

Eliminating Tension Headaches



Tips for getting it set up right the first time.

Use the Pretension Guide

How to identify what is causing the tension problem? Use the new improved Tension Guide

○ TENSION PERFECTION CHECKLIST

Ensuring your machine has perfect tension is a skill that takes practice to gain. Use this checklist to remember the steps needed to make sure your tension is great.

■ Select Your Materials Carefully

Different materials can affect your machine's tension differently.

- Make sure you use a full quilt sandwich—quilt-backing, batting, and quilt-top. Also, thicker batting makes tension more even. Consider using a double layer of batting to get it thick enough.
- Use good quality thread. Older thread is more likely to break, which can affect the consistency of your stitches. See your machine manual for more information about thread, including how to test your thread before you use it.
- Fill your bobbins with thread that has a similar weight and fiber content to your top thread.
- Remember to prepare your pre-wound bobbins by removing 3–5 yards from them before use. Pre-wound bobbins are often coated in glue and overfilled to help with shipping.

■ Clean Your Machine & Frame

Debris on your machine or frame can affect the tension by disrupting your machine's movement.

- Make sure you regularly clean the following parts of your machine and frame:
 - Frame tracks
 - Bobbin case & hook assembly
 - Bottom carriage tracks
 - Large & small tensioner discs
- Don't use any soap or chemicals. You can use slightly damp cloth if you want.

■ Adjust Your Rail Height

Properly adjusted frame rails are key to good fabric and stitch tension.

- Make sure the take-up rail is set as close as possible without touching ($\approx 1/4"$) above your machine's bed. See your frame manual for details on how to adjust your rails.
- For a rolling frame, you might have to adjust the rail height in the middle of your project. See your frame manual for information about rolling your quilt.
- For a hoop frame, your rail height remains constant throughout your project.

■ Oil Your Machine

Like a car, your machine needs regular oil maintenance. See your machine manual for details on oiling your machine.

- Make sure you oil your machine at the start of each project.
- Oil your hook assembly at the start of each project and after every other bobbin change.

■ Check The Encoders & Cables

Your encoders directly affect stitch regulation. The cables make sure your machine has power and all parts of your machine are connected.

- Double-check that your encoders are in working order—the lock collars are facing up and the wheels are on the tracks.
- Confirm that all cables on your machine are plugged in to the correct ports and attached in a way that won't affect your machine's movement on the frame.

■ Move Your Machine

Sudden restrictions of your machine's movements can throw off your tension.

- Before you start quilting, move the bottom carriage and the machine all around the frame, checking that they move smoothly on the tracks and that nothing can be caught in the wheels.

■ Replace Your Needle

The type and wear of your needle affects your machine's tension.

- Use a new needle for each project to ensure it's straight and sharp. See your machine manual for instructions on replacing your needle.
- Select a needle that matches your thread type. See your machine manual for a chart that details which needle to use with which thread.

■ Check Your Machine's Foot Height

When you quilt with thick fabric or batting layers, the hopping foot might press down on the quilt too tightly and cause drag. Alternatively, if the hopping foot is too high, your machine can skip stitches.

- Check the hopping foot height when you start a project. See your machine manual for instructions.

■ Check Your Bobbin Tension

Correct bobbin tension leads to correct overall tension.

- Wind your bobbin correctly. See your machine manual for details.
- Load the bobbin case so the bobbin turns clockwise when you pull the thread. See your machine manual for details.
- Check your bobbin case tension when you start and when you change your bobbin. See your machine manual for more details and for steps to correct the bobbin tension if needed.

■ Thread Your Machine Carefully

The tension on the top thread is heavily influenced by how you thread your machine.

- Make sure the top thread is threaded properly through the tensioners and thread guides before it gets to the needle. See your machine manual for details on threading your machine.

■ Test Your Tension!

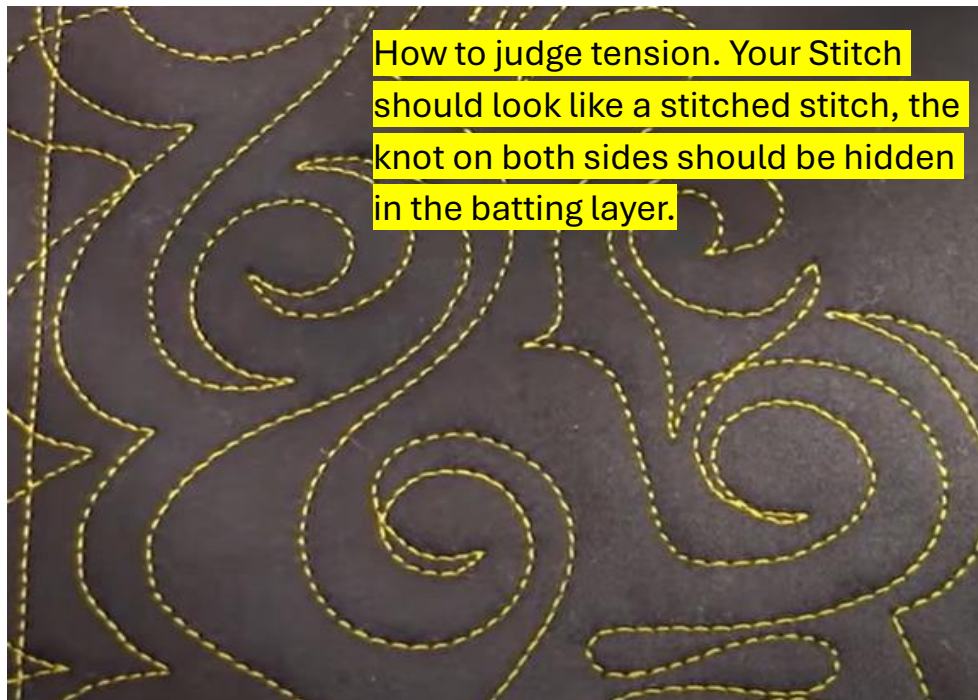
You can't have perfect tension if you don't measure it and adjust it as needed.

- Use the side of your quilt or a scrape quilt sandwich similar to your quilt to test your tension.
- Try stitching with straight lines in various directions and some curved lines and loops.
- If your tension seems off, use your machine manual to adjust the top tension. If you're still having tension issues, check out the tension troubleshooting guide.

Understanding Tension:

What is good tension?

Perfect sewing machine tension occurs when the top and bottom threads are perfectly balanced. That means you shouldn't see any little loops on either the top or bottom of your fabric, and the stitching should look even on both sides.



Stitches are supposed to interlock in the batting of a quilt. This means the knot should be hidden in the batting layer for an even stitch.

By following the “Tension Perfection Checklist” your stitches should look even and balanced. However, when you are happily quilting sometimes just by changing threads or bobbins you can run into tension issues. Here are some steps to check to help you quickly resolve some tension issues.

1. Check your needle- make sure it is in correctly with the scarf facing the back of the machine and your needle eye is front and centered. Use a piece of paper to check and your needle alignment magnet tool. Even another pin or needle can also help. Look at your thread if it is shredding it could be that your needle is too small for the thread weight, or you might have a burr on your needle from the friction of the thread pulling thru.

Getting the top thread not to show on bottom? **Loosen the tension on the knob slightly so it is not pulling the top thread to the bottom.**

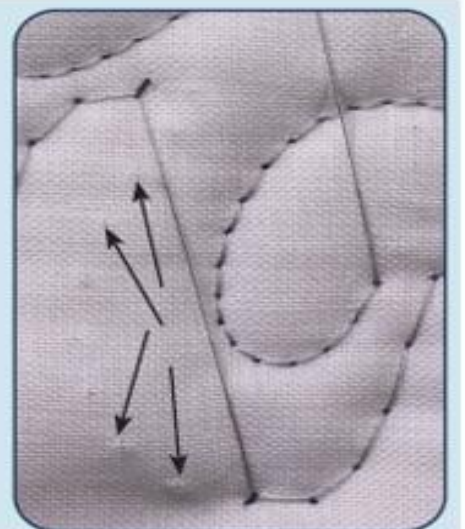
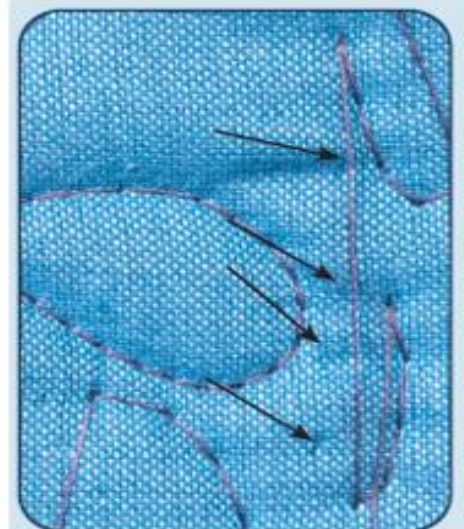
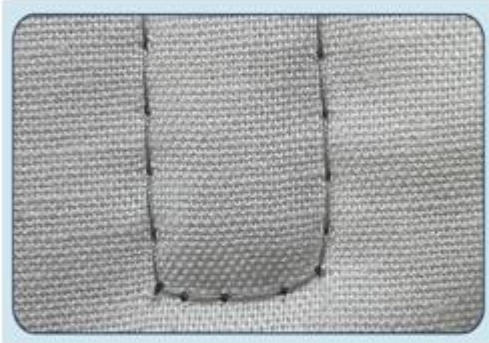
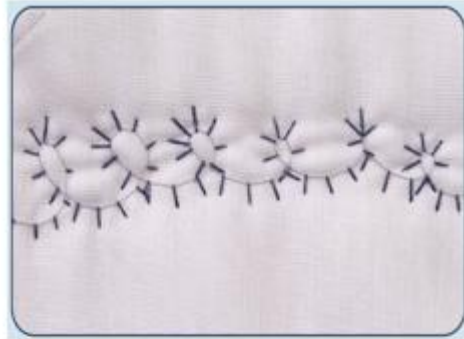
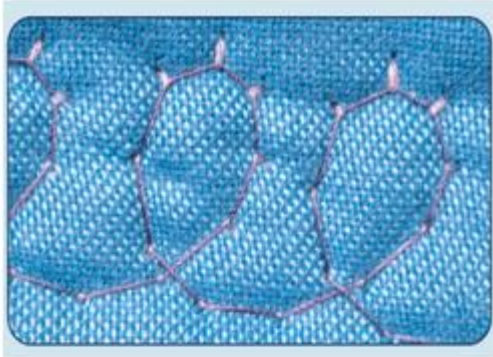
What do the numbers mean on the tension button? **The numbers on a sewing machine's tension knob indicate the level of tension, with lower numbers indicating less tension and higher numbers indicating more tension.**



What is the chronological order of steps to take with tension issues?

1. **Make sure the machine is threaded correctly. No cords or twisted threads caught on screws or wrapped around a guide.**
2. **Check Needle, make sure it is in correctly, seeded all the way up. Screwed tight. And the eye is facing front with the scarf facing back.**
3. **Bobbin case and bobbin.**

What does bad tension look like?

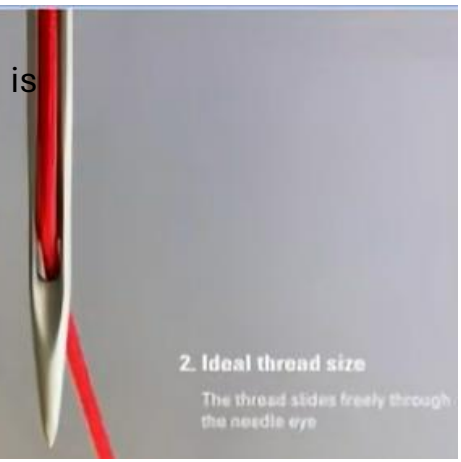


Thread Too Thick:
Thread will not glide smoothly through the needle eye and will get stuck and shred also breaking even skipped stitches.



1. Thread too thick
The thread cannot slide smoothly through the needle eye

Just right thread: Thread is the right size for the needle and will glide freely through the eye.



2. Ideal thread size
The thread slides freely through the needle eye

How thread type and needle size effect tension

The 6-digit material number to allow simple needle ordering

The needle system with equivalent system designations (max. 3 designations)

Most needle systems can be purchased with different point styles. Suitable for everything from the finest fabric to the thickest leather.



The needle size in Nm and other current size descriptions

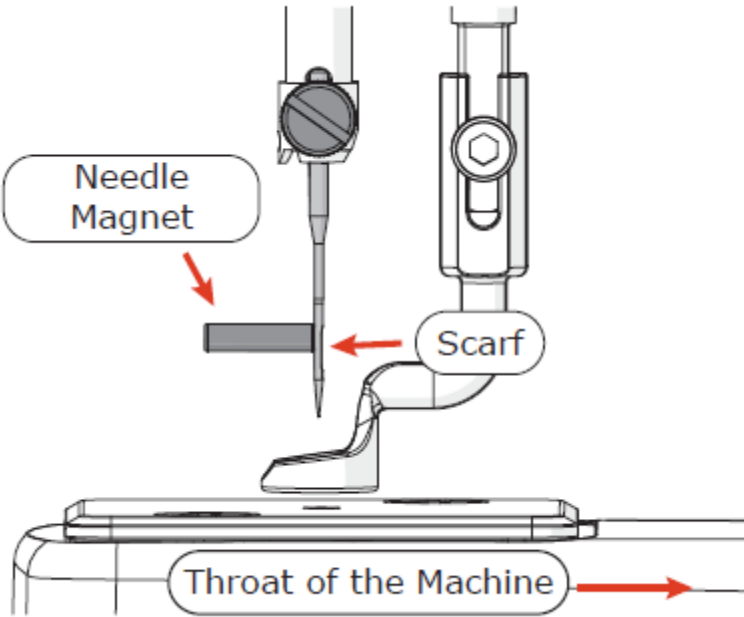
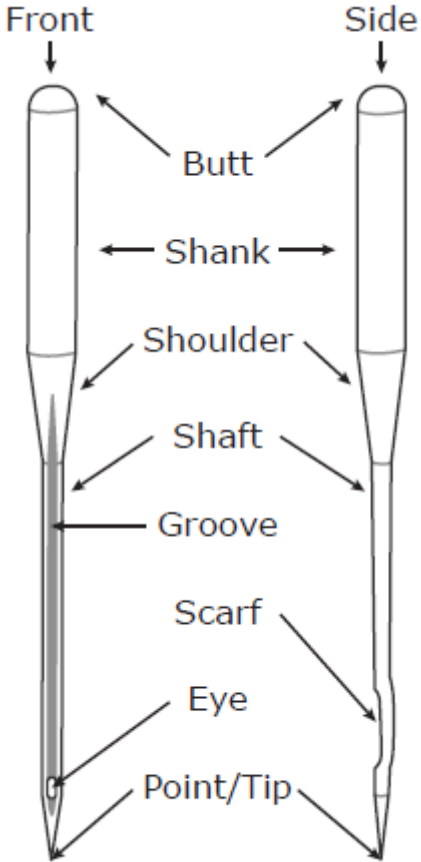
Data Matrix code

The production number allows all production steps for this needle to be traced back. This is also required for the manual entry in the label scanner

GB designation	Point	SNF Cat. No.	SNF Point	Size range								
				2.0 65-70	2.5 75-80	3.0 85-90	3.5 95-100	4.0 105-110	4.5 120	5.0 125-130	6.0 140-160	7.0 180-200
DBx1 MR	R	1515-01-	SET	•	•	•	•	•		•		
DBx1 MR FFG	FFG	1515-06-	L Ball	•	•	•	•	•				
62x45 MR	R	4107-01-	SET							•	•	
62x57 MR	R	3260-01-	SET					•	•	•		
UY128GAS MR FFG	FFG	3651-06-	L Ball		•	•	•	•	•	•	•	
134 K MR	R	1910-01-	SET					•		•		
134 MR	R	1955-01-	SET	•	•	•	•	•	•	•	•	
134 MR FFG	FFG	1955-06-	L Ball	•	•	•	•	•	•	•	•	
134 MR FFG GEBEDUR®	FFG	-	L Ball	•	•	•	•	•	•	•	•	
134 MR FG	FG	1955-07-	M Ball					•	•	•	•	
134-35 MR	R	7225-01-	SET			•		•	•	•	•	
135X17 MR	R	3355-01-	SET		•	•	•	•	•	•	•	•
135X17 MR FFG	FFG	3355-06-	L Ball							•		
135X17 MR FG	FG	3355-07-	M Ball			•						
135X17 MR GEBEDUR®	R	-	SET							•	•	
UY180GYS MR	R	6935-01-	SET					•		•	•	
UY180GYS MR FG	FG	3355-07-	M Ball							•		
1906 MR FFG	FFG	1906-06-	L Ball	•	•	•						
3386 MR	R	3386-01-	SET									•
4510 MR FFG	FFG	4510-06-	L Ball					•		•		
5205 MR	R	5205-01-	SET							•		

Needle: Select a needle based on the thread. The chart below shows recommended needles for different thread types.

Needle Size	Thread Size and Type
14 / 90	<ul style="list-style-type: none"> • mono-filament • 100 wt. silk • 60 wt. polyester
16 / 100	<ul style="list-style-type: none"> • mono-filament • 60 wt. polyester or cotton • 50 wt. cotton
18 / 110	<ul style="list-style-type: none"> • 50 wt. polyester (Finesses) • 40 wt. cottons and polyester • 30 wt. cotton and polyester
20 / 125	<ul style="list-style-type: none"> • 30 wt. or heavier of any thread



What are some things that can cause tension to change while quilting a project? **The bobbin, how it is wound. The thread itself may have some inconsistency, the needle, as you are rolling the quilt that can also affect tension.**

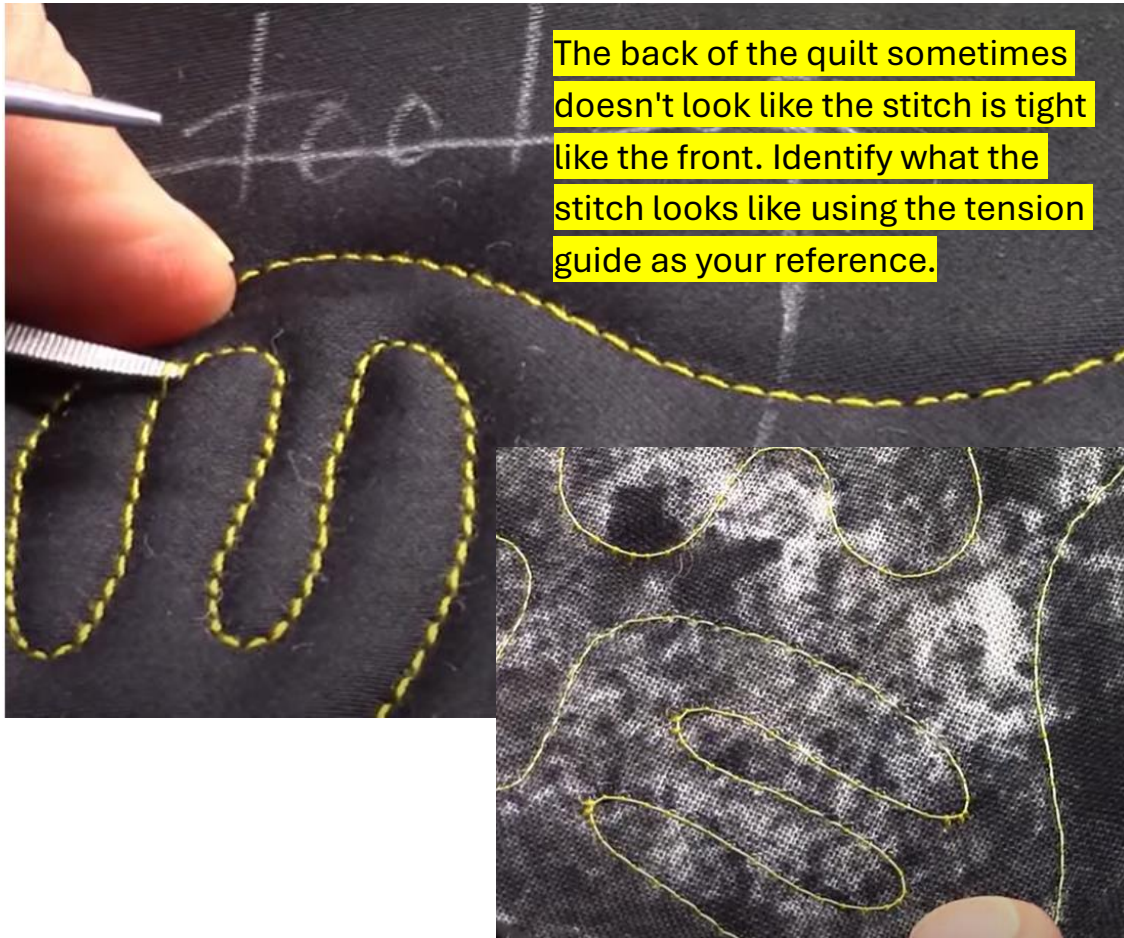
How do they balance/dynamic change when you need to use different weights in the bobbin and top thread? **Start with tensioning too tight then start slacking off to adjust for balance.**

Bobbin thread wt. / upper thread wt.- how they affect tension- same wt.? tension dials cleaning suggestion, how each affect tension. **The thread determines the needle size. Many times, we use what we have on hand and are readily available, it may not be the correct needle size for the thread we are using.**

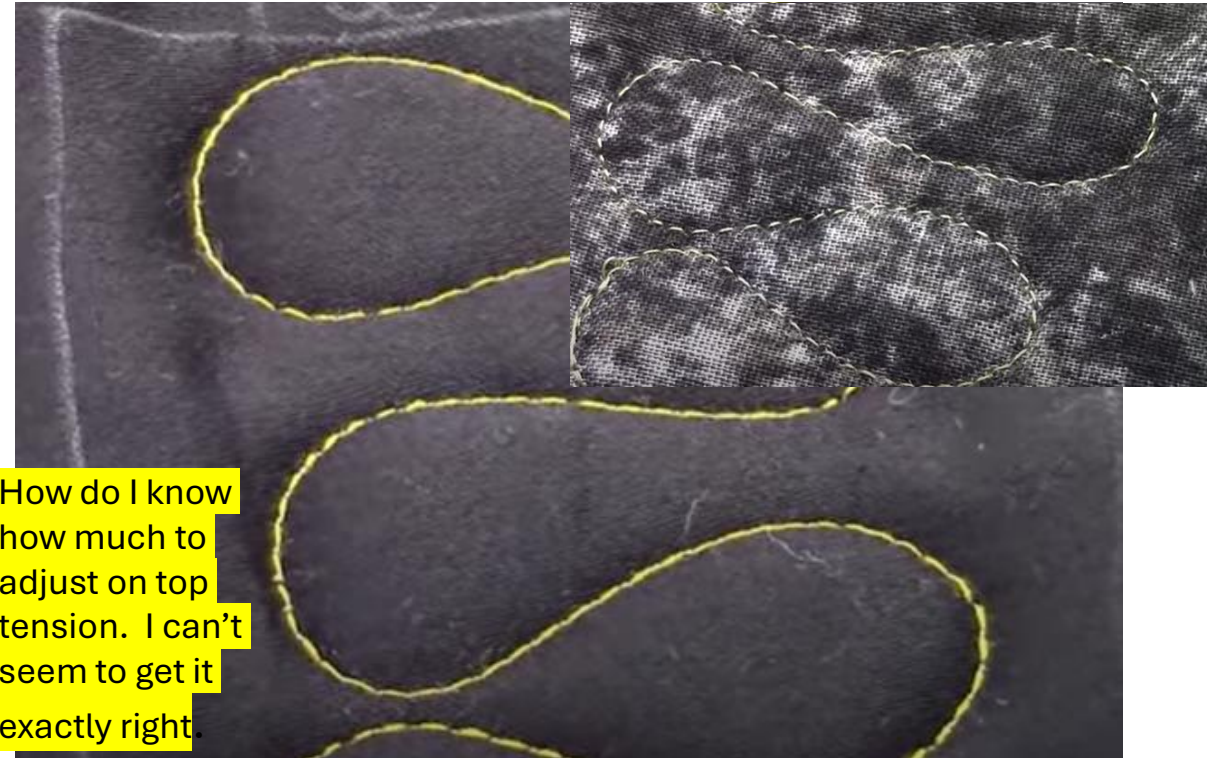
1. Check threading of machine!

Check Bobbin Case Tension & Bobbin

Top tension too loose stitches on top are loose take your fingernail or scissors and check for looseness.



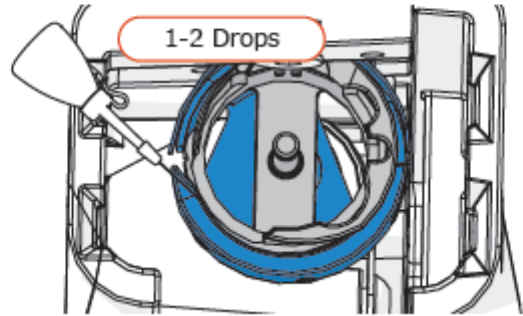
Top tension too tight just lays on the top and is not pulled down between the layers.



Usually if you notice your bobbin thread pulling up on the top, you will need to loosen your top tension by turning your tensioner knob to the left. If you observe top thread on the bottom, you will need to tighten your top tension turning the tensioner knob to the right. I know this sounds so simple; but when this situation strikes it doesn't necessarily go that smoothly or easily.

What does bad tension look like?

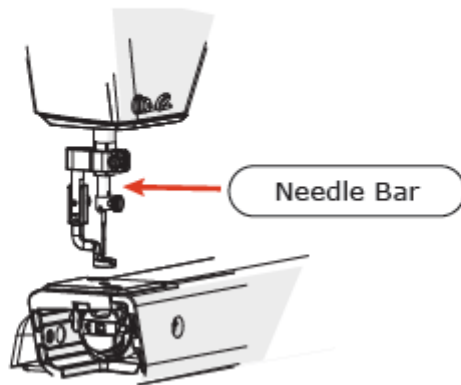
Place one to two drops of oil into the hook assembly between the inner part (shown in gray) and outer part (shown in blue).



Before putting the bobbin case back into the hook have the machine run in manual mode for a few minutes to work the oil into the joints to lubricate. This will help with excess oil.

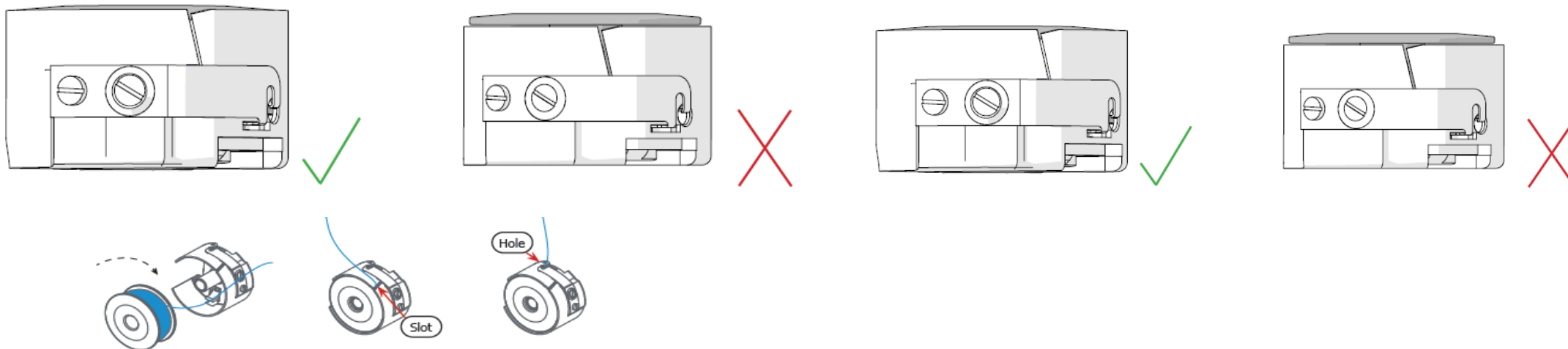
Make sure you wipe off any excess oil, so it does not get onto your quilt.

Place one to two drops of oil at the top of the needle bar and work the oil into the machine by turning the hand wheel a few times around.

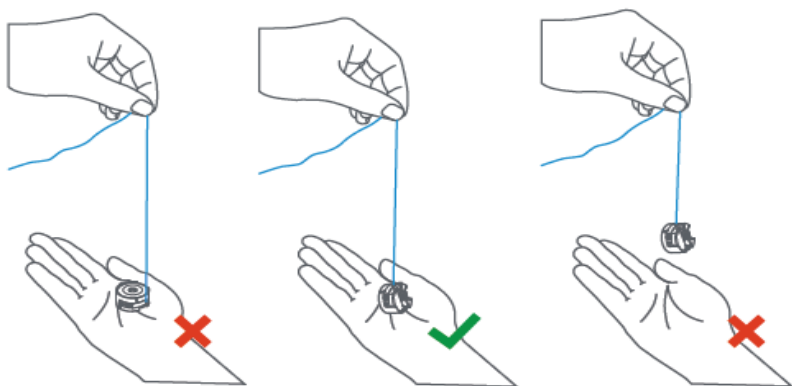


- 2 Look at the bobbin case from the side. The bobbin should barely poke out of the opening of the bobbin case. If the side of the bobbin is lifted clear over the edge of the case, the anti-backlash spring might not be installed correctly or it might be damaged.

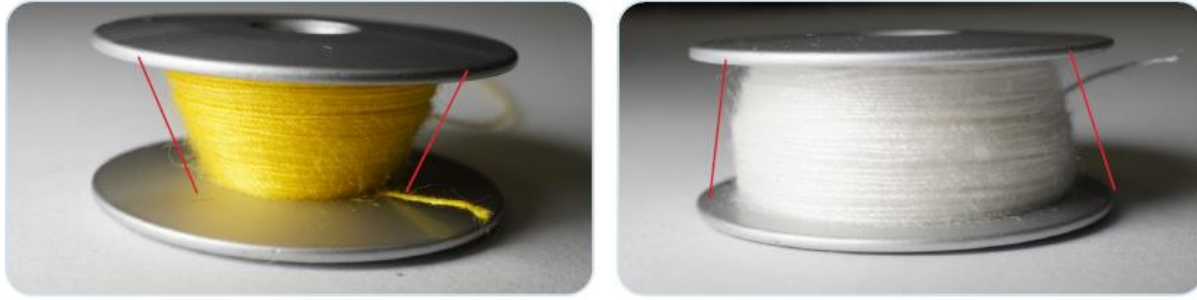
- 2 Look at the bobbin case from the side. The bobbin should barely poke out of the opening of the bobbin case. If the side of the bobbin is lifted clear over the edge of the case, the anti-backlash spring might not be installed correctly or it might be damaged.



Then check your bobbin tension. Lay your bobbin case in your hand and pull on the thread. You should be able to lift your bobbin upright but not out of your hand.

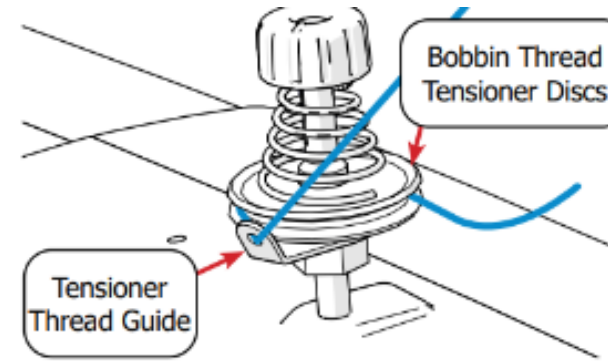


Eye lashing on curves on the bottom. This could be the bobbin case spring. **Check to see high out of the case it is pushing your bobbin if it is higher than the lip of the case then the spring is bent, and you will need to work and adjust it or get a new bobbin case. Recommended you always have a spare bobbin case on hand! Check to make sure your thread is flossed between both tension discs. Loosen your top tensioner knob if you have adjusted the first two. Page 13 tension guide.**



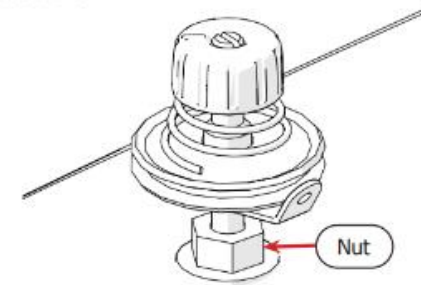
To fix coning, adjust the bobbin thread tensioner height to ensure the thread is winding at the correct angle. See your machine's instruction manual for instructions.

How do you get consistency when winding your own bobbins? Which way to turn the dial on the bobbin winder when it has cone shape. **Page 16 Tension guide. To fix coning, adjust the bobbin thread tensioner height to ensure the thread is winding at the correct angle. See your machine's instruction manual for instructions. Make sure you floss the thread between the tensioner disc and give a tug if you feel some tension, it is probably okay. If you don't then tighten the pressure of the disc by turning the knob to the right. By adding pressure or tension it will pull evenly.**



Adjusting the Bobbin Winder (continued)

- 2 Unthread the bobbin thread tensioner. With a 7 mm wrench or needle-nose pliers, loosen the nut at the base of the tensioner.



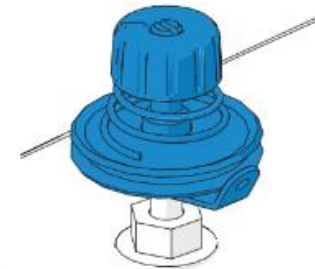
- 3 Turn the top part of the tensioner assembly (shown in blue) a full rotation to adjust the height of the tension discs.



If the bobbin is filling more toward the top, turn the tensioner one full rotation clockwise and re-test.



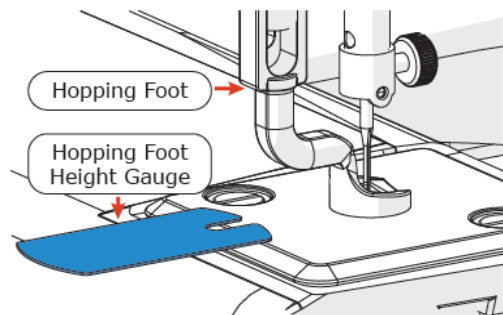
If the bobbin is filling more toward the top, turn the tensioner one full rotation counter-clockwise and re-test.



Checking Your Hopping Foot

When quilting with thick fabric or batting layers, the hopping foot may press down on the quilt too tightly and begin to drag. Alternatively, having the hopping foot too high can result in skipped stitches. Raise or lower the hopping foot to correct these problems.

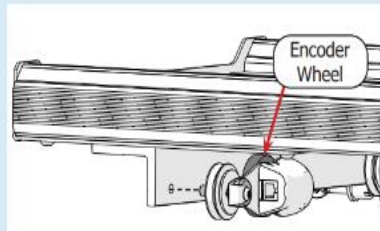
Move the machine so it is not over fabric. Then use the hand wheel to drop the needle bar to the lowest position.



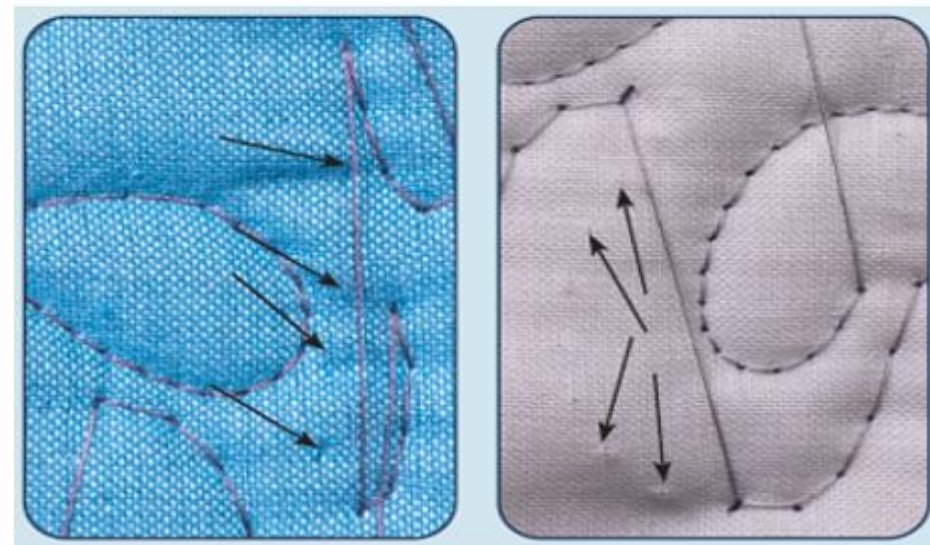
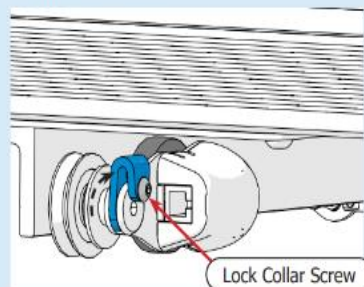
With the 3 mm Allen wrench, loosen the hopping foot screw. Slide the hopping foot height tool (shown in blue) underneath the hopping foot, around the needle. Lower the hopping foot until it rests on the height tool. Retighten the hopping foot screw.

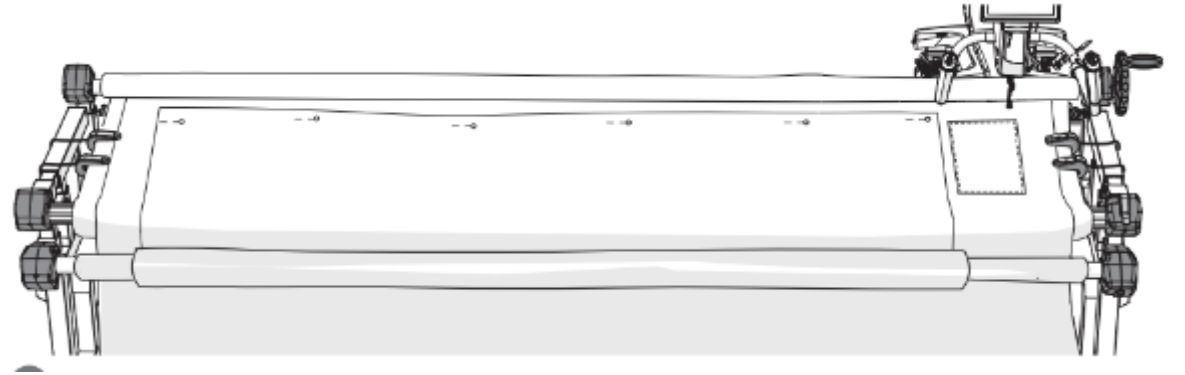


- c With the 4 mm Allen wrench, screw the encoder into the left rear wheel hole on the carriage so the **encoder wheel** is between the rear wheels.

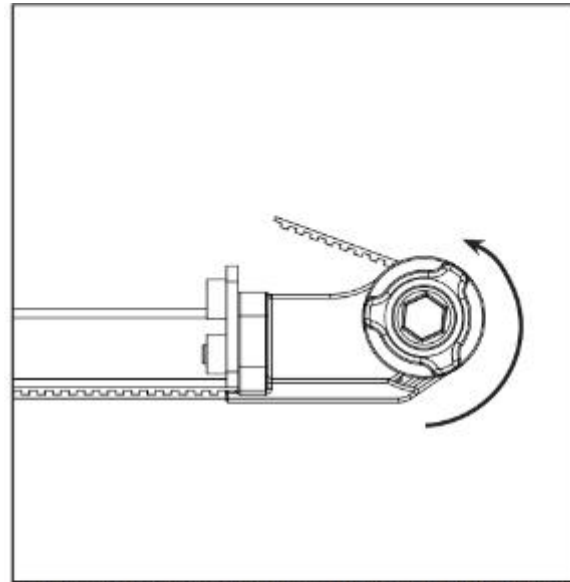


- d Turn the encoder **lock collar** (shown in blue) to point up. Then tighten the **lock collar screw** with the 2.5 mm Allen wrench.



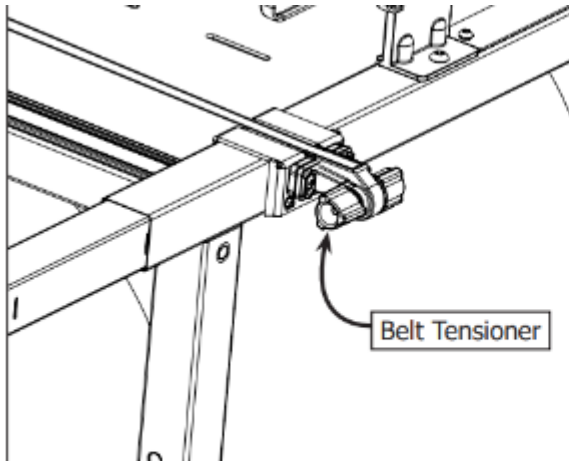


Puckering is usually caused when you're tightening the fabric tension on your quilt too much for how you are quilting. Rule: make it smooth and no wrinkles and use some side tension if the bungees get in your way, then pin a leader to the sides and clamp the bungees to the side leaders.

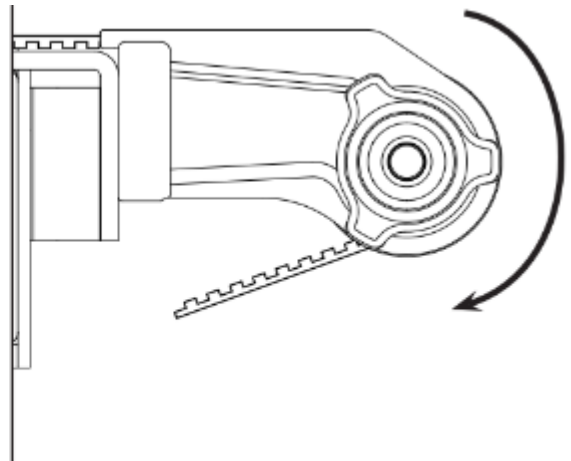


4-18: Feed the free end of the Short Belt into the Belt Tensioner. Turn the right knob to tighten the belt all the way through the Tensioner. Once the belt is tight rotate the left knob clockwise to lock it in place.

Belts are too loose, and you get a lot of vibration as well as flat spots and jagged stitching. Make sure your wheels are aligned for using the automation. If you are using brackets that can shift and move, make sure those are aligned as well.



5-2: Insert the free end of the Long Belt into the Belt Tensioner Assembly.



5-3: Twist the right Belt Tensioner knob to tighten the belt. Once the belt is tight rotate the left knob clockwise to lock it into place.