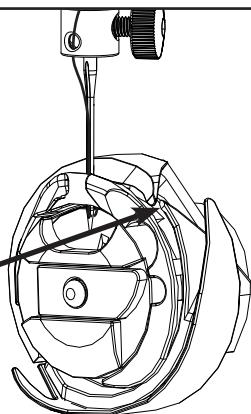


# Handi Quilter - No Loop No Stitch

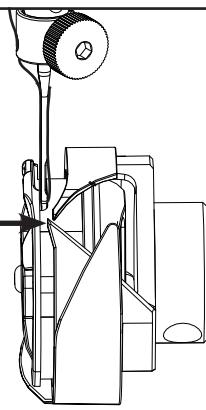
The formation of a stitch occurs when the sewing machine hook picks up a loop on the back of the needle and passes that thread all the way around the bobbin-case basket, bobbin-case, bobbin and bobbin thread. This is when the top thread and bobbin thread get wrapped around each other like a half of a knot forming a lock stitch (where each stitch is locked into the fabric sandwich). But just how, why, where and when is the loop formed?

1a.



Note the hook point position when the needle is at its lowest position

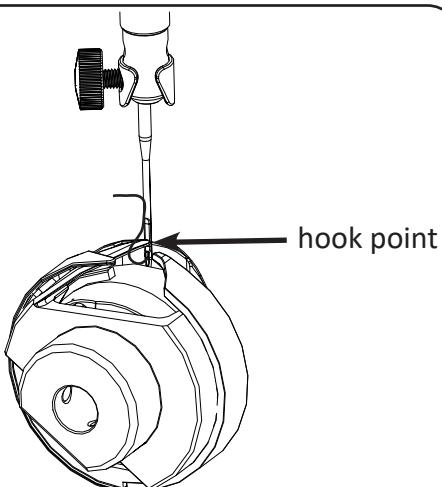
1b.



Needle at lowest position - front view

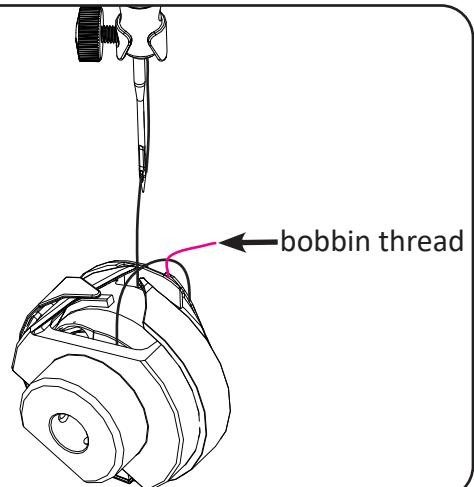
Needle at lowest position - side view

2.



Needle raised 2.2mm from lowest position for loop to form and allowing the hook point to enter the needle thread loop.

3.

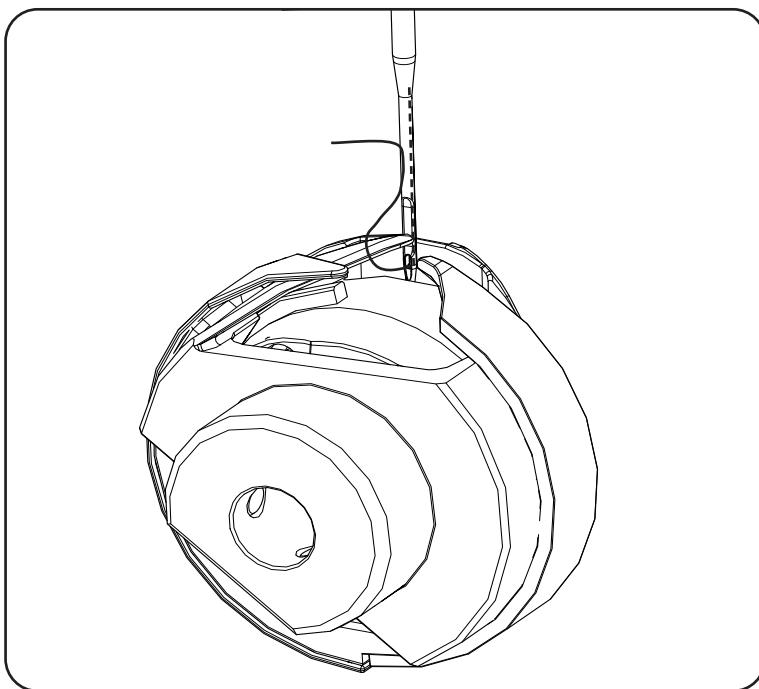


After the hook has made an entire revolution after entering the loop, the needle thread has passed over the bobbin case basket, bobbin-case, and bobbin, wrapping itself around the bobbin case thread.

4. The take up lever will then pull up the extra slack in the thread creating a nice tight knot in the fabric. The take-up lever is assisted by the take-up spring / check spring and the tensions to create a nice stitch.

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The loop is formed because of the scientific principle of friction. One might surmise that this is why we sometimes have skipping issues with slippery fabrics. The thread is pinched against the back of the needle when the needle size is appropriate for the fabric and thread. If the needle is too small for the thread the needle will be difficult to thread and there will be too much friction between the thread and the needle eye. If the needle is too large the needle shaft/blade will punch a hole larger than needed. The friction between the back of the needle and the fabric will be reduced and the loop will not form properly. The loop may then be missed by the hook or possibly hit by the sharp hook point, damaging or shredding the thread; no loop no stitch.



**About needle characteristics** As the needle size increases the following things change on the needle:

- The blade/shaft gets larger.
- The long groove down the front of the needle gets larger to protect the thread from being pinched in the front by the fabric (the loop is formed at the rear of the needle).
- The eye gets bigger.
- The scarf gets deeper to prevent interference with the hook. The needle blade gets larger concentrically towards the front and the rear where the hook passes; this necessitates the scarf at the rear of the needle getting deeper to maintain the same clearance between the needle and the hook.
- The shaft/blade gets a little longer. The constant is the length of the needle from the butt or end of the needle to the needle eye; consequently, if a large needle was not a little longer it would be very blunt near the eye of the needle.

All of these things are done by the needle company for us so when the machine is timed properly it will work with small to large needles which are the correct system for the machine. The needle system determines all the necessary dimensions, characteristics, and requirements of the needle for specific machines. HQ longarm machines use the 134 Needle system.

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## Long Groove Down the Front of the Needle

The front of the needle has a long groove down to the eye of the needle to protect the thread from being pinched in the front of the needle. If the needle is too small for the needle thread, the thread will have friction at the front as well as the rear of the needle. Part of the loop will be pulled to the front making the loop a smaller target for the hook point to hit. This increases the chances of skipped stitches (long stitches with needle penetration hole/holes in between them).

## Loop Lift

Loop lift is a common term used for lock stitch sewing machines and the timing of those machines. It refers to the amount the needle lifts from its lowest position before the hook picks up the loop at the back of the needle. Most Handi Quilter machines use a 2.2mm loop lift; however, the Infinity machine uses a 2.6mm loop lift setting. This gives the hook on the Infinity machine a bigger target to hit at the higher speeds possible on the Infinity machine.

## Extreme Example

One takes the largest needle they can find, perhaps a 125/20 and the finest thread, perhaps a size 100 silk thread and lastly let's add some slippery fabric. The needle will make a huge hole in the fabric and the fine thread will have little if any friction at the back of the needle. The slippery fabric decreases even further the friction between the fabric, thread and needle. This is like a perfect storm for a loop to not form and for skipped stitches to occur.

## Other Causes of Poor Loop Formation

- When the needle is not inserted all the way to the stop/sight hole (the hole drilled through the needle bar clamp to stop the needle at the same height each time it is installed). This will lower the loop at the back of the needle changing the height of the loop and increase the chance of the loop being missed by the hook. The stop/sight hole is drilled all the way through the needle clamp and is located right above the needle clamp screw. One can look through it to ensure the butt of the needle is touching at the top and inserted all the way.
- If the needle is rotated clockwise or counterclockwise the position of the loop will be advanced or retarded in relation to the hook making it possible for it to be hit or missed. When the hook hits the loop it causes shredding or thread breakage. When the hook misses the loop it causes skipped stitches.
- Tensions being balanced but set too tight can cause the thread to pull the needle when the machine is moved across the quilt. This will change the position of the needle and the loop, allowing the hook to miss or hit the loop.
- Adjusting the hopping foot to be higher to make it easier to slide the machine over the quilt. (Note: the hopping foot is spring loaded and can simply be raised by hand to get it onto the quilt without adjustment.) If the foot is set too high the fabric can raise with the needle and thread and the loop will not form properly.
- If one moves too quickly, jerky or roughly across the quilt the needle can be displaced and the loop position changed making it possible to be missed by the hook.

**If the hook misses the loop or there is no loop there is no stitch, No Loop No Stitch!**

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