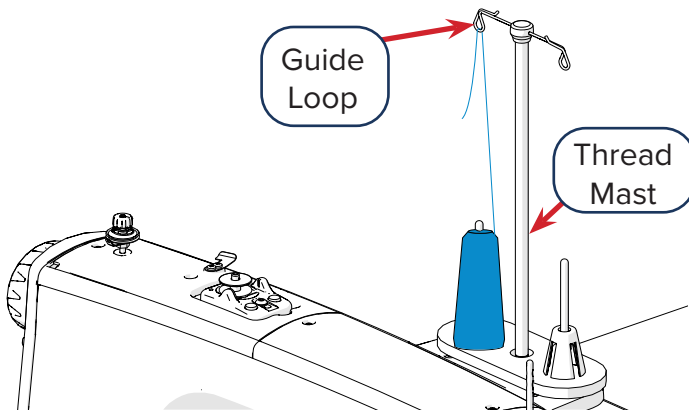
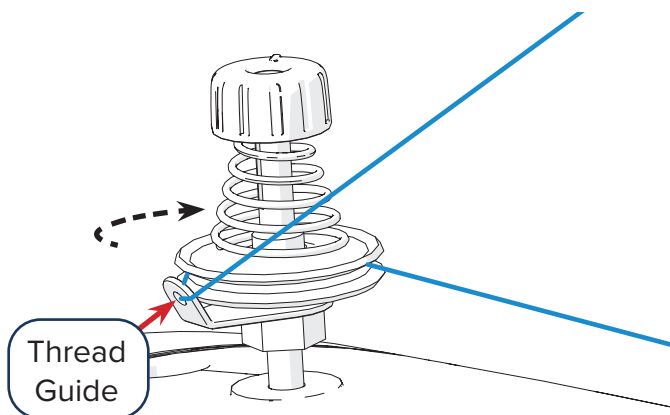


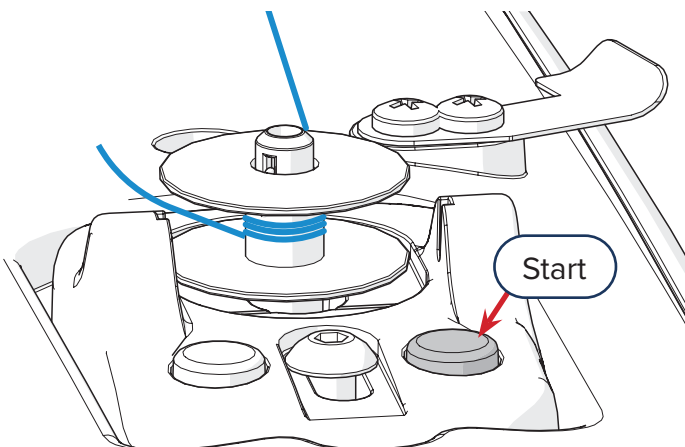
- 1 Place the thread cone on the back thread stand. Run the thread through the **thread mast guide loop** directly above the thread cone.



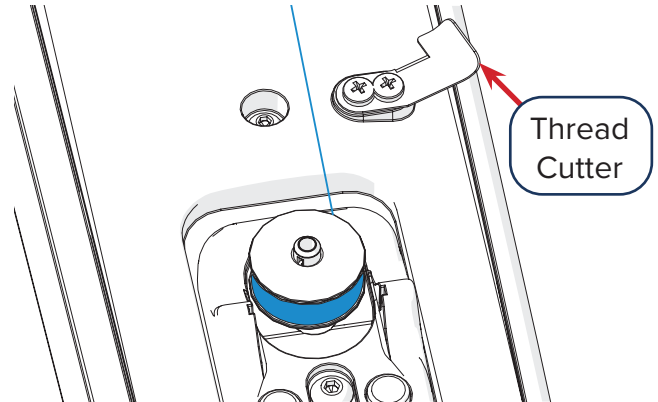
- 2 Feed the thread through the hole in the **thread guide**, then wrap it around the back of the tensioner, between the discs.



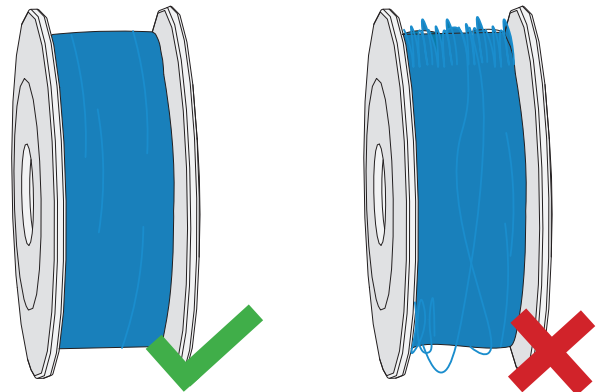
- 3 Wrap the thread clockwise around the empty bobbin. Press **Start** when ready to wind.



- 4 Winding stops automatically when the bobbin is full. Cut the bobbin away from the thread cone using the **thread cutter** near the bobbin winder.

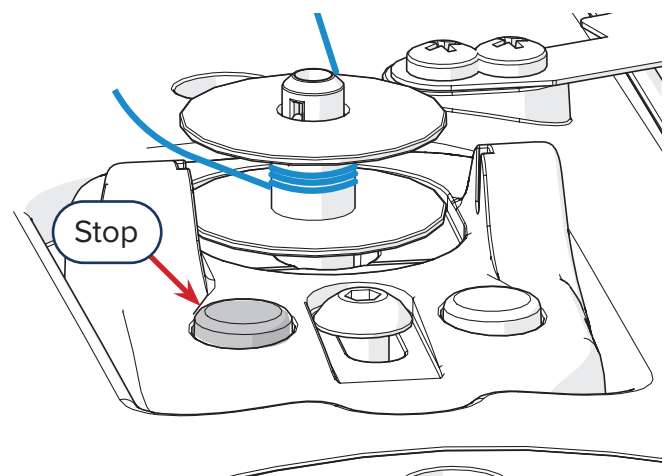


- 5 The bobbin thread should be neat and smooth, and not mounded to one side.



To troubleshoot bobbin winding issues, see page 88.

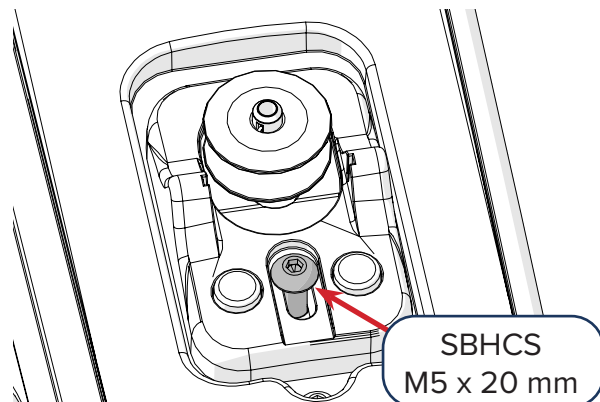
Note: To stop winding early, press **Stop**.



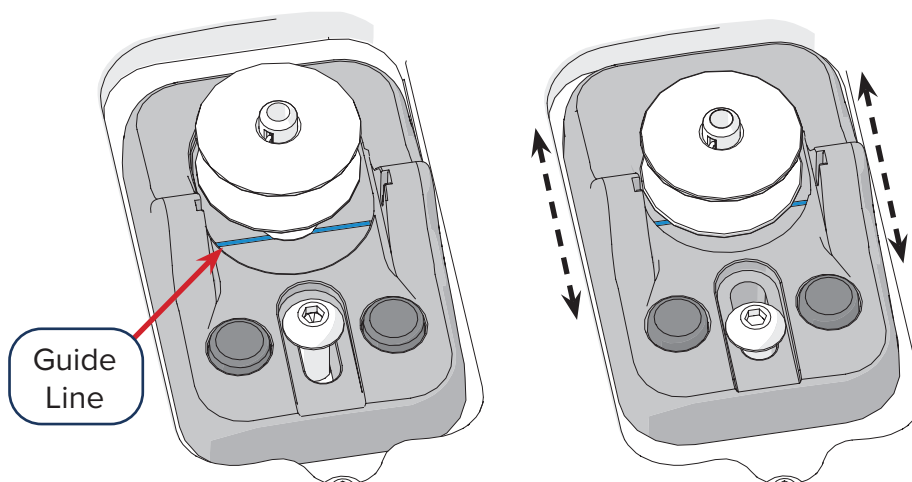
Adjust Fill Level Instructions

The bobbin winder can be adjusted to fill a bobbin to different levels if desired:

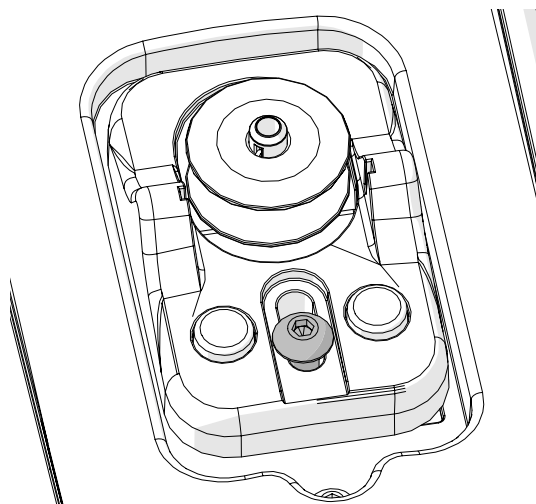
- 1 To adjust the bobbin winder, loosen the **M5 x 20 mm SBHCS** with the 3 mm Allen wrench.



- 2 Slide the bobbin winder until the **guide line** underneath the bobbin is positioned where you want the bobbin thread to finish filling.



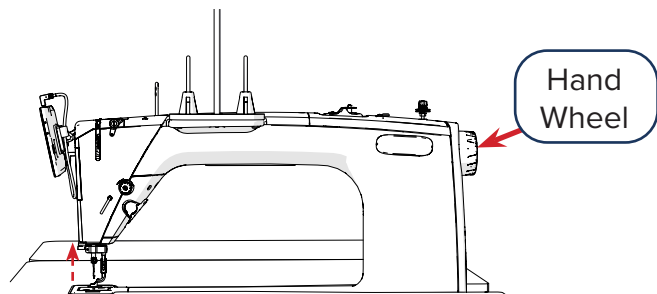
- 3 Tighten the M5 x 20 mm SBHCS to secure the bobbin winder in place.



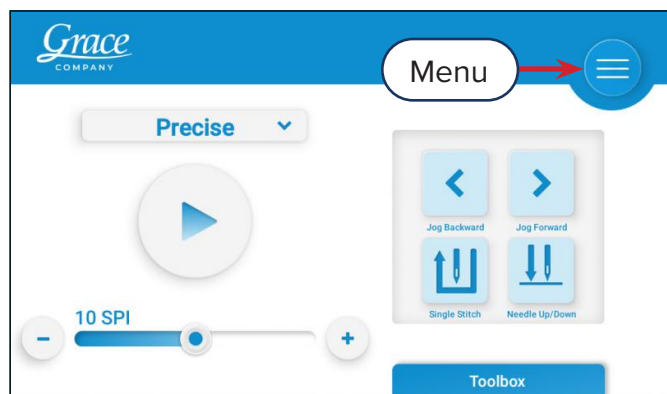
Load the Bobbin Case

Take the following steps to insert the wound bobbin into the bobbin case and place it in the machine:

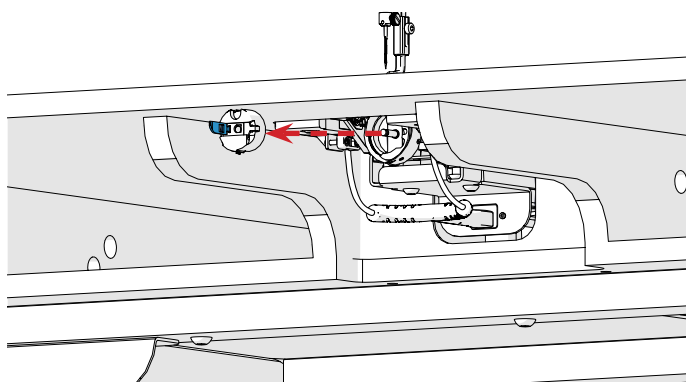
- 1 Check that the needle is up. If needed, rotate the **hand wheel** or press Needle Up/Down on the display to raise the needle.



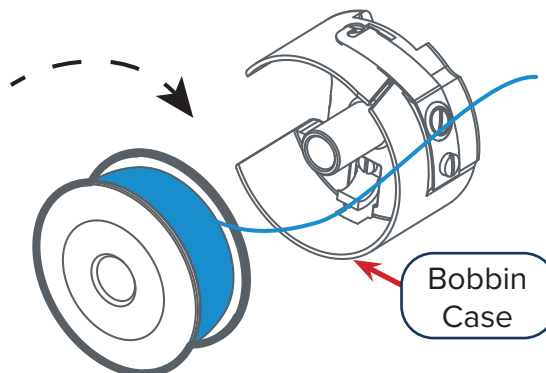
- 2 For your safety, press the **menu** icon on the display to open the Settings menu; this prevents the machine from stitching.



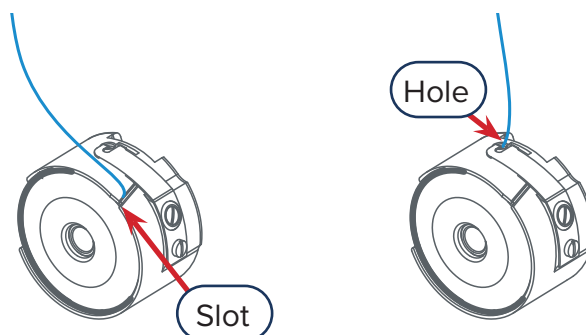
- 3 Pull on the bobbin case **release lever** (shown in blue) to remove the bobbin case from the hook assembly.



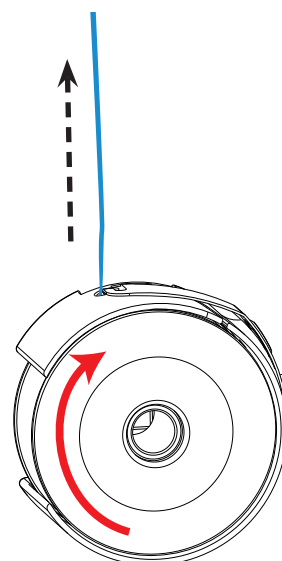
- 4 Place the wound bobbin into the **bobbin case**. Note the direction the thread is coming off the bobbin in relation to the case.



- 5 Slip a few inches of thread through the **slot** and out of the **hole**.



Note: If the bobbin is installed correctly, it turns clockwise when the thread is pulled.

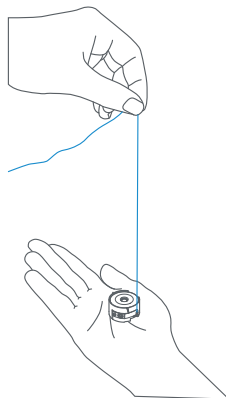


Quilting Preparation

Load the Bobbin Case (continued)

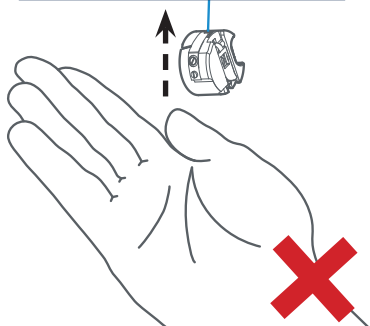
- 6 Test the tension of the bobbin case every time the bobbin thread is changed; bobbin tension is the foundation for correct thread tension.

- a Place the bobbin case on its side, on your palm.

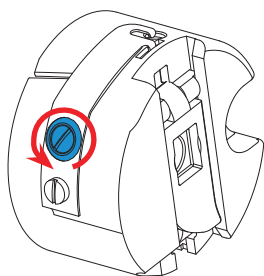


- b Pull up on the thread. The thread should run freely and the bobbin should rise into a vertical position without lifting off your hand.

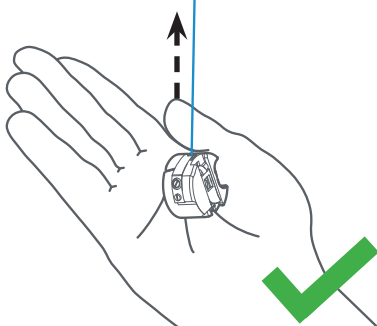
Too Much Tension



Too Much Tension: If the case lifts into the air, there is too much tension. Turn the **large screw** (shown in blue) counter-clockwise.

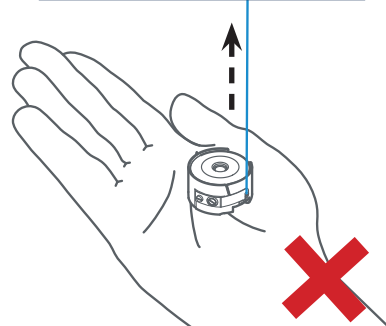


Correct Tension

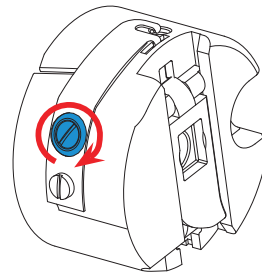


Correct Tension: If the bobbin case lifts into a vertical position but remains on your hand, the tension is correct.

Too Little Tension

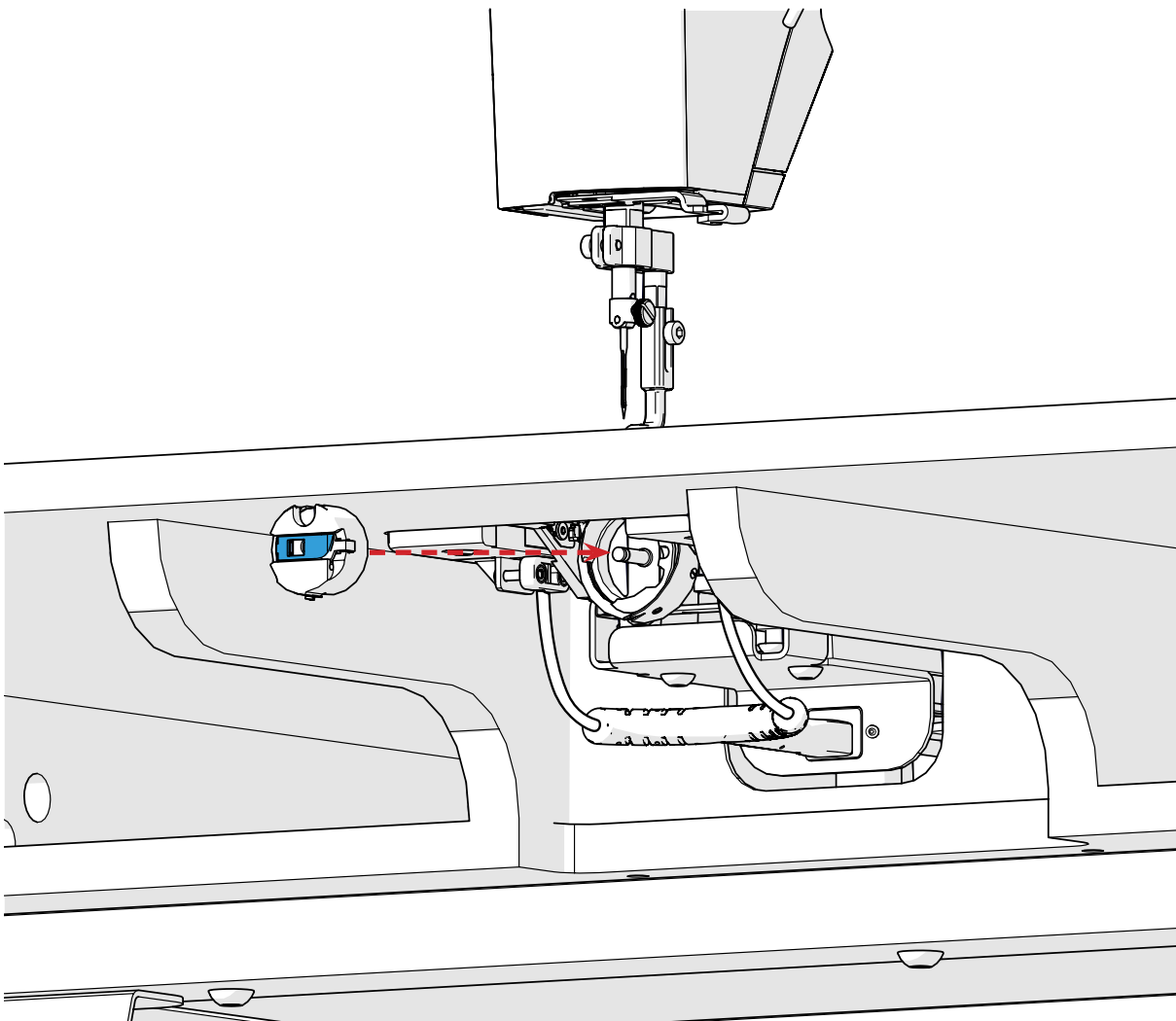


Too Little Tension: If the bobbin case remains on its side, there is too little tension. Turn the **large screw** (shown in blue) clockwise.



Load the Bobbin Case (continued)

- 7 Place the bobbin case inside the quilting machine with the **release lever** (shown in blue) at the 3 o'clock position. It should click into place. Do not pull on the lever while inserting the bobbin case.

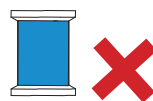
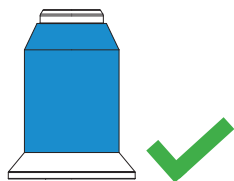


Quilting Preparation

Thread the Machine

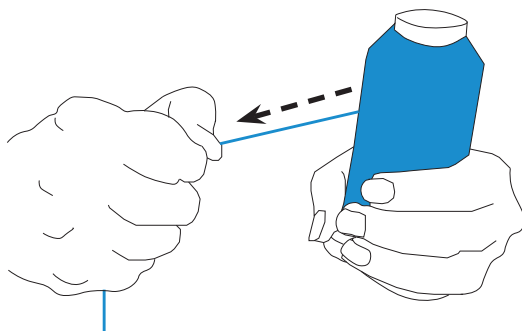
Before threading the machine, make sure you've selected quality thread for your project (see page 96). Choosing the right thread for the machine can prevent the thread from breaking or tangling up under the needle plate. Note the following:

- This machine uses cone-style thread, not thread from a spool. Do not use spool thread unless the Horizontal Spool Holder accessory has been installed.

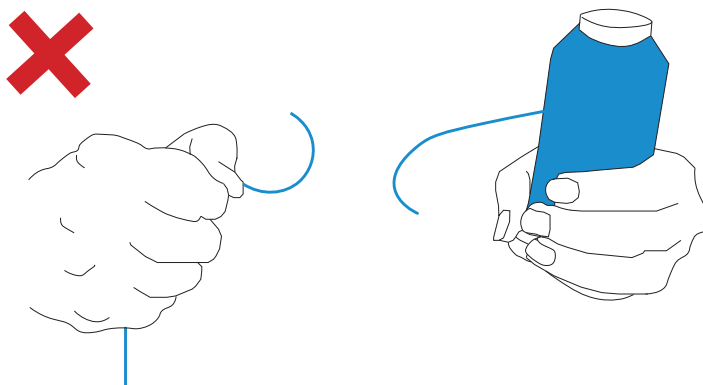


- Choose thread that is strong enough to pass the yank test, demonstrated below. Re-test thread as it ages because thread strength diminishes over time.

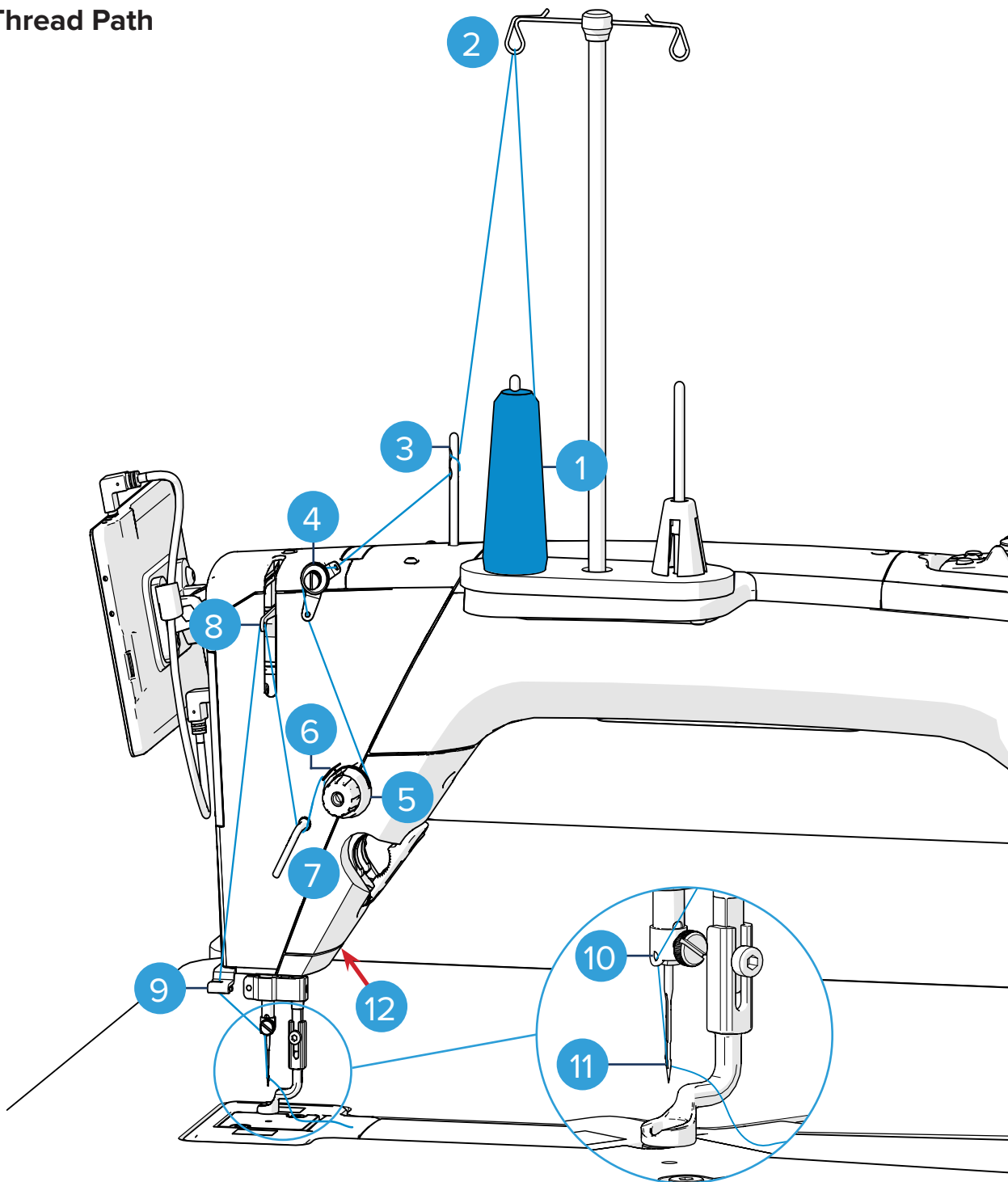
- a** Hold the cone in one hand and the end of the thread in the other.



- b** Tug on the thread. If the thread snaps easily, it might be too brittle to use for quilting.



Thread Path

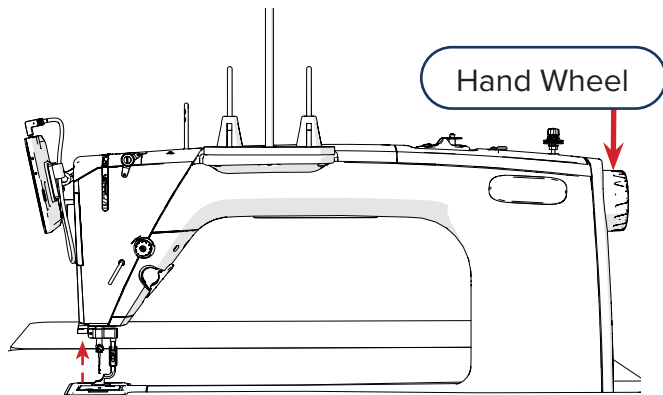


- | | | |
|---|--------------------------------|-----------------------------|
| 1 Thread cone | 5 Large thread tensioner discs | 9 Bottom thread guide |
| 2 Thread mast guide loop | 6 Check spring | 10 Needle bar eyelet |
| 3 Thread guide rod | 7 Thread guide | 11 Needle eye |
| 4 Small thread tensioner arms and discs | 8 Take-up lever | 12 Thread cutter (optional) |

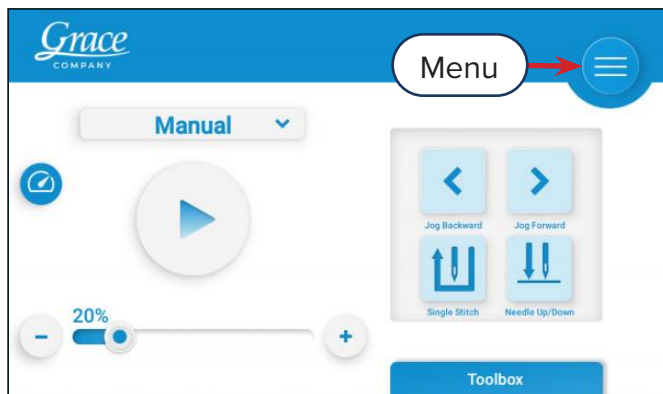
Quilting Preparation

Thread the Machine (continued)

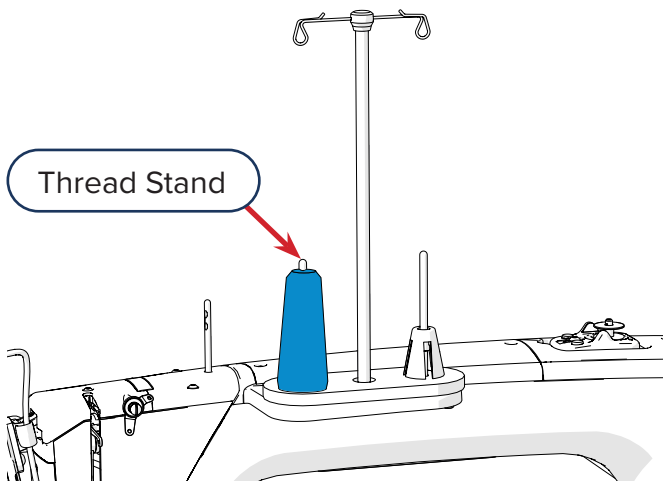
- 1 Rotate the **hand wheel** or press Needle Up/Down on the display to raise the needle to the top position.



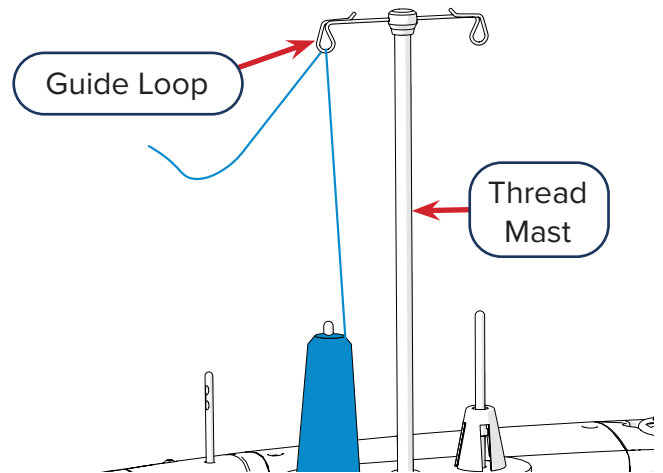
- 2 For your safety, press the **menu** icon on the display to open the Settings menu; this prevents the machine from stitching.



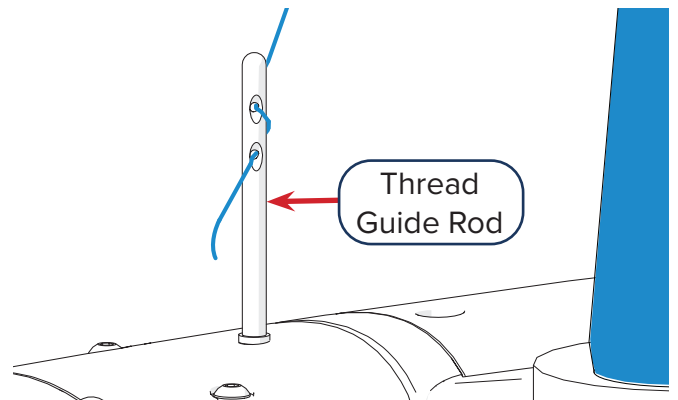
- 3 Slide the thread cone onto the front **thread stand**.



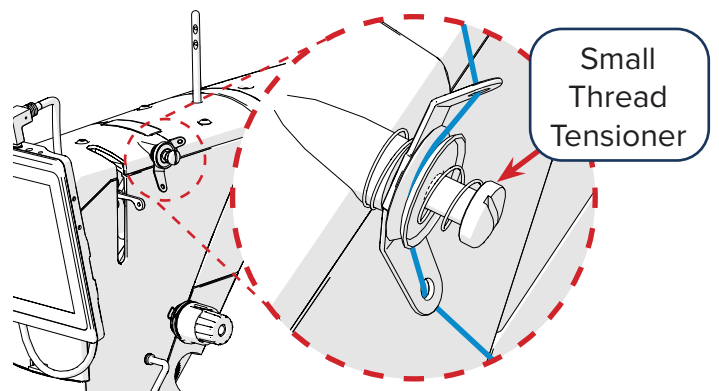
- 4 Pull the thread through the **thread mast guide loop** directly above the thread cone.



- 5 Feed the thread through the top hole of the **thread guide rod**. Wrap the thread around the back of the guide and insert through the bottom hole.

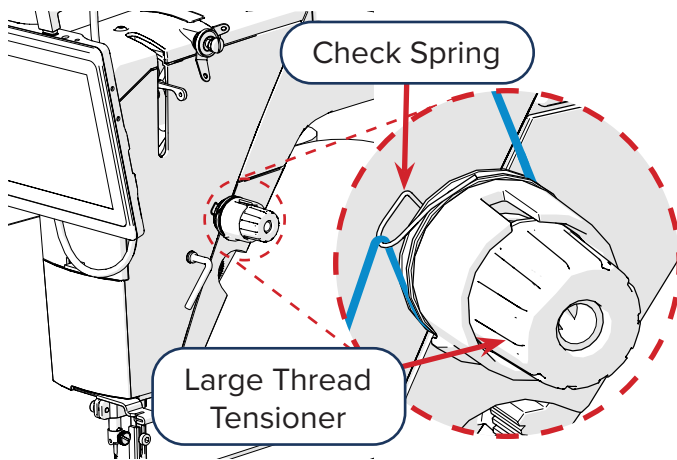


- 6 Run the thread through the top hole on the **small thread tensioner**. Then floss the thread between the two discs, and insert it through the bottom hole.

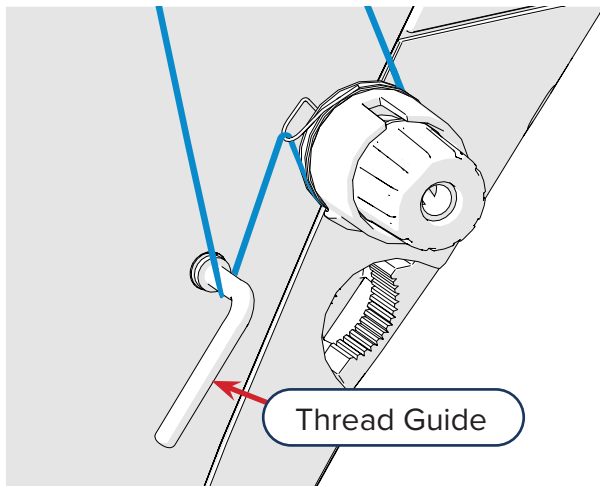


Thread the Machine (continued)

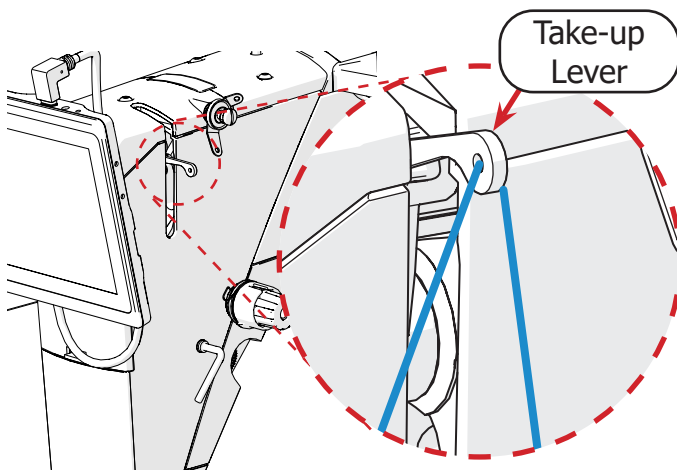
- 7 Floss the thread between the discs on the **large thread tensioner**. Wrap the thread over the **check spring**.



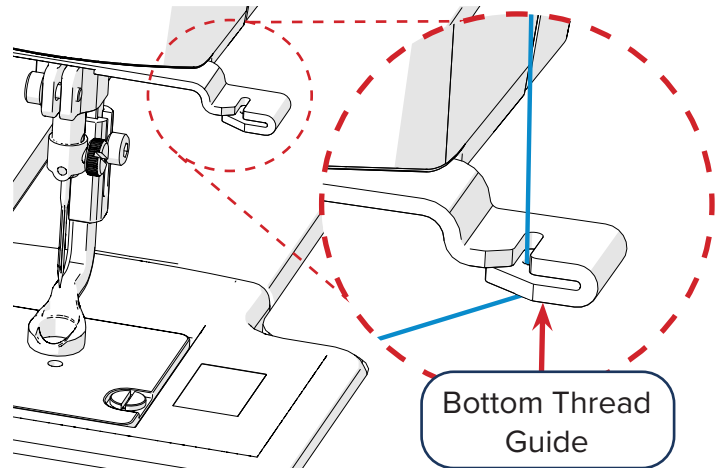
- 8 Next, run the thread under the **thread guide** near the large thread tensioner.



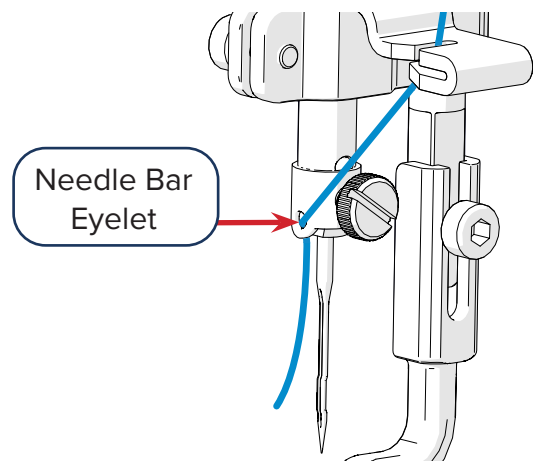
- 9 Pull the thread through the hole in the **take-up lever**.



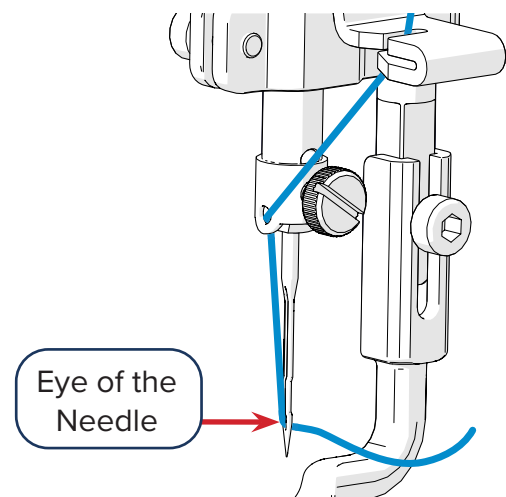
- 10 Slide the thread into the slot in the **bottom thread guide** and wrap it around the guide hook.



- 11 Now pass the thread through the front of the **needle bar eyelet**, located above the needle.



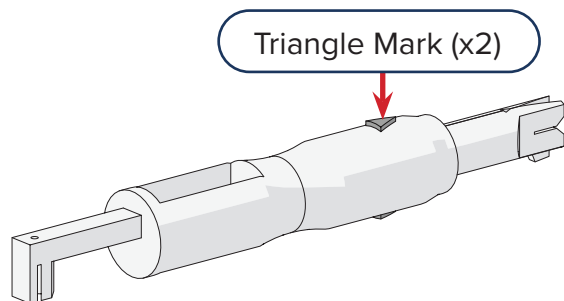
- 12 Thread through the **eye of the needle**.



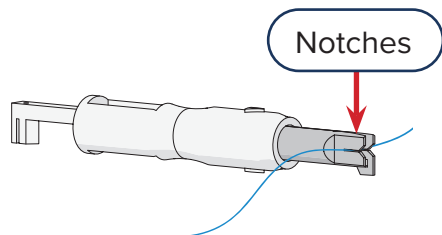
Thread the Machine (continued)

Tip: Use the needle threader (in the Tools box in Box 1) to assist with threading the needle:

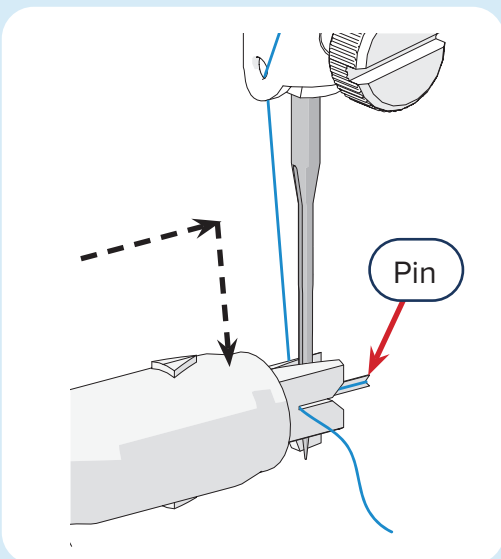
- a** Turn the needle threader so the **triangle marks** are on the top and bottom.



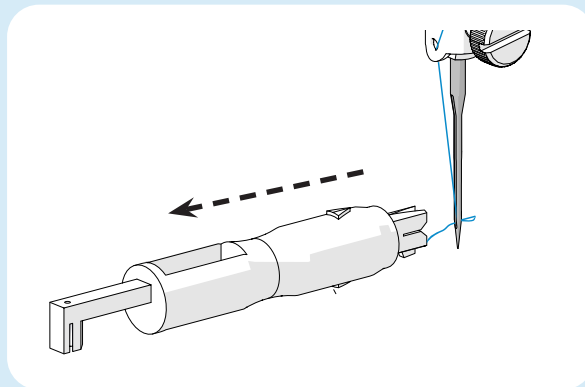
- b** Slot the thread horizontally into the **notches** on the tip of the threader.



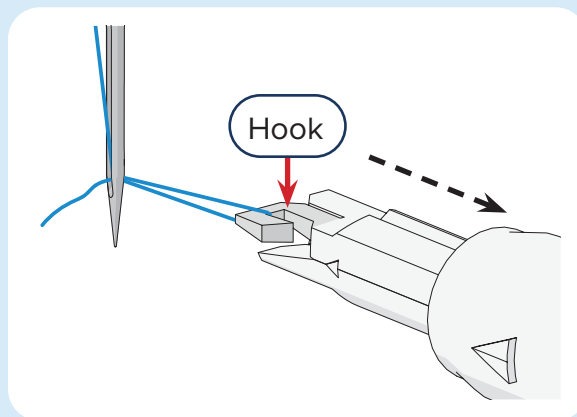
- c** Gently push the threader against the needle. Slowly slide it down until the **pin** emerges, pushing a loop of thread through the needle's eye.



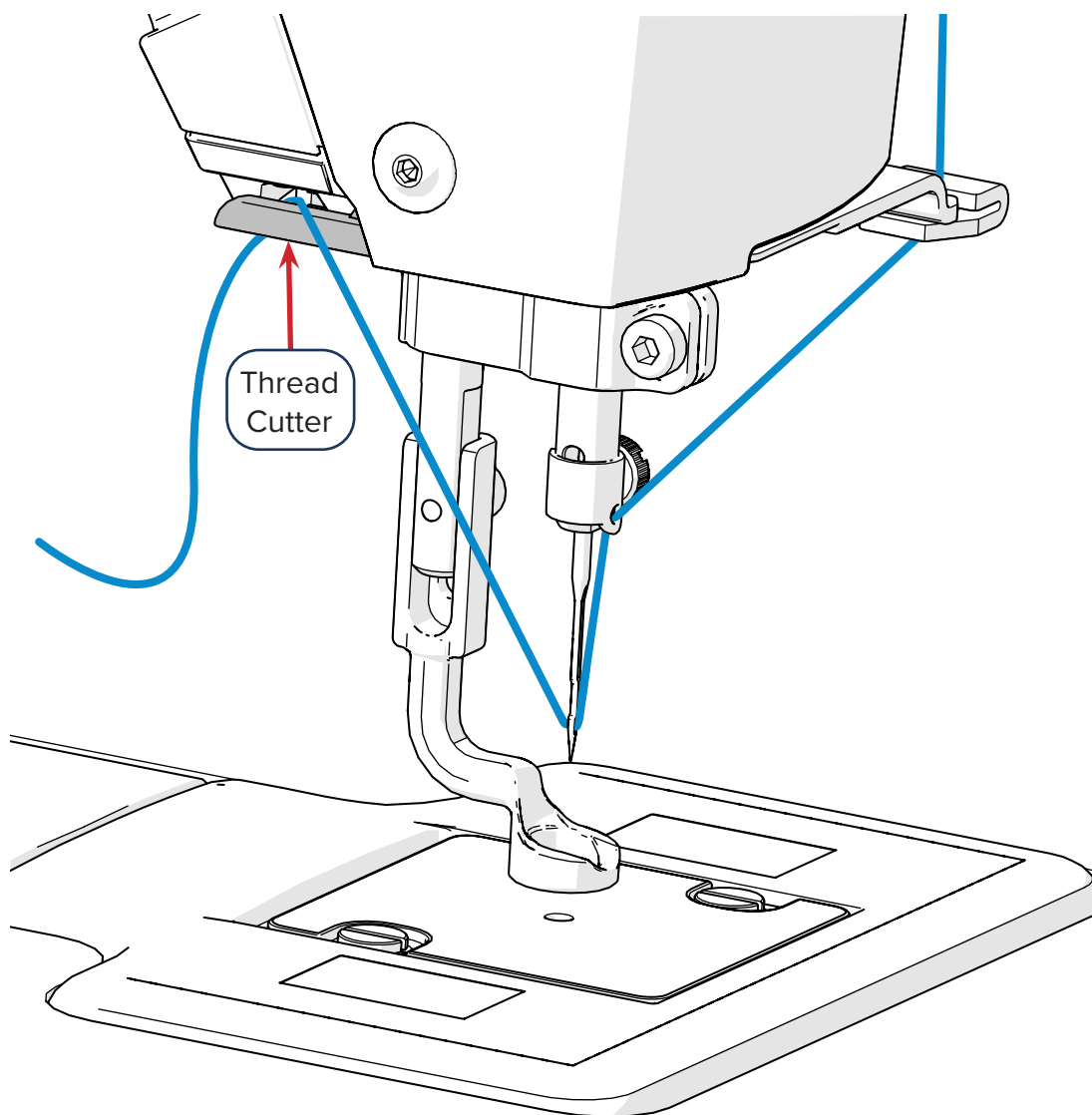
- d** Slowly pull the threader away from the needle. **Note:** If the thread comes back with the threader, try again more slowly.



- e** Use the **hook** to grab the loop and pull the rest of the thread through the eye.



- 13 Loop excess thread over the **thread cutter** on the left of the machine to cut the thread.

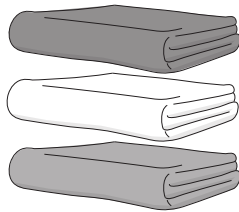


Quilting Preparation

Prepare Your Quilt

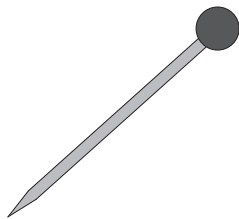
Parts & Tools Needed

Quilt Top, Batting,
& Backing



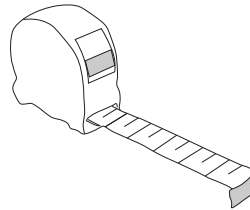
(not included)

Pins



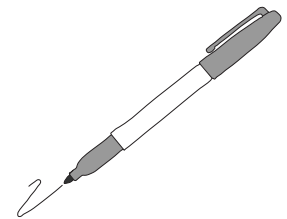
(not included)

Measuring
Tape



(not included)

Fabric Marking
Pencil or Chalk



(not included)

Terminology

The following terms are used in preparing your quilt:

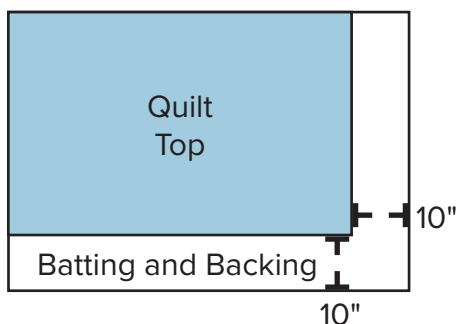
- **Quilt Sandwich:** Quilt top and quilt backing with a layer of quilt batting between them.
- **Right Side/Wrong Side of Fabric:** Some fabrics have a “right side” with prints, textures, or other qualities that the other side (the “wrong side”) does not have. The wrong side might simply look faded or washed out compared to the right side.
- **Scrim Side of Batting:** Some types of batting have a side that feels coarse or pimply compared to the other side, which feels smooth and puffy. The coarse and pimply side is the “scrim side.”

Instructions

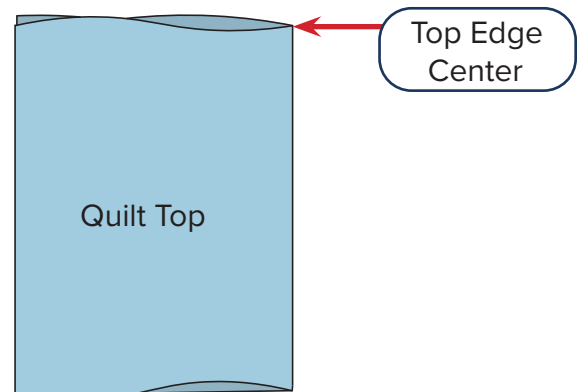
Take the following steps to prepare your quilt sandwich:

Tip: Use spare pieces of fabric so you can safely experiment and make mistakes. Use all three layers (quilt top, backing, and batting) when practicing.

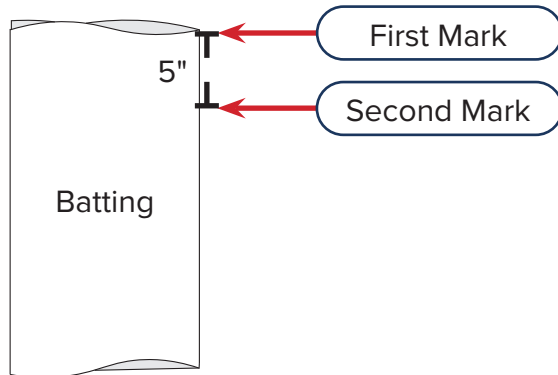
- 1 Cut your **quilt backing** and **quilt batting** at least 10 inches longer than your quilt top.
Note: The extra length gives you something to hold on to while moving your fabric, as well as more range around the fabric sensors, especially around the edges.



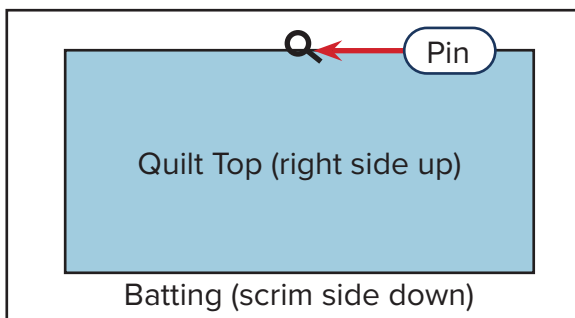
- 2 Fold your quilt top in half with the right side facing outward. **Mark the center of the top edge** with a pin or marker on the right side of the fabric.



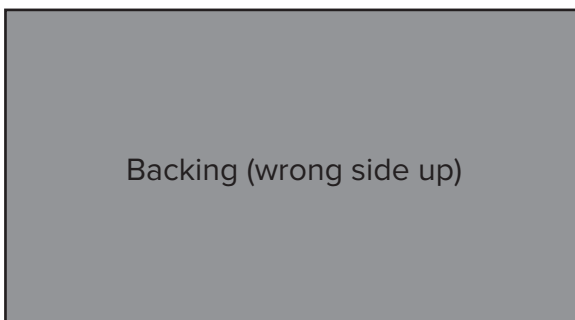
- 3 Fold your batting in half with the scrim side facing inward and **mark the center of the top edge** with a pin or marker. Then use a measuring tape or ruler to make a **second mark** 5 inches below the first.



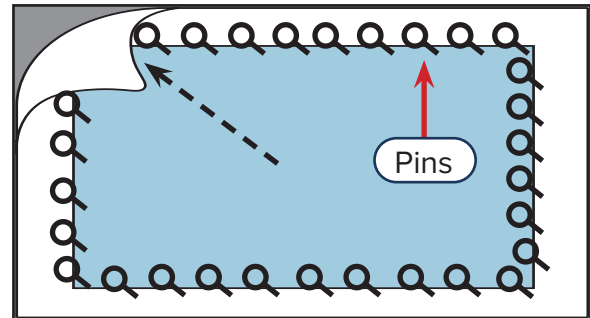
- 4 Align the mark on the quilt top with the second mark on the batting. **Pin** the two layers together with the right side of the quilt top facing up and the scrim side of the batting facing down.



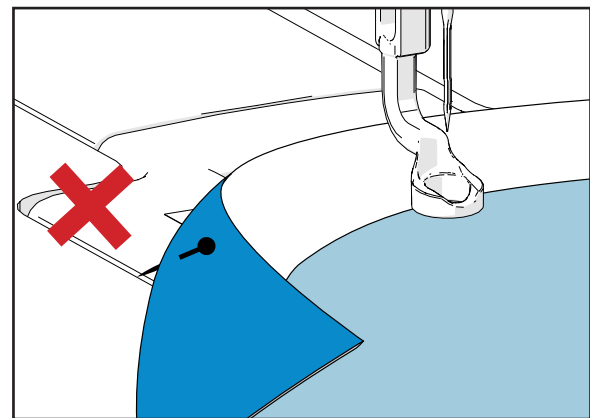
- 5 Lay your quilt backing down with the wrong side facing up.



- 6 Lay the batting and quilt top over the backing and **pin** all of the layers together.

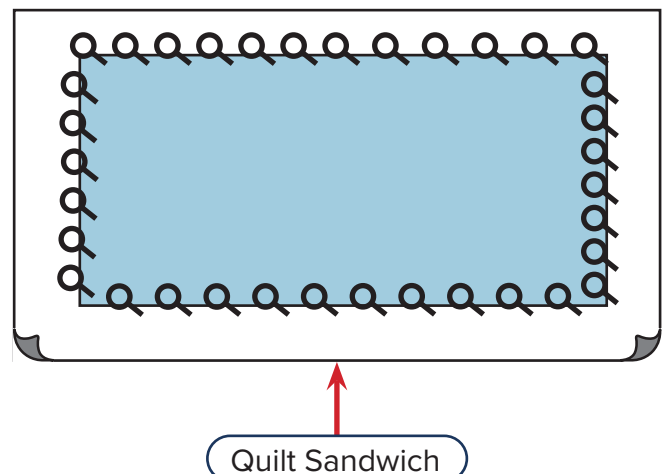


Important: Keep the ends of your pins on the top of the quilt sandwich to prevent catching on the table top around the fabric sensor assembly.



Tip: Some quilters like to use pin caps on the tips of their pins to prevent being poked while quilting.

- 7 Roll up your **quilt sandwich** so you can easily carry it to the machine.

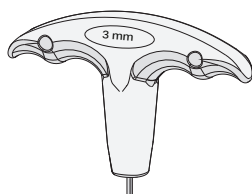


Quilting Preparation

Set the Hopping Foot Height

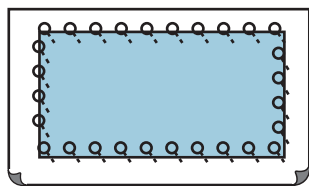
Parts & Tools Needed

T-handle Allen Wrench
3 mm (optional)



Box 1: Tools Box

Quilt
Sandwich



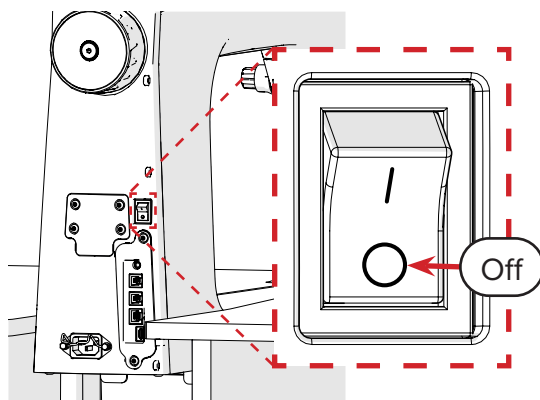
(not included)

Instructions

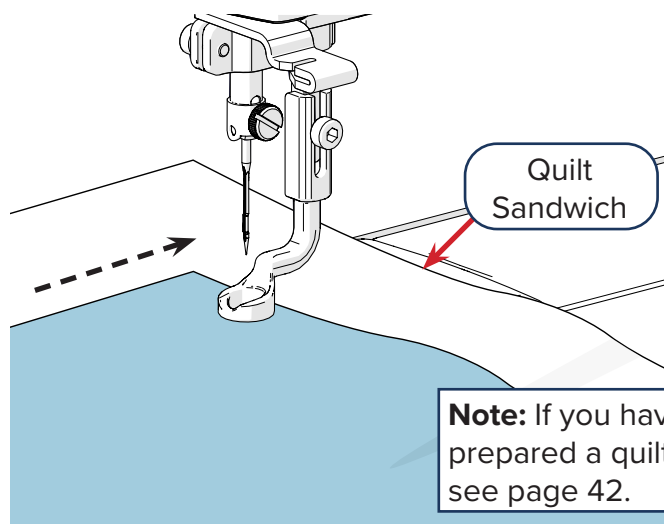
The hopping foot height depends on the thickness of your fabric and batting. Set the height at the start of each project. Incorrect height can lead to skipped stitches and tension problems.

Take the following steps to set the hopping foot height:

- 1 Power **off** the machine.



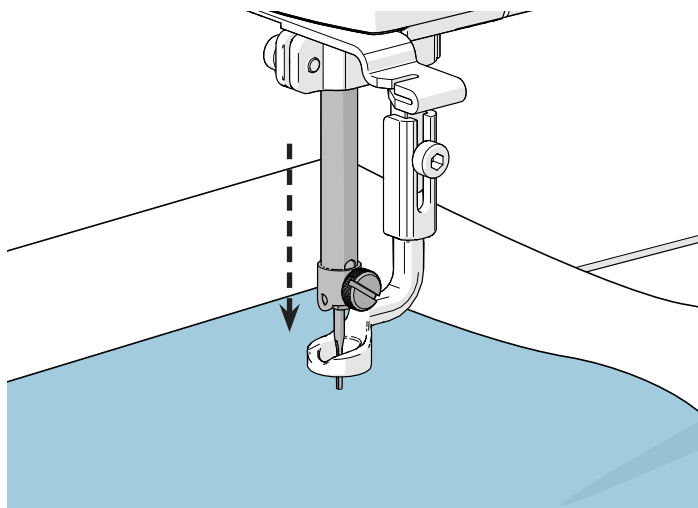
- 2 Slide your **quilt sandwich** underneath the hopping foot.



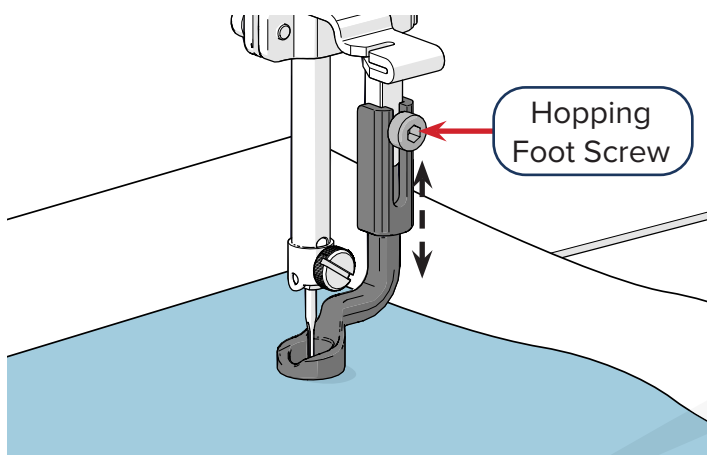
Note: If you haven't prepared a quilt sandwich, see page 42.

Set the Hopping Foot Height (continued)

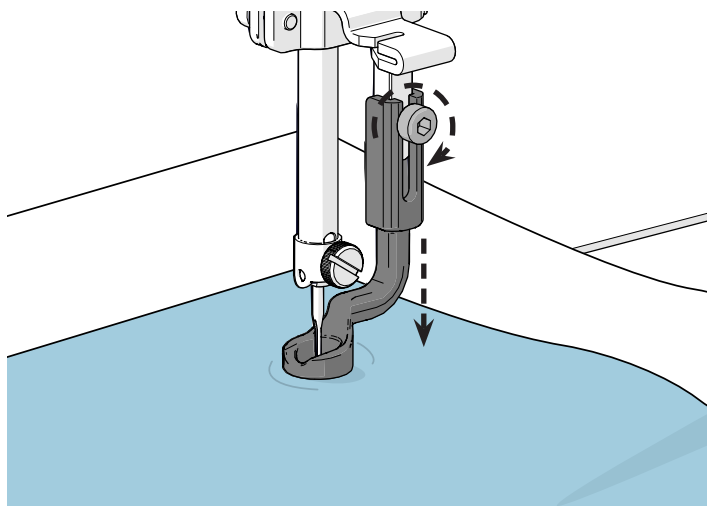
- 3 Use the hand wheel to lower the needle to its lowest position.



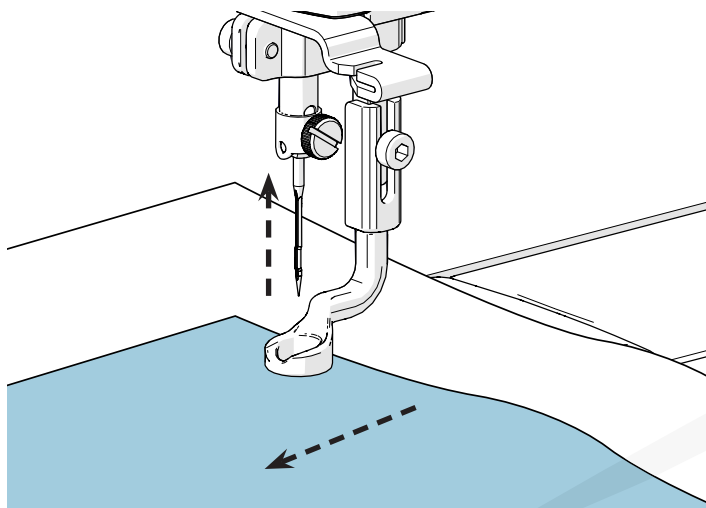
- 4 With the 3 mm Allen wrench, loosen the **hopping foot screw** but do not remove it. The hopping foot should slide freely.



- 5 Press gently on the hopping foot to flatten the fabric around it and tighten the screw.



- 6 Use the hand wheel to raise the needle and remove your quilt sandwich.



Note: If the machine skips stitches, the hopping foot might be too high. If the hopping foot is dragging on the quilt, the hopping foot might be too low.



Settings & Tools

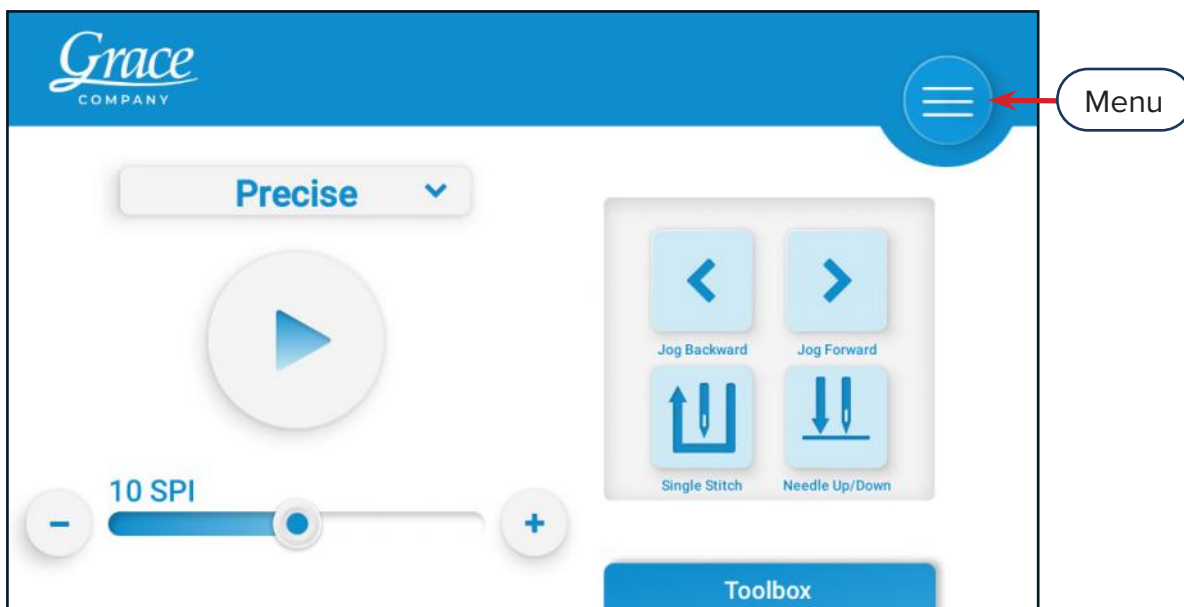
This section of the manual covers how to choose your machine settings and use the tools.

- Choose Machine Settings47
- Use the Calculator 50
- Use the Bobbin Estimator..... 51
- Track Stitch Count & Run Time 53

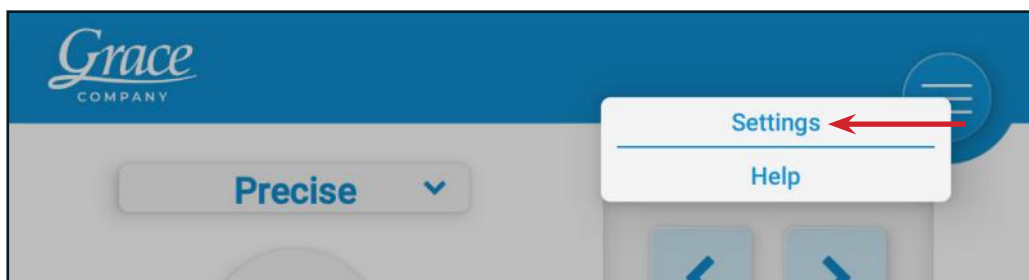
Choose Machine Settings

To customize your settings, take the following steps:

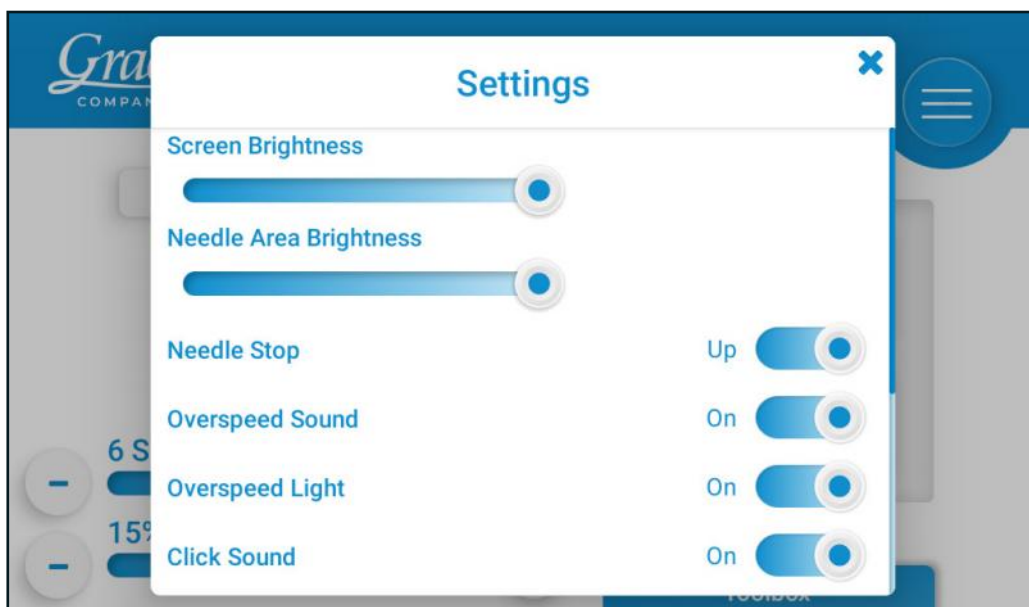
- 1 Press the **menu** icon on the top right corner of the screen.



- 2 Choose **Settings**.

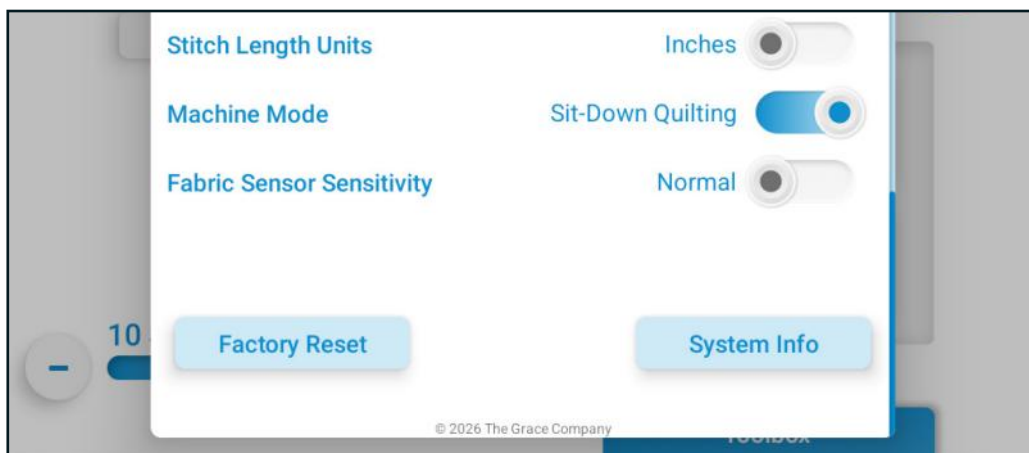


The Settings menu opens.



Choose Machine Settings (continued)

The Settings menu (continued):



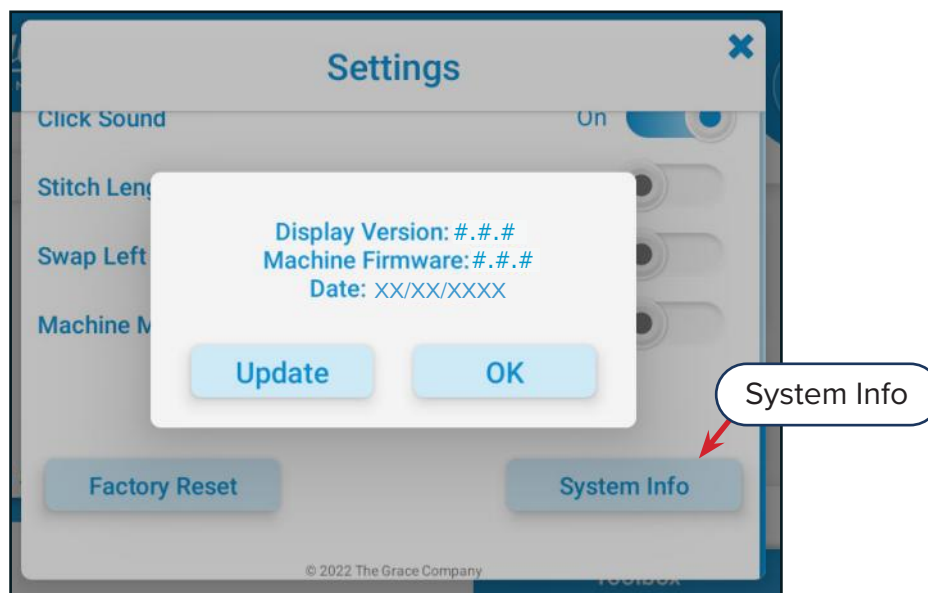
Note: Stitching is disabled while the Settings menu is open.

3 Choose desired settings:

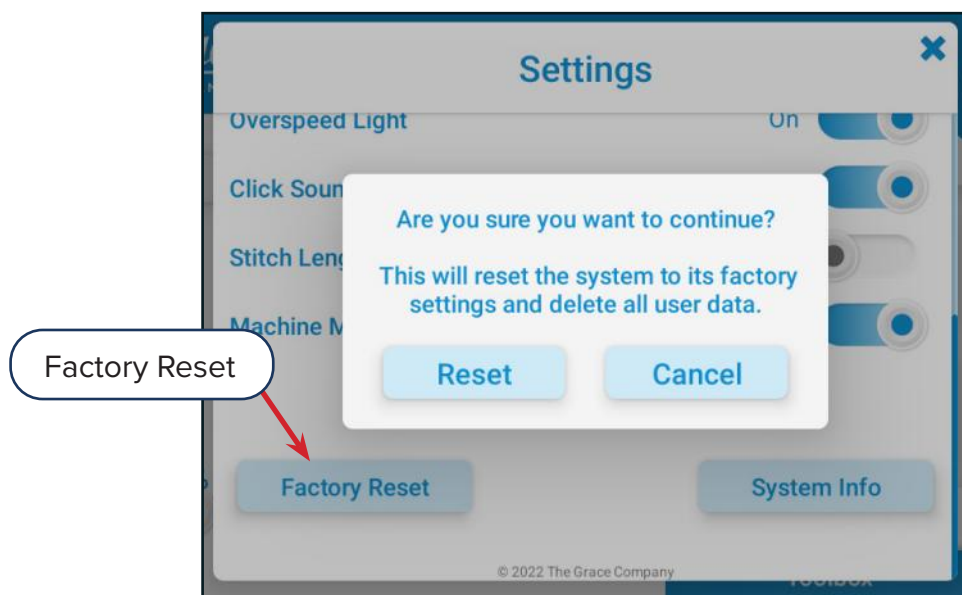
- **Screen Brightness:** Use the sliding button to adjust the brightness of the display.
- **Needle Area Brightness:** Use the sliding button to adjust the brightness of the light over the needle area and those along the machine throat.
- **Needle Stop:** Choose whether the needle will default to the “up” or “down” position when stitching is inactive.
- **Overspeed Sound:** Choose whether to have the overspeed alarm on or off. When on, the overspeed alarm beeps when the fabric is moved more quickly than the regulated stitching can manage.
- **Overspeed Light:** Choose whether to have the overspeed warning light on or off. When on, the overspeed warning light activates when the fabric is moved more quickly than the regulated stitching can manage.
- **Click Sound:** Choose whether pressing on-screen buttons should make a click sound or not.
- **Stitch Length Units:** Choose to display machine stitch length in stitches per centimeter (SPC) or stitches per inch (SPI).
- **Machine Mode:** Choose between Sit-Down Quilting and Frame Quilting. The default is Sit-Down Quilting. Only change to Frame Quilting if you place your machine on a frame.
- **Fabric Sensor Sensitivity:** Choose between Normal and High sensitivity. The default is Normal. Only change to High if you are using a reflective fabric and you are experiencing problems with regulated stitching, such as skipped stitches or sensors failing to notice movement. This might help the sensors perform better for your fabric, though highly reflective fabrics might continue to have issues. Remember to switch back to Normal when you are done.

Choose Machine Settings (continued)

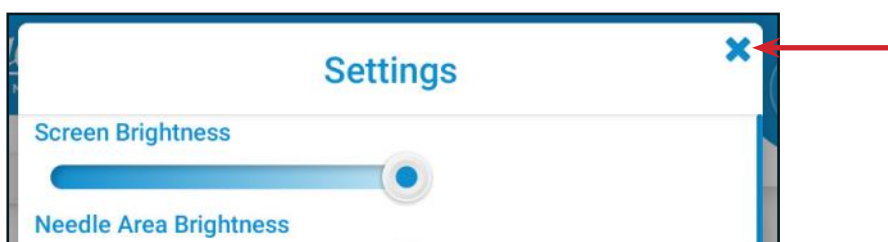
The **System Info** button accesses the System Information screen. This screen shows the display and firmware versions for your machine (see page 86), along with the date of the last firmware update.



The **Factory Reset** button returns all settings to their original default status.



- 4 To return to the main screen, press the **X** in the top-right corner of the Settings menu or anywhere outside of the Settings screen.

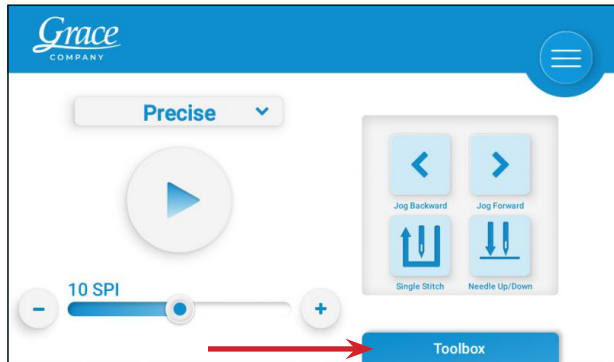


Settings & Tools

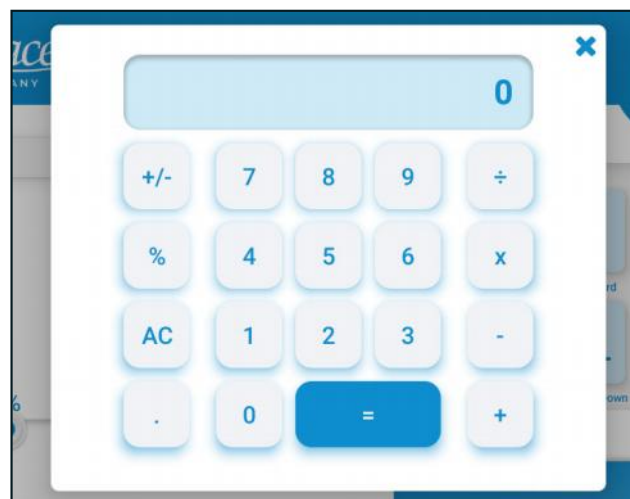
Use the Calculator

Your machine can be used to make quick calculations:

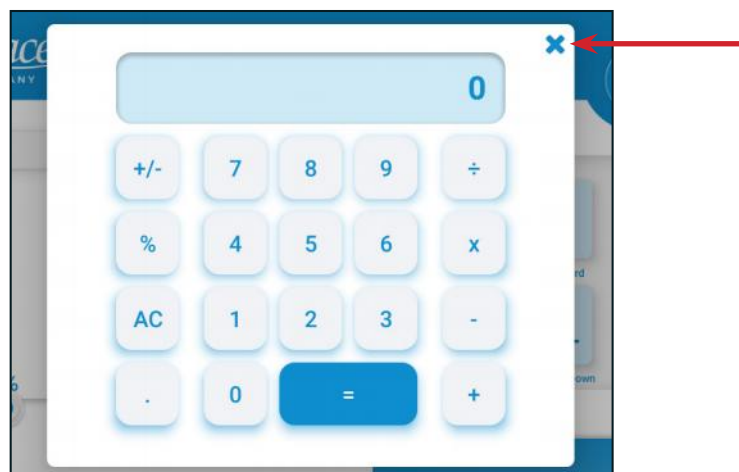
- 1 To access the calculator, tap on the **Toolbox** at the bottom of any quilting screen and select **Calculator**.



- 2 Use the calculator to add, subtract, multiply, divide, and find percentages.



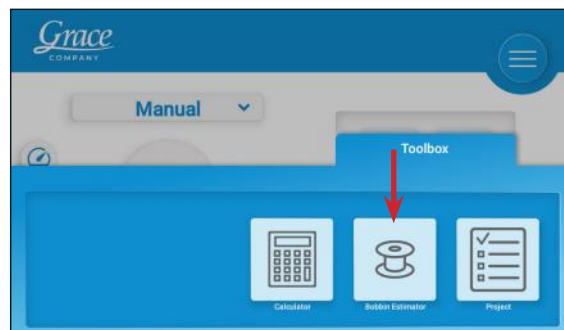
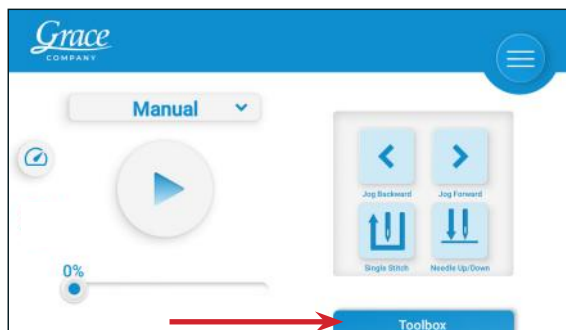
- 3 To return to the main screen, press the **X** in the top-right corner or anywhere outside of the calculator screen.



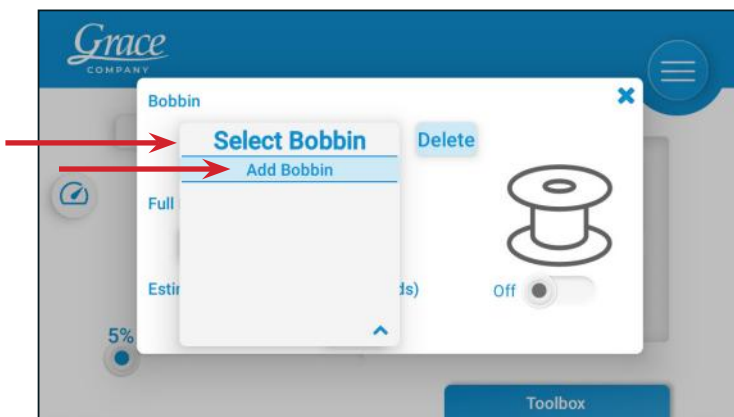
Use the Bobbin Estimator

The bobbin estimator calculates the likely amount of thread remaining on the bobbin. To achieve the closest estimate, information must be accurately entered into the bobbin estimator. Take the following steps to use the bobbin estimator tool:

- 1 To access the bobbin estimator tool, tap on the **Toolbox** at the bottom of any quilting screen and select the **Bobbin Estimator**.



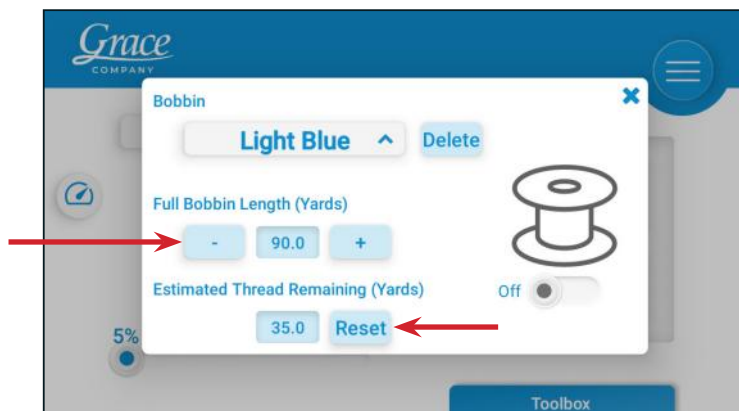
- 2 Press **Select Bobbin**. The drop-down menu will show a list of any bobbins you've added in the past. To add a bobbin, press **Add Bobbin**. An on-screen keyboard will appear so you can name the new bobbin.



Tip: Use a bobbin name you'll remember in case you switch it out before it's empty. If you use it again, you'll be able to select it from the list and continue with the correct estimate of remaining thread.

Name examples: "Ct Light Blue" for light blue cotton, or "Poly Wht 40 Wt" for 40-weight white polyester.

- 3 Enter the estimated **number of yards** on the bobbin. As a starting reference, an M-class bobbin fully wound with 40 wt cotton thread is around 90 yards. Yardage will vary depending on the fiber and weight of the thread. Press **Reset**. The Estimated Thread Remaining changes to match the Full Bobbin Length.



Tip: It may take some practice to estimate the length of a fully wound bobbin. Keep a record of your starting estimate. When you run out of bobbin thread, open the estimator tool and see how close your guess was. Use this information to adjust your starting estimate next time you use the same type of thread.

Settings & Tools

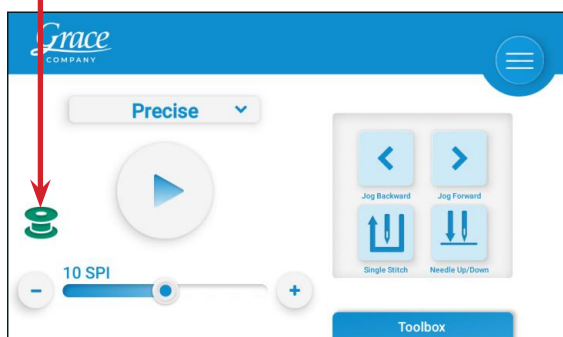
Use the Bobbin Estimator (continued)

- 4 Turn on the bobbin estimator. When on, any stitches the machine makes will subtract from the Estimated Thread Remaining.



The **bobbin estimator symbol** will show on the left side of the quilting screen when the estimator is on. Color changes notify when the bobbin is estimated to be nearing the end of the thread.

Bobbin Estimator Symbol



21% - 100% remaining



11% - 20% remaining



0% - 10% remaining

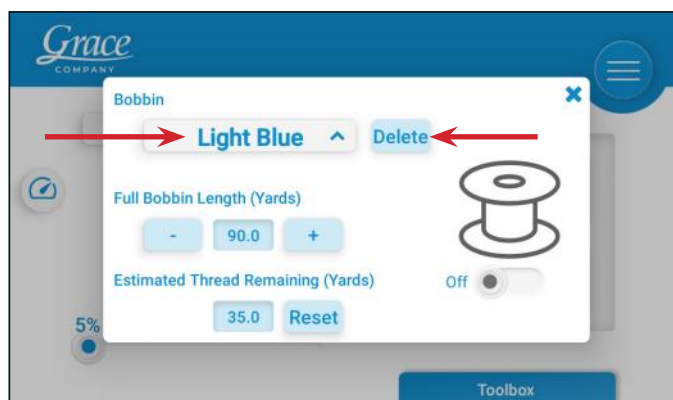
Note: Pressing the bobbin symbol on a quilting screen opens the bobbin estimator tool.

- 5 When the bobbin thread is empty, you can either delete the record of the bobbin or reset it to be used again. **Reset** is recommended if you're planning on winding the bobbin back up with the same thread.

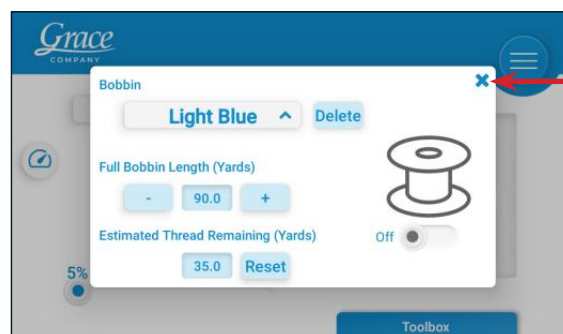
Press **Reset** to restore the Estimated Thread Remaining to the full estimate.



To delete a bobbin, select it from the drop-down and press **Delete**.



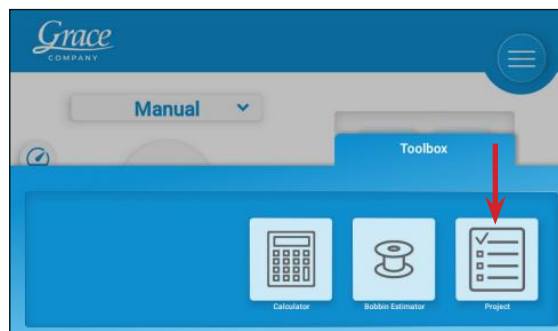
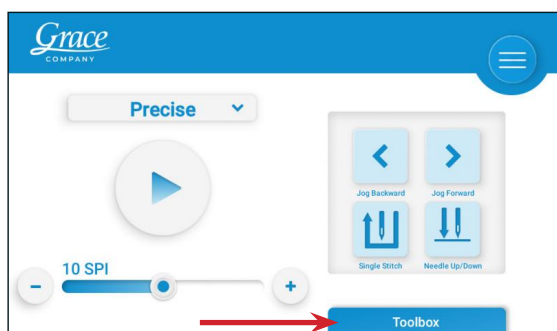
- 6 To return to the main quilting screen, press the **X** in the top-right corner or press anywhere outside of the Bobbin Estimator screen.



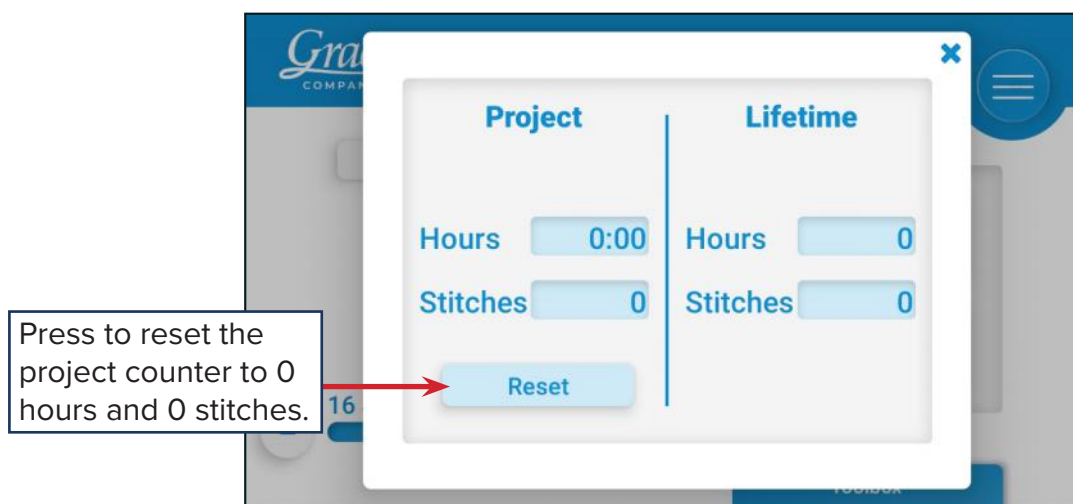
Track Stitch Count & Run Time

Use the Project tool to track the stitch count and run time for individual projects and for the lifetime of your machine.

- 1 To access the Project tool, tap on the **Toolbox** at the bottom of any quilting screen and select **Project**.



- 2 Project shows the hours and minutes run and number of stitches created since the counter was last reset. Lifetime shows the hours the machine has spent running and the number of stitches it has made since it was manufactured.



Tip: It's recommended to oil your machine after 20 hours of use. The Hours counter can help keep track of when your machine is due to be oiled. After cleaning and oiling your machine, press **Reset** to start the counters over at zero.

The counters under Lifetime cannot be reset.

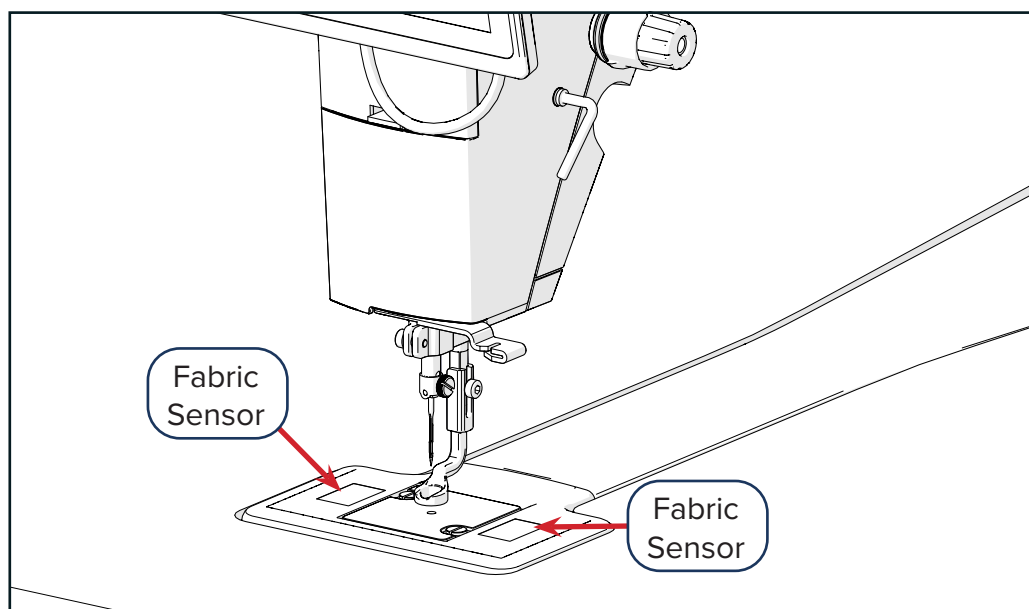
Quilting

This section of the manual covers how to use the quilting modes on your machine, test thread tension, and get started quilting.

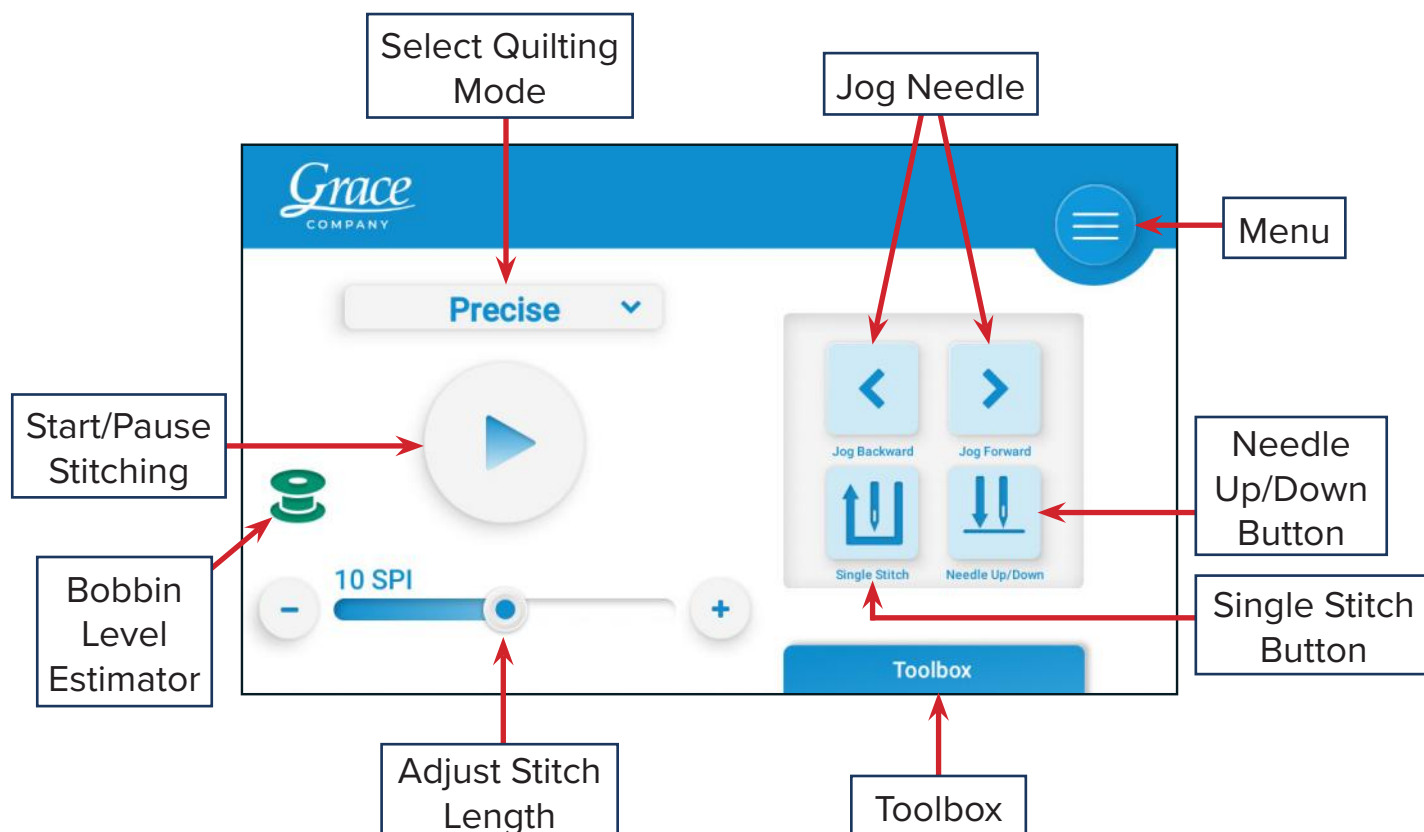
Use Precise Quilting Mode	55
Use Cruise Quilting Mode	57
Use Manual Quilting Mode	59
Adjust the Thread Tension	61
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Use Precise Quilting Mode

Precise mode is a regulated stitching mode, which means the machine assists you in making consistent stitches. You select the stitch length you want, and the machine adjusts to achieve that stitch length. In precise mode, the machine stitches when you move your fabric over the **fabric sensors**. Precise mode automatically stops stitching after five seconds of no movement over the sensors. The machine defaults to precise mode when turned on.



CAUTION: The fabric sensors cannot distinguish between your hand versus your quilt. Always be careful when putting your hands near the needle area when precise mode is turned on, in case you accidentally trigger stitching.



Use Precise Quilting Mode (continued)

To quilt in precise mode, take the following steps:

- 1 Tap the **select quilting mode** dropdown and choose **Precise**.
- 2 Choose your desired stitch length, measured in stitches per inch (SPI). Adjust the SPI with the [+] and [-] symbols or the sliding bar. Higher SPI means more stitches per inch, thus making a shorter stitch length.

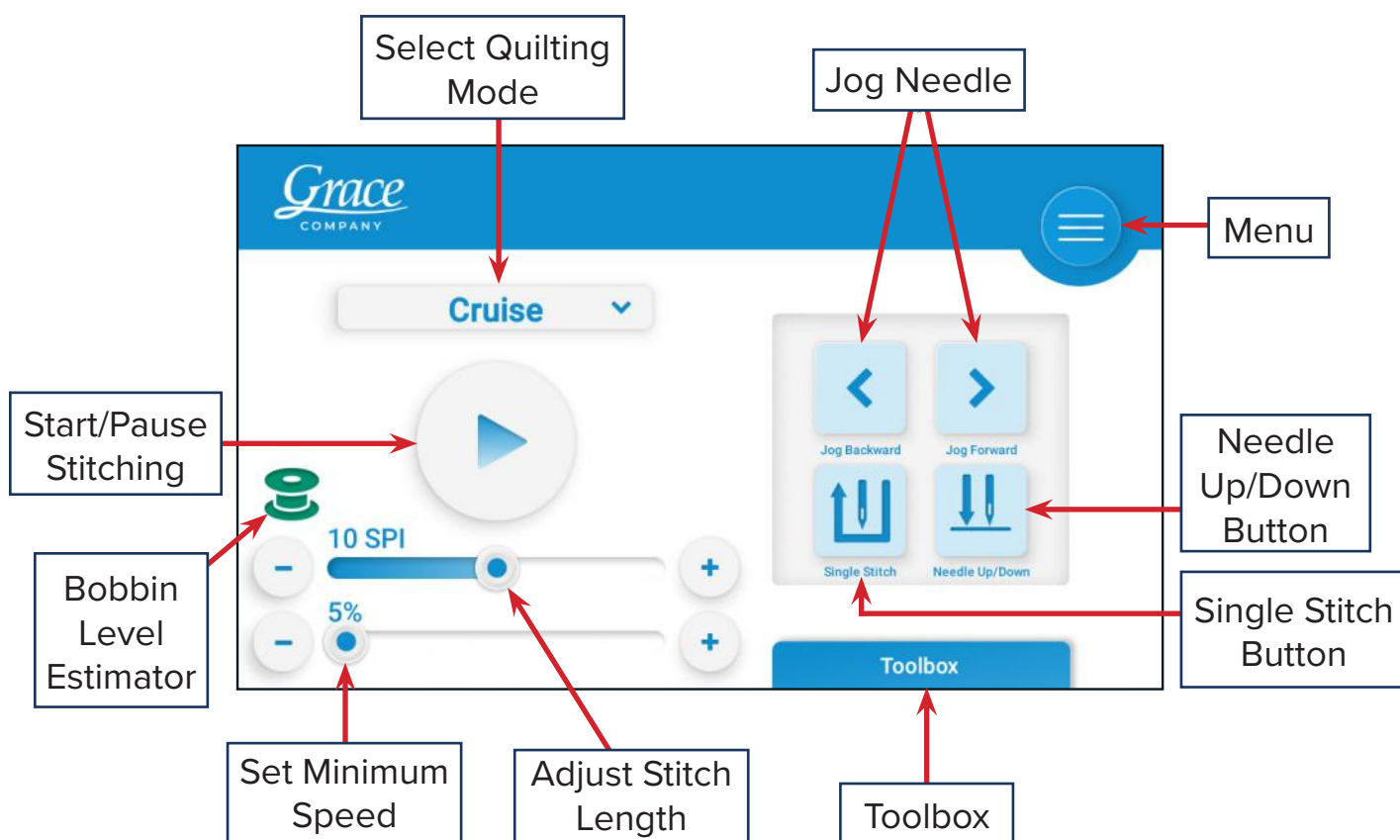
Note: If desired, you may use centimeters instead of inches to measure stitch length. To change units, go to the Settings menu (see page 47).
- 3 Position your fabric under the needle at your desired start position. You can use the jog needle buttons (Jog Backward or Jog Forward) to move the needle closer or farther from the fabric in small increments to help place your stitch.
- 4 Make a single stitch by pressing the Single Stitch button once or Needle Up/Down button twice.

Note: While stitching is active, the Single Stitch and Needle Up/Down buttons are disabled.
- 5 Stitching is activated in two ways:
 - **Start/Pause button activation:** Press the Start/Pause button on the display and begin moving your fabric (stitching does not activate until you move your fabric over the sensors). If you pause for more than five seconds, precise mode automatically stops stitching. Press Start/Pause to begin again.
 - **Foot pedal activation:** Press the foot pedal down fully and begin moving your fabric (stitching does not activate until you move your fabric over the sensors). You must keep the foot pedal pressed to keep stitching activated. If you pause for more than five seconds, precise mode stops stitching even with the foot pedal pressed. Release the foot pedal and press it again to start once more.
- 6 Moving your fabric too quickly while quilting can reduce the quality of the stitch regulation. If this happens, the overspeed alarm will sound, a red LED light will shine on the needle area, and the Start/Pause stitching button will turn red. Slow your movement to stop the alarm, light, and display alert. Both the alarm and the light can be deactivated in the Settings menu (see page 47).
- 7 When activated, the bobbin level estimator shows on the left side of the display. For instructions on how to use the bobbin level estimator, see page 51.
 - When the icon is green, the bobbin is estimated to be between 21% and 100% full.
 - When the icon is yellow, the bobbin is estimated to be between 11% and 20% full.
 - When the icon is red, the bobbin is estimated to be under 10% full.
- 8 To deactivate stitching, press the Start/Pause button on the display or release the foot pedal, whichever is in use. You can also pause for five seconds, and precise mode will stop stitching. The needle will move into the needle stop position, either up or down, as indicated in the Settings menu (see page 47).

Use Cruise Quilting Mode

Cruise mode is another regulated mode. You choose the stitch length and a minimum speed. When cruise mode is on, the machine stitches continuously at the minimum speed. When you move your fabric, the machine adjusts to help make stitches at your chosen stitch length. This mode is helpful for continuous, smooth, or curvy designs.

IMPORTANT: Cruise mode continues to stitch in place (at the minimum speed) even when you stop moving your fabric. You must deactivate stitching when you are done, or you might damage your quilt and machine by continuously stitching in the same place.



To quilt in regulated cruise mode, take the following steps:

- 1 Tap the **select quilting mode** dropdown and choose **Cruise**.
 - 2 Choose your desired stitch length, measured in stitches per inch (SPI). Adjust the SPI with the [+] and [-] symbols or the sliding bar. Higher SPI means shorter stitch length.
- Note:** If desired, you may use centimeters instead of inches to measure stitch length. To change units, go to the Settings menu (see page 47).
- 3 Choose the minimum speed you want the machine to stitch. This can be set from 5% to 25% of the machine's top speed of 2600 stitches per minute. Use the [+] and [-] symbols or the sliding bar to adjust the minimum speed.
 - 4 Position your fabric under the needle at your desired start position. You can use the needle jog buttons (Jog Backward or Jog Forward) to move the needle closer or farther from the fabric in small increments to help place your stitch.

Use Cruise Quilting Mode (continued)

- 5 Make a single stitch by pressing the Single Stitch button once or Needle Up/Down button twice.

Note: While stitching is active, the Single Stitch and Needle Up/Down buttons are disabled.

- 6 Stitching is activated in two ways:

- **Start/Pause button activation:** Press the Start/Pause button on the display. Cruise mode stitches continuously. You must press the Start/Pause button again to stop.
- **Foot pedal activation:** Press the foot pedal down fully. You must keep the foot pedal pressed to keep stitching activated. To stop stitching, release the foot pedal.

- 7 Moving your fabric too quickly while quilting can reduce the quality of the stitch regulation. If this happens, the overspeed alarm will sound, a red LED light will shine on the needle area, and the Start/Pause stitching button will turn red. Slow your movement to stop the alarm, light, and display alert. Both the alarm and the light can be deactivated in the Settings menu (see page 47).

- 8 When activated, the bobbin level estimator will show on the left side of the display. For instructions on how to use the bobbin level estimator, see page 51.

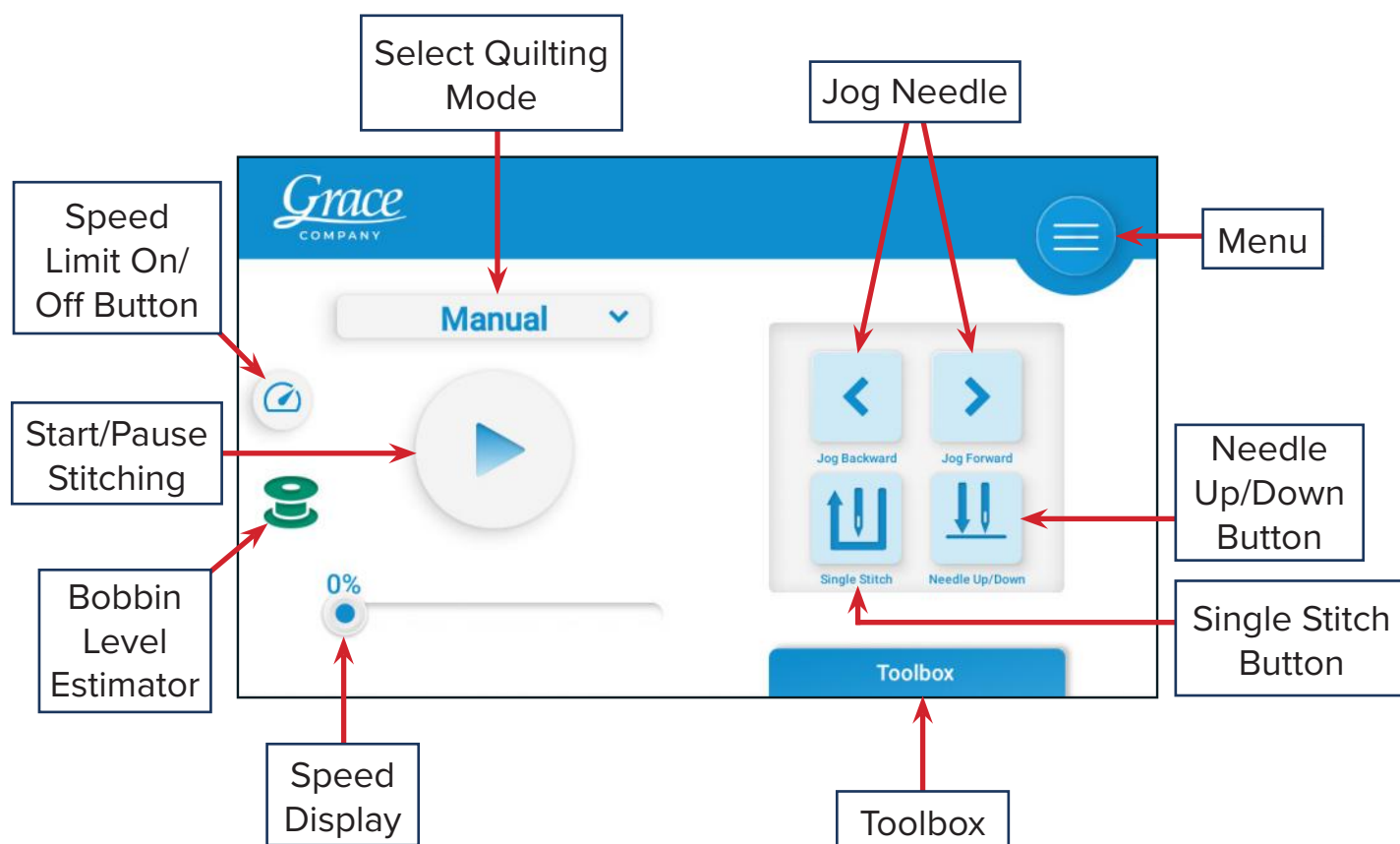
- When the icon is green, the bobbin is estimated to be between 21% and 100% full.
- When the icon is yellow, the bobbin is estimated to be between 11% and 20% full.
- When the icon is red, the bobbin is estimated to be under 10% full.

- 9 To deactivate stitching, press the Start/Pause stitching button on the display or release the foot pedal, whichever is in use. The needle will move into the needle stop position indicated in the Settings menu (see page 47).

CAUTION: When cruise mode is on, the machine will stitch continuously, whether or not you are moving your fabric. Be sure to pause stitching if you stop moving your fabric or your machine will continue to stitch in the same place. This could damage your quilt and machine.

Use Manual Quilting Mode

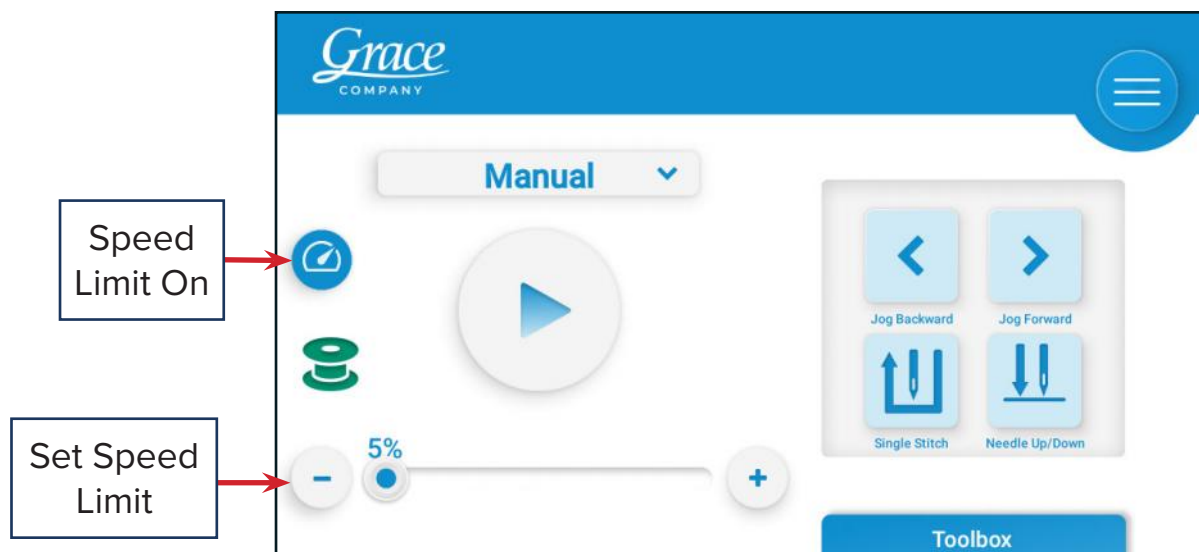
In manual mode, there is no stitch regulation. You control the stitch length by moving the fabric at a stable speed. This mode is useful for small, continuous patterns or for times when you want direct control over your stitch length.



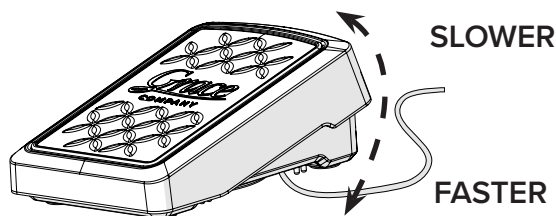
To quilt in manual mode, take the following steps:

- 1 Tap the **select quilting mode** dropdown and choose **Manual**.
- 2 Choose whether or not to set a speed limit:
 - **No Speed Limit:** Without a speed limit, you use the foot pedal to control the stitch speed, which can reach 2600 stitches per minute when the pedal is fully pressed. As you quilt, your speed is displayed on the screen as a percentage of the total possible speed.
Note: You cannot use the Start/Pause button on the display without setting a speed limit. If you attempt to do so, you will be prompted with this warning: “Enable Speed Limit to use start button.”
 - **Speed Limit:** Tap the Speed Limit button to set a speed limit. Choose a maximum speed for the machine by tapping the [+] and [-] symbols or by dragging the sliding bar. If you use the foot pedal to activate stitching, you can go slower than the speed limit by pressing lightly. If you press the foot pedal fully, the machine will stitch at the speed limit but not exceed it. With the Start/Pause button, the machine will continuously stitch at the speed limit. To remove the speed limit, tap the Speed Limit button to toggle it off.

Use Manual Quilting Mode (continued)



- 3 Position your fabric under the needle at your desired start position. You can use the jog needle buttons (Jog Backward or Jog Forward) to move the needle closer or farther from the fabric in small increments to help place your stitch.
- 4 Make a single stitch by pressing the Single Stitch button once or Needle Up/Down button twice.
Note: While stitching is active, the Single Stitch and Needle Up/Down buttons are disabled.
- 5 Stitching is activated in two ways:
 - **Start/Pause button activation:** Press the Start/Pause stitching button on the display. **Note:** This option only works if a speed limit is set.
 - **Foot pedal activation:** Press the foot pedal to control your stitching speed. If you set a speed limit, you can press lightly to go slower than the speed limit or press the pedal down fully to quilt at the speed limit.

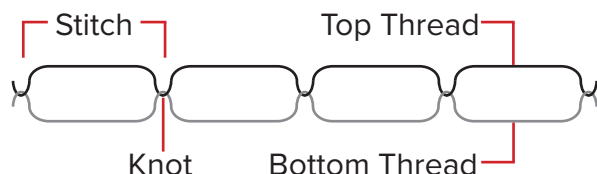


- 6 When activated, the bobbin level estimator will show on the left side of the display. For instructions on how to use the bobbin level estimator, see page 51.
 - When the icon is green, the bobbin is estimated to be between 21% and 100% full.
 - When the icon is yellow, the bobbin is estimated to be between 11% and 20% full.
 - When the icon is red, the bobbin is estimated to be under 10% full.
- 7 To deactivate stitching, press the Start/Pause stitching button on the display or release the foot pedal, whichever is in use. The needle will move into the needle stop position indicated in the Settings menu (see page 47).

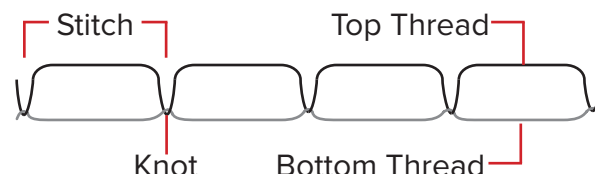
Adjust the Thread Tension

Thread tension is the interaction of the top and bottom threads. The top thread runs from the cone or spool, through the machine thread guides and tensioners, to the needle. The bottom thread comes from the bobbin and wraps around the top thread to form a stitch.

Balanced Tension: Top and bottom threads pull on each other evenly and knots are centered in the fabric layers.



Unbalanced Tension: Knots are pulled to one side of the fabric layers.

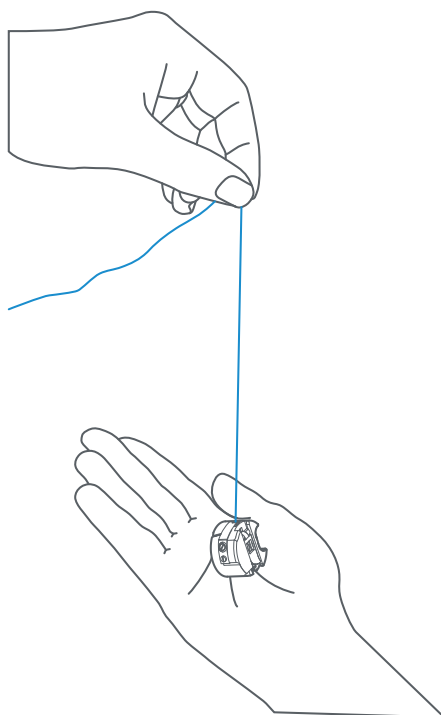


Thread tension is affected by factors beyond the top and bottom thread tension, including proper machine threading, correct hopping foot height, and more. For a detailed checklist, see the Tension Perfection Checklist that came with your machine.

Instructions

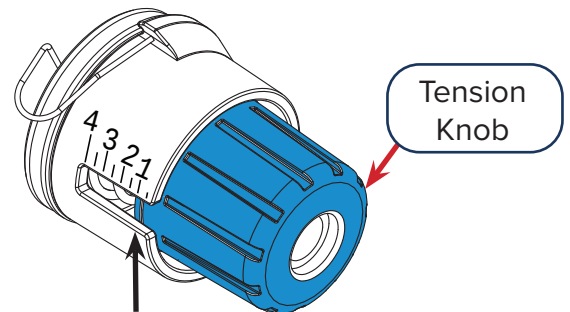
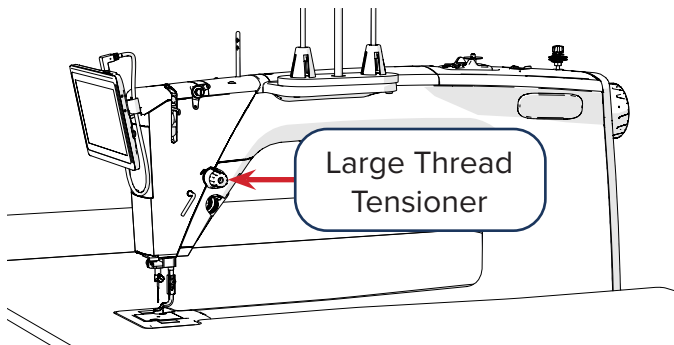
Test your thread tension on extra materials before sewing on a project. To adjust the thread tension, take the following steps:

- 1 Set the bobbin (bottom thread) tension first. Bottom thread tension is the foundation for proper thread tension. Place the bobbin case on its side, on your palm. Pull up on the thread. The tension is correct if the thread runs freely and the bobbin rises into a vertical position without lifting off your hand. For details on how to adjust your bottom tension, see page 34.



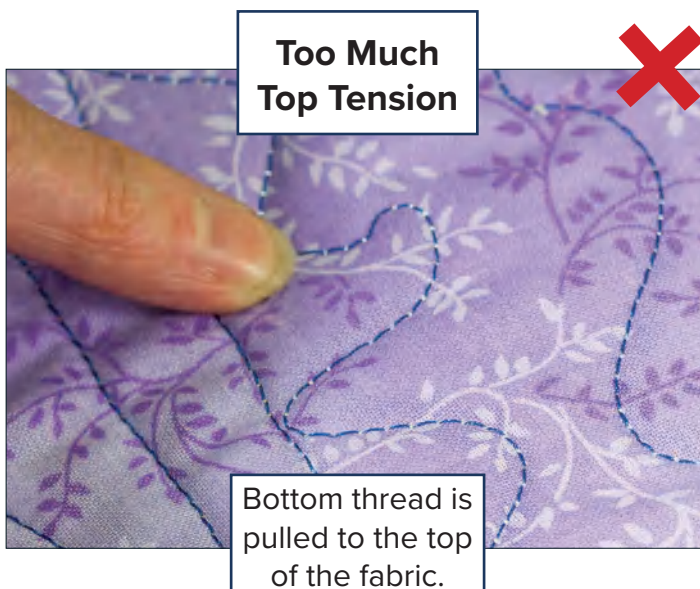
Adjust the Thread Tension (continued)

- Loosen the **tension knob** on the **large thread tensioner** to set the tension to “1.” The left edge of the tension knob lines up with the number that the tension is set to.



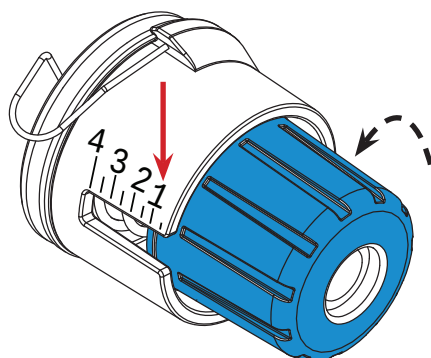
Note: Setting 1 is the lowest tension setting. This is an ideal starting place to find the correct top thread tension. Take care not to go past one: the tension knob might unscrew completely and fall off the machine. If that happens, see “Re-assemble the Thread Tensioner” on page 85.

- Slowly increase the tension while stitching into scrap material similar to your project. When the thread tension is balanced, the top and bottom thread will knot in the middle of the fabric layers.

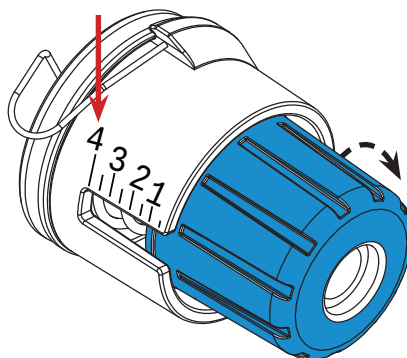


Adjust the Thread Tension (continued)

- If the bobbin (bottom) thread is pulled through the top layer of fabric, there is too much top tension. Loosen the tension by turning the large thread tensioner knob counter-clockwise toward setting “1.”



- If the top thread is pulled down through the bottom layer of fabric, there is too little top tension. Increase the tension on the top by turning the large thread tensioner knob clockwise toward setting “4.” Stop turning the knob when the desired tension is achieved.

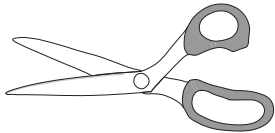


Unbalanced tension can cause skipped stitches, eyelashing, railroad tracks, and more. For details on specific stitch problems, see “Troubleshoot the Thread Tension” on page 99.

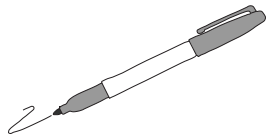
Get Started Quilting

Parts & Tools Needed

Scissors
(not included)



Washable Fabric
Marker/chalk
(not included)

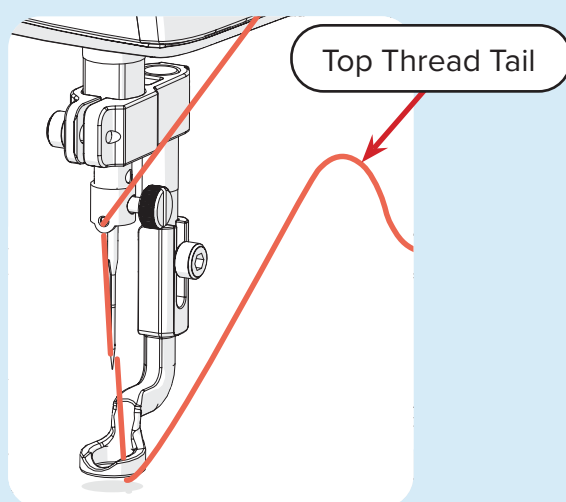
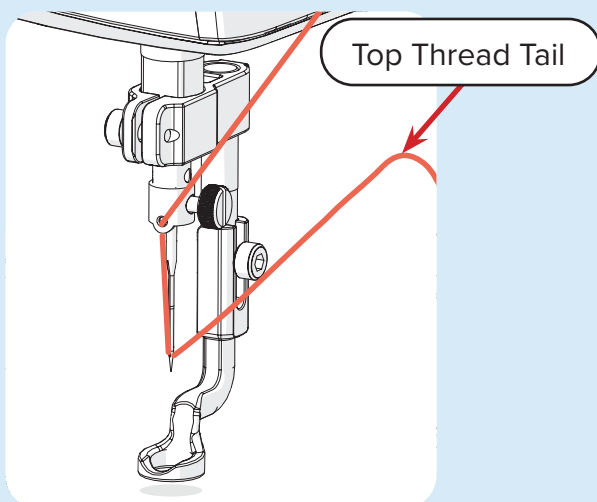


Instructions

Now that your machine and quilt sandwich are prepared, it's time to quilt. Practice on scrap fabric to become familiar with the machine's settings and movements so you can quilt with confidence. It is normal to make mistakes, so don't get discouraged if your stitches don't look perfect right away.

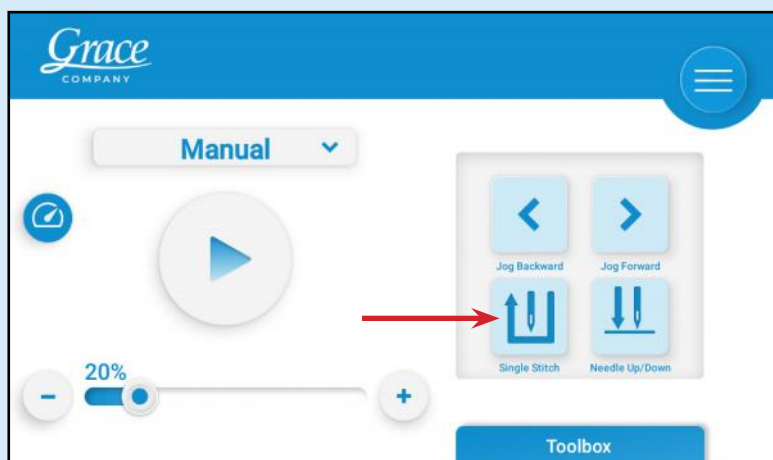
- 1 Make sure the following items have been completed:
 - Your machine is threaded and tensioned.
 - Your practice fabric is prepped.
- 2 Use fabric chalk or a marker to draw a simple design on your practice fabric.
- 3 When you start stitching, the tail of the bobbin thread is underneath the quilt. Since you can't see it, it's easy to stitch over the tail and end up with an unsightly bunch of thread under the quilt. To prevent that, take the following steps to pull up your bobbin thread at the start of quilting:

- a First, position your fabric beneath the needle where you want to begin stitching.
- b Pick up and hold the top thread tail that is threaded through the needle.

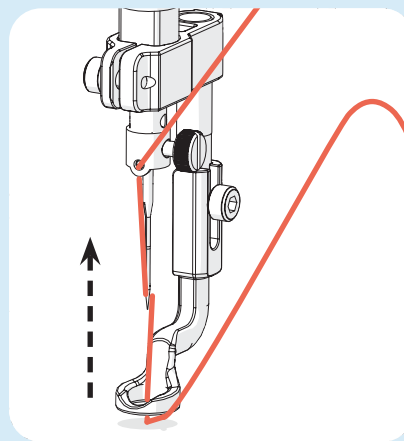
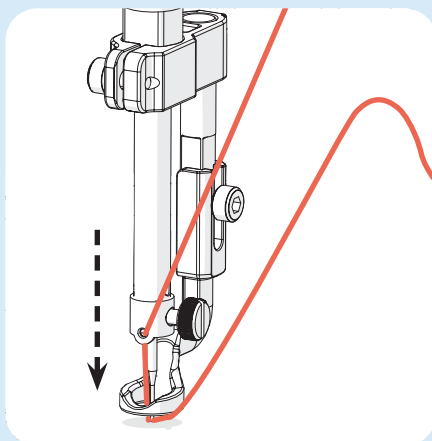


Note: It doesn't matter if the thread is under the hopping foot or not.

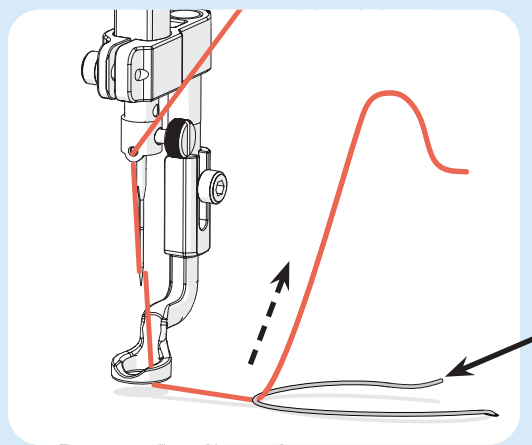
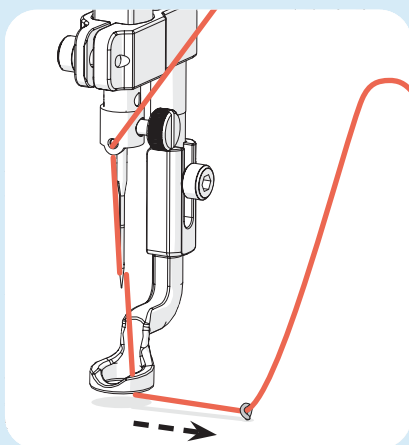
- c While still holding the thread tail, press the Single Stitch button.



The needle will drop into the fabric and return to the surface, making a single stitch.

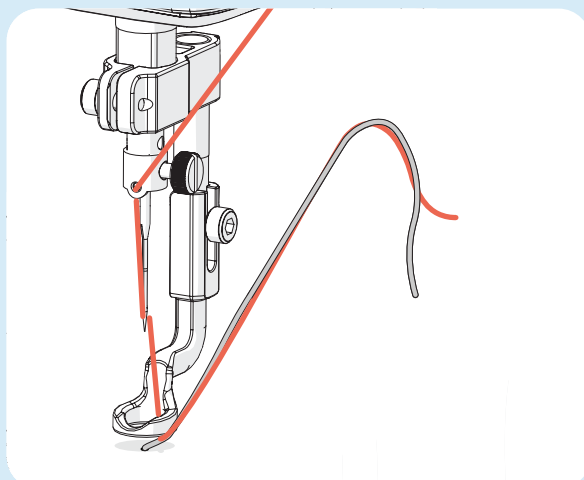
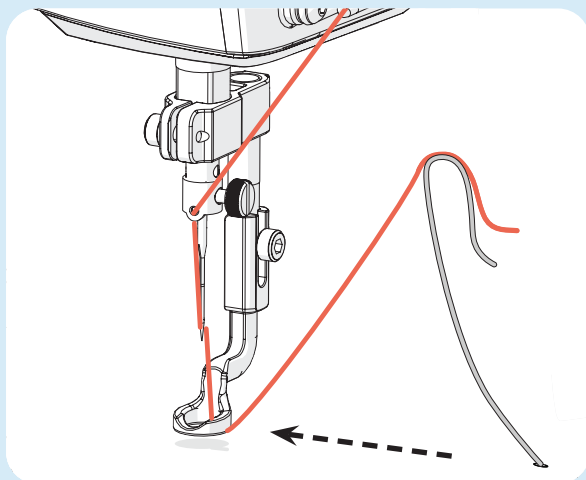


- d Continue holding the thread tail and move the fabric away from the needle. A loop of bobbin thread is pulled up to the surface. Keep pulling until the bobbin tail comes out. **Note:** If the bobbin thread tail is short, it might take a few attempts to pull up the bobbin thread successfully. Installing the bobbin into the bobbin case with 3–5 inches of tail helps prevent this problem.

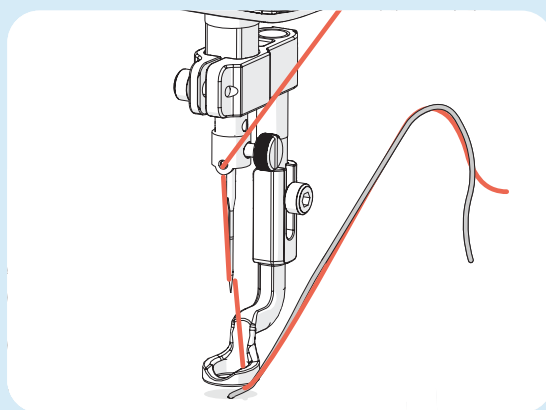


Get Started Quilting (continued)

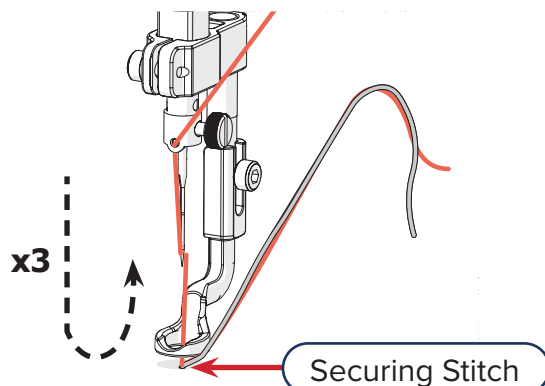
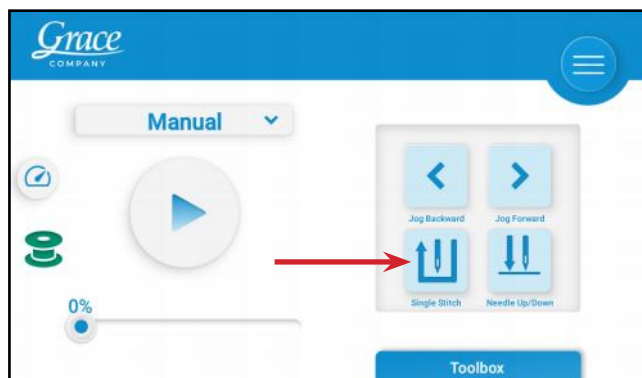
- e Gather up both thread tails and move the fabric back to the first stitch.



Important: When you move your fabric back to the original stitch, slack bobbin thread builds up right under the fabric. Pull on the bobbin thread tail until the resistance slightly increases (be careful not to keep pulling—you'll end up wasting thread).

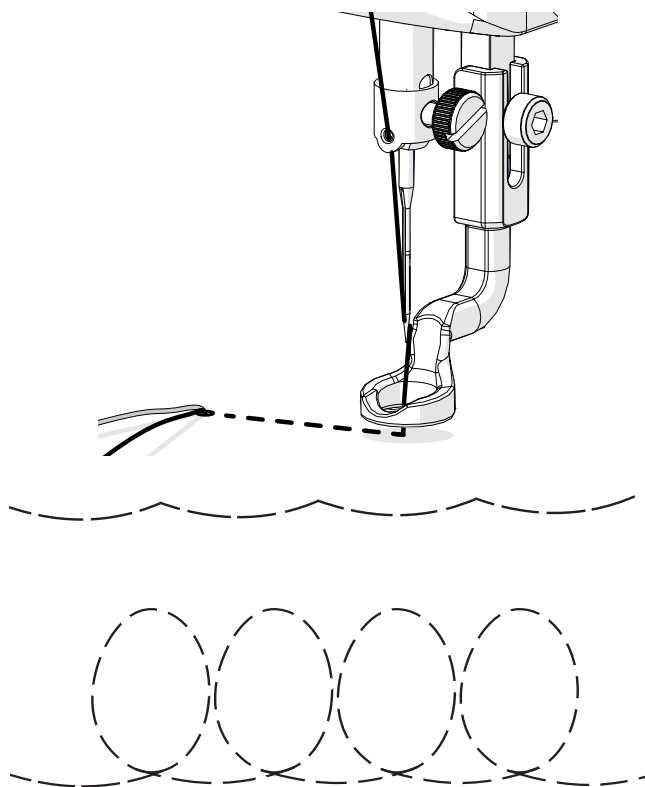


- 4 Press the Single Stitch button three times to make a **securing stitch**. Move your fabric slightly so the stitches are very close together but not in the exact same place.



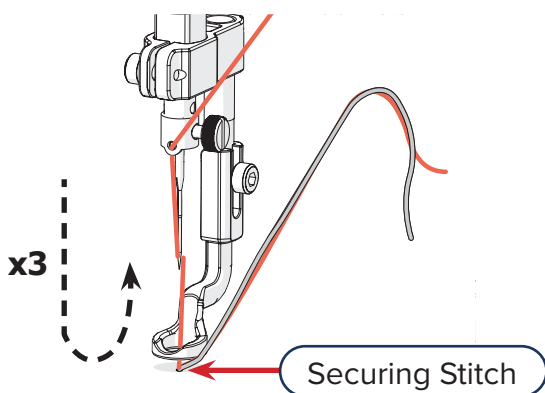
Get Started Quilting (continued)

- 5 Use any quilting mode and stitch over the design you drew on your fabric.



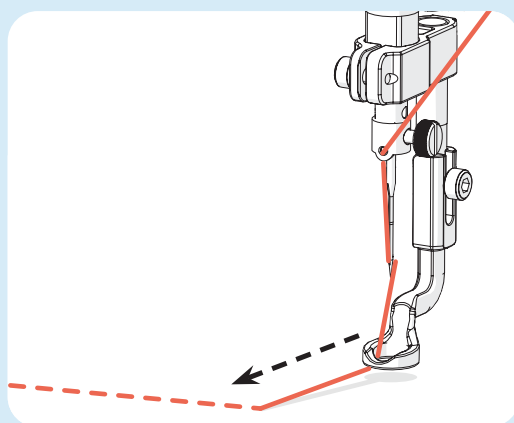
Grace

- 6 When finished, make a **securing stitch**. Secure your fabric every time you start and end a line of stitching.

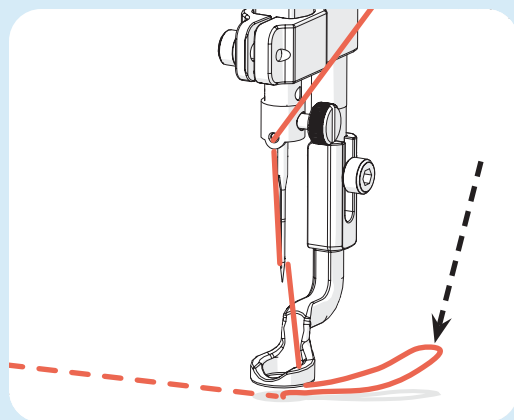


- 7 Take the following steps to pull up the bobbin thread at the end of stitching:

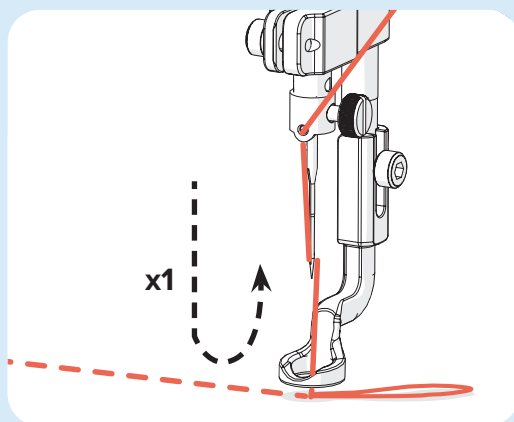
- a Move your fabric away from the needle.



- b Hold the top thread to make a loop and return the fabric to the needle position.

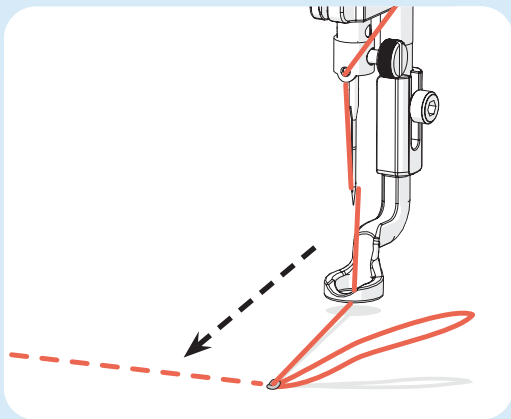


- c Still holding the loop, press the Single Stitch button.

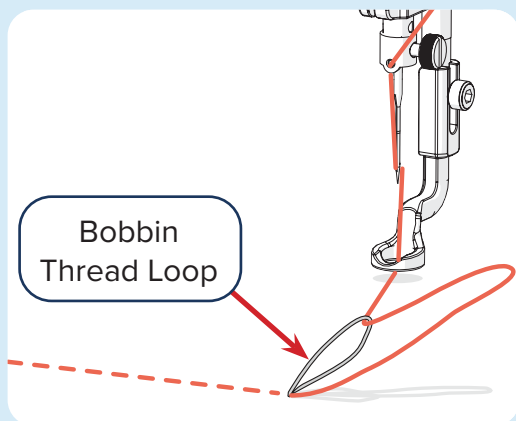


Get Started Quilting (continued)

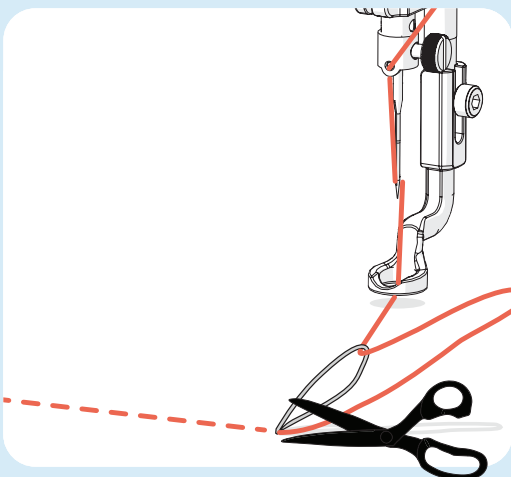
- d Still holding the loop, move the fabric away from the last stitch again.



- e As you move away, a **loop of bobbin thread** is pulled up. Keep going until the loop is big enough to grab.



- f Trim away all the threads close to the tie off or last stitch.



- 8 You may now cut the thread tails from the start of your design.

Practice! Keep trying different stitches until you feel comfortable with the various quilting modes.

Congratulations! Now that you have practiced and familiarized yourself with the basic settings and movements of your machine, you are ready to begin your quilting journey.

Good luck, and thank you again for choosing Grace Company to help with your quilting needs.

Machine Maintenance

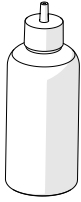
This section of the manual covers important processes for machine maintenance and care.

Prepare the Oil Bottle	70
Oil and Clean the Machine.....	71
Clean the Fabric Sensors	74
Change the Needle.....	75
Adjust the Hopping Foot	77
Remove & Install the Needle Plate.....	83
Re-assemble the Thread Tensioner.....	85
Check the Firmware.....	86

Prepare the Oil Bottle

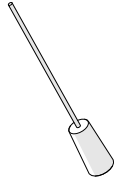
Parts & Tools Needed

Oil Bottle



Box 1 : Tools Box

Oil Bottle Applicator
Needle

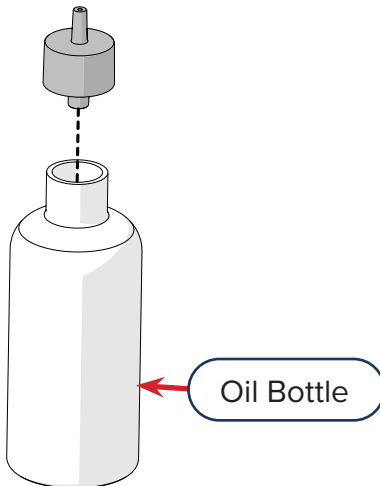


Box 1 : Tools Box

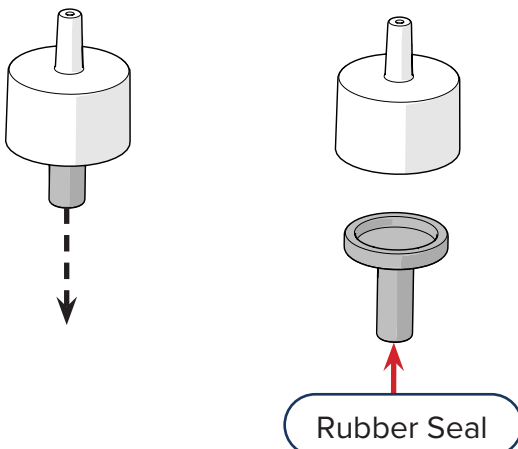
Instructions

Take the following steps to prepare the oil bottle for use in oiling the machine:

- 1 Unscrew the cap from the **oil bottle**.



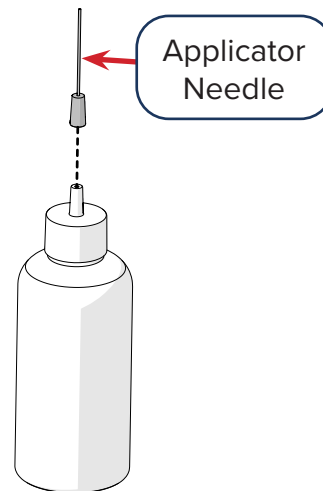
- 2 Pull the black **rubber seal** away from the lid. The seal can be discarded.



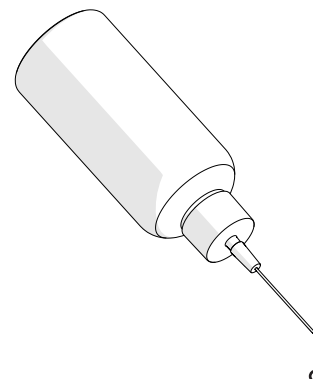
- 3 Screw the cap back onto the bottle.



- 4 Press the **applicator needle** onto the cap.



- 5 **To apply the oil:** Hold the bottle upside down and squeeze gently.



Oil and Clean the Machine

Parts & Tools Needed

Oil Bottle



Box 1: Tools Box

Lint Brush



Box 1: Tools Box

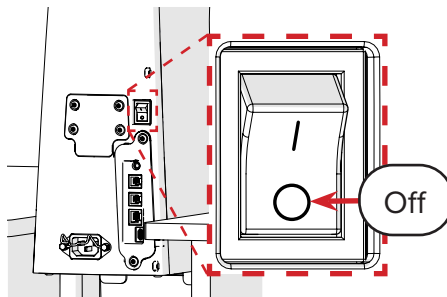
Tip: Use the hours counter on the Projects screen to keep track of quilting time. See page 53.

Instructions

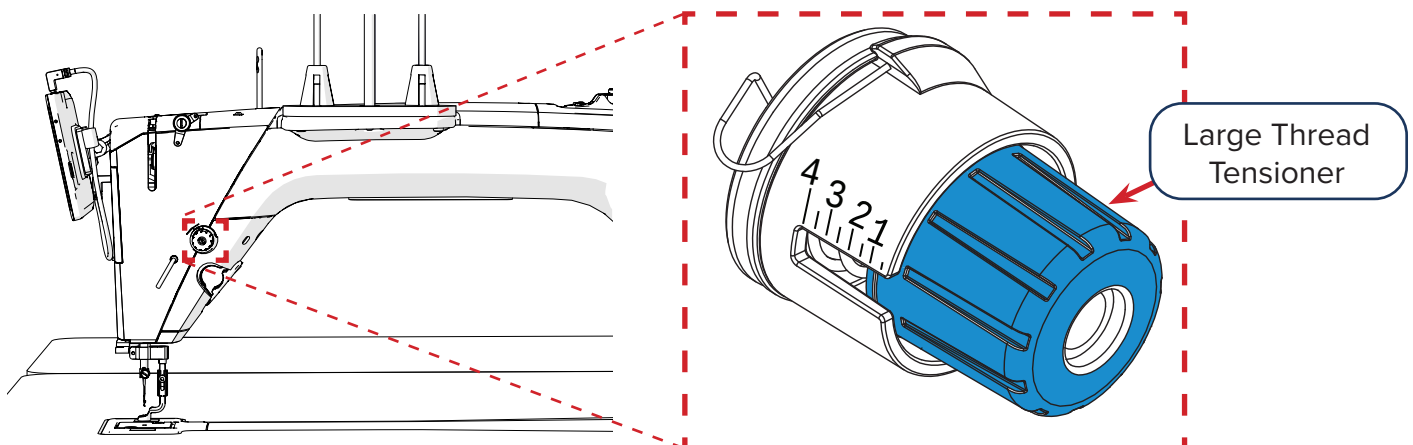
Oil & Clean	
Machine	• At the start of a new project • After 20 hours of use • After the machine sits unused for more than 30 days
Hook Assembly	• Every other bobbin change

Take the following steps to clean and oil the machine:

- 1 Turn **off** the machine's power and unthread the machine.



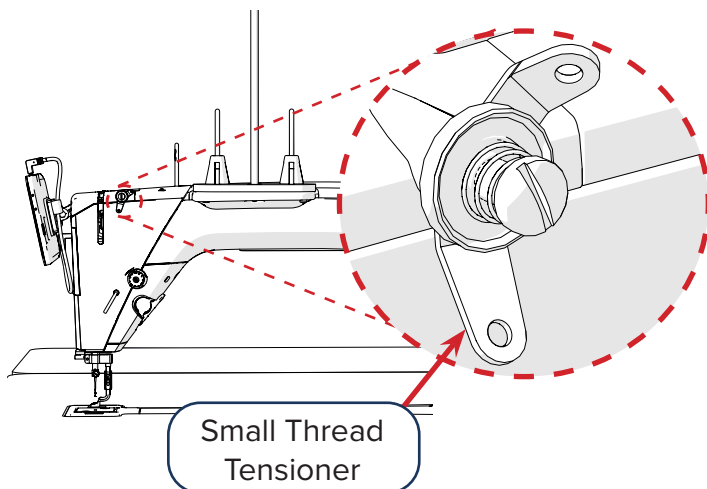
- 2 Twist the **large thread tensioner** knob to set the tensioner to 1. This exposes the tensioner discs. Use the lint brush to clear away the lint and thread remnants.



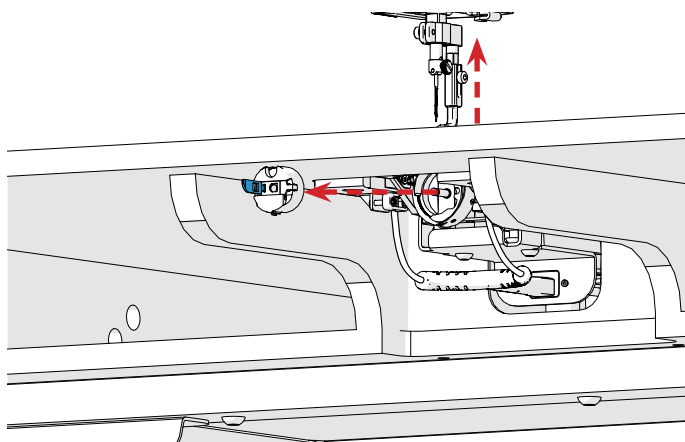
Machine Maintenance

Oil and Clean the Machine (continued)

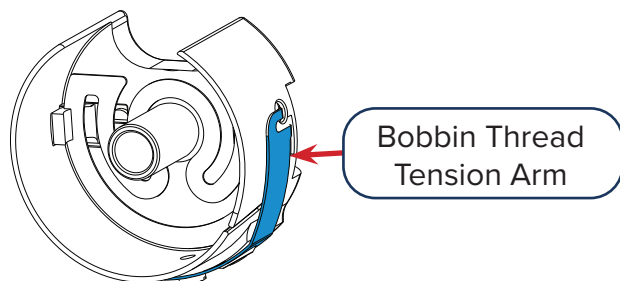
- 3 Clear any debris from the spring and discs of the **small thread tensioner**.



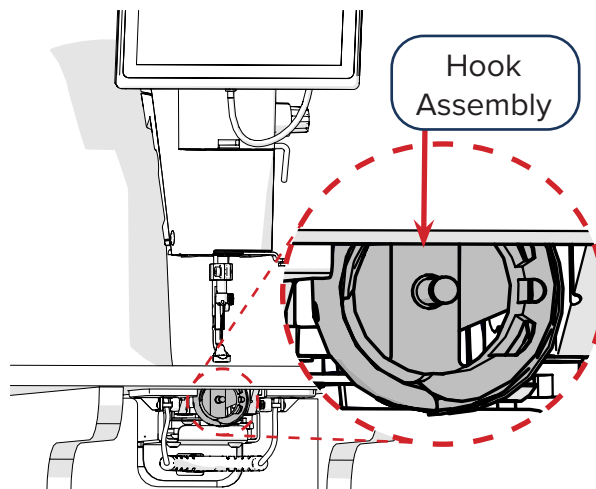
- 4 Raise the **needle**, then pull the **release lever** (shown in blue) on the bobbin case to remove the case from the hook assembly.



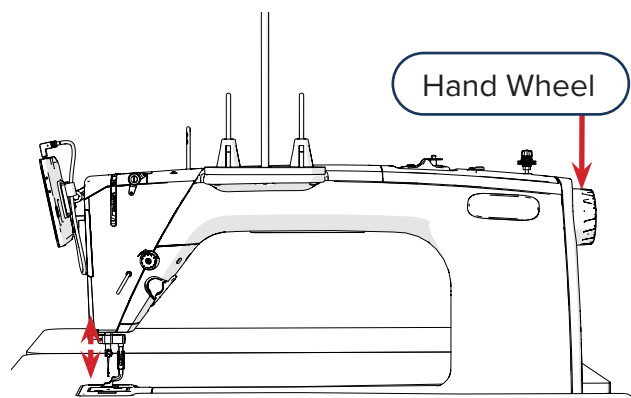
- 5 Remove the bobbin from the case. Clean the bobbin case with the lint brush. Be sure to clean the area under the **bobbin thread tension arm**.



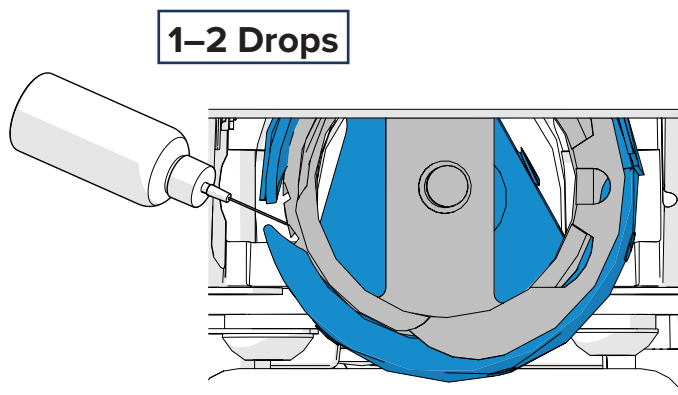
- 6 Clear away any lint, cloth, and thread remnants in and around the **hook assembly**.



- 7 Rotate the **hand wheel** until the needle is halfway down. This will put the hook in the best position for oiling.

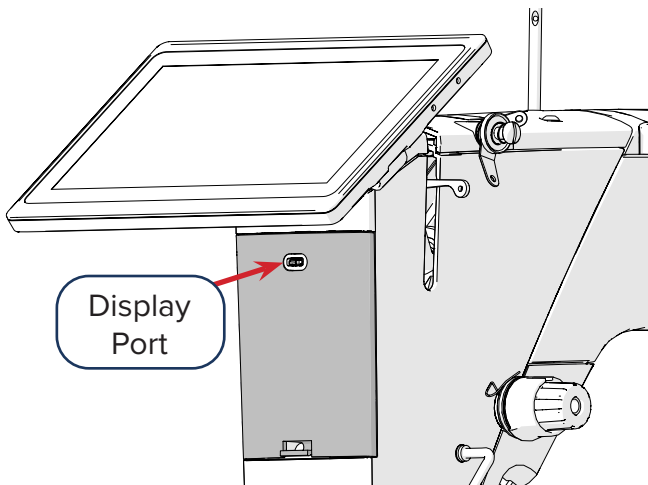


- 8 Place 1–2 drops of oil into the hook assembly between the **inner part** (shown in gray) and **outer part** (shown in blue).

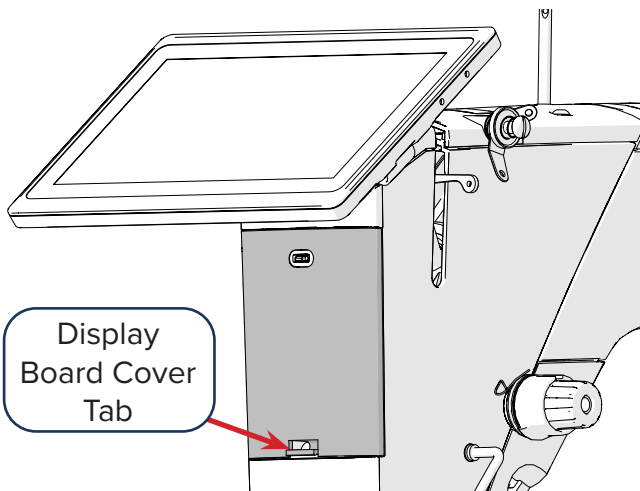


Oil and Clean the Machine (continued)

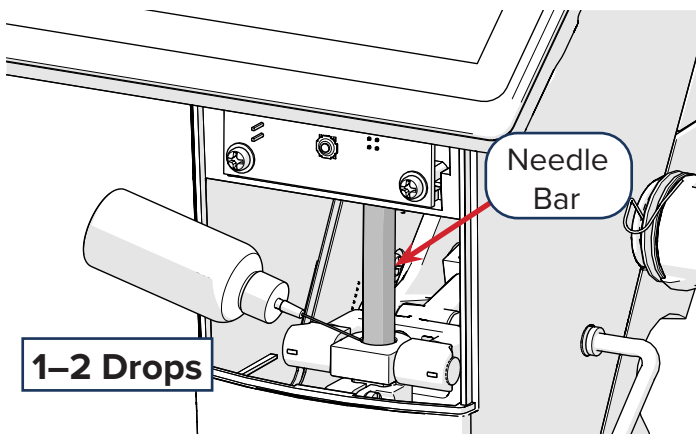
- 9 Unplug the display from the **port** on the machine.



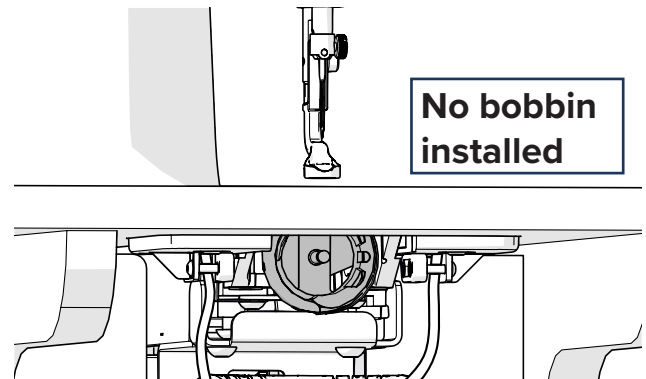
- 10 Pull the **tab** on the **display board cover** to remove the cover from the machine.



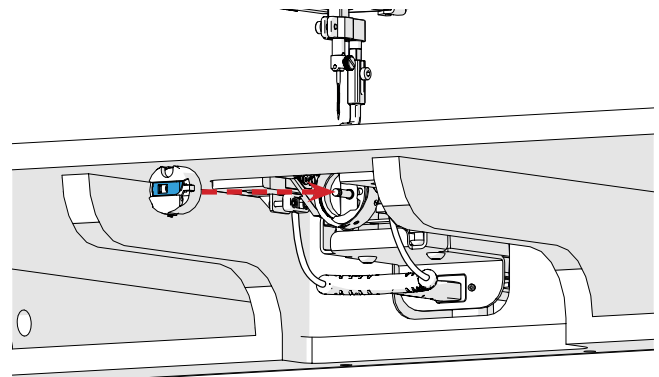
- 11 Place 1–2 drops of oil on the **needle bar**. Then replace the display board cover and plug the display back into the port.



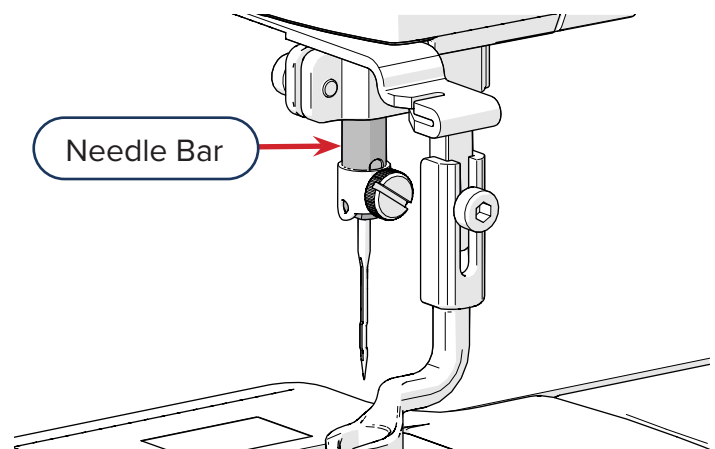
- 12 Power on the machine. **Without a bobbin installed**, run the machine in cruise mode for about 10 seconds. This will distribute the oil in the hook assembly without getting oil on your bobbin thread.



- 13 Replace the bobbin case with the release lever (shown in blue) at the 3 o'clock position. It should click into place. Do not pull on the lever while inserting.



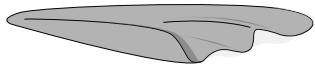
- 14 Wipe down the **needle bar** regularly to prevent oil from accumulating and dripping onto your quilt.



Clean the Fabric Sensors

Parts & Tools Needed

Soft Cloth



(not included)

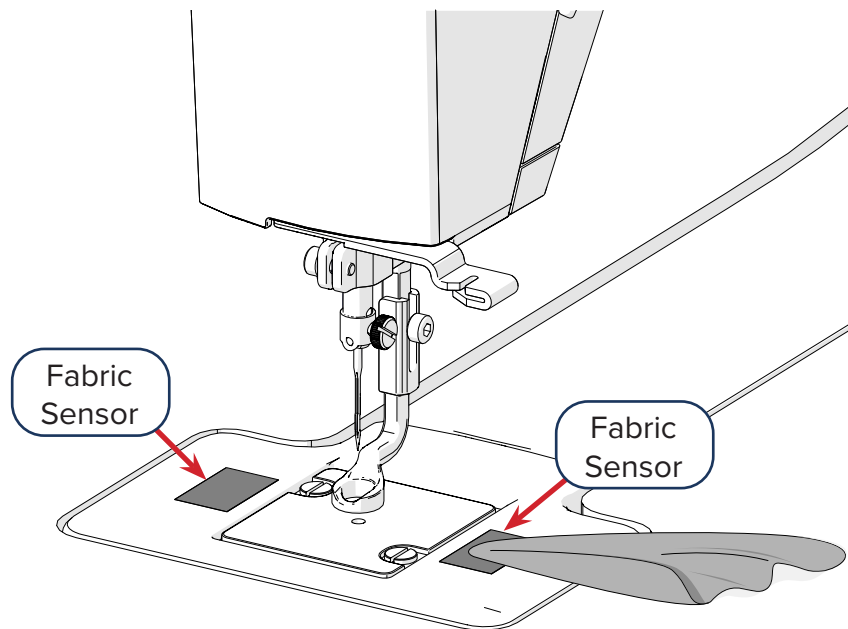
Instructions

The fabric sensors are essential for stitch regulation. Dirty sensors can affect the quality of stitches, resulting in skipped stitches or other stitch problems. Clean the fabric sensors regularly to keep them functioning at their best.

Note: Dark-colored fabric used for the quilt backing needs to be free of lint, as it can interfere with the performance of the fabric sensors.

Take the following step to clean the sensors:

- 1 Use a soft, scratch-free cloth, such as microfiber, to gently wipe away any lint or fingerprints from the **fabric sensors**.



Change the Needle

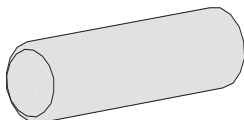
Parts & Tools Needed

Needle



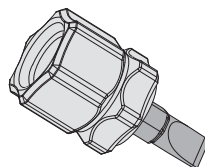
Box 1: Tools Box

Needle Magnet



Box 1: Tools Box

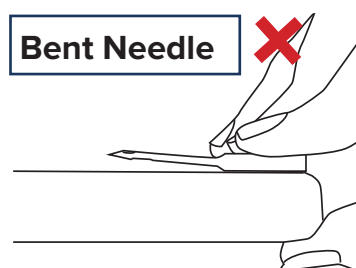
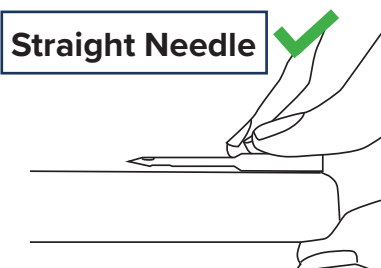
Flat-head Screwdriver



Box 1: Tools Box

Instructions

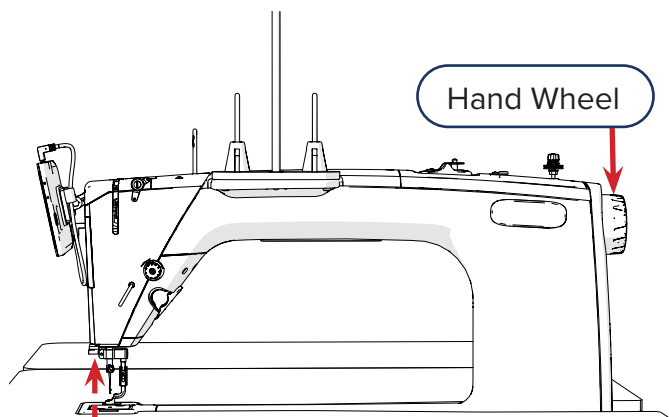
A broken, bent, or burred needle may break thread, damage fabric, or even damage the machine. Always check that the needle is in good repair before starting a new project, and replace the needle after eight hours of use.



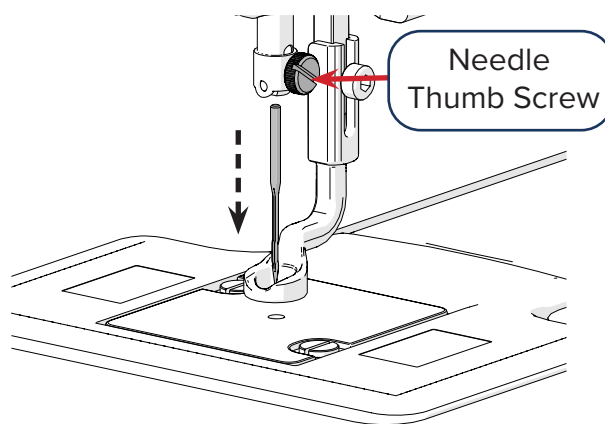
To avoid damage to the machine, please choose an approved needle style from the list below:

- DPx5 MR
- 134 MR
- 1955 MR

- 1 Turn off the machine's power.
- 2 Rotate the **hand wheel** to raise the needle to its highest position.

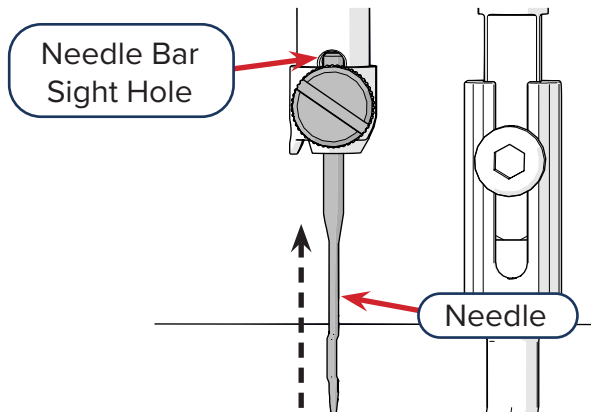


- 3 Loosen the **needle thumb screw** and remove the needle. If needed, use a flat-head screwdriver.

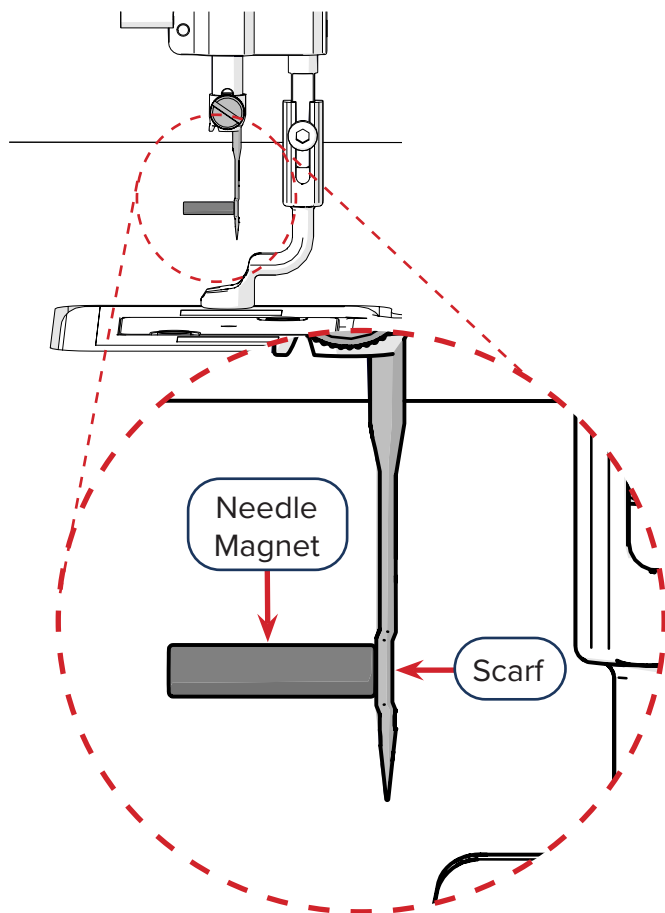


Change the Needle (continued)

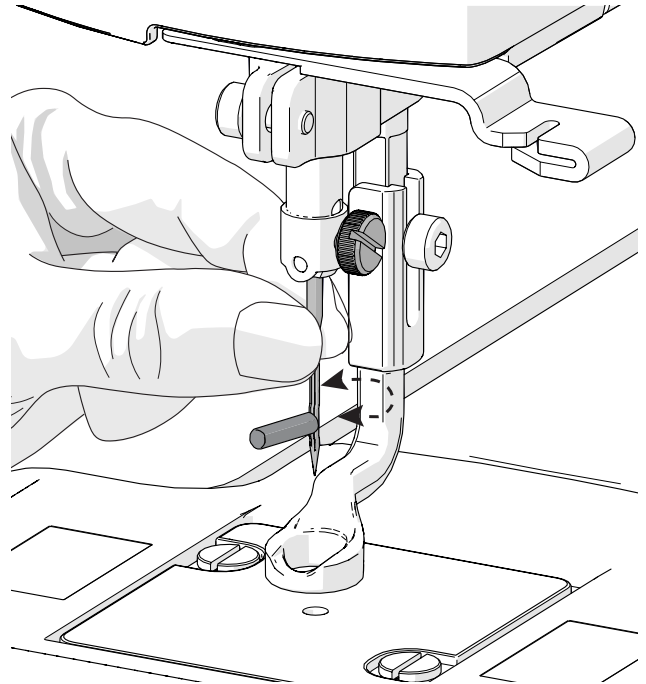
- 4 Insert the new **needle** all the way into the needle bar. Check the **needle bar sight hole** above the thumb screw to make sure the needle is inserted all the way.



- 5 The **scarf**, a cut-out on the back of the needle, should face the throat of the machine. Place the **needle magnet** on the opposite side of the scarf.

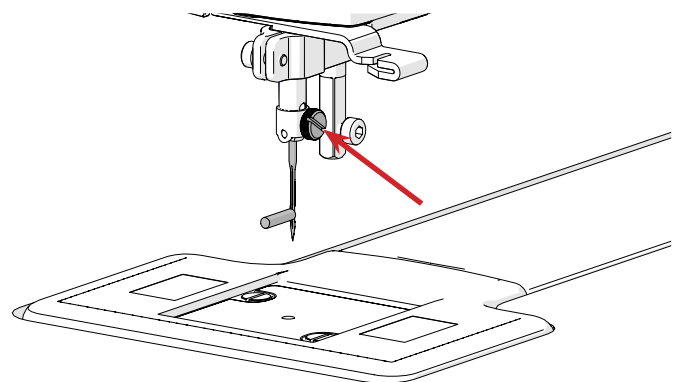


- 6 Use the needle magnet as a visual guide to check that the needle is straight. Twist the needle until the magnet points as straight out from the machine as possible.



Note: Do not attempt to adjust the needle by moving the magnet directly.

- 7 Hand-tighten the thumb screw to hold the needle in place. If you use a flat-head screwdriver, do not over-tighten the screw.

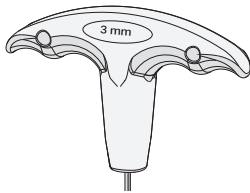


- 8 Remove the needle magnet.

Adjust the Hopping Foot

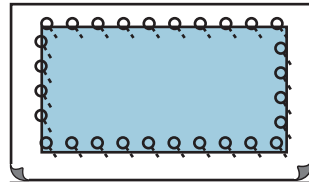
Parts & Tools Needed

T-handle Allen Wrench
3 mm (optional)



Box 1: Tools Box

Quilt
Sandwich



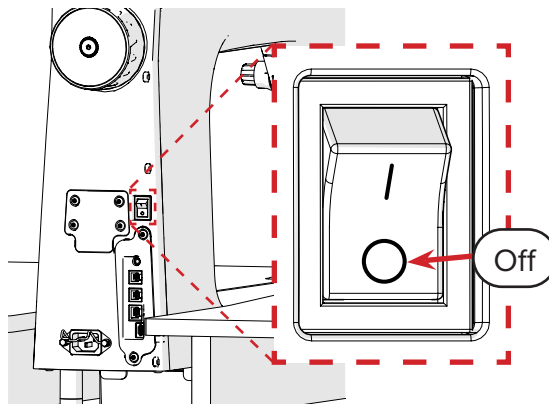
(not included)

Height Adjustment Instructions

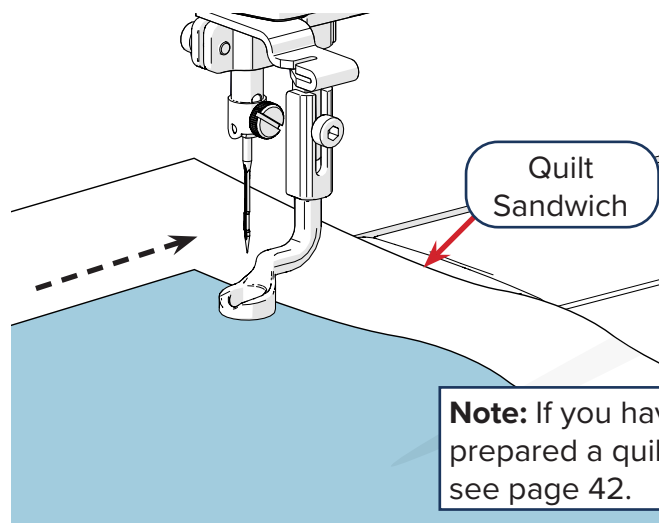
The hopping foot height depends on the thickness of your fabric and batting. Set the hopping foot height at the start of each project. Incorrect hopping foot height can lead to skipped stitches and tension problems.

Take the following steps to set the hopping foot height:

- 1 Power **off** the machine.



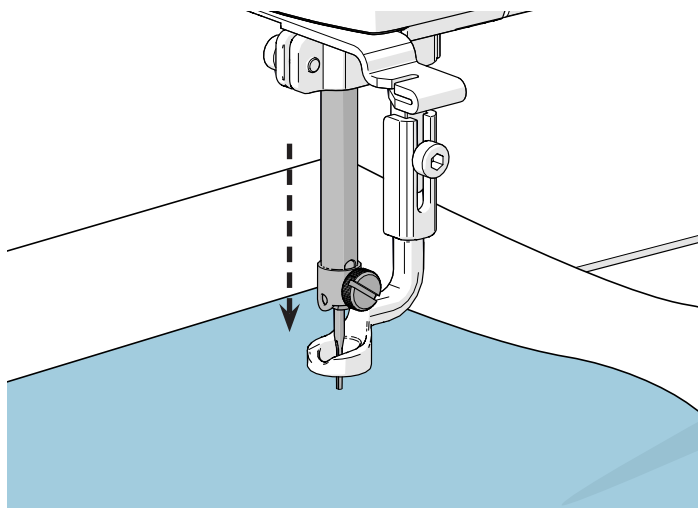
- 2 Slide your **quilt sandwich** underneath the hopping foot.



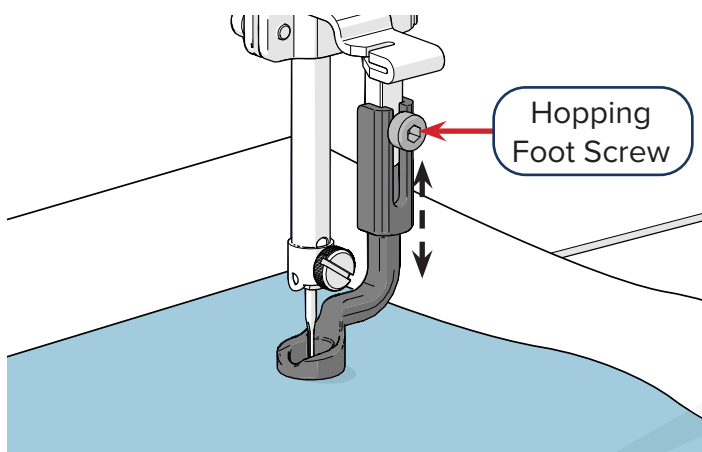
Note: If you haven't prepared a quilt sandwich, see page 42.

Adjust the Hopping Foot (continued)

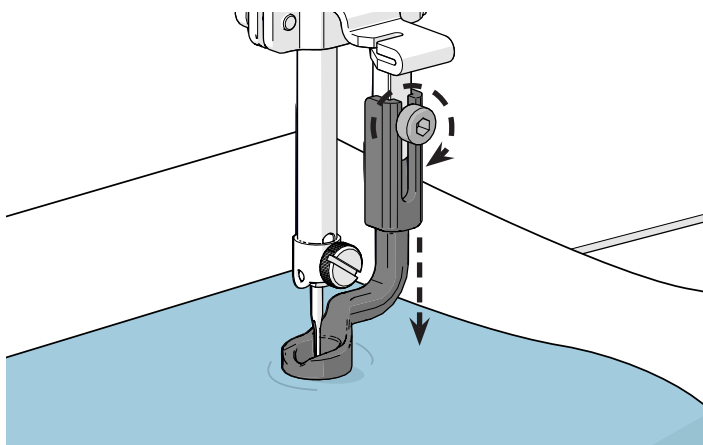
- 3 Use the hand wheel to lower the needle to its lowest position.



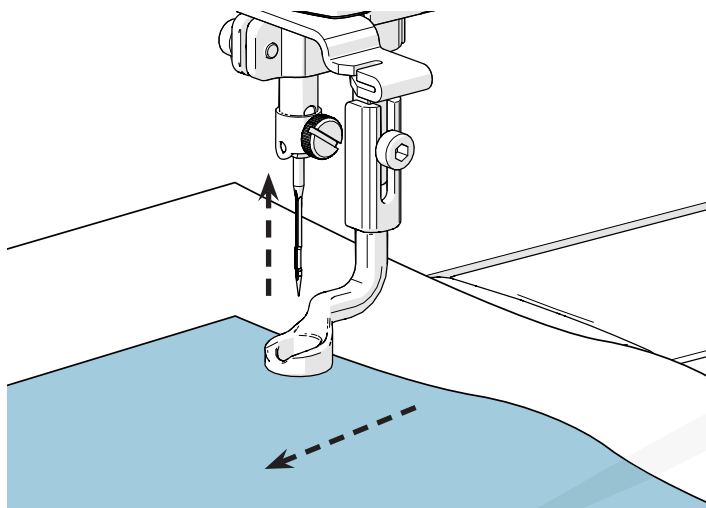
- 4 With the 3 mm Allen wrench, loosen the **hopping foot screw** but do not remove it. The hopping foot should slide freely.



- 5 Press down gently on the hopping foot to flatten the fabric around it, then tighten the screw.



- 6 Use the hand wheel to raise the needle and remove your quilt sandwich.



Note: If the machine skips stitches, the hopping foot is too high. If your quilt is difficult to move around, the hopping foot is too low.