows the Allen screw where the Belt Tension Arm Extension is to be inserted to make the belt adjustment.
2. The second image includes the Belt Tension Arm Extension (part number 2874-15) installed on the bottom and rear of the longarm (MY19 models).
3. If your MY19 model does not have a Belt Tension Arm Extension tool, you can use a 5/32'' Allen wrench to make the belt adjustment.
    a. If you have an MY19 Lucey or MY19 Lenni model with no Belt Tension Arm Extension Tool, you will either need to obtain one from APQS (part number 2874-15) and remove the head from your table to install the tool or to make the necessary belt adjustment using a 5/32''Allen wrench.
    b. The arm extension can be installed using a 3/32'' Allen wrench to tighten the two screws.



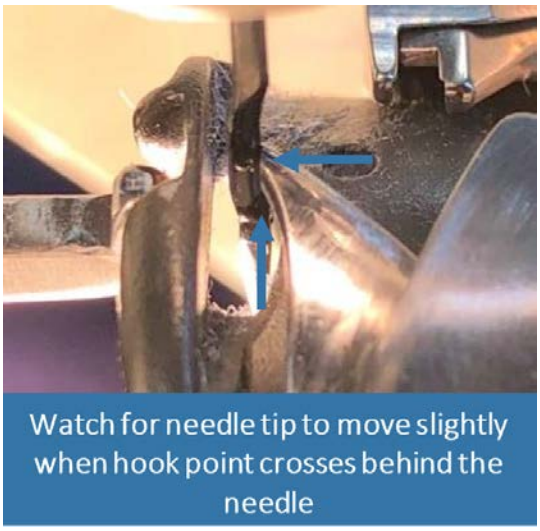
4. Once the Belt Tension Arm Extension (or 5/32'' Allen wrench) is inserted into the belt tensioning Allen screw, turn the tool two full turns *counterclockwise (to the left)* to loosen the timing belt tension (pulling the wrench toward you as you are standing at the back of the head).



5. Move to the front of the machine head.
6. With your right hand holding the hook assembly securely and the left hand on your Flywheel, turn the Flywheel DOWN until you hear one click.
7. The one click sound is that you have adjusted the timing belt by "one tooth."



8. You now need to verify your needle depth with the needle in the lowest position. Rotate your Flywheel DOWN so the Hook Assembly is moving in a reverse motion. Verify that you can now see the hole of the needle through the hook assembly.

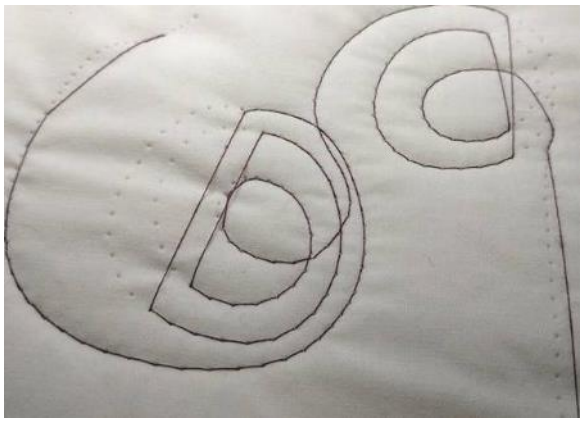


9. Turn Flywheel UP to *verify Hook rotation and needle clearance*.
10. If an additional adjustment is needed to the Timing Belt, repeat Steps 6, 7 and 8.
11. If no further Timing Belt adjustment is needed, move to the back of the machine, and tighten the Timing Belt by moving the Belt Tension Arm Extension or Allen wrench clockwise 2-1/2 turns.

Timing Your APQS Machine

When do I need to time my machine?

Symptom: Skipping or missing stitches in manual mode *and* regulated mode



Solution: Change the needle. (We strongly recommend using the prescribed 1955-01-MR 4.0 needles.) These needles were chosen to provide the very best stitch quality for your machine, while reducing the tension problems caused by needle flexing. If the skips don't improve, **check** timing. If the machine has recently had a needle break, check the needle bar depth. If skips with needle holes are noted in one direction only, look for deflection of the needle.

Symptom: Thread looping on bottom, breaking thread

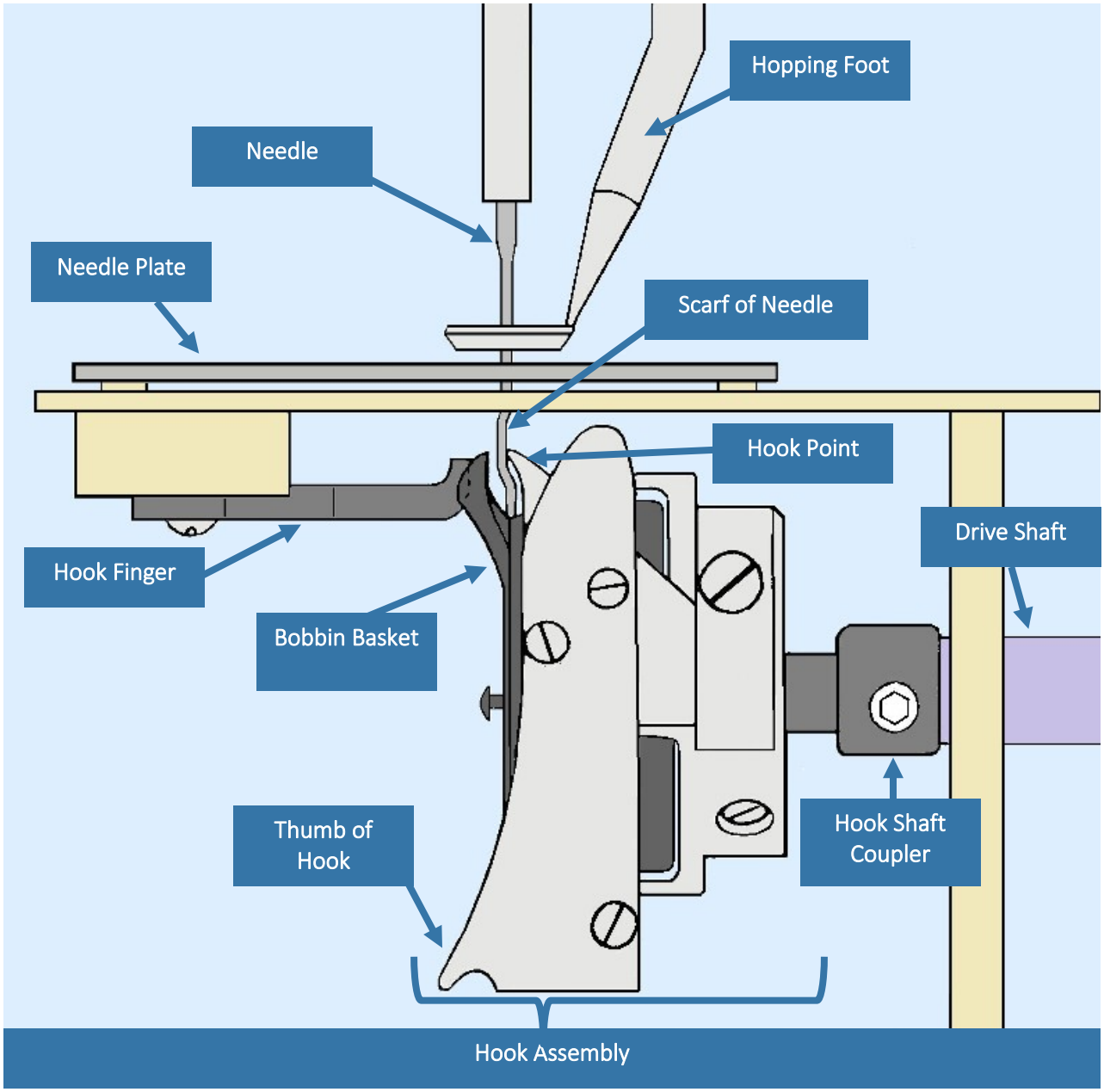
Solution: Tighten top tension and/or loosen bobbin tension. Check for burrs on the hook or needle plate needle hole. The timing is set very carefully at the factory, and rarely needs adjustment.

After double-checking the tension, thread path, bobbin, etc., continue to sew. If skipped or missed stitches persist, then the timing should be reviewed.

If the timing appears to be correct and the machine continues to skip stitches, this may be an indication of some other problem. Please call our technical support team at 800-426-7233. We're glad to help!

Safety Note: Turn off the machine's power before proceeding.

Take a minute to acquaint yourself with the hook assembly area. The diagram below is a side view of the area, and names all of the machine parts. Knowing the terminology will help in the future with the timing process.



Tools needed:

#2 Phillips Screwdriver with short handle
Cabinet Tip Screwdriver
(Flat Blade Screwdriver with 3/16" tip and long handle)
At least 1 other long-handled flat blade screwdriver
Flat Mill File – "Bastard" Cut
Jeweler's Loupe or other form of magnification
Flashlight

APQS Parts: (if replacement is needed)

Style "L" Hook Assembly – 2036-02
Style "L" Hook Finger – 2035-01
Style "M" Hook Assembly – 2036-04
Style "M" Hook Finger – 2035-02

Time to complete:

Approximately 30 minutes or more, depending on experience

Cabinet Tip Screwdriver

Keystone Tip Screwdriver

#2 Phillips "Stubby" Screwdriver

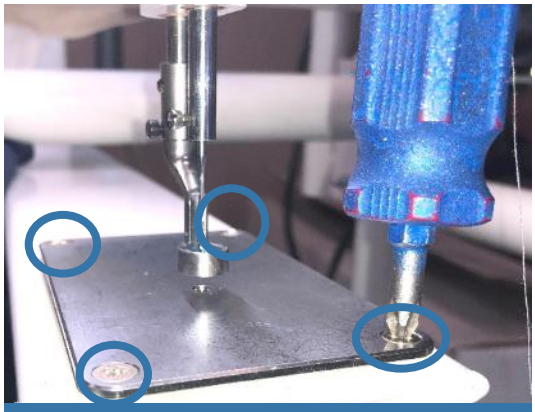
Flat Mill File – "Bastard" Cut

Jeweler's Eye Loupe

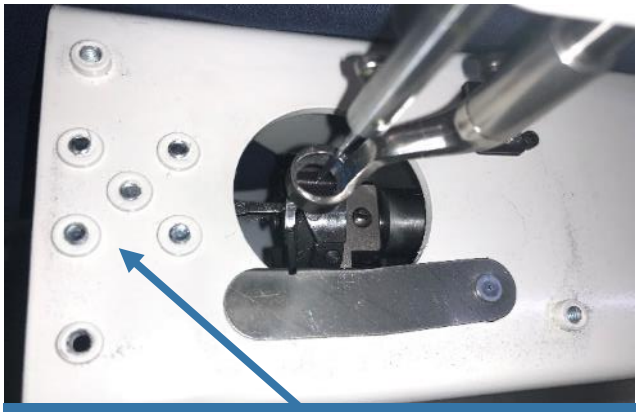
• Evaluate Old Hook Assembly for Damage

In many cases you can re-time your machine using your current hook assembly. However, if it is damaged from a bad needle jam or break, you may need to replace it (call us at 800-426-7233 to order a replacement hook). If you are replacing the hook, use the following steps to remove the old hook and position the replacement hook before beginning the timing process. If you only need to **check** the timing, proceed to Step 1 of the Timing Process (Needle Bar Depth) on Page 155.

Remove needle from needle bar, remove the needle plate using a short Phillips screwdriver. With the needle plate removed, you will see spacers that are permanently attached to the machine – no washers needed.

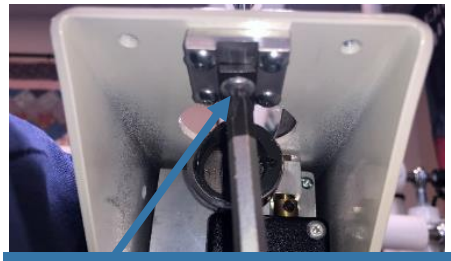


Remove all 4 needle plate screws.



Spacers are permanently attached to machine.

Remove the hook retaining finger screw using Phillips screwdriver and pop out the hook finger.



Remove this screw to remove hook retaining finger.

Loosen the three slotted screws on back side of hook assembly at least one complete revolution. Turn the flywheel manually to access the three screws.

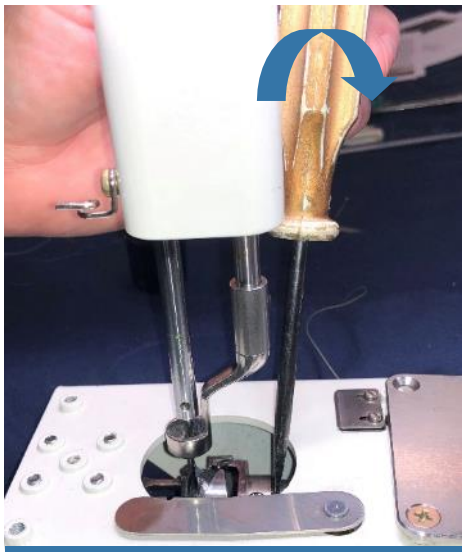
Loosen 3 screws that hold hook assembly onto machine.

The hook assembly itself will be difficult to remove because the three set screws you just loosened have scarred up the hook shaft. To remove the old hook, look down through the hole in the throat of the machine, and locate the hook shaft coupler that is on the shaft behind the back of the hook assembly. The “air gap” between the coupler and hook assembly will be used to remove the old hook assembly.

Air gap between hook assembly and hook shaft coupler.

If the air gap is small, use a flat blade screwdriver to open the gap. From the top of the machine, insert the tip of a flat blade screwdriver in the space between the back of the hook assembly and the hook coupler, and twist the screwdriver’s handle – this will open up the space between the two pieces.

Screwdriver tip in air gap between hook assembly and coupler.



Turn handle of screwdriver to open up air gap.

To remove the hook assembly, it is easiest to work from underneath the machine – you'll need to make sure you insert the tip of two long-handled screwdrivers in the air gap. Use the pictures below to complete the removal process safely.

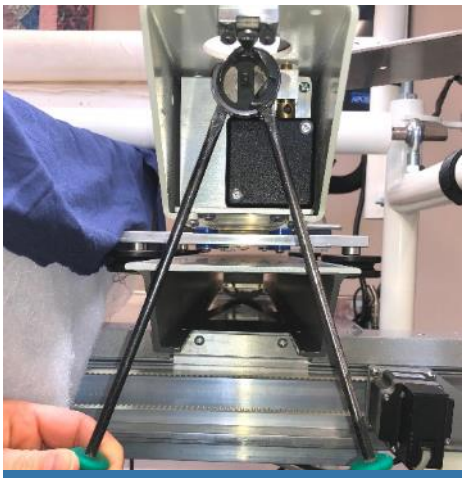
Working from the underside of the machine, use two long-handled flat blade screwdrivers – put the blades in the air gap – one on either side of the main shaft. Twist the screwdriver handles to open the air gap more, and then "walk" the old hook assembly off the shaft.

DO NOT USE THE FRAME OF THE MACHINE TO PULL THE OLD HOOK ASSEMBLY OFF THE SHAFT!

You greatly increase the risk of changing the position of the hook shaft coupler or the drive shaft, which will make the timing process much more difficult to complete.

INCORRECT POSITION FOR SCREWDRIVER.

CORRECT POSITION FOR SCREWDRIVER.



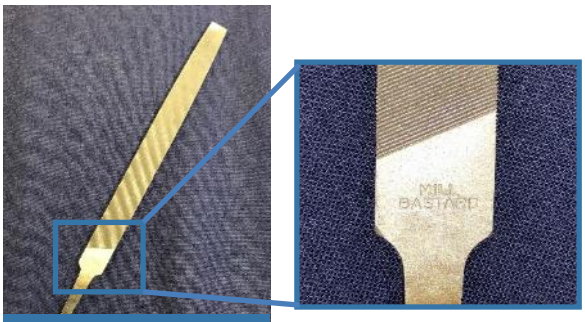
Pull screwdriver handles towards you to "walk" the hook off the coupler.

Inspect the hook shaft after removing the hook assembly, and lightly buff any rough areas where set screws were located. You can use a flat file as shown on the next page. Turn the machine on with Stitch Regulator light of the front panel at a low speed (8 or 9) and hold the file lightly and flat against the shaft as shown on the next page.

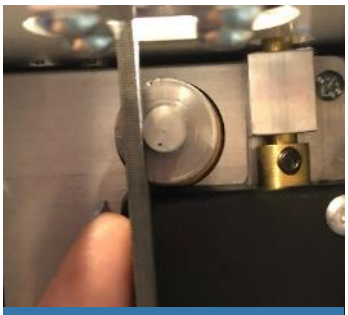
Make sure there is not a needle in the needle bar for the next step.

You only want to take off the excess material to smooth off the shaft – you will not be trying to remove the marks completely, just taking off the material that was removed by the screws. Be sure to hold the file flat against the shaft and not at an angle – that would cause the shaft to be become tapered, and the hook assembly will not mount correctly.

Divot in coupler shaft



Flat file



Use gentle pressure while holding the file flat against the shaft to smooth.

To test, check the screws on the inside of the hook assembly first. Make sure they are not protruding into the area where the coupler shaft will be inserted. Then, check to see if you have filed enough by trying to get the hook assembly on the shaft. You should be able to get the hook assembly onto the shaft easily and be able to spin the hook on the shaft freely – this will make the timing process much easier. Continue gently buffing until the assembly slides on and off without effort.

The next step will allow you to get the timing components mounted on the machine to make the timing process go more smoothly. You will need to begin by using a new needle.

Install a New Needle

ALWAYS BEGIN TIMING PROCESS WITH A NEW NEEDLE.

It is helpful to mark the back of the new needle you are using with a couple of reference points that will be needed later with a fine-point permanent marker. Make the first mark halfway down in the flat part of the scarf and make the second at the bottom of the flat part of the scarf, just before the curve begins. See the photo below on the left. Once those lines are made, color above the top line, and below the bottom line – this will help cut down on the glare when looking at the needle in later steps. See the photo below right showing the position of the marks. Just use a fine-point permanent marker for these marks.

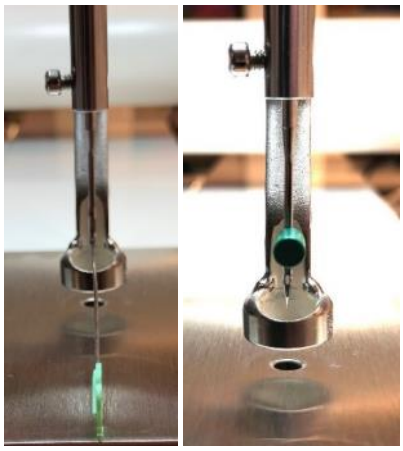
Install the needle as shown below. Make sure the needle is installed properly with the eye pointing straight ahead. Slide the needle all the way up into the needle bar and orient it correctly before tightening the needle set screw.

Front (freehand) Back (throat) of machine

Needle viewed from thread path side of machine.

Needle viewed from front handles.

Make sure the needle is inserted with the eye centered – you can use a thin pin pushed through the needle eye to show the direction it is pointing, or use a magnet – we have the magnets available through our online store if you are interested.



Hold the hook assembly as shown at the right AT RIGHT, lining up the oval slot in the bobbin basket with the hook point.

Oval hole in bobbin basket.

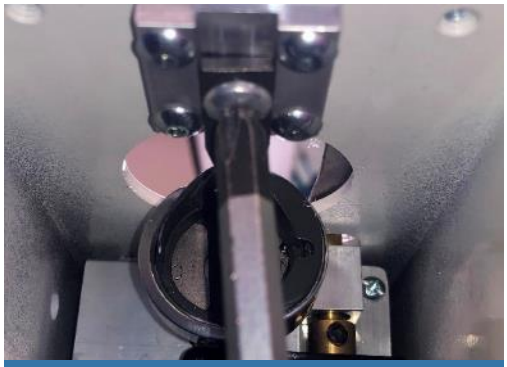
Place the hook assembly on the hook coupler shaft. Hold the hook assembly firmly to keep the outer portion of the hook from rotating. with your other hand, rotate the flywheel CLOCKWISE (up toward the ceiling on the non-thread-path side of the machine) to put the needle in the lowest position. Make sure the needle goes into the oval slot in the bobbin basket as shown in the photo below right. Position the hook assembly so that the hook point touches the needle at this point. It does not matter where – just having the hook assembly close to the needle will help install the hook finger in the next step.

DO NOT TIGHTEN ANY SCREWS ON THE HOOK ASSEMBLY AT THIS POINT!

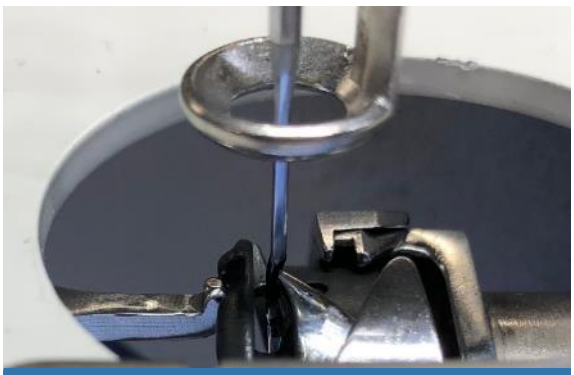
Hook Assembly on Coupler – all screws loose at this point.

Needle at lowest position through oval hole in bobbin basket – hook point moved to touch side of needle.

Reposition the hook finger as shown below, **but do not firmly tighten down the Phillips screw holding the finger yet** – the finger placement will be adjusted later after the timing process. With the hook point touching the needle, position the hook finger about half-way into the cut-out along the front edge. This will allow you to be able to move the hook assembly a little forward, or a little backward without losing the basket position. The hook finger should be close enough to hold the basket from spinning, but the exact position is not critical at this point.



Reinstall hook finger mounting screw, but do not over-tighten.



Hook point touching side of needle to allow for hook finger positioning.

Now you can begin the timing process!

Timing Process

REMEMBER: ALWAYS BEGIN TIMING PROCESS WITH A NEW NEEDLE.

See the previous section for hints on adding timing reference marks to your new needle.

Step 1: Check Needle Bar Depth

If you have not already removed your needle plate in a previous step, you will need to do so now. Remove the four Phillips-head screws holding the needle plate in place and move the plate off the machine. Remove the upper thread and bobbin case as well if they have not already been removed.

Remember that the cover goes on only one way – the needle hole is not centered on the plate. Keep this in mind when reinstalling the plate.

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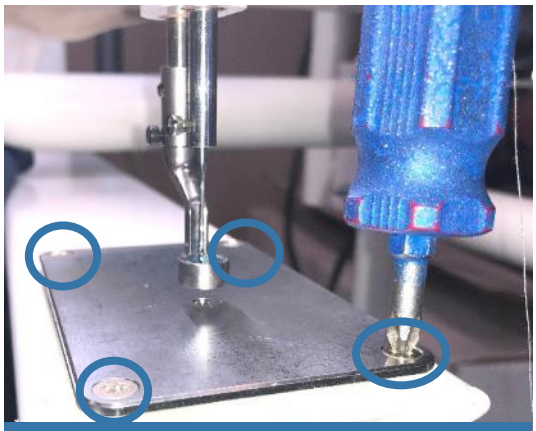


Remove all 4 needle plate screws.

Spacers are permanently attached to machine.

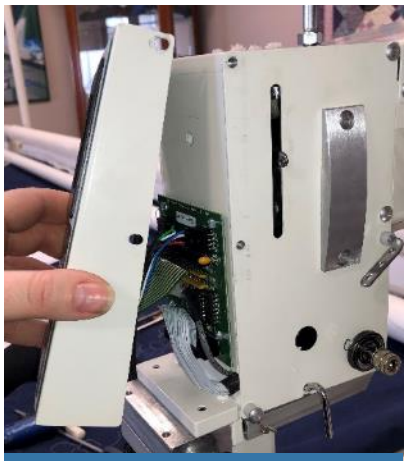
Make sure your needle is in its ***lowest position*** by rotating the front hand wheel in a clockwise direction until the needle is in the lowest part of its stroke, right before the needle starts up again. From the front of the machine (where the bobbin case fits), look directly into the front of the hook assembly. You should be able to see the needle protruding down into the area where the bobbin case fits. The ***top of the needle's eye*** and just a small sliver of silver above the needle eye should be **just** visible inside the bobbin basket. (See photos to the right.)

Needle Depth – Style "L" Hook Assembly

Needle Depth – Style "M" Hook Assembly

If an adjustment is necessary, you will need to remove the front cover of your machine. Using a Phillips screwdriver, remove the two screws on each side of the front cover and set them aside.

Remove 2 screws on each side of front cover.



Carefully pull front cover away from machine.

Once the cover has been removed, the easiest way to keep it out of the way while you make adjustments to the needle bar is to move the cover up on the machine and use one of the Phillips screws you removed to hold it in place as shown below. This will give you access to the needle bar adjustment hole. This will only be accessible when the needle bar is at the lowest position.

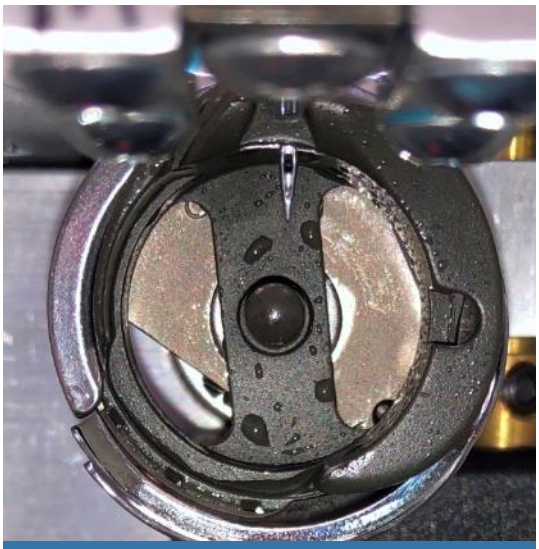
Use 1 Phillips screw to hold front cover on machine.

Needle bar clamp adjustment access.

To loosen the needle bar clamp, you'll need to use a flat blade screwdriver that has a narrow shaft and narrow tip, like the one shown below. The width of the tip should be no wider than 3/16''that is the size of the screw that you will be trying to loosen. The access hole is narrow, so having a screwdriver that does not have a "shoulder" will enable you to loosen the screw. A long handle will give you more torque on the screw, as it is very tight.

"Cabinet tip" screwdriver – tip width 3/16" and total length of at least 10''

Loosen the needle bar clamping screw by turning it ½ turn to the left (counterclockwise). Reposition the needle bar so that the top of the needle's eye looks like the one shown in the photographs below. Be careful not to twist the needle bar as you adjust it; use the position of the needle bar set screw as guides to make sure the bar is staying straight. Re-tighten the clamping screw as tight as possible.



Needle Depth – Style "L" Hook Assembly

Needle Depth – Style "M" Hook Assembly

Double-check the needle depth one more time, comparing it to the photos above. Make sure the needle bar is in its lowest position by rotating the flywheel back and forth slightly. If the needle depth looks correct, you will NOT make any further adjustments to the needle bar.

Replace the front cover on the machine. From this point forward, all the adjustments will be made as the machine turns the hook assembly – the needle bar depth will not be changed once it is set as shown above.

Carefully reposition front cover on machine.

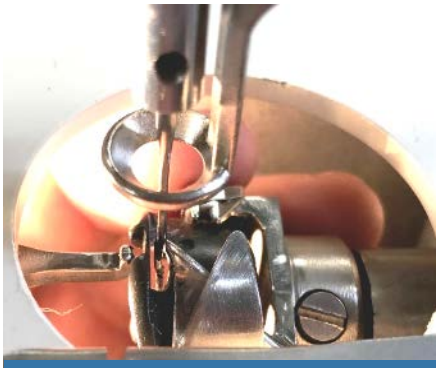
Replace 2 screws on each side of front cover.

Step 2: Check Proper Hook Rotation

NOTE: For this step of the timing process, you must be sure to turn the hand wheel in a clockwise motion ONLY.

Once the proper needle bar depth is established, proceed by checking for proper hook rotation. As the needle is on its **upstroke** during normal rotation, the point of the hook should pass by the needle slightly **below** the mid-point on the scarf (notch) of the needle. This would be just BELOW the top mark you added to the back of the needle. The process to position the needle and hook for proper rotation begins below.

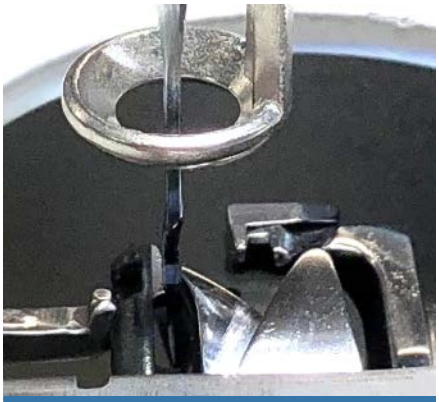
With the needle bar in its **lowest** position, hold the hook assembly in place with the hook point behind the needle. Rotate the hand wheel of the machine in a **clockwise direction** slowly. Observe the scarf (or notch) on the back side of the needle as it is coming up from lowest point. Once you have located the silver stripe on the back of the needle as shown in the photo below right, stop rotating the flywheel.



Starting position.

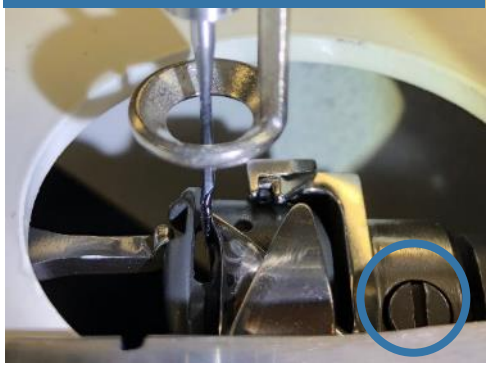
Needle brought up to locate silver stripe on needle scarf.

Now, hold the flywheel in place, and move the point of the rotating hook assembly to sit in the silver stripe. (See photos below.) Now, let go of the flywheel, hold the hook assembly in position and slightly tighten the set screw that is visible on the back of the hook. When screw is “snug,” re-check the position of the hook point in the needle scarf – it should not have moved. If it has, loosen the screw and reposition the hook point again lightly before tightening the screw when the correct position is set.



Hook point positioned in silver stripe on needle scarf.

Once position is correct, slightly tighten screw visible on back of hook assembly.



Do not re-tighten all of the screws until completing the next step.

Test the hook rotation by turning the hand wheel several times CLOCKWISE (normal rotation for the machine). If you have set the rotation correctly, the needle should clear all rotating parts for several full rotations without hitting anything.

Verify correct hook position by turning flywheel.

Step 3: Check Needle/Hook Clearance

Once the proper hook rotation is set, look at the needle and hook point relationship. The goal of this step is to get the hook assembly close enough to the needle so that the hook point touches and slightly deflects the needle as it passes behind the needle's scarf. This is very difficult to see with the naked eye; use a magnifying glass or jeweler's loupe (found at hardware stores – see the photo at right).

Jeweler's Loupe with at least 5 times magnification.

Rotate the flywheel on the machine back and forth slightly and observe the hook point and needle scarf.

It can be helpful to shine the flashlight from underneath the machine for this step, and turning off the LED lights on the machine, if they aren't already off. You are watching for the tip of the needle to be deflected slightly as the hook point passes behind it.

Watch for needle tip to move slightly when hook point crosses behind the needle.

If the hook point does **not** touch or slightly deflect the needle, you must move the hook assembly forward on the collar shaft, bringing the hook closer to the needle.

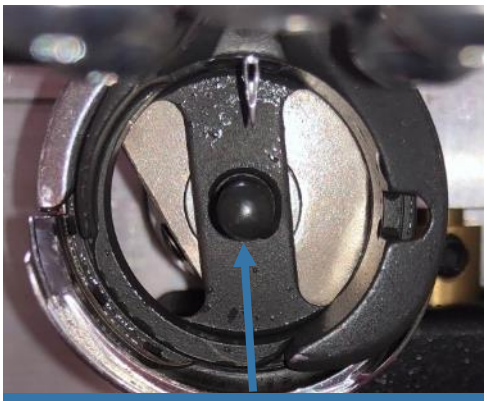
You can use a screwdriver to gently pry the hook *forward* ***WITHOUT CHANGING THE PROPER HOOK ROTATION THAT WAS SET IN STEP 2!*** If the screw on the hook assembly is only slightly tightened in the previous step, using the screwdriver to move the hook will not require loosening the screw.

Place the blade of the screwdriver behind the hook on the shaft, in the air space between the back of the hook assembly and the hook shaft collar. Twist the handle of the screwdriver to apply pressure to the hook assembly. Avoid pushing against the machine's housing with the screwdriver. Gently force the hook forward until the hook's point touches the needle scarf. See the photo at right.

To move hook closer to needle, use tip of screwdriver in air gap and turn handle to force hook closer to needle.

If the hook point is hitting the needle too hard (bending the needle), you will need to move the hook backward (away from the needle) to the point where it ***just slightly deflects*** the needle. With the screw tightened in the previous step, the hook will not move easily on the shaft. Using the handle of your screwdriver, tap the post inside the bobbin basket to nudge it back.

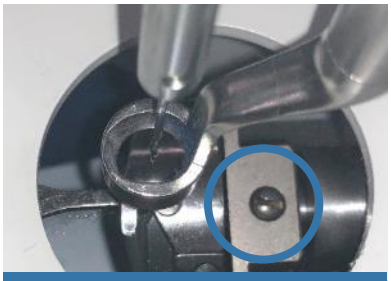
This process can go back and forth a few times until you get the deflection just right. Don't get discouraged; it does take a little time! The precision is important to the quality of your stitches and successful sewing.



Use screwdriver handle to tap on center shaft to move hook back and lessen deflection.

Once the deflection is achieved, and you have checked that the rotation has not changed from Step 2, you may tighten the hook set screws a little at a time. Tighten one hook set screw slightly, then rotate the flywheel all the way around to check the hook clearance and deflection again. Tighten the next set screw slightly and check the settings again. Continue rotating and tightening each screw until they all feel very snug. ***Wait to do the final tightening on the screws until you have completed the next step and turned the machine on.***

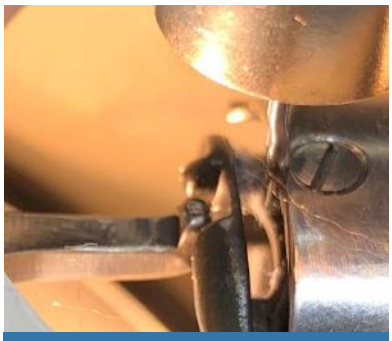
NOTE: For Style "L" Hook Assemblies, be very careful when working with the screw on the flat side of the hook assembly. It is not as strong as the other two screws are, so you will not be able to tighten it as tight as the other two !



DO NOT OVER-TIGHTEN THIS SCREW!

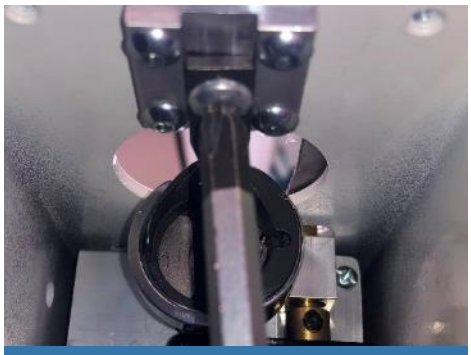
Step 4: Hook Retaining Finger Position

The last step in the timing process is checking the hook retaining finger position. The hook retaining finger keeps the bobbin basket from spinning inside the hook assembly. You will see a notch in the top part of the bobbin basket – the front part of the hook retaining finger fits into this notch.
The hook retaining finger should only be approximately 1/3 of the way into the notch area of the bobbin basket. Most of the notch needs to remain unobstructed; this allows the top thread to pass through the gap between the hook retaining finger and the notch in the bobbin basket. The hook at the end of the finger should be pointing up when installed.



Hook Finger 1/3 into notch in bobbin basket.

The hook retaining finger is held in place by a single Phillips-head screw, located on the underside of the machine body, just in front of the hook assembly. The finger is slotted where the Phillips screw holds it. If an adjustment is necessary, loosen the screw and slide the hook retaining finger into the proper position as illustrated in the photo above (on the previous page).When you have the position of the hook finger set correctly, tighten the screw securely.



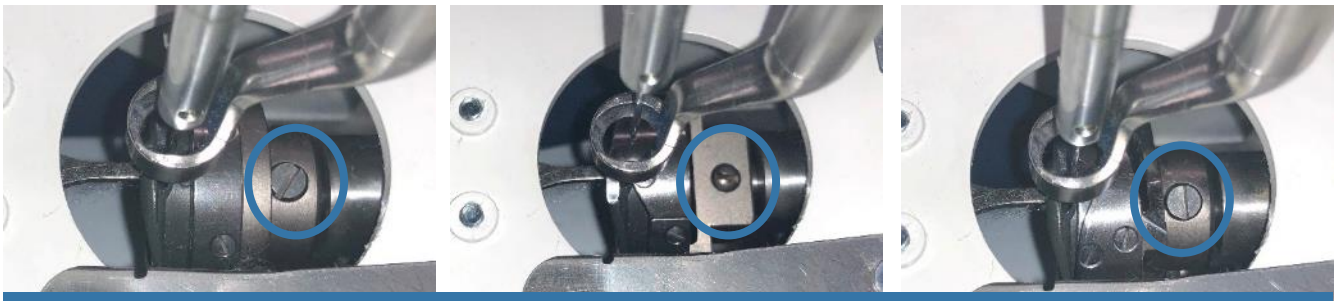
Securely tighten hook finger screw when in correct position.

Step 5: Test the Deflection

Before putting the needle plate back on the machine, turn the power on, and cycle the needle up/needle down a few times to make sure the needle clears the hook assembly under its own power. This will be the last chance to make sure you have timed the needle and hook assembly correctly.

Turn the machine's stitch regulator off by using the Smart Touch Pad. Adjust the stitches setting to a low setting, and then engage the motor by pushing the toggle switch away from the white button. Listen to the machine as it runs – you should hear an audible "tick" sound each time the needle is deflected. This should be a "tick" and not a "thunk." If the noise is not heard, or if it is too loud, go back to the deflection part of the timing process and adjust as needed.

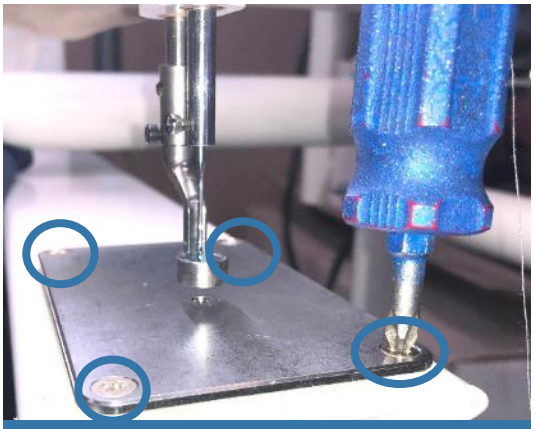
Before installing the needle plate, take a minute to make sure the screws on the hook assembly are securely tight. Remember, if you are working with a Style "L" Hook assembly, you will not securely tighten the screw on the flat side of the hook.



Tighten 3 screws that hold hook assembly onto machine.
On Style "L" Hook Assemblies – DO NOT OVER-TIGHTEN the screw in middle photo!

Step 6: Reinstall the Needle Plate

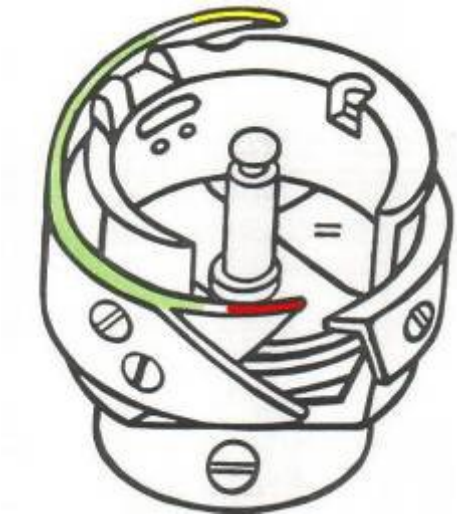
Raise the needle out of the hook area using the flywheel. Reinstall the needle plate, making sure it is oriented correctly for the needle to pass through the needle plate hole. Be sure to tighten the screws securely.



Reinstall and tighten all 4 needle plate screws.

Hook Assembly Maintenance Instructions

Note that if you break a needle, there ***will be*** a burr or scratch somewhere on the hook assembly. Sometimes it may take a very thorough search to locate it. Good lighting and a magnifying glass will help locate any burrs or scratches.



This diagram shows some of the areas on the hook assembly that should be checked occasionally for abrasions or burrs, which can cause thread breakage and looping problems. If you ever break a needle or are having problems with thread breakage, follow the procedure described below. Note that the hook assembly does ***not*** need to be removed to work on it.

If the hook is removed for any reason you will have to re-time the machine!

Step 1: Check the area marked in green.

It should be shiny and as smooth as glass. Use your fingernail and slide it along the surface of this area. Sometimes you cannot see any damage or roughness on this area but you can feel it with your fingernail.

If you detect any imperfection in this surface, it must be polished smooth. **DO *NOT* POLISH THE AREA MARKED IN RED!** The red area is the hook point; it must stay very sharp on the tip. If the hook point is buffed, then the entire hook assembly will need to be replaced.

Rotate the hand wheel of the machine so that the area to be polished is on the bottom. This prevents the grit from the emery cloth from falling down into the rotating components of the hook assembly. Use fine grit emery cloth #320-400 and polish it smooth. Emery cloth (also called crocus cloth) can be purchased at a hardware store or auto parts store.

Step 2: Check the area marked in yellow.

The front edge as well as the top side and back of this piece should be smooth.

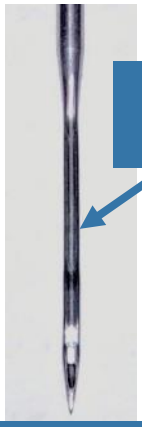
Follow the polishing procedure as described in Step 1 above. Once again, be sure to avoid the area of the hook colored in red.

Each quilting machine is adjusted and thoroughly tested before being shipped from the factory. If the machine does not function properly, please check the following:

The needle must be properly inserted into the machine. The needle should be straight with the scarf facing toward the back of the machine. The long groove down the edge of the needle should be toward the front of the machine.

Front (freehand) Back (throat) of machine

Needle viewed from thread path side of machine.



Needle viewed from front handles.

For best results while stitching, a use a sharp needle. A dull or blunt needle will make a popping noise as it enters the fabric and should be replaced immediately. Also check the needle for any burrs which may be cutting the thread. We discourage using titanium-coated needles in your APQS machine. If a titanium needle breaks, more severe damage to your quilt and hook assembly can occur (compared to steel needles).

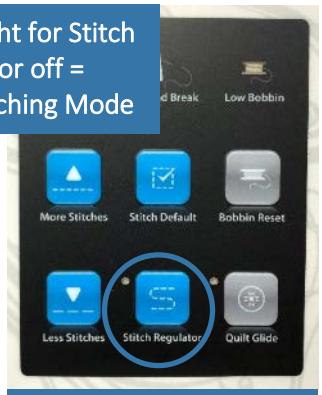
Standard MR 4.0 Needles (silver colored)

Titanium Needles (gold colored)

Quick Troubleshooting Guide

If you are operating the machine in manual mode, be sure to begin moving the machine head immediately after starting the machine to prevent thread breakage. When stopping the machine, turn the sewing motor off by pushing the toggle switch away from the white dot on any handle.

Millie
Smart Touch Pad

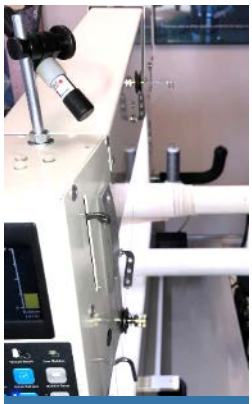


Freddie
Smart Touch Pad

Thread used should be industrial strength, preferably at least 50 weight. We recommend using polyester for strength; however, if cotton thread is used, check the hook and bobbin case frequently to keep them clear of lint produced by cotton. Clean under the tension finger "tongue" with compressed air or the corner of a business card - DO NOT USE A PIN. This can scratch the underside of the "tongue" and cause shredding.

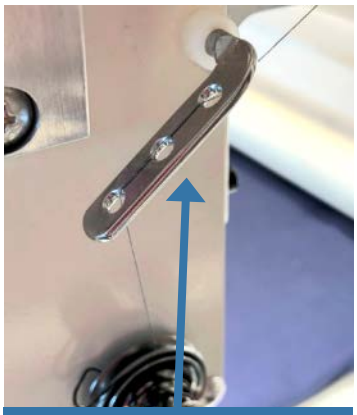
Tension finger "tongue"

Check the threading diagrams to be sure that the machine is threaded correctly. See Machine Threading Section.



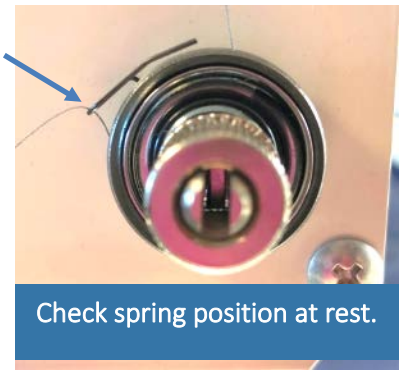
Thread path

The thread must have proper pre-tension before entering the tension disks to prevent it from slipping out of the disks. See the machine threading section for information on how to thread the 3-hole guide directly above the tensioner to create the proper pre-tension on your thread type.



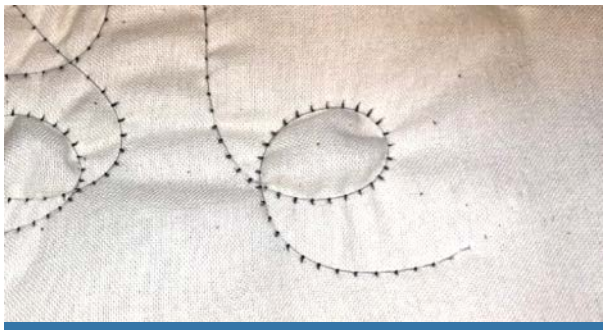
3-hole thread guide above tension control.

The bottom of the check spring's "u-shaped curve" on the tension control unit should be at approximately 10 o'clock in its resting position, with only a light to moderate amount of tension on the spring. Refer to Tension Assembly Maintenance section for adjustment.



Check spring position at rest.

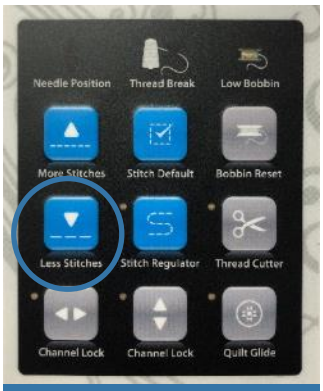
The tension must be adjusted when using different types of thread (polyester, cotton and monofilament). The thread will break if the top tension is too tight or loop if the tension is too loose.



Top tension too tight.

Top tension too loose.

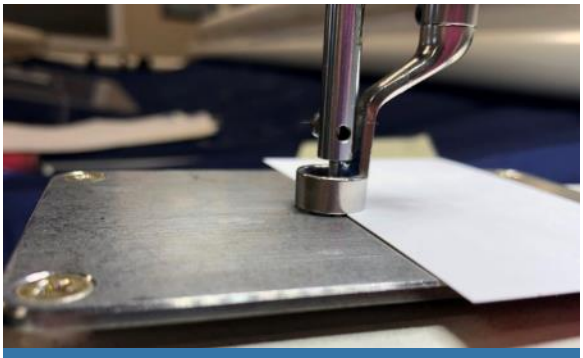
If thread is fraying and breaking, it may be a direct result of the machine being run either too fast or too slow.
To correct this problem, adjust the sewing motor speed in manual mode using the touch pad “Less Stitches” button.
You may also need to adjust the speed at which you are moving the machine head. Thread fraying or breakage can be caused by tension that is too tight, or there could be a burr or scratch somewhere on the hook assembly or in the needle plate’s needle hole.



Millie
Smart Touch Pad

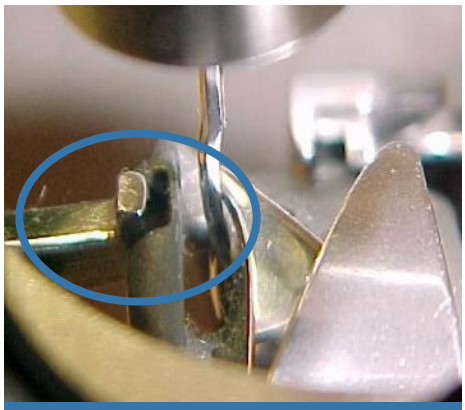
Freddie
Smart Touch Pad

The hopping foot height should be only 1/64’’ (approximate thickness of a business card) in its ***lowest position, without fabric under it***. This is the best height for very thin battings.
An adjustment can be made to accommodate thicker battings. See Hopping Foot Adjustment section.



Checking hopping foot height.

The hook retaining finger should set approximately 1/3 of the way into the notch in the bobbin basket. This allows the bobbin thread to pass through when making a stitch, yet keeps the bobbin basket from spinning. See Timing Section for more information.



Correct hook finger position.

PROBLEM	PROBABLE CAUSE
Top thread frays or breaks	A. Moving machine too slowly in manual mode B. Motor is running too fast in manual mode C. Damaged needle D. Burr on sewing hook E. Burr on needle plate F. Needle rubbing side of needle plate hole G. Improper threading H. Needle size too small compared to thread I. Poor thread quality
Skipping stitches	A. Needle is bent or improperly set B. Hopping foot too high C. Hook too far from needle D. Hook and needle out of time E. Damaged hook point F. Top tension too tight G. Encoder wheel slipping H. Improper electrical connections
Thread loops on quilt back	A. Moving machine too fast B. Motor is running too slow for manual movements C. Top tension is too loose D. Improper threading E. Burr on sewing hook F. Fuzzy, linty thread
Machine fails to run	A. Master power switch off B. Motor speed gauge set to “0” or “turtle” icon C. Breaker tripped in electrical panel D. Blown fuse on quilting machine E. Faulty extension cord (if used) F. Outlet failure G. Power cord near switch loose
Machine too noisy	A. Hook assembly is dry and needs oil B. Hook assembly damage C. Damaged needle D. Hopping foot set too low E. Loose screw in needle plate
Machine hard to push while quilting	A. Quilt rubbing on leveler bar B. Improper hopping foot height C. Thread wrapped around wheels D. Channel lock engaged
Machine hard to push without machine running	A. Quilt table not level B. Thread wrapped around wheels or bearings C. Carriage wheels need cleaning to remove oxidation/lint/thread

Indicator Light Definition & Location

The indictor lights on the back, right-hand side of the quilting machine help diagnose problems. Use this chart when working with an APQS technician to determine certain functions and help guide the technician toward a solution.

Indicator Lights

A1	A2	A3
B1	B2	B3
C1	C2	C3
D1	D2	D3
E1	E2	E3
F1	F2	F3

Indicator Light Description

Light #		Millie	Freddie	Lucey	Lenni
A1	Circuit board lockout	x	x	x	x
A2	Needle 'DOWN' position	x	x	x	x
A3	Needle 'UP' position	x	x	x	x
B1	Optical Sensor	x	x	x	x
B2	Head Encoder	x	x	x	x
B3	Carriage Encoder	x	x	x	x
C1	Max Speed	x	x	x	x
C2	Single Stitch Switches	x	x	x	x
C3	On/Off Switches	x	x	x	x
D1	Increase Stitches Button	x	x	blank	blank
D2	Stitch Default Button	x	x	blank	blank
D3	Bobbin Level Reset Button	x	x	blank	blank
E1	Decrease Stitches Button	x	x	blank	blank
E2	Stitch Regulator Button	x	x	blank	blank
E3	Thread Cutter Button	x	x	blank	blank
F1	Vertical Channel Lock Button	x	blank	blank	blank
F2	Horizontal Channel Lock Button	x	blank	blank	blank
F3	Quilt Glide Button	x	x	blank	blank

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