

BERNINA 990

Quilting Workbook



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B 990

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INTRODUCTION

Welcome to the BERNINA 990 Quilting Workbook. The following tutorials and exercises will help you become familiar with the B 990 and all of its quilting capabilities. Once you've mastered the techniques, you're sure to love your machine for many years to come.

It is highly recommended to work through the activities in this workbook in sequential order, without skipping any lessons, at least once. Once you have completed all the exercises, keep this workbook as a reference guide as you use your machine and explore the creative possibilities. Then, after a period of using your machine, come back to the exercises again to reaffirm the knowledge you have been putting into practice. Revisiting the lessons regularly will cement your confidence in the BERNINA 990.

Sew at your own pace. You can also follow along the BERNINA 990 Skill Hub online course for helpful videos and unique learning tools. In addition to the workbooks, online course, and classes from your BERNINA dealer, there are many instructional videos and tutorials built directly into the machine.

Instructional video tutorials are available on the [bernina.com](https://www.bernina.com) website and the [BERNINA International YouTube channel](#) too. You will also find inspiring sewing projects and eBooks on the BERNINA website at [bernina.com](#) in the [Learn & Create](#) section.



PREPARING TO STITCH

EXERCISE MATERIALS

Fabric & Stabilizer

- Cut (9) 2 ½ squares of woven fabric (5 in Color A, 4 in Color B)
- Cut (2) 5" squares of woven fabric
- Cut (1) 8" square of quilting cotton
- Cut (2) 18" x 21" pieces of woven fabric
- (1) 12" x 15" piece of woven fabric
- Cut (1) 8" square of quilting cotton
- Cut (1) 5" square of fusible webbing
- Cut (1) 5" square and (1) 12" x 15" piece of tear-away stabilizer
- Cut (1) 8" square and (3) 18" x 21" pieces of low- to medium-loft batting
- Apply fusible web to the back of (1) 5" square and cut out a shape (heart) for appliqué. Fuse this to the center of the other 5" square of woven fabric. Place tear-away stabilizer under the square.
- Prepare three quilt sandwiches: Place (1) 18" x 21" piece of low- to medium-loft batting between (2) 18" x 21" pieces of woven fabric. Spray basting with 505 spray in-between the layers is a helpful method to prevent shifting.

Notions

- 80/12 Microtex needle
- Cotton or polyester thread
- Basting spray adhesive
- Pins (optional)

Hoops & Presser Feet

- Oval Hoop
- Giant Hoop
- Open Embroidery Foot #20C
- Embroidery Foot #26L
- BERNINA Stitch Regulator #42
- Walking Foot #50
- Adjustable Rulerwork Foot #72/72S
- Adjustable Stippling Foot #73 or Free-motion Embroidery Foot #24
- Patchwork Foot #97D

MACHINE SET UP REFERENCES

Before beginning the exercises, set up your machine for sewing. Please refer to your manual and/or the following video references to learn how to set up your machine.

Set Up for Sewing



In this video, learn how to change your presser foot and stitch plate, activate Dual Feed, add the Slide-on table, and set up the Foot Control and Free Hand System Lever.

Thread the Machine



Learn how to thread your bobbin and needle in this tutorial.

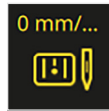
Attach the Module



This tutorial walks you through attaching the embroidery module to the machine in preparation for embroidery.

FEATURE FOCUS

Stitch Plates



The BERNINA 990 will automatically recognize the stitch plate attached. You will see an indication of which stitch plate is attached in the Status Bar on the left-hand side of the machine screen. The patchwork and quilting techniques in this book require or benefit from using all of the different plates provided with your B 990. If the stitch plate attached to the machine is incompatible with the selected stitch or mode, there will be a clear indication of the stitch shown in red or pop up error message.

PATCHWORK SETTINGS

SECURING PROGRAM

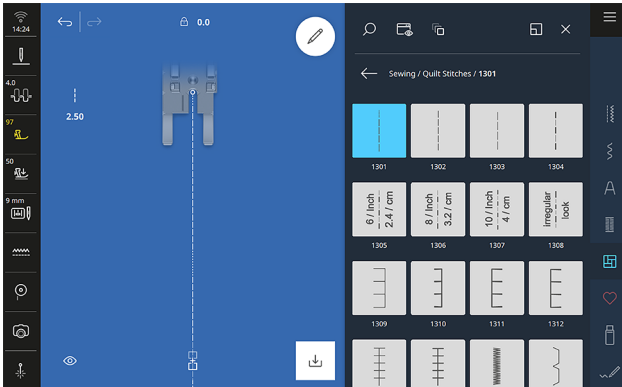



Fig. 1

Many of the stitches on the BERNINA 990 were designed with quilters in mind, and they can be found in the Quilt Stitches folder in the File Manager. The very first stitch in this folder, #1301 (Fig. 1), is the Quilting Securing Program. This stitch has short running stitches programmed as a way to secure at the beginning and end. The tension is set to work best with cotton piecing threads.

File Manager » Quilt Stitches

1. Select stitch #1301.
2. Sew a seam. The seam will begin with four short running stitches and then continue at a standard stitch length (default is 2.5 mm).

3.  When you reach the end of the seam, stop before going off the edge of the fabric, then tap the Quick Reverse button. When you press down on the foot control again, the machine will sew another four running stitches and then stop on its own.

PROGRAMMABLE SETTINGS

Your BERNINA 990 includes many features and settings to help optimize your quilting processes from patchwork to appliqué to quilting.

Hover

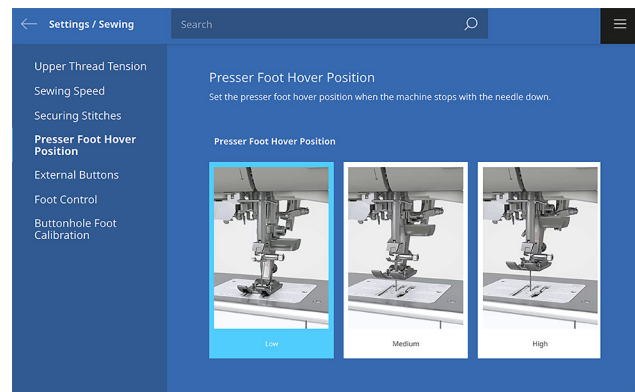


Fig. 2

The Hover feature will automatically raise the presser foot slightly when the machine is set for the needle to stop down. This is a particularly useful tool with patchwork like chain piecing.

Main Menu » Settings » Sewing » Presser Foot Hover Position

The default setting is Low, meaning the presser foot will not raise (Fig. 2). Medium will raise the presser foot slightly, only several millimeters up from the fabric. High will raise the presser foot to the highest position.

BERNINA Foot Control

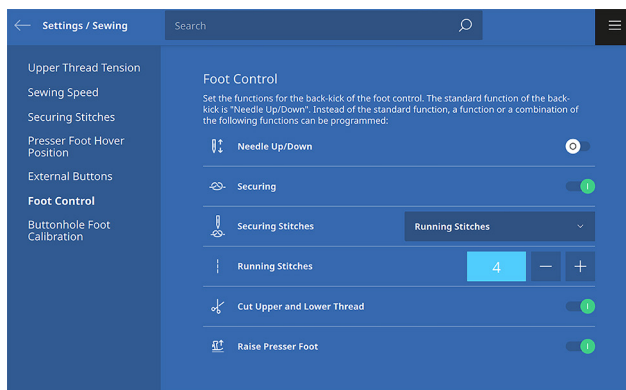


Fig. 3

The foot control for your BERNINA 990 has a Back-kick feature, allowing you to program additional functionality with the press of your heel on the back edge of the foot control. This Back-kick can be programmed to perform a variety of functions so that you can keep your hands on your fabric at all times.

**Main Menu » Settings » Sewing »
Foot Control**

The default functionality of the foot control is Needle Up/Down and it takes a half step in the stitch sequence, either raising or lowering the needle depending on its position. However, if you toggle this setting off, you have additional options for programming custom settings for your Back-kick, such as:

- Securing stitch – Activate a securing stitch and choose whether that stitch secures in place or sews a series of short running stitches. If you select running stitches, you may also customize how many stitches the machine will sew (as few as two or as many as six.)

- Cut upper and lower thread
- Raise presser foot

You may pick and choose any combination of these automatic functionalities to suit your preferences.

Securing Button

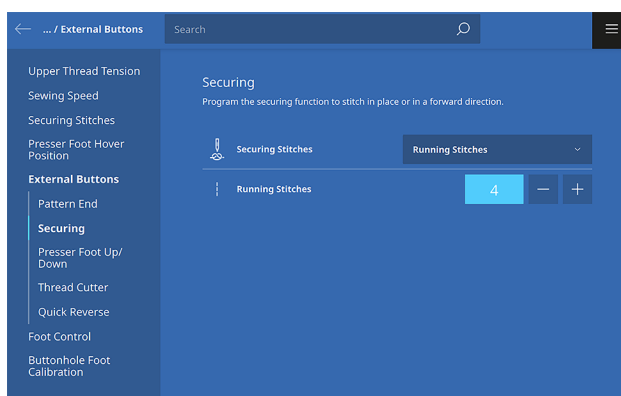


Fig. 4

If you prefer not to use a stitch with built-in securing stitches, you can manually insert a securing stitch at any point by pressing the Securing button. The type of securing stitch sewn can be customized.

**Main Menu » Settings » Sewing »
External Buttons » Securing**

Here, you can choose between Securing in Place or Running Stitches. If you select Running Stitches, you can customize how many stitches the machine will sew, from two to six stitches.

Exercise 1

STITCH COUNTER

Materials & Machine Settings



(9) 2 ½" squares of woven fabric (five squares in Color A, and four in Color B)



Needle: 80/12 Microtex



Needle Position: Center




Foot: Patchwork Foot #97D

The Stitch Counter is a tool that records a seam length and allows you to stitch the exact same seam length repeatedly until overwritten or cleared. This tool is useful when chain piecing repetitive seams. Use the Stitch Counter to create a 9-patch block.

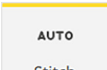
1. In Sewing Mode, select:

File Manager » Quilt Stitches » stitch #1303

2.  Open the Edit menu.

3.  In the Edit submenu, select Stitch Counter. When active, the Stitch Counter tool is highlighted in yellow.

4. Sew one square each of A and B together with a ¼" seam allowance.

5.  Tap the Quick Reverse button. The Stitch Counter display, shown below the Stitch Length setting, changes to read AUTO and shows the length of the programmed seam (Fig. 5).

6. Piece together another pair of 2 ½" squares without cutting the threads (chain piecing). When you resume sewing, the machine will automatically stop after the saved number of stitches.
7. Continue seaming with the stitch counter until you have three short rows of squares in alternating colors (A-B-A, B-A-B, A-B-A). Deactivate Stitch Counter.

To reprogram the Stitch Counter seam length, select CLR or tap the icon to turn it off and back on. To resume stitching a programmed seam length after Stitch Counter has been turned off, tap the Stitch Counter icon twice until it once again reads AUTO.

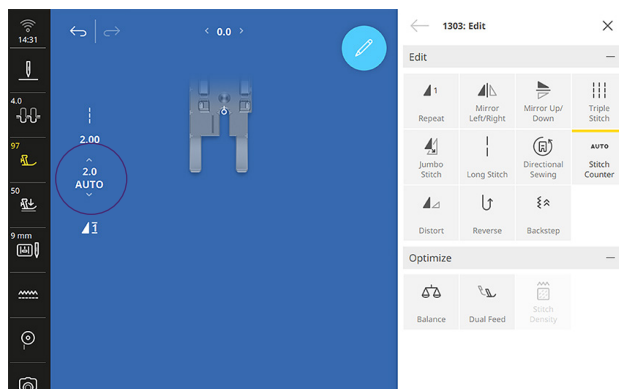
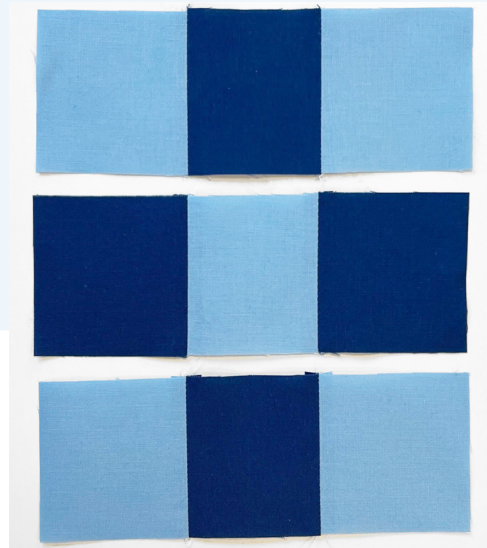



Fig. 5

Exercise 2

DUAL FEED BALANCE

Materials & Machine Settings

 (3) strips of pieced 2 ½" squares from Exercise 1

 **Needle:** 80/12 Microtex

 **Needle Position:** Center

 **Foot:** Patchwork Foot #97D

BERNINA Dual Feed is a mechanism that helps feed the fabric from the top while the feed dog on the machine controls the bottom layer. The BERNINA 990 has the additional capability of being able to adjust the Dual Feed function for even more control when seaming fabrics that stretch or shift during sewing, like bias-cut edges or when seaming rows of blocks in a quilt.

Presser feet with the label "D" are designed to be used with Dual Feed. BERNINA Dual Feed can only be used with presser feet compatible with this feature.

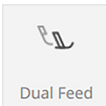
1. Attach a Dual Feed presser foot, such as Patchwork Foot #97D.
2. Pull the Dual Feed lever down until it engages.
3. In Sewing Mode, select:

File Manager » Quilt Stitches » stitch #1302

4. Align two of the rows of pieced 2 ½" squares in alternating colors and pin as needed.
5. Sew the two rows together with a ¼" seam allowance.

Evaluate—did the seams nest? Did your rows end at equal length? Did the layers feed evenly together? Balancing the Dual Feed will adjust the rate at which the Dual Feed lever moves in relation to the feed dog.

6. Select Edit menu.

7.  In the Optimize submenu, select Dual Feed. If the top layer of fabric ended up longer than the bottom layer, increase the Dual Feed Balance value. If the top layer ended up shorter than the bottom layer, decrease the Dual Feed Balance value.

8. Sew the third row to the first two with a ¼" seam allowance.

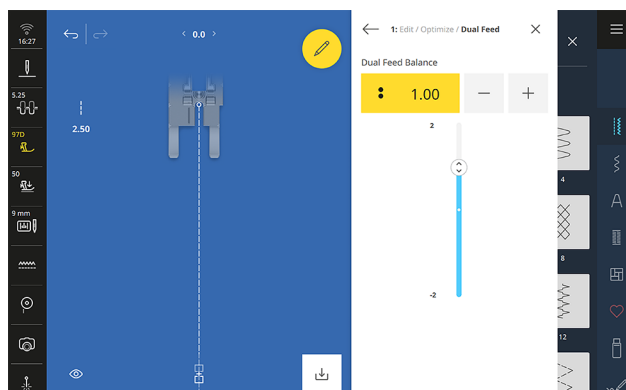


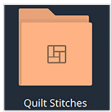
Fig. 6

Chapter III

APPLIQUÉ

Appliqué is a process of sewing layers of fabric on top of one another, rather than pieced edge-to-edge with joining seams, to add dimension or design to your project. The stitching is often visible with appliqué. Appliqué can be done manually, or it can also be accomplished as an in-the-hoop project using embroidery designs that are digitized for appliqué.

QUILT STITCHES FOLDER



Along with the quilting securing program used in piecing, there are many additional stitches built into the B 990 for a variety of quilting techniques. There are straight stitches calibrated for using finer cotton threads often used in quilts, stitches that imitate the look of hand quilting, textured stitches for crazy patchwork techniques, and a variety of appliqué stitches. Among the appliqué stitches are a variety of blanket stitches, a satin stitch, and a narrow blind stitch. If the built-in stitches do not suit your project or liking, remember that any stitch on your BERNINA can be adjusted in width or length to perfection.

NEEDLE POSITION



Adjusting the needle position on your stitch can make it easier to precisely align fabrics for perfect placement. It is recommended to use a presser foot with good visibility, such as Open Embroidery Foot #20/20C/20D. This foot has a wide opening in front of the needle and defined “toes” to which you can align your appliqué fabric. When the needle is moved to the far left or right position, using the Needle Position buttons below the Multi-function Knobs, and the fabric is

guided against the inner edge of the foot, the stitch will land neatly along the edge of the appliqué.

PINPOINT LASER



With the fine point of the Pinpoint Laser, you can see exactly where your needle is going to land in the fabric before it drops. This is useful with appliqué stitches, as you can be sure your stitch will catch the background and/or appliqué fabric with each step of the needle. The Pinpoint Laser can be toggled on or off at any time in the Status Bar.

FEATURE FOCUS

Camera



The camera allows you to see a live view of your fabric underneath the presser foot in the Stitch Altering Area. This allows you to preview your selected stitch and make any adjustments to it in real time in relation to the fabric. You can also zoom in with the camera for extra-precise adjustments.


With appliqué stitching, the camera is also useful for aligning start and end points or gauging how the stitch pattern maneuvers around points and curves.


A note on using the camera: Because of the short distance between the camera lens and the surface of the fabric, the alignment of your stitch relative to the presser foot will vary depending on the height of the presser foot. When the presser foot is at its highest position, the alignment will look much different from when the foot is lowered to the fabric, in position for sewing. For the most accurate preview of your stitch on the fabric, lower the presser foot completely.

Exercise 3


APPLIQUÉ

Materials & Machine Settings

 Fused appliqué heart square with (1) 5" square of stabilizer

 **Needle:** 80/12 Microtex

 **Needle Position:** 5 (right)

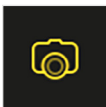
 **Foot:** Open Embroidery Foot #20C

1. In Sewing Mode, select:

File Manager » Quilt Stitches » stitch #1309

2. Increase the stitch width to 3.2 mm (Fig. 7) and the stitch length to 3.0 mm.

3. Move the needle position to the right (5) using the right needle position buttons located under the Multi-function knobs (Fig. 8).

4.   In the Status Bar, activate the Camera and Laser. The icons will turn yellow.

5. Place your appliqué underneath the presser foot and lower the foot.

6. Align the raw edge of your appliqué with the inside of the right edge of the presser foot. Use the Laser to ensure that the beginning of your blanket stitch will sew only through the background fabric.

7. Sew your appliqué. Use the camera view to help guide your stitching (Fig. 9). As you approach your starting point, use the camera view to gauge how many stitch patterns you can sew before you overlap the starting point.

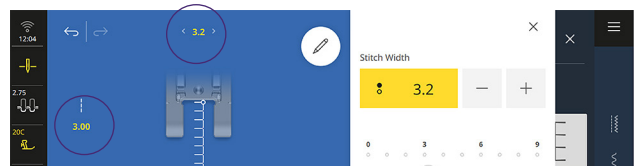


Fig. 7

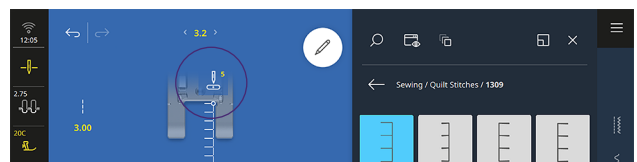


Fig. 8

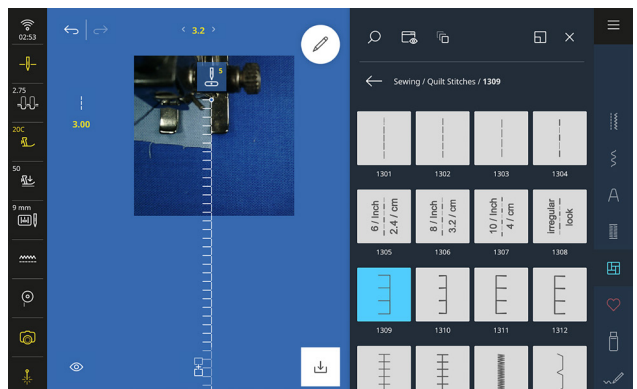


Fig. 9

FEATURE FOCUS

Stitch Designer

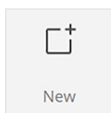


A fantastic feature on your B 990 sewing machine is the Stitch Designer. With it, you can create your own decorative stitch patterns or alter designs already built into the machine. You already know BERNINA offers you Total Stitch Control, but Stitch Designer takes this to a new level!

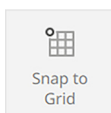
Try making a unique blanket stitch for your next appliqué project.

1. Select the Stitch Designer icon at the bottom of the Quick Access Bar.

2. Select New.



3. Select Snap to Grid.



4. Tap on one point at the center-top of Stitch Design Area.
5. Count down 2 points and tap.
6. Count left 4 points and tap, then tap again on the previous point.
7. Count down again 2 points and tap.
8. Count left 3 points and tap, then tap again on the previous point.
9. Repeat Steps 5-6 (Fig. 10).
10. Select the green checkmark to confirm and return back to the Sewing Screen (Fig. 11).

Each square in the grid is 1 mm, so what looks large to you on the screen is quite small stitched out.

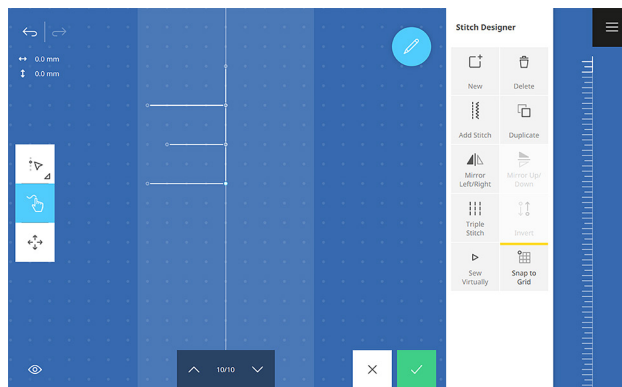


Fig. 10

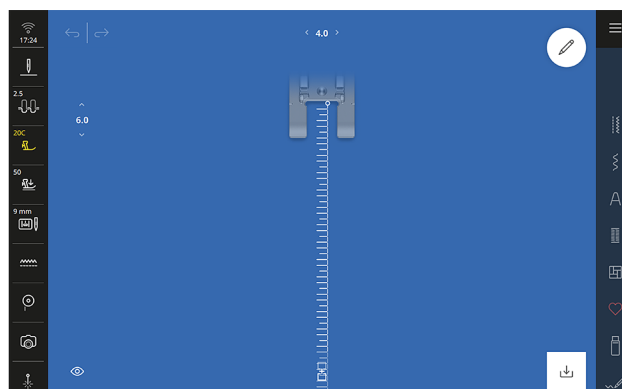
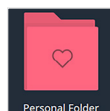



Fig. 11

Save to Personal Memory



You can save any stitch, including customized stitch settings, by saving it to the machine in the Personal Memory folder.

1. Select the Save icon at the bottom right.

2. Choose Save New to save it as a new stitch.
3. Name the stitch as desired and confirm.
4. Confirm save location with the green checkmark.

To retrieve the stitch, select Personal Folder in the File Manager or the heart icon in the Quick Access Bar.

IN-THE-HOOP APPLIQUÉ

Fabrics can be appliquéd automatically in embroidery mode with an embroidery hoop using specialized designs.

Several quilt appliqué designs are built into the B 990 and can be found at the bottom of the Quilt Inspiration folder.

**Embroidery » Embroidery Designs »
Inspirations » Quilt**

These designs will display the EXP file label (as opposed to BQM) and all have accompanying CutWork files if you wish to use the CutWork tool to cut out the appliqué shapes in the hoop.

These designs are digitized to include three particular elements to create this appliqué effect.

1. **Placement Stitch:** this is a single line of stitching indicating where the appliqué should be placed in the hoop. Your fabric may be precut to this shape or larger than the placement line, but will need to be secured in place with some type of adhesive (such as fusible web or spray adhesive).
2. **Cut Line Stitch:** There are two methods for cutting your fabric—either precut (in which case you can skip the cut line) or by placing a piece of fabric larger than the placement line over the placement line, and then stitching the cut line. Trim the fabric up to (but not through) the cut line before moving on to the next stitch.

3. **Tack-down Stitch:** after the appliqué fabric is placed in the hoop, the tack-down stitch secures the appliqué fabric to the background fabric and stabilizer.
4. **Final Appliqué Stitch:** the cover stitch. This is a more decorative stitch (such as a satin, blanket, or feather stitch) to cover the tack-down lines and raw edges of your appliqué (Fig. 12).

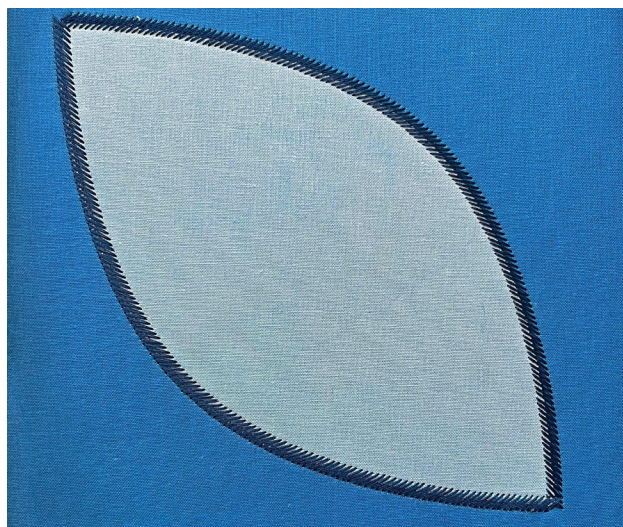


Fig. 12

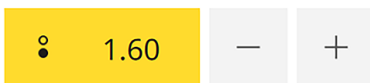
FOUNDATION PAPER PIECING

Foundation paper piecing is a technique that allows you to achieve complex angles and points. Designs are printed on paper and the patchwork is sewn with the fabric on the back side of the paper with the printed design facing up, stitching precisely on printed lines. The paper is then removed from the patchwork before layering batting and backing for quilting, or other preferred finishing.

Exact instructions for foundation paper piecing will vary by quilt pattern, but this technique universally benefits from a few key tips:

- Strong seams:** Because the paper foundation of the quilt block is torn out after the seams are sewn, this technique requires very strong, secure seams. Reducing your stitch length to 1.60 to 1.80 mm will not only result in stronger seams but also create more perforations in the foundation paper, making it easier to remove and reducing the chance of popping a seam while tearing the paper.

Stitch Length



- Precise placement:** Following the exact printed lines on your paper foundation is key to achieving your desired result. Use a presser foot with clear visibility, like the Open Embroidery Foot #20C or Reverse Pattern Foot with Clear Sole #34C/34D (Fig. 13). Activate the Laser to see exactly where the needle will land, so your seams start and end precisely on the printed lines.

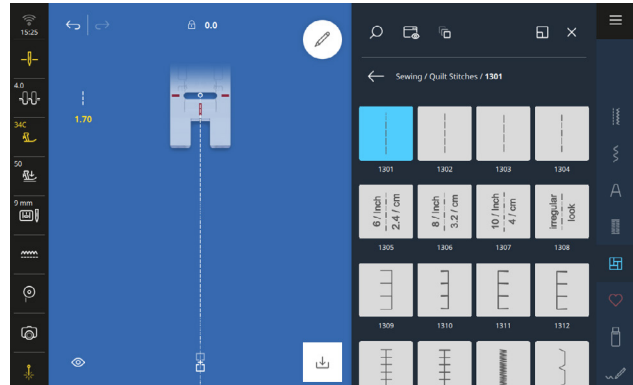


Fig. 13

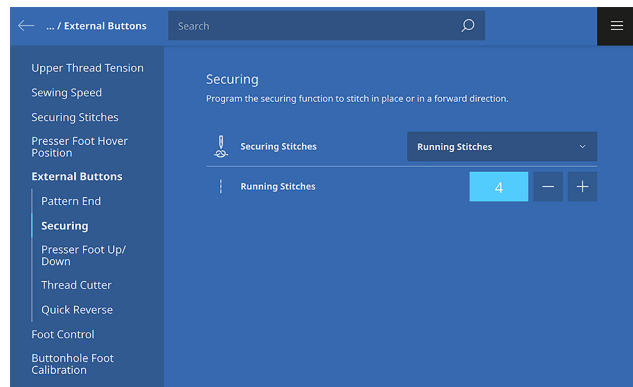


Fig. 14

- Programmable securing:** Some securing options could create more bulk than desired, particularly when many seams are intersecting. Program your securing stitch (with either the Securing button (Fig. 14) or Back-kick on the Foot Control) to sew with running stitches for securing with the least amount of bulk.

WALKING FOOT QUILTING

The simplest way to quilt is using a traditional presser foot and the feed dog to feed the quilt through the machine. The Three-sole Walking Foot with Seam Guide #50 (Fig. 15) is the ideal presser foot for this process because it is engineered to move bulky layers efficiently, with minimal shifting of layers. The foot comes with three interchangeable soles and two guides to aid you in a variety of applications.

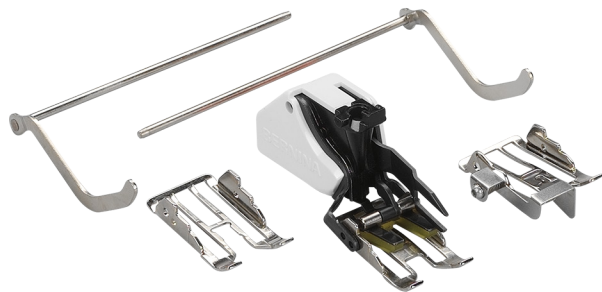


Fig. 15

WHY A WALKING FOOT?

A standard presser foot relies on the feed dog of the machine to move fabric under the foot and through the machine. The walking foot is designed to help grab fabric from the top and the bottom and move it all together.

The walking foot incorporates a set of rubberized feet that are mechanized to move in sync with the movement of the feed dog in order to grip your fabric and move it through the machine with even feeding. This mechanism works by having a small U-shaped fork that sits around the needle bar so that the foot moves with each stitch.

THREE INTERCHANGEABLE SOLES

Three different soles are included with the walking foot—a standard closed-toe sole, an open-toe sole, and a sole with a guide aligned to the center needle position.

The standard closed-toe sole works well for most applications. There is a small groove in line with the center needle position to aid in guiding fabric.

The open-toe sole may be a better option when more visibility is needed in stitching, like when using a wider stitch to quilt, such as a serpentine stitch. There is clear visibility of the needle in all positions.

The sole with center guide is ideal for applications such as stitching in the ditch, edge stitching, or even appliqué on bulky fabrics like wool. Fabric is easily positioned against the guide and the needle position can be adjusted to sew precisely in line with or alongside the guide.

WALKING FOOT OR DUAL FEED?

At first glance, the Walking Foot and Dual Feed may appear to do similar things—they both help feed fabric from the top. So when should you use each option?


The Walking Foot is ideal for handling bulk and many layers that might shift while stitching. This makes it the best option for quilting.


Dual Feed can be used with a wide range of compatible presser feet for specialty applications, such as a zipper foot or a non-stick sole. Dual Feed will help two layers of fabric feed more evenly, like when seaming rows in a quilt or matching a pattern in your backing.

Exercise 4


STRAIGHT-LINE QUILTING

Materials & Machine Settings

 9-patch block from Exercise 2; (1) 8" square of quilting cotton; (1) 8" square of low- to medium-loft batting

 **Needle:** 80/12 Microtex

 **Needle Position:** Center


 **Foot:** Walking Foot #50 with Edgestitch sole



Part One: Stitch-in-the-Ditch

1. Create a quilt sandwich by placing batting between the 9-patch block and the quilting cotton. Use spray adhesive or safety pins to prevent the layers from shifting.
2. In Sewing Mode, select:

File Manager » Quilt Stitches » stitch #1302

3.  Set Needle Stop Down in the Status Bar. This will prevent your stitch from shifting when you need to pause and readjust your quilt.
4. Activate the Pinpoint Laser so you can see your needle land precisely in the "ditch" of your patchwork seams.
5. Place your quilt sandwich underneath the presser foot, aligning the center guide with a seam in your patchwork.

After you start quilting, pause to look behind the presser foot and inspect your stitch. The quilting should fall invisibly into the patchwork seam, but you may need to adjust your needle position slightly to make this so. The direction you have pressed your patchwork seams can affect how neatly the presser foot guide, and thus the quilting seam, falls into the ditch. If your quilting is clearly visible, try moving the needle position to better align with your seam.

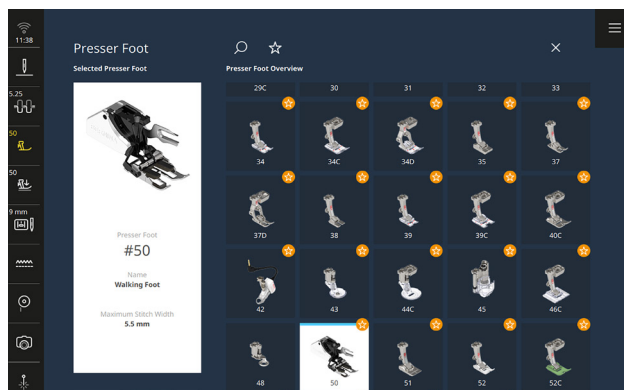


Fig. 16

Tip:

It's a good practice to start quilting from the center and work outward.

Part Two: Channel Quilting

1. Change to the closed-toe sole to the Three-sole Walking Foot with Seam Guide #50.

- Slide the straight bar of the left seam guide through the holes in the collar and walking foot. Set the guide to measure 1" from the groove at the center needle position on the walking foot sole. Tighten the screw on the collar to secure.
- Place the collar on to the back side of the walking foot housing, with the screw fully loosened. Line up the holes in the collar with the holes along the top of the housing.
- Place the quilt under the presser foot and line the guide up to the seam of the first row of your patchwork. Sew across the quilt, keeping the guide on the last line of stitching.
- Practice adding rows of stitches to your 9-patch. Consider trying a serpentine stitch.

SERPENTINE STITCH

A beginner friendly way to quilt with the walking foot is to sew rows of wavy lines. When you use a wavy line stitch, the eye is not drawn to imperfections in the same way as a straight line that could veer or slip to one side of a seam.

In the Quilt Stitches folder, you will find some variations on the serpentine stitch already programmed into the machine: #1317, #1318, and #1319. When selecting stitches to use with the walking foot, keep in mind that you will need to adjust the stitch width to 5.5 mm.

All these stitches are derived from stitch #4, a practical stitch for sewing stretch. You may have learned to use a longer stitch length with stitch #4 to create a wavy line. The difference with the programmed stitches is that they have been optimized for smooth curves at various lengths, while maintaining a consis-

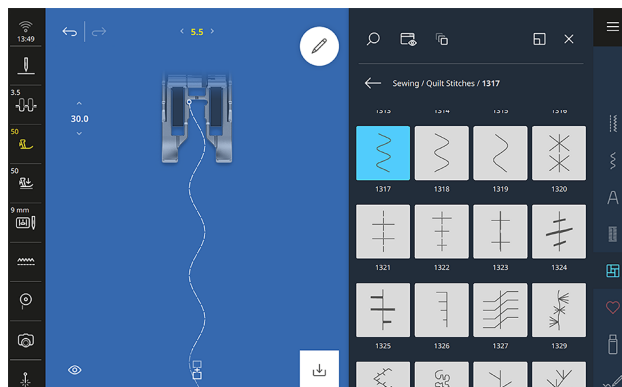


Fig. 17

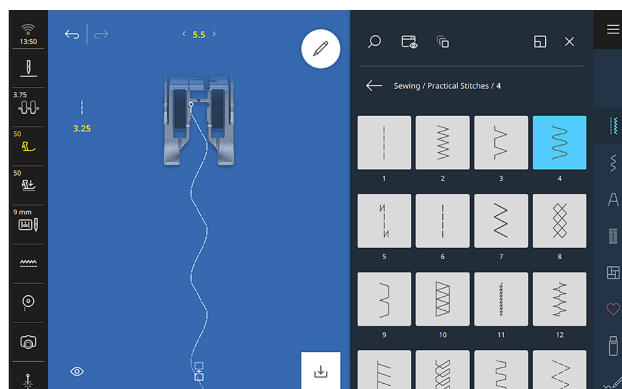


Fig. 18

tent and normal stitch length. Notice how much smoother (Fig. 17) looks compared to an altered version of stitch #4 (Fig. 18).

FEATURE FOCUS

Presser Foot Pressure

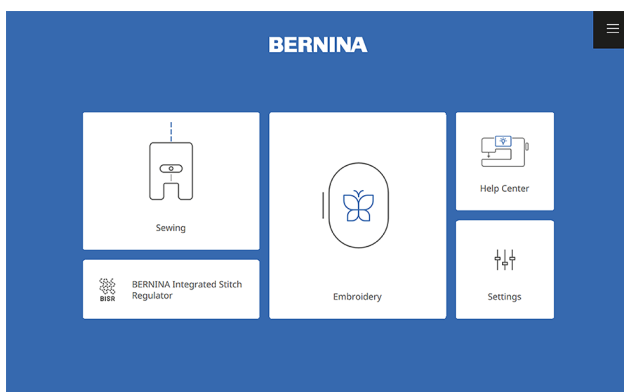
Another option for controlling how evenly a fabric feeds through the machine is to adjust Presser Foot Pressure. When working with thick fabrics, a reduced presser foot pressure enables the fabric to be moved more easily beneath the presser foot. When working with thin fabrics, a higher presser foot pressure prevents the fabric from slipping easily.

FREE-MOTION QUILTING

BERNINA STITCH REGULATOR OPTIONS



The BERNINA Integrated Stitch Regulator (BISR) is a feature designed to assist with free-motion stitching techniques by helping to keep the stitch length regular and consistent. The advantage of using the integrated option is that any free-motion presser foot can be used with the BISR.



Main Menu » Home »
BERNINA Integrated Stitch Regulator

Modes & Settings

BISR and BSR both offer three different modes of operation (Fig. 19). Which mode you use will vary depending on your desired quilting technique and preference.

- **Mode 1:** The needle will stitch constantly, even without the fabric moving, until deactivated, with either the foot control or Start/ Stop button.
- **Mode 2:** The motor is engaged only when the fabric is moved under the foot, giving you time to stop and think about the path the needle is taking.

NOTE: If there is no movement for over seven seconds, the stitch regulator will automatically deactivate.

- **Mode 3:** Used for free-motion basting. Basting stitches can be set to either 2 SPI (stitches per inch) or 4 SPI.

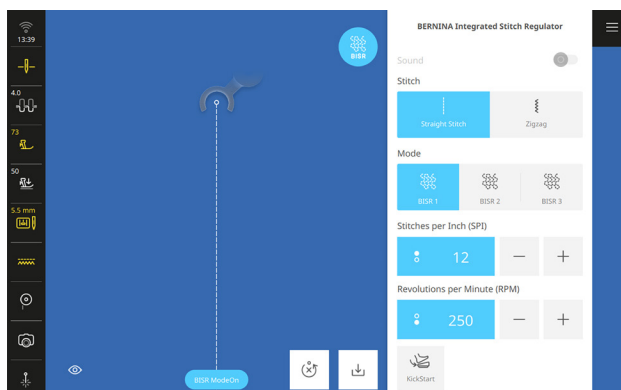
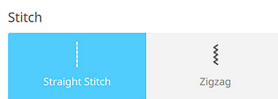


Fig. 19

There are additional setting options available for Modes 1 and 2:

- **Straight stitch or zigzag:** Choose either a straight stitch, for more traditional quilting styles, or a zigzag for a more textured look, like thread painting.



- **Stitches per Inch:** Control your desired stitch length in stitch regulation. This ranges from 2 to 24 SPI with the default being 12.



- **Revolutions per Minute (RPM):** This option is only available with Mode 1. This setting controls the minimum speed of the needle in RPM. Because the needle does not stop

stitching in Mode 1, this is the speed your needle will stitch when you slow your movement to a stop. The minimum is 100 and the maximum is 1000, with the default being 250.

Revolutions per Minute (RPM)



BSR vs BISR?

Stitch regulation is achieved by a sensor detecting the speed of fabric movement and adjusting needle speed to match.

The B 990 features a built-in, or “integrated”, stitch regulator with a sensor that detects the fabric’s movement from the underside, allowing you to use any free-motion foot you wish and achieve perfectly regulated stitch lengths.

The traditional BSR attachment has a sensor that reads fabric from the top side and has three interchangeable soles.

Which one should you use? Whichever you prefer! While they function slightly differently, they offer the same options with stitch length, speed, and Kick-start, and both will give you beautiful, even free-motion stitches.

FEATURE FOCUS

Kick-start

Sewing with stitch regulation can be activated in one of three ways:

- The BERNINA Foot Control as you would when traditionally sewing
- The Start/Stop button on the front of the machine
- With Kick-start (Fig. 20)

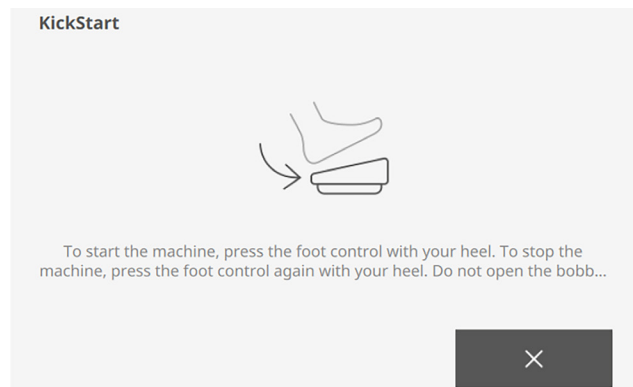


Fig. 20

Kick-start is activated in the BISR menu and allows the Back-kick on the Foot Control to operate as a Start/Stop button on the machine. When active, the Kick-start screen remains open and any other programmed functionality of the Back-kick (i.e. needle up/down, thread cutting, etc) is disabled. When the Kick-start screen is closed, or if you stop stitching for 60 seconds, the feature will turn off.

Exercise 5

STITCH REGULATION

Materials & Machine Settings



(1) 18" x 21" quilt sandwich



Needle: 80/12 Microtex



Needle Position: Center



Foot: Adjustable Stippling Foot #73 or
Free-motion Embroidery Foot #24



Practice the different modes of the BERNINA Integrated Stitch Regulator by working through the following exercise.

Attach the 5.5 mm/BISR Stitch Plate.

1. Place fabric under the presser foot. Activate the Pinpoint Laser in the Status Bar.
2. Select Mode 3 (Basting) and bring the bobbin thread up.
3. Hold your thread tails as you begin stitching and baste around the edges of your sample quilt sandwich. Baste down the center of the quilt vertically and horizontally, dividing the quilt into quadrants.
4. Select Mode 1. Hold the needle thread and press the Needle Up/Down button two times to pull the bobbin thread to the top of the fabric.
5. Practice quilting meandering boxes (Fig. 23) across one half of your sandwich using Mode 1. Try other designs that include crisp points, like hearts or leaves.
6. Select Mode 2. Practice filling in the other half of your sandwich with meandering curves (Fig. 24) in this mode. Try designs with smoother curves and no points, like pebbles or stippling.
7. In the final two quadrants, work on Rulerwork techniques.

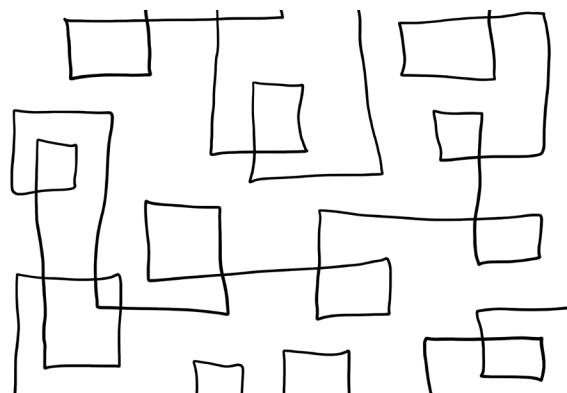


Fig. 23

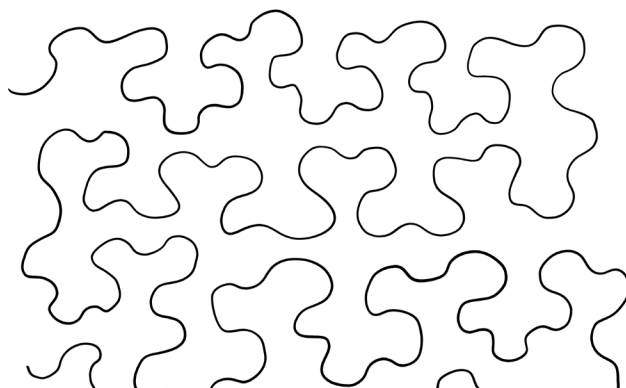


Fig. 24

RULERWORK QUILTING

Rulerwork (Fig. 21) is a quilting technique that uses Adjustable Ruler Foot #72/72S and clear template rulers to guide quilting designs. There are many different styles and shapes of rulers available to help you create endless custom quilting designs.

Rulerwork is a skill that requires some practice to learn. There are several great tutorials online and in books to help you learn how to work with rulers. Here are some simple steps to follow to get started.

1. Attach Adjustable Ruler Foot #72 or Adjustable Ruler Foot with Slit #72S to the machine.
2. Select the Presser Foot menu. Select foot #72.
3. In the Status Bar, set the needle to Stop Down.
4. In the BERNINA Integrated Stitch Regulator menu, select Mode 2.
5. Bring the bobbin thread up by holding the needle thread tail and pressing the Needle Up/Down button (Fig. 22) two times.
6. Lower the needle and presser foot, then slide the edge of the ruler up next to the foot.
7. Hold the ruler with fingertips and with enough pressure to move the ruler and fabric as one, gently guide along the presser foot edge.

For a longer line, stop and reposition the ruler to begin again. Always begin with the foot down and needle down before placing the ruler next to the foot.



Fig. 21

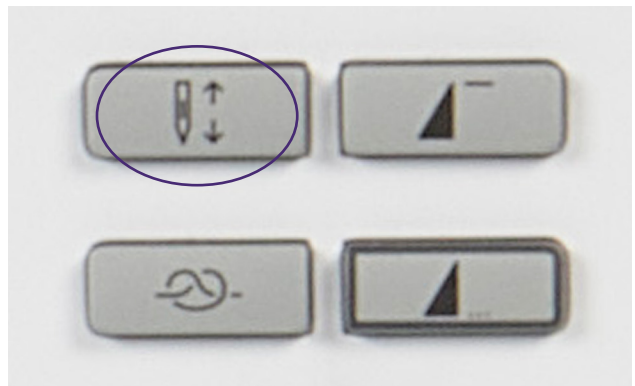


Fig. 22

Tip:

Avoid pressing too hard on the ruler or too hard against the foot; both will make moving the fabric difficult.

COMPUTERIZED QUILTING

Computerized quilting allows you to automate your quilting process using the BERNINA 990 embroidery module and embroidery hoops. Quilting can be laid out using existing Customizable Quilt Designs or by using built-in decorative stitches to create a one-of-a-kind design. This chapter will walk you through both options and share tips for stitching out computerized quilting successfully.

HOOPING QUILTS



Fig. 25



Hooping quilts is different than standard embroidery hooping with fabric and stabilizer. Quilts are bulky, heavy, and have multiple layers that all must be hooped smoothly. Here are a few tips for successfully hooping your quilts.

- **Use extra clips on the Giant Hoop:** If using the Giant Hoop for your computerized quilting, use the extra clips to hold your quilt sandwich in the hoop.
- **Pin-less basting:** Baste your quilt sandwich without safety pins. Using pins can create challenges with hooping and add significant weight to your quilt. Instead, use temporary adhesive spray, fusible batting, or thread baste (like with BISR Mode 3), or any combination of these.
- **Try a Clamp Hoop:** BERNINA Clamp Hoops (optional accessories) are designed for computerized quilting. They include a thick acrylic template with markings for different sized quilt blocks in $\frac{1}{4}$ " increments. The template is lined up on the quilt top, then the quilt is pressed down into the hoop and secured with clamps all the way around the edge.
- **Keep re-hooping simple:** After first hooping your quilt and placing it on the machine, try to move the quilt on and off the machine as little as possible by re-hooping at the machine. When it is time to re-hoop, remove the inner ring of the embroidery hoop (or clamps, if using a Clamp Hoop), reposition the quilt, then replace the inner ring or clamps.

PLACEMENT SCANNER

Use the Placement Scanner for accurate visualization and placement of your quilt designs before you stitch. Scanning your quilt will allow you to use the hooped quilt as the background in your Design Altering Area.

Main Menu » Home » Embroidery

1. Hoop your quilt.
2. Select Embroidery Foot #26 from Presser Foot Selection menu.
3.  Select the View Toolbar.
4.  Select the Hoop Background icon.

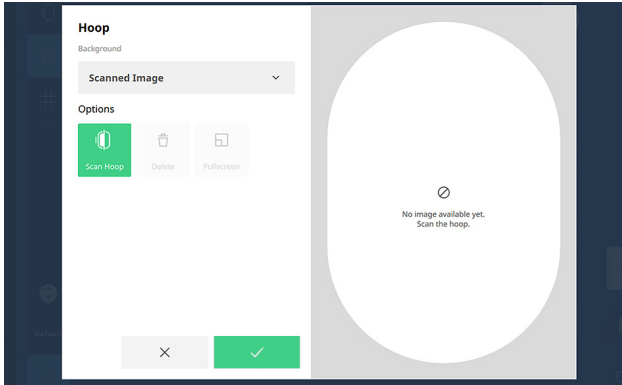


Fig. 26

5. Select Scanned Image from the dropdown, then Scan Hoop (Fig. 26).
6. Attach the embroidery hoop when the machine prompts you to do so. The machine will then ask you to verify that the area around the machine and hoop are free of obstacles. Select Confirm. The machine will begin scanning the embroidery hoop.
7. When the machine has finished scanning, a preview of the scan will appear. Select Confirm to return to the Design Altering Area.
8. Close the View Toolbar.

After scanning, you can toggle the scanned image background on or off at any time by opening the View Toolbar and selecting Background On/Off. The scanned image will be saved in the machine until deleted or a new scan is created.

CUSTOMIZABLE QUILT DESIGNS

Customizable Quilt Designs are stitching files that perform differently than a standard embroidery files. These designs can be resized to any size and stitches will be recalculated for your desired SPI setting. The preferred file type is BQM, but the BERNINA 990 can also read HQF, PAT, PLI, QLI, and TAP.

Set SPI for Quilt Designs

Main Menu » Settings » Embroidery » SPI (Customizable Quilt Designs)

The stitch length for Customizable Quilt Designs can be set as long as 4 SPI or as short as 24 SPI (Fig. 27). Any time a design in this format is set up and stitched out, it will stitch at the set SPI.

If you make a change to your SPI settings while preparing a Customizable Quilt Design, you must change the setting before going to Stitchout for the stitch length change to take effect.

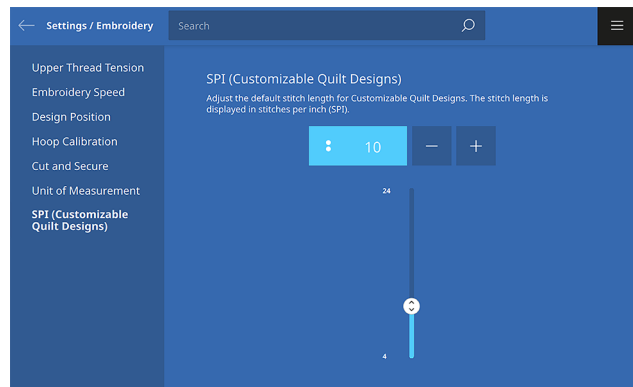


Fig. 27


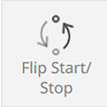

TIP:

More intricate designs with tighter curves may necessitate a shorter stitch length (higher number) in order to maintain smooth curves.

FEATURE FOCUS

Start/Stop Editing

On the B 990, we can toggle on a setting in the Edit Menu to show the start and stop points on our designs. Besides seeing the exact start and end points, there are also tools to help arrange or alter the designs to create continuous quilting from multiple individual motifs.

-  **Show Start/Stop:** Under the Position submenu, when this is active (highlighted in yellow), green and red crosshairs will appear on the designs at the first and last stitch, respectively. This allows you to visualize the direction of stitching on your design. Once turned on, it will remain on until deactivated.
-  **Flip Start/Stop:** When arranging multiple quilting designs, they may align visually, but their stitching paths might not allow one design to move continuously into the next. Flip Start/Stop, also under the Position submenu, will reverse the stitching path without altering the design visually. Flip Start/Stop works only with customizable quilt designs.
-  **Match Start/Stop:** To ensure that designs are aligned perfectly, Match Start/Stop, in the Arrange submenu, will snap the selected designs together so that one design will start precisely where the previous one ended with no visual “jump” between the two.

Tip:

For computerized quilting (quilting in the hoop), it is recommended to use the standard (black) bobbin case and increase your needle tension slightly. Traditional embroidery has more tension on the bobbin thread than the needle thread, pulling the needle thread to the back side of the fabric. For quilting, you want the needle thread and bobbin thread to intersect in the middle of the quilt sandwich.

QUILT STITCHOUT SETTINGS

Computerized quilting requires unique settings to ensure the designs stitch out as beautifully balanced quilting stitches rather than traditional embroidery. Here are some tips to achieve great results when sewing computerized quilt designs.

- Use the same thread (fiber and weight) in both the needle and bobbin. You may wish to use contrasting colors for testing your design, but use the same color for best results in your final project.
- Test your thread/fabric/batting combination. You may need to make adjustments to your machine, such as the SPI setting.
- Adjust the thread tension. Compared to traditional embroidery, computerized quilting requires more tension on the upper thread in order to create a balanced stitch. In the Status Bar, select Upper Thread Tension. Increase the thread tension as desired.

Stitchout Summary



When you have finished arranging your quilting designs, select Stitchout. The Stitchout Summary page will appear (Fig. 28) and you can check common stitchout settings.

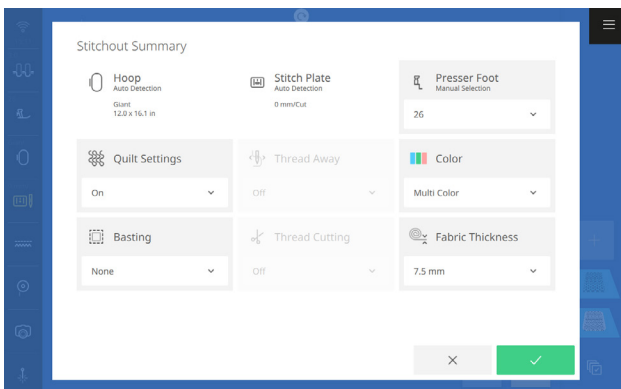



Fig. 28


- **Quilt Settings:** In this dropdown, turn the Quilt Settings on. When Quilt Settings are turned on, you will see Thread Away and Thread Cutting are disabled. There will be no automatic thread cuts or Thread Away movement between thread cuts. A unique quilting securing stitch will also be activated. This securing stitch is a series of short running stitches that create less bulk than a traditional embroidery securing stitch.
 - **Color:** Set to Reduce Thread Changes. This will have the machine read all designs or objects that are the same color as one unified item. The machine will not stop or secure between designs. This will allow designs that are aligned properly to stitch in one fluid, continuous line.
 - **Fabric Thickness:** Set to 7.5 mm. Increasing the Fabric Thickness setting will also help you achieve a better balanced stitch.
- Once you have selected all your preferred settings, select confirm to go to stitchout. Attach the embroidery hoop to the module arm when prompted. Be sure that no loose parts of the quilt are trapped under the hoop before stitching.
- Handling quilts with the embroidery module takes some practice, but here some good rules for working with quilts in the hoop.
- **Pull Up Bobbin Thread:** Holding your needle thread tail, press the Needle Up/Down button to use the Thread Up command and bring your bobbin thread to the top side of your quilt. It is important to hold and manage your thread tails at the start of stitching when Quilt Settings are active.
 - **Press the Start/Stop button:** Begin stitching with the Start/Stop button while holding both the needle and bobbin thread tails. The machine will slowly stitch the securing stitches then proceed at speed into the quilting design. Stop the machine after securing, trim or move excess threads, then press Start to continue and finish the quilting design. When the design is finished stitching, cut threads as desired.
 - **Work center outward:** As you work from the center of the quilt outward, always keep the bulkiest part of the quilt out of the freearm area. This will make it less likely that part of the quilt will slip under the hoop in the sewing process.

Exercise 6


ARRANGING QUILT DESIGNS

Materials & Machine Settings

 (1) 18" x 21" quilt sandwich

 **Needle:** 80/12 Microtex


 **Needle Position:** Center

 **Foot:** Embroidery Foot #26


Several settings and tools in your BERNINA will help you arrange quilting designs with as few starts and stops as possible. Work through the following exercise to create a unified quilting motif using multiple designs.

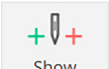
1. Select the Main Menu, then Embroidery mode.

**File Manager » Embroidery Designs »
Inspirations » Quilt**

2. Select design #Q135.
3.  Select Add Design in the Layer Bar.

4. Select design #Q130 to add it to the composition.
5. In the Status Bar, select the Hoop menu. Select the Giant Hoop (Fig. 29).
6. Drag and drop the designs in the Design Altering Area so that the leaves are below the circle, creating the rough image of a flower (Fig. 30). To select different designs in the composition, tap them in the Design Altering Area or select them from the Layer Bar.

7.  Tap the Edit menu icon.

8.  In the Position submenu, activate Show Start/Stop.

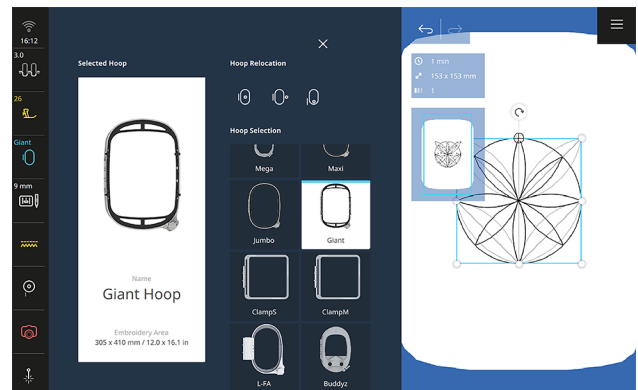
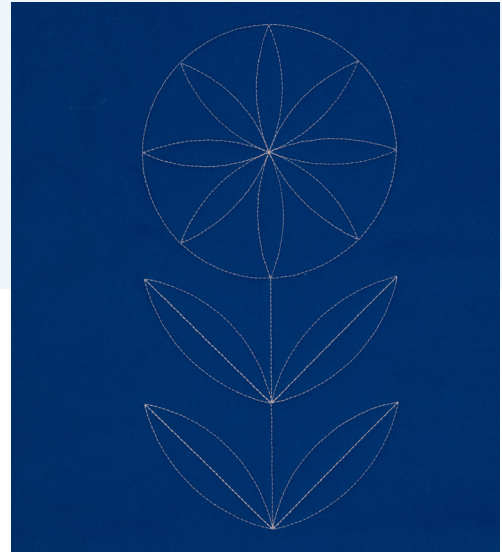


Fig. 29

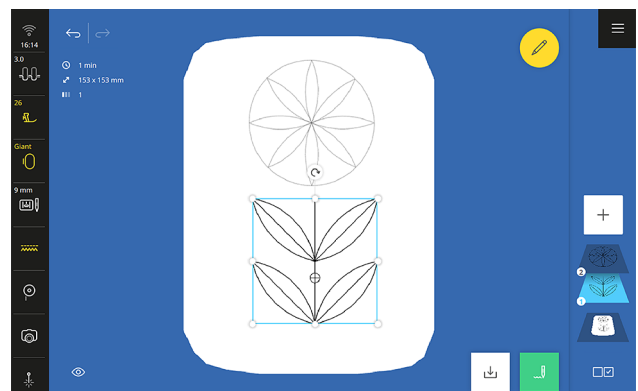
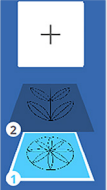
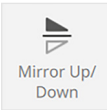


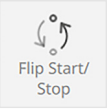
Fig. 30

- 

Select the flower bloom layer in the Layer Bar. Drag and drop to set it as Layer 1. The bloom design will start and stop at the same spot, currently at the top of the design.

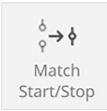
- 

Select Mirror Up/Down. The start and stop are now at the bottom of the flower “bloom,” near the top of the flower stem (Fig. 31).

- 

Select the stem-and-leaf design. Select Flip Start/Stop. The stitching path is now reversed so that the start is at the top and the stop is at the bottom.

- Select both layers in the composition by tapping the bottom layer in the Layer Bar.

- 

Select Match Start/Stop. The designs will move to perfectly align so that the stop point of the first design flows directly into the start point of the next (Fig. 32).

- Select Group.

- Select Move, then the Center icon.

- Select the green needle icon to go to Stitchout.

- In the Stitchout Summary, turn Quilt Settings on, set Color to Reduce Thread Changes, and Fabric Thickness to 7.5 mm, then confirm.

- Bring the bobbin thread up by holding the needle thread tail and pressing the Needle Up/Down button. After the design is secured and in progress, you may let go of threads or pause the machine to trim them. When the design is finished, cut threads manually.

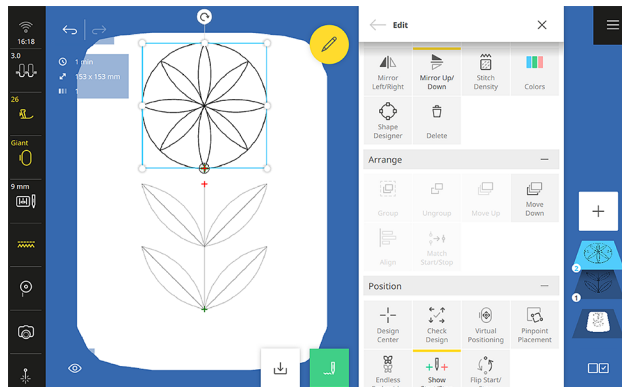


Fig. 31

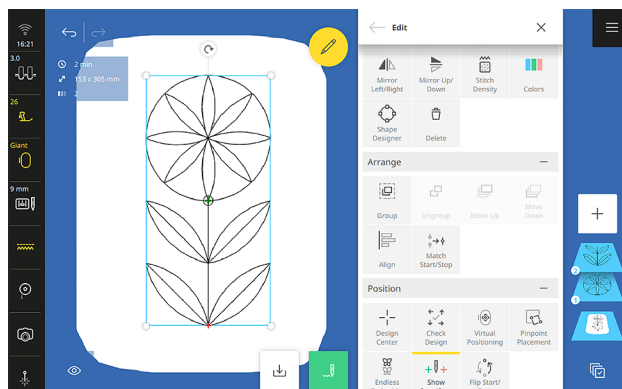


Fig. 32

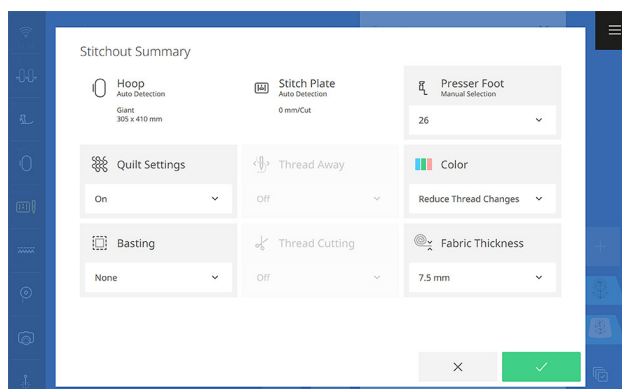



Fig. 33

Exercise 7


DECORATIVE STITCH QUILT BACKGROUND

Materials & Machine Settings

 (1) 18" x 21" quilt sandwich

 **Needle:** 80/12 Microtex

 **Needle Position:** Center

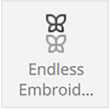
 **Foot:** Embroidery Foot #26

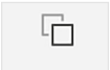
Decorative stitches can be used to quilt fabric in the hoop and many of them work well for simple all-over quilting designs or quilted backgrounds.

1. In Embroidery Mode, select:

Add design » Sewing » Decorative Stitches » folder #1601

2. Select stitch #1614.
3. Select the Giant Hoop from the Hoop menu. Close the Hoop menu (Fig. 34).
4. Open the Edit menu and tap Show Start/Stop.

5.  Select Endless Embroidery. Endless Embroidery will stack the design as many times as it will fit vertically in the selected embroidery hoop. Under Spacing, reduce the design spacing to -0.3mm, so that the design start/stop points line up exactly. Deselect the four blue-highlighted References Points (Fig. 35). Tap the green checkmark to confirm and close Endless Embroidery.

6. In the Design Altering Area, move the design to the left edge of the embroidery hoop.
7.  Select Duplicate to copy the design to the right of the original.

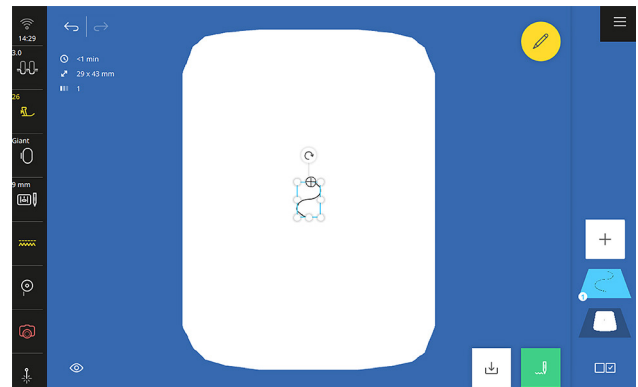
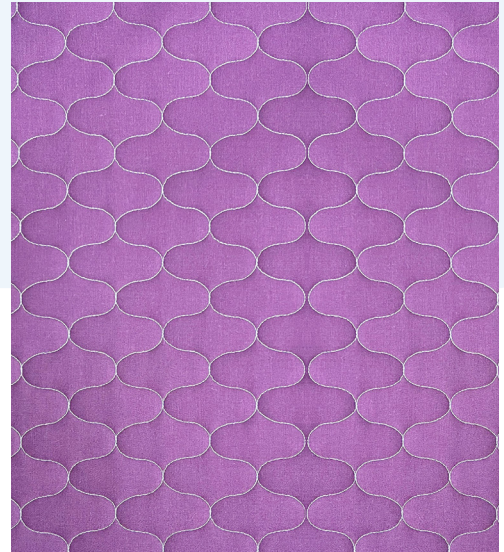


Fig. 34

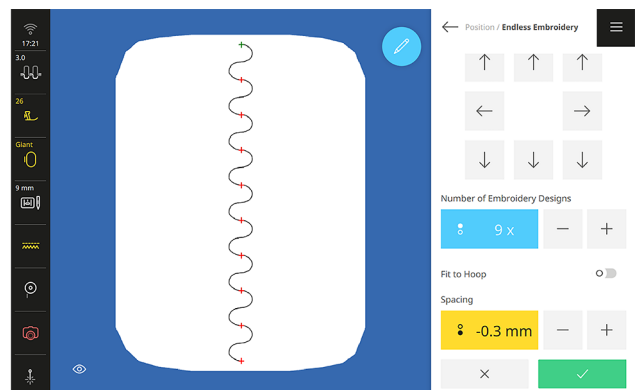


Fig. 35

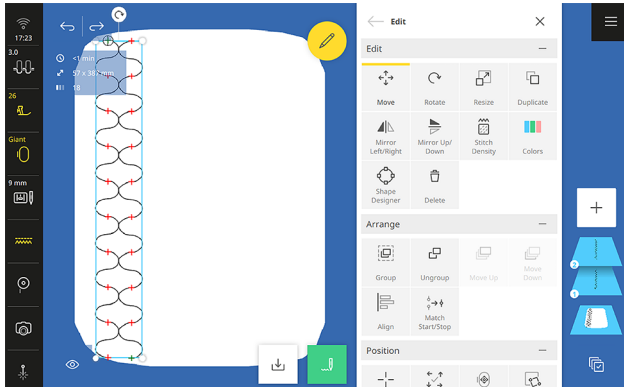


Fig. 36

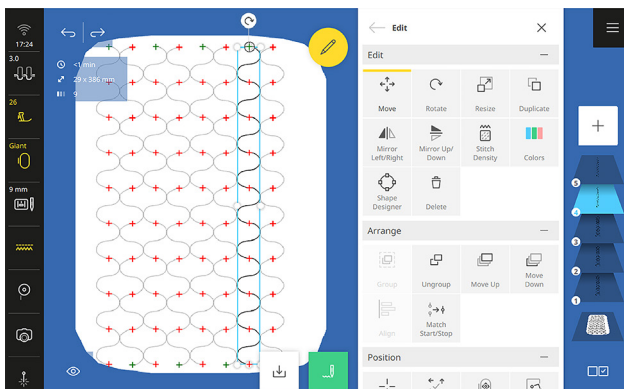


Fig. 37

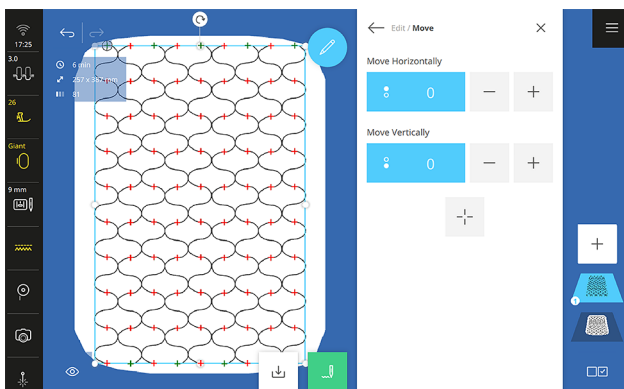


Fig. 38

8. Select Mirror Up/Down (Fig. 36).
9. Select all layers in the composition by tapping the bottom layer in the Layer Bar.
10. Select Group.
11. Select Duplicate three more times to create a total of four layers in the Layer Bar.
12. Select Layer 4 and tap Ungroup. A new Layer 5 will appear.
13. With only Layer 4 still selected, tap Duplicate once. There are now six layers in the Layer Bar and the decorative stitch design should fill almost the entire embroidery hoop.
14. Select all layers in the composition by tapping the bottom layer in the Layer Bar.
15. Select Group.
16. Select Move, then tap the Center function to bring the entire composition to the center of the hoop (Fig. 38).

Your new decorative stitch composition can be stitched out in one full hooping on a small piece of fabric for small projects or quilt the stitch composition on a larger project by continually re-hooping and repositioning the design.

Thread Tails:

Some quilters take the time to bury their thread tails with a hand sewing needle while some trim right to the fabric surface. How you manage thread tails ultimately comes to personal preference. Your quilting will be plenty secure using the Quilt Settings during Stitchout but some prefer the added security of neatly burying then trimming tails.

LETTERING

An important part of the quilt making process is marking your work for generations to come. Embroidering a label for your quilt is quick, easy, and will hold up through years or even decades of use and washes.

On the sewing side of the machine, consider using the Alphabet Stitches and Combi Mode to create a simple row of text that can be stitched onto the binding of a quilt for a quick and clever way to add a name or date.

SIMPLE COMBI MODE LABEL


Follow along at your machine screen or refer back to these directions to use this method of quilt labeling on the binding.



1.  Open Combi Mode on your screen.

2. Select:

File Manager » Alphabet Stitches » Block

3. Type the word "SEW" (notice the option for upper/lower case letters, numbers, and characters).

4.  Select the View icon at the bottom left of the screen.

5. 
 Select Presser Foot Off and Rotate, which rotates the text horizontally, allowing you to read the lettering easily should you wish to add additional stitches or a date to your text.

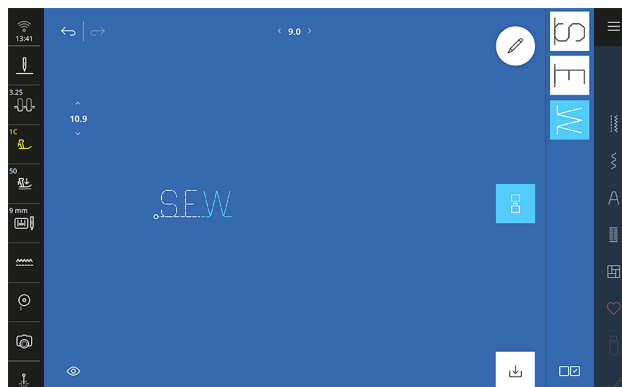


Fig. 39

Remember, you can save combination stitches in your personal folder to use over and over again.


LETTERING IN EMBROIDERY


A nice touch to a handmade quilt is a beautiful embroidered label on the back of the quilt. The lettering in embroidery on the B 990 offers you a wide range of built-in fonts that can be set to any size with full stitch recalculation. For quilt labels, this allows us to make tiny lettering and have it stitch out smoothly with beautiful, consistent stitch quality. Stitch out the following exercise in Embroidery.

Exercise 8


EMBROIDERED QUILT LABEL

Materials & Machine Settings

 (1) 12" x 15" piece of woven fabric hooped with (1) 12" x 15" piece of tearaway stabilizer

 **Needle:** 80/12 Microtex

 **Needle Position:** Center

 **Foot:** Embroidery Foot #26

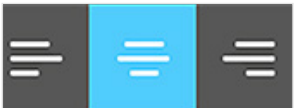
Labeling your work has never been easier than with the Editing and Advanced Lettering tools on the BERNINA 990.

Write Your Message

1. In Embroidery Mode, select:

Add Design » Lettering

2. Select the first font, Art Deco Block. The Lettering window will open.
3. Use the keyboard to type in the phrase "Made with Love". Select the Return key, then type "On My BERNINA 990". Select the Return key and type the current month and year.

4.  At the top left of the keyboard, select Center

Alignment.

5. Swipe to scroll through the font options, previewing how your lettering looks in different fonts. Select Children's Slab and select the green checkmark to confirm (Fig. 40).
6. Use any of the corner handles on the design to resize your lettering to approximately 5 ½" wide by 1 ½" tall (approximately 38%).

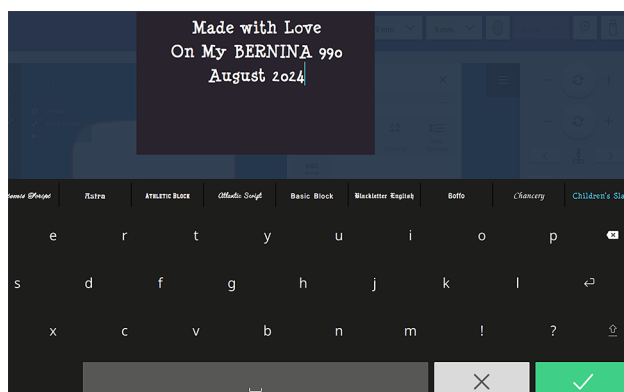
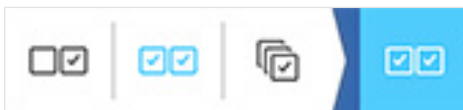


Fig. 40

Create a Frame

Add Design » Embroidery Folder » Embroidery Designs » Borders

7. Select the back arrow in the File Manager to return to the Embroidery folder. Open design #82008-45.
8. Drag the design to the left in the Design Altering Area, so that the space between the leaves fits around the lettering (Fig. 41).
9. In the Edit menu, tap Duplicate to copy the border design.
10. Tap Mirror Left/Right and Mirror Up/Down to create an inverse version of the first design. Drag the design in the Design Altering Area to align with the left border design around the right side of the lettering (Fig. 42).
11. Tap Selection Options under the Layer Bar and choose Multiple Selection. Select the two frame designs, Layers 2 and 3.



12. Select Group.
13. Select the bottom layer in the Layer Bar to select all.
14. In the Edit menu, select Align, then Center Vertical and Center Horizontal.
15. Tap Selection Options under the Layer Bar and choose Single Selection. Select Layer 1, the label lettering.



16. Under the Lettering submenu, select Line Spacing.

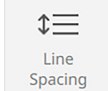


Fig. 41

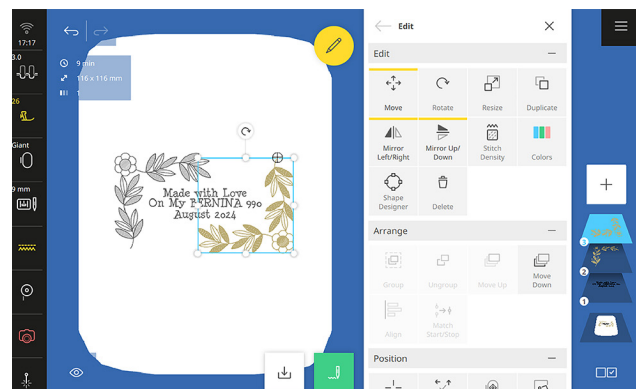


Fig. 42



Fig. 43

17. Increase the line spacing to 175 to fill more of the space within your frame (Fig. 43).
18. Select the bottom most (not numbered) layer in the Layer Bar to select all.
19. In the Edit menu, under the Arrange submenu, select Group. The entire composition is now grouped together as one layer or object (Fig. 44).
20. Save the quilt label composition for later use and/or select the green Stitchout icon to sew out your quilt label.



Fig. 44

TIP:

With designs that end up wider than they are tall, rotate them by 90 degrees to ensure they stitchout in the smallest possible hoop.



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