



Free-motion Stitching

One way to become comfortable with free-motion stitching is to learn to “doodle” with the needle and thread. You move the fabric as the needle moves up and down; each time the needle completes one cycle, a stitch is created. The length of the stitches is determined by the motor speed and by how fast or how slow the fabric is moved under the needle. For most free-hand techniques, smooth lines and evenly spaced stitches are preferred; this usually takes a bit of practice to achieve. *TIP: Use the BERNINA® Stitch Regulator (BSR), if available, to assist in the production of regular, even free-motion stitching (see page 18-19).*

Beginning to Stitch

Raise the presser foot and the needle to slide the hooped fabric into position. The fabric should lie against the bed of the sewing machine. *Note: For proper hoop support, place the sewing machine in a cabinet, attach the Slide-On Table to the machine, or place the clear acrylic BERNINA® Sewing Table around the freearm of the machine before positioning the hoop under the needle.*

Place hooped fabric under the presser foot. Lower the presser foot; even though the foot does not touch the fabric, the presser foot lifter must be lowered to engage the tension disks.

Use the foot control or Needle Stop Up/Down button to sew *one stitch*, stopping with the needle up. Pull needle thread to bring bobbin thread up to the surface. Holding the thread tails toward the back of the machine, sew a few stitches nearly – but not quite – in place to secure the stitching. Clip thread tails.

Begin stitching, running the machine at a moderate speed while moving the hoop in a smooth, controlled manner. As you move the fabric, keep the tightening screw side of the hoop to the left; movements should be forward and back and side-to-side, *without turning or rotating the hoop.*

Practice Exercises

Practice making simple, repetitive shapes to become comfortable with moving the fabric and to gain control over

Fabric Preparation Tips

Most free-motion stitching is worked with fabric that has been stabilized and hooped (in a wooden machine embroidery hoop) so it is a smooth, taut surface on which to stitch. When preparing the fabric, there are a few points to remember:

- Use temporary spray adhesive to adhere the stabilizer (cut-away, tear-away, etc.) to the wrong side of the fabric.
- If using a pattern or design, transfer it to the fabric before hooping using a fabric marker or other method. *Note: See page 24 for specific directions for Bobbin Play, which requires the pattern to be transferred to the wrong side (stabilizer) of the project.*
- After placing the fabric between the inner and outer hoops, push the inner hoop down. Tighten the clamping screw finger-tight. If the inner hoop does not easily slide into the outer hoop, further loosen the clamping screw. *Note: Although it is possible to force the inner hoop into the outer hoop with a tight screw, this may cause fabric burn, permanently damaging the fabric.*
- Tighten the fabric within the hoop, keeping the fabric grain lines straight. Fabric should be “drum-tight” – but not stretched out of shape – within the hoop.

your movements before trying the free-motion techniques described on the following pages. Become comfortable with the feel and the movement of the hoop; this takes practice so don't give up!



Writing your name or other words is also a great practice exercise. Use a cursive style, connecting all letters of one word in one continuous motion. Focus on where the needle needs to go rather than where your hands are and soon it will become as natural as writing with a pencil.



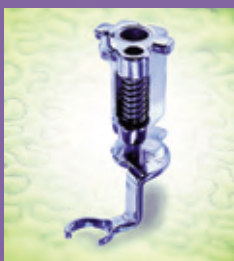
There are several BERNINA® free-motion presser feet that are specifically designed for free-motion stitching. All of them are spring-loaded feet designed to work with the hopper mechanism of the machine to keep the fabric from “flagging” (travelling up the needle). When lowered, these feet do not “sit” on the fabric as they are not designed to come in contact with the feed dog of the machine.



- **Darning Foot #9** – the original BERNINA® free-motion foot, #9 has a round needle opening and is primarily used for darning although it is suitable for most free-motion techniques.



- **Embroidery Foot #15** – designed for use with BERNINA® embroidery systems, this foot can also be used for most free-motion techniques.



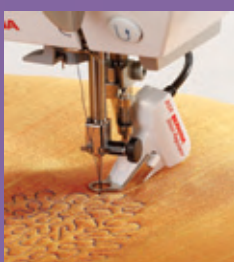
- **Freehand Embroidery Foot #24** – similar to Darning Foot #9, but with an opening in the front of the foot for better visibility; especially helpful when following a marked design.



- **Teardrop Embroidery Foot #26** – this foot is for machine embroidery with the *aurora* and *artista* embroidery systems. The teardrop shaped needle opening is designed for improved fabric handling, providing more support around the needle, preventing even small amounts of flagging (fabric travelling up the needle).



- **Freehand Quilting Foot #29** – designed for use with multiple layers of fabric such as a quilt; also available (as 29C) for BERNINA® machines that have a rotary hook system with stitches up to 9mm wide.



- **BERNINA® Stitch Regulator #42** – this innovative presser foot is designed to work with certain models of BERNINA® machines to produce even, consistent straight and/or zigzag stitches. For more information, see pages 18-19.

BERNINA® Stitch Regulator

The BERNINA® Stitch Regulator (BSR) makes free-motion stitching techniques easy to master, even for beginners. The BSR adjusts the speed of the needle to coordinate with the movement of the fabric, aiding in the production of consistent, regular stitches. *Note: The BERNINA® Stitch Regulator may be used only on BERNINA® sewing systems equipped with the BSR connection (aurora 430/440 (straight stitch only), artista 630/640, artista 730, and the artista 200 (with Upgrade Kit installed). Note: See chart on following page.*

Producing evenly spaced stitches in straight lines with smooth curves requires practice – coordinating the speed of stitching with the speed of fabric movement can be somewhat intimidating. By eliminating much of the free-motion learning curve, the BERNINA® Stitch Regulator allows the sewer to concentrate on creating a beautiful design rather than on the mechanics of forming individual stitches. As fabric is moved under the BERNINA® Stitch Regulator's optical sensor, the BSR adjusts the motor speed of the machine and the up-and-down motion of the needle to correspond with that of the fabric. If the sensor does not sense any fabric movement for seven seconds, the BSR automatically deactivates and the red light goes off.

When using the BERNINA® Stitch Regulator, the presser foot pressure is reduced to 0 and the feed dog mechanism is lowered; this allows the fabric to be moved freely under the sole of the foot. A consistent stitch length is maintained when the fabric is moved within the allowed speed range; exceeding this rate distorts the consistency of the stitch. When activated, an audio signal beeps if the fabric movement under the foot is too rapid.

A Choice of Stitches

Depending on the model of machine equipped with the BSR, you can select a straight stitch or a zigzag stitch for your free-motion stitching. Straight stitch can be used for most techniques such as quilting, thread painting, raw edge appliqué and bobbin work. The zigzag stitch works well to add dimension to thread-painted motifs, to fill in initials for monograms, and to use for decorative embellishments such as a unique free-form appliqué stitch.

A Choice of Stitching Modes

The BERNINA® Stitch Regulator has two stitching modes. Deciding which to use for a specific technique is a matter of personal preference.

Mode 1 provides continuous power to the needle. When the foot control is depressed or the Start/Stop button is engaged, the needle moves up and down – stitching in place at a reduced speed – until the BSR senses fabric movement. Then the machine speeds up and slows down as fabric is moved under the foot. The needle will continue to move up and down even if the foot does not sense fabric movement. When stitching in Mode 1, secure thread tails by selecting a short stitch length and moving the fabric under the needle along the design pattern line. To hide the securing stitches, begin sewing a short distance ($\frac{1}{8}$ ") from the starting end of the draw line, then stitch back to the beginning of the design. Disengage the BERNINA® Stitch Regulator and cut the thread tails. Re-engage the BSR and lengthen the stitch; resume stitching, placing the longer stitches exactly on top of the securing stitches to hide them.



The most consistent stitch length is maintained when the fabric is moved smoothly – without abrupt changes in direction or speed. When the fabric movement exceeds the limits of the BSR, an audio signal “beeps” as a reminder to reduce speed.

Mode 2 does not engage the needle until either the foot control or Start/Stop button is engaged and the fabric is moved. If the foot does not sense fabric movement, the needle stops moving up and down even if the foot control is depressed or the Start/Stop unit is still active. Selecting Mode 2 enables the use of the Security Function for locking stitches. Position the needle over the beginning of the design, then activate the BERNINA® Stitch Regulator by depressing the foot control or engaging the Start/Stop button. Set the desired stitch length, then touch the Securing function. The needle will move up and down, taking four stitches and securing the thread tails to the fabric. When the needle stops moving, move the fabric under the needle and stitch the design. Touch the Securing function again at the completion of the stitched design to secure the stitching; clip thread ends.

A Choice of Soles

The BERNINA® Stitch Regulator is packaged with three interchangeable soles. Following are guidelines for using these soles, but ultimately the choice of which sole to use is a personal preference. Try them all to determine which sole you prefer for specific techniques.

- Closed Metal Sole - similar to the Darning Foot #9. It is used for free-motion darning, free-motion stipple quilting, free-motion echo quilting, and free-motion embroidery.
- Open Metal Sole - similar to the Freehand Embroidery Foot #24, the front of the foot is cut away, providing better visibility to the needle area. Use this foot for free-motion embroidery and free-motion quilting techniques on thick, smooth fabrics. The curved design of the foot's toes move easily over multiple layers of fabric. *Note: The Open Metal Sole is **not** suitable for loopy fabrics such as terry toweling or bouclé; the toes of the sole can become entangled in the material's loops.*
- Transparent Sole - rounded with cross hairs and concentric circle guides etched into the foot. Use the cross hairs as a guide when stitching straight lines in the ditch. The concentric circles are helpful guides for echo quilting.

The stitched design to the right was created by Kayla Kennington using free-motion straight and zigzag stitching with the BERNINA® Stitch Regulator.

BERNINA® STITCH REGULATOR

MODELS	AVAILABILITY	STITCHES
artista 730E and artista 730	standard	straight stitch and zigzag stitch
artista 200E and artista 200	optional as an upgrade	straight stitch and zigzag stitch
artista 640E and artista 640	optional	straight stitch and zigzag stitch
artista 630E and artista 630	optional	straight stitch and zigzag stitch
aurora 440 QEE and aurora 440 QE	standard	straight stitch
aurora 430E and aurora 430	optional	straight stitch



Thread Painting

Using the needle as a “brush” and the thread as “paint” lets you imagine almost anything and then translate it into thread “painted” onto fabric. Both the straight stitch and zigzag stitch can be used for this technique, offering different textures and styles for your artwork.

Preparation:

Draw the design onto the fabric. The work must be stabilized so stitching will not pucker; choose a stabilizer to complement the fabric. Place the stabilizer on the wrong side of the fabric, adhering it with temporary spray adhesive if desired. Hoop fabric and stabilizer as one unit. Set the machine for straight or zigzag stitching as desired.

Attach your favorite free-motion foot to the machine. (see page 17) *Note: If using BSR, set stitch length at 0.4 to 1.5mm.*

Stitching:

Position the hooped project under the needle and lower the presser foot. Take a single stitch. Pull the needle thread to bring the bobbin thread up to the surface. Holding both the needle and bobbin threads, take 3 or 4 short stitches to secure the thread to the fabric. Trim the thread tails close to the fabric. Keep hands to the sides of the hoop – the feed-dog is disengaged, so the hands must move the fabric forward and backward, side to side.

To “paint” with a straight stitch, sew multiple rows of stitches side by side, following the contour of the design area. To “paint” with a zigzag stitch, move the hoop in a forward and back motion, filling in the design area with thread. Use the straight stitch to outline, accent, and define lines within the design. Accent lines are often sewn with thread colors one shade lighter or darker than the background area. Contrasting thread colors can also be effective. An accent line can be a single or a double line of stitching. If using a double line, place stitches on top of each other. When a section of the design is complete, take several small stitches to secure the thread to the fabric. Trim the needle and bobbin thread close to the fabric.

THREAD SHADING

Add additional accent colors to a thread-painted or embroidered design with simple shading, blending, and/or feathering techniques. Set the machine for zigzag stitching. *Note: If using BSR, set stitch length at 1mm to 1.5mm.*

Position the needle over the area to be shaded, feathered, or blended. Lower the presser foot and take a single stitch. Pull the needle thread to bring the bobbin thread to the surface. Holding both the needle and bobbin threads, take 3 or 4 short stitches to secure the thread to the fabric. Trim the thread tails close to the fabric.

Using an open zigzag stitch and a forward and back movement of the hoop, stitch on top of previously filled areas of the design. To avoid excessive thread build-up when shading with multiple thread colors, lengthen the zigzag stitch for each color, or stitch with a Double/Twin needle to reduce the amount of bobbin thread under the stitching. When the section is complete, take several small stitches to secure the thread to the fabric. Trim the needle and bobbin thread close to the fabric.



Trapunto & Raw Edge Appliqué

Trapunto is a three-dimensional technique that gives a raised look to selected areas of stitching. While the look is related to quilting, only the design is stuffed, not the background.

Hoop two layers of fabric together, marking the design shape on the top layer of fabric with a fabric marker. Set the machine for straight stitching. Attach your favorite free-motion foot to the machine. (see page 17) *Note: If using BSR, set stitch length at 2mm to 3mm.*



Position the project under the needle and lower the presser foot.

Take a single stitch. Pull the needle thread to bring the bobbin thread to the surface. Holding both the needle and bobbin threads, take 3 or 4 short stitches to secure the thread to the fabric. Trim the thread tails close to the fabric.

Stitch completely around the drawn design several times, moving the fabric under the foot without turning the hoop. When a design/color is complete, take several small stitches to secure the thread to the fabric. Trim the needle and bobbin thread close to the fabric.

Make a small cut in the backing fabric within the stitched shape. Fill the motif with small bits of batting or fiberfill. Fuse a small piece of interfacing over the opening on the back of the work.

RAW EDGE APPLIQUÉ

Raw Edge Appliqué is an easy way to apply fabric shapes to a background fabric. This technique often uses motifs cut from printed fabric and results in a simple or primitive look.

Prepare background fabric by bonding tear-away or cut-away stabilizer to the wrong side with temporary spray adhesive. Cut fabric shapes as desired; if cutting printed motifs, trim about $\frac{1}{4}$ " outside the edge of the motif. Using fusible web or spray adhesive, position and bond the shapes to the background fabric as desired. Hoop the prepared fabric in a wooden embroidery hoop.

Thread the machine with a polyester, cotton, or rayon embroidery thread. Attach the free-motion presser foot of your choice (see page 17) to the machine and select a straight stitch.

Position the hooped project under the needle and lower the presser foot. Take a single stitch. Pull the needle thread to bring the bobbin thread to the surface. Holding both the needle and bobbin threads, take 3 or 4 short stitches to secure the thread to the fabric. Trim the thread tails close to the fabric.

Stitch around the edge of the motif about $\frac{1}{4}$ " from the cut edge of the fabric. Follow the same path 3-4 times to secure the appliqué shapes and form a decorative edge of thread around the edges of the motifs. When finished, take 3-4 small stitches to secure; clip thread tails.



Free-motion Quilting

Quilting refers to stitching two layers of fabric with batting between them. A variety of styles and techniques are used to do this.

STIPPLE QUILTING

Also called serpentine quilting, stippling is used to secure and fill areas of a quilt or quilted garment. Generally the designs are curved, and stitching lines do not cross or intersect. The lines of stitching should be evenly spaced, about $\frac{1}{4}$ " apart.

Set the machine for straight stitching. Attach your favorite free-motion foot to the machine. (see page 17) *Note: If using BSR, set stitch length at 2mm to 3mm; for very small, tight stippling, adjust stitch length to 1.25mm to 1.5mm.*

Prepare a "quilt sandwich" (top, batting, backing), bonding the layers together with temporary spray adhesive. If desired, mark a stippling design on the quilt.

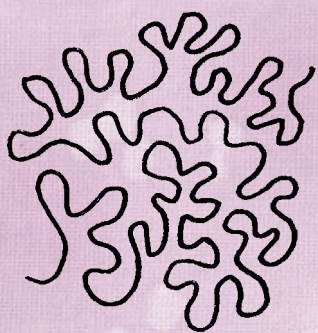
Loosen the clamping screw on a wooden embroidery hoop and hoop the area to be quilted with the marked stitching pattern facing upward.

Tip: When working with a large and/or bulky quilt or other project, be sure to support the weight of the fabric to prevent it from pulling the hoop or distorting the fabric. For proper hoop support, place the sewing machine in a cabinet, attach the Slide-On Table to the machine, or

place the clear acrylic BERNINA® Sewing/Quilting Table around the free-arm of the machine before positioning the hoop under the needle.

Position the project under the needle and lower the presser foot; take a single stitch. Pull the needle thread to bring the bobbin thread to the surface. Holding both the needle and bobbin threads, take 3 or 4 short stitches to secure the thread to the fabric. Trim the thread tails close to the fabric.

Re-hoop as needed to continue quilting until the design is complete.



Stipple Quilting



OUTLINE QUILTING

Accentuate printed, appliquéd, or pieced motifs by outlining them with a single line of stitching. Thread the machine with coordinating or contrasting thread. Adjust the stitch length to 1-3mm; shorter for smaller designs, longer for larger motifs.

Position the needle over the fabric and lower the presser foot. Pull the bobbin thread up to the top of the work; take a few short stitches to secure and clip threads. Outline the design, stitching on or outside the edge of the motif as desired.

ECHO QUILTING

Often used to set off or emphasize an appliquéd or pieced design, this technique can be compared to the rings formed when a stone is thrown into a pond. Position the needle over the fabric and lower the presser foot. Outline the design with rows of stitching. Use the presser foot to gauge the distance between the rows of echo stitching.

CONTINUOUS LINE QUILTING

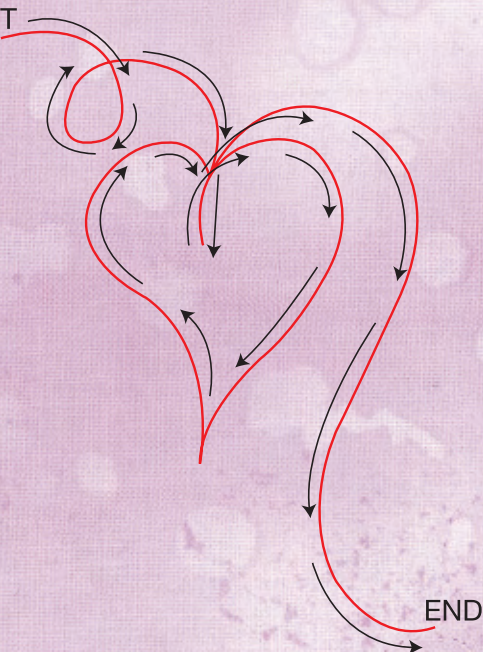
Stitch continuous, connected quilting designs, eliminating the need for frequent stops and starts and securing of thread tails.

Trace, transfer, or draw continuous line stitching paths onto quilt. Designs are available in many forms and from a variety of sources, including books and magazines, templates, and printed on “stitch-through” paper. Patterns may also be stitched freeform without following a marked path, moving from one shape to the next, as the leaves in the sample were stitched to fill the space between flowers.

Thread the machine with coordinating or contrasting thread. Adjust the stitch length to 1-3mm; shorter for smaller designs, longer for larger motifs. Position the needle over the fabric and lower the presser foot.

Stitch along the drawn thread path.

START



Outline Quilting



Echo Quilting



Continuous Line Quilting

Bobbin Play



Add textured dimension to projects by stitching with heavy threads, cords, and yarns on the bobbin and sewing with the project upside down. Use decorative thread, cord, or yarn – such as YLI Silk Ribbon or Pearl Crown Rayon, DMC Perle Cotton, or Superior Threads Razzle Dazzle – and the Black Latch Bobbin Case or a secondary bobbin case to create textured free-motion stitchery.

Interface or otherwise stabilize the fabric to be embellished. Trace the reversed design onto the stabilizer. Hoop the project fabric with the right side of the fabric against the outer hoop. *Note: The right side of the fabric will lie on the bed of the machine and the drawn design on the interfacing will be facing up in the hoop.*

Wind several bobbins with decorative thread using the bobbin winder of the machine and a slow speed. If you are using a machine that doesn't have multiple-speed bobbin winder, let the decorative thread pass through your fingers to control the speed and wind it evenly onto the bobbin.

Insert the bobbin into the Black Latch Bobbin Case (or a secondary bobbin case) and loosen the tension by turning the screw in a counter clockwise direction. The looser the tension on the bobbin case, the loopier the stitches will be, creating more texture. *Tip: When loosening the screw, hold your hands over a container so that if it drops, you will find it. The screw is very short and small, making it easy to fall out when loosened and difficult to find if it does.*

The thickness of the thread/yarn being used will greatly reduce the yardage wound onto the bobbin. Expect to stop and change the bobbin often. At the beginning and end of each bobbin, pull the bobbin thread to the wrong side of the fabric. When the work is complete, use a hand-sewing needle to secure needle and bobbin threads to the wrong side of the project. *Note: If your machine has a lower bobbin monitor, the machine will stop sewing with sufficient bobbin thread to enable you to pull the bobbin through to the wrong side of the fabric.*

Thread the needle with a coordinating polyester thread and increase upper tension to 8-9.5. Set the machine for straight stitching. Attach your favorite free-motion foot to the machine (see page 17). *Note: If using BSR, set stitch length at 2mm to 3mm.* Take a single stitch and pull the needle thread to bring the heavy bobbin thread to the *wrong* side of the fabric. Hold the thread tails while stitching to prevent them from entangling in the design. Following the drawn design, sew slowly with long straight stitches.

Run the machine at a smooth, even speed, filling in the shapes. Cover each area completely, moving the fabric constantly to avoid building up too much bobbin thread in any one place. Moving the hoop in a circular motion will produce softer, curlier patterns; straight, parallel rows will yield a more linear texture.

A SEPARATE BOBBIN CASE



When stitching bobbin-work, using a Black Latch bobbin case (available for CB bobbin systems) or a secondary bobbin case (for rotary bobbin systems) is recommended. Changes made to the tension will not affect normal sewing tension if the primary bobbin case is

not adjusted. If a secondary bobbin case is used for the rotary systems, mark it with a dab of paint or nail polish to distinguish it from your regular sewing bobbin case.

Free-motion Floral

Create this simple floral grouping using several free-motion techniques. Follow instructions on the previous pages and refer to the chart below and photos shown on pages 15-24 as needed.

