

## Resolving Stitch Issues

The following issues are commonly seen and discussed across the internet. Everyone has a bad day and can forget to check these common items. Each issue and its probable solutions are discussed in the following sections.

1. Skipped Stitches - Needle makes a hole but does not make a stitch.
2. Long Stitches - Needle does not go down when expected, leaving no hole and a long stitch.
3. Thread Shredding, Breaking, or Fraying
4. Tension Issues
5. Jagged Stitches - Stitches not in a straight line, when sewing vertically front to rear.

### 1. Skipped Stitches

Skipped stitches occur when the needle makes a hole but does not make a stitch.

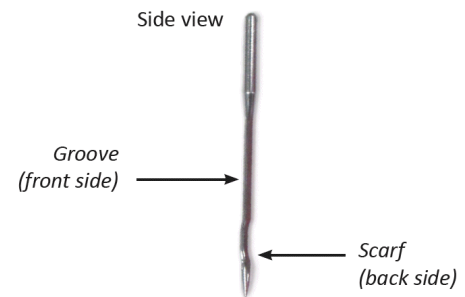
#### 1. Have you replaced the needle?

You've heard the saying that "every quilt deserves a new needle." While that may or may not be true, it is a good place to start when troubleshooting. A dull or incorrect needle will cause poor stitches. Make sure the needle is the correct type and gauge for the thread you are using. The groove in the needle needs to fit the thread. Superior Threads has some great information on matching needle size to thread (<https://www.superiorthreads.com/education/thread-weight>).

#### 2. Is the needle in backwards?

The needle groove should be to the front, and the scarf to the rear. (See the diagram showing the needle side view.)

Almost everyone will insert the needle backward at least once. Avoid the frustration by running your fingernail down the front groove of the needle to check that it is inserted correctly.



#### 3. Is the needle inserted straight?

The needle should be inserted so that the groove is in the 6:00 position (as it would appear on the face of a clock). To help ensure the correct orientation, try using a needle magnet. The magnet will stick to the front of the groove and show you exactly how your needle is oriented. Needle magnets are available in sets of two from the MK Quilts store (<https://shop.mkquilts.com/needle-magnet/>).

#### 4. Is the needle inserted all the way to the top in the needle bar?

Ensure that the needle has been inserted all the way up into the needle clamp until it hits the top of the stop/sight hole. If the needle is too long due to not being fully inserted in the needle bar, it will throw off the timing.

**5. Have you threaded your machine correctly?**

Refer to your manual or on-screen threading guide if needed. Sometimes just rethreading your machine, even if you cannot see a problem with the threading, will resolve your issue.

**6. Is the thread tension too tight?**

Check the bobbin case tension, and then check the top thread tension. Refer to your user manual for more information on tension, or look at the Tension Issues section (section 4) of this document.

**7. Is the fabric too tight on the frame?**

Loosen the fabric on the frame. Fabric that is too tight on the frame can cause the fibers to separate and the quilt to bounce while quilting. Loosening the fabric reduces the needle friction on the thread, resulting in a smaller thread loop. If you push your finger up from under the fabric, you should be able to grab your first knuckle above the quilt. For tightly woven fabrics, such as batiks, you may need to loosen the fabric a notch or two more.

**8. Is it skipping often, or only occasionally in one direction?**

Many machines will get “a little out of time” and only skip in certain situations, such as going right to left or basting. If you have cleaned the Hook & Basket and checked everything else, you are likely looking at a timing issue.

**9. Did you have an “unfortunate incident” such as a needle breaking?**

Resetting the timing on a machine is not a warranty issue. When set properly, the timing on a machine will not change without a physical event happening to jar the Hook & Basket so that it moves on the shaft. Watch the MK Quilts “Checking the Timing” video, and consider purchasing the timing tools. Each service manual has good photos and instructions on how to do timing. It does take practice and skill, but does not require opening the machine.

**10. Is the hopping/presser foot still moving and holding the fabric down as the needle comes up?**

One common problem occurs when a hopping foot gets caught under a seam and is pulled from the internal mechanism. The hopping foot is spring loaded and should snap down without banging hard on the needle plate. If the hopping foot is not articulating as expected, it likely needs to be put back into place, which requires opening the machine. This is best done by a technician, but could be done with remote technical assistance.

**11. Is your hopping/presser foot at the right height?**

Some experienced longarmers will raise their hopping foot on very thick quilts, and then forget to reset the height. The hopping foot is spring loaded and almost never needs to

be adjusted in this way. The hopping foot should barely touch the needle plate when the needle is in its lowest position. Anything more than a business card thickness worth of space could lead to stitch issues.

## 12. How old is your machine?

In very old machines, the needle bar brass bearings can wear. These bearings can only be replaced at the factory. This should be your last concern, as it is normally only seen in machines that have over 80 million stitches. An unserviced machine may see this issue sooner due to a lack of oil.

## 2. Long Stitches

Long stitches occur when the needle does not go down when expected, leaving no hole and a long stitch.

Long Stitches are almost always due to issues with the encoders and stitch regulation. Please review the “Resolving Machine Issues” guide for troubleshooting this issue.

## 3. Thread Shredding, Fraying, or Breaking

### 1. Ask yourself, “What changed?”

Did you change your quilt fabric, batting, thread, pattern, or tension? If there was not an incident to knock out timing, then the issue is likely due to something that changed, or it may be due to lint in the Hook & Basket.

You may want to remove your needle plate and make sure the needle did not strike the Hook & Basket causing any sharp edges. If part of the needle jammed into the Hook & Basket, the machine is likely going to be out of timing, so removing and inspecting the Hook & Basket is recommended. (Removing the Hook & Basket requires timing to be performed.)

### 2. Check that the machine is threaded correctly.

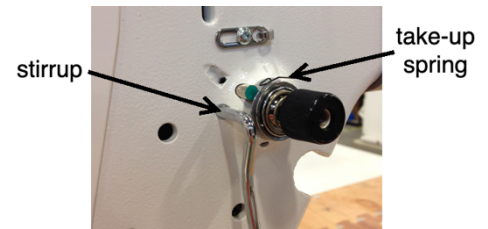
Look for accidental double-wrapping of thread on thread guides. Inspect the thread mast, making sure the eyelets of the mast are directly over the spools. Inspect the vertical positioning of the thread cones, because tipped cones can dramatically affect thread tension and can cause breakage.

### 3. Inspect all thread guides.

Inspect all thread guides in the upper threading area, stirrup thread guide, edge of ring light (if you have an HQ Avante), needle bar thread guide, needle plate hole, and the holes in any of the plastic specialty presser feet for nicks or grooves that might have been created by thread friction.

#### 4. Check the take-up spring.

Check that the take-up spring on the tension mechanism is not hitting the stirrup thread guide. Take up springs can deform and strike the bar, breaking thread and causing tension issues. If your machine has a thread-break sensor, also ensure that the take-up spring is not catching on the sensor.



#### 5. Check the needle size.

Confirm that you have the correct size needle and correct needle system for the type and weight of thread being used. You may need to go to a needle that is the next size larger. Also, be sure the needle is inserted correctly.

#### 6. Check for burrs.

Look for a burr on the needle and/or the hook (especially if you have had an “unfortunate incident”.) If the burr is on the needle, replace with a new needle. If the burr is on the hook, you will need to remove the burr, usually with fine emery cloth.

#### 7. Remove lint.

Inspect and remove any lint in the thread guides, tension discs, and bobbin case/spring. A lint brush or toothbrush can help blow away much of the lint. A business card can be used to remove lint from the spring on the side of the bobbin case.

#### 8. Be sure your upper thread tension is not too tight.

Even if your stitches look good, tension might be too tight. See the “Tension Issues” section of this document for more information about setting tension.

#### 9. Be sure you are using good quality thread that is being fed properly.

Poor quality or old thread may break easily. Remember that thread pulls off a spool differently than a cone, and may require a horizontal holder.

#### 10. Consider your fabric on the frame.

Is your fabric of poor quality, or is the fabric stretched too tightly on your frame? When poking your finger up from underneath the fabric, you should be able to grab your first knuckle. Batik backings may require a slightly looser tension. The side clamps should only provide enough tension to hold the fabric, not to pull on it.

#### 11. Check that your bobbin rotation is smooth.

Pull gently on the thread coming up from the bobbin to check that your bobbin rotation is smooth. If it is not smooth (that is, if you feel little tugs or hesitations), change the bobbin. The slightest hesitation of the bobbin rotation can be the cause of dramatic tension change and thread breakage.

**12. Try a new sandwich of fabric and batting.**

Put on a new sandwich of fabric and batting. If the shredding persists, swap out the thread on top and bottom with thread from a different spool. Some thread lots can be defective.

**13. Have your machine re-timed.**

Have your machine re-timed even if it does not look out of time. Clean the Hook & Basket very well while it is out of the machine. This cleaning and re-timing has resolved several instances of random shredding without finding another cause.

**14. Replace the Hook & Basket.**

The Hook & Basket is an expendable item that is not covered under warranty. Keeping it well-oiled is necessary for reducing wear. Excess oil, however, will weaken thread and lead to breakage. Stitch off slowly in the batting after oiling until oil is distributed, to avoid getting oil on your project.

## 4. Tension Issues

Tension issues can have various causes, as described below. Remember to always set your bobbin tension first, then set your top tension. To set your bobbin tension, use a TOWA gauge or the “drop test”.

### 4.1 Top Thread Lays Flat on Fabric

1. Upper tension dial is set too tightly.
2. Check for lint in upper tension discs, bobbin tension spring, and under bobbin backlash spring.
3. Check to ensure that machine is threaded correctly.
4. Bobbin is wound poorly.
5. Thread is not in bobbin tension spring.
6. Bobbin tension is not set correctly.

### 4.2 Bottom Thread Lays Flat

1. Upper thread tension is too loose.
2. Lint is present in bobbin tension spring.
3. Bobbin is wound poorly.
4. Thread is not in bobbin tension spring.
5. Bobbin tension is not set correctly.

### 4.3 Bottom Loops

1. The top thread is outside of the tension disks. This is the most common cause.
2. Top thread tension is set too loosely.
3. Machine is not threaded correctly.
4. Burr is present on Hook & Basket.

### 4.4 Inconsistent Tension

1. Bobbin is poorly wound.

(Refer to your bobbin winder manual for details.) A poorly wound bobbin may be the result of winding too fast. The thread can stretch, making the tension so tight that it collapses the inner core of the bobbin, causing the top of the bobbin to be concave. (Concave bobbins are unusable and need to be discarded. See the photo at right for a picture of a concave bobbin.)



A bobbin can also have a “sloppy” wind if thread jumps out of the tension discs on the winder or if the tension is set too loose. A bobbin is too loosely wound if you can easily push your fingernail into the threads. Be sure the pigtail guide is set to the left of the tension disc, to avoid the thread from jumping out of the discs while winding.

2. Bobbin may have too much thread. The thread should not fill the bobbin all the way out to the edge.

If you are using prewound bobbins, it is sometimes recommended to pull off a few yards of thread on a new bobbin.

3. Check for lint caught under the tension spring in the bobbin by pushing the edge of a business card under the spring.
4. Look to see if the bobbin case is worn out or has a weak backlash spring. Replace the backlash spring, or replace the whole bobbin case.
5. Check your backlash spring.

Be sure the backlash spring is inserted into the bobbin case correctly, with the cone elevation facing up, and notches of the spring seated properly. Do not flatten the spring. When the bobbin is in the bobbin case, it should sit a little higher than the edge of the bobbin case, and you will be able to depress it slightly with your finger.

6. Check your tension assembly.

Check to be sure there is no thread or debris caught in the tension discs. Check to be sure that the tensioner is functional by increasing and decreasing the amount of tension and watching the numbers on your screen change accordingly.

7. Thread guides shredding, but not breaking thread, could lead to an obstruction along your thread path. Floss all thread guides and examine for any grooves or rough surfaces.
8. Check the “levelness”, both vertically and horizontally, of your table.

## 5. Jagged Stitches

After an extensive investigation with Handi Quilter and MK Quilts, we believe that a front to back vertical stitch can look jagged due to the thread alternating which side of the needle it is pulling the thread from. Simply turn the needle to a 5:30 position (as it would appear on the face of a clock) so that the thread routinely goes down the same side of the needle on front to back vertical stitches.

Testing was done varying the following parameters on a number of machines:

- Top and bottom tension
- Fabric type
- Fabric angle
- Batting thickness
- Needle bar assembly alignment
- Needle type
- Needle angle
- Stitches per inch

Our conclusion was that if a machine is perfectly aligned, the thread will randomly pass down the right or left side of the needle as it pulls thread when stitching a straight vertical stitch toward the back. The top thread is normally threaded from the front of the needle to the back, so if the previous stitch is in front of the needle, the thread will pull around the needle on one side or the other. The thread enters the next stitch hole at a different angle leading to the appearance of the jagged stitch. Thread tension and type can affect this stitch, but we found that only the angling of the needle assures a perfect front to back vertical stitch.