



# QUICK START GUIDE

## SWD SERIES



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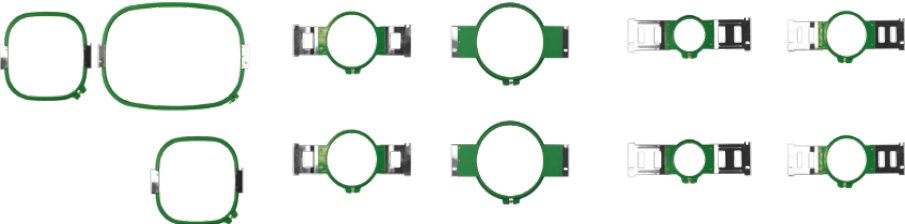









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# GETTING STARTED: MACHINE OVERVIEW

## Machine Contents

### Package Contents

			
11 hoops			1 sash frame
			
1 cap driver	2 cap rings	1 cap station	1 set of bracket arms
			
Power cord	Ethernet cable	Toolbox and welcome kit	Amann starter kit

### Toolbox Contents

			
One pack of needles	Pair of thread clippers	Three double end wrenches	Phillips screwdriver
			
Flat screwdriver	Set of nine hexagonal wrenches	Nipper pliers	Small round mouth bottle
			
Sewing machine oil	USB drive	Bobbin case	Cleaning brush
			
Spare parts including but not limited to screws, springs, reciprocators, needle bar guides, pickers and bobbin			



# Machine Components



Figure 1

## Machine Stand

Your embroidery machine includes a heavy duty steel stand designed to support your machine during the embroidery process. Assemble the stand if you plan on using it to support your machine. If you don't plan on using the stand, make sure your machine is placed on a sturdy surface with enough space to embroider.



Figure 2

## Control Panel

Your embroidery machine contains a touch-screen panel to facilitate operation. Before operating your machine, make sure to adjust the [position of the control panel to your liking](#). You may learn more about the panel features in the Control Panel Overview section.

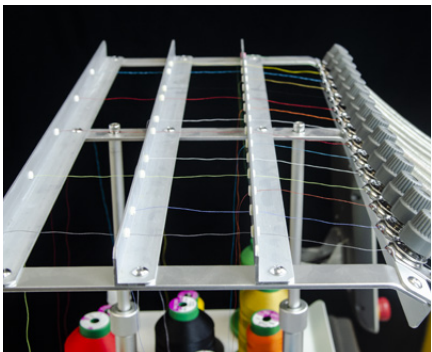


Figure 3

## Thread Rack

Your embroidery machine contains a thread rack that will hold your thread and feed the thread through the machine's thread path. Before threading your machine, be sure to [raise the thread rack](#).



Figure 4

## Emergency Stop Button

In case of an emergency, press the emergency stop button located on the bottom left side of the panel. **See Figure 4.**

To restart the machine, rotate the knob clockwise following the directional arrows. The knob will then release, allowing you to press start.



Figure 5

## Machine Head Indicator Light

The machine head indicator light is located on the top right of the machine head. **See Figure 5.**

During working status, the machine head indicator light is green. If you encounter a thread break while embroidering, the indicator light will flash red.

# Machine Set Up

## ASSEMBLING THE STAND

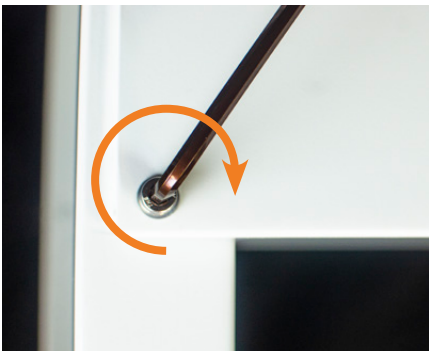


Figure 6

### Step 1: Attach the connecting plates

- Unpack and unwrap the stand columns, Ricoma connecting plates and tools. Remove all protective covering and plastic wrap and discard.
- Place the stand columns upside down.
- Attach the Ricoma connecting plates to the stand columns upside down using the hex head screws fitted with a lock-washer and washer. Secure with the Allen wrench. **See Figure 6.**



Figure 7

### Step 2: Attach the casters

- Next, remove the protective cover on the caster's screw, and fasten the caster to its corresponding slot, which can be found on the flat column that connects the stand legs to each other.
- After rotating the caster clockwise, secure the hex nut using the provided open-end wrench. **See Figure 7.**
- Repeat these steps for the remaining three casters.



Figure 8

### Step 3: Attach the level pegs

Next, take all four level pegs on your machine stand and rotate them counterclockwise by hand until they reach the floor. Once they reach the floor, continue to rotate using the open-end wrench to secure them tight. **See Figure 8.**

Once all four pegs are tight, the wheels will lift, and the machine stand will no longer be able to slide with the wheels.

#### Step 4: Attach the machine to the stand



Figure 9

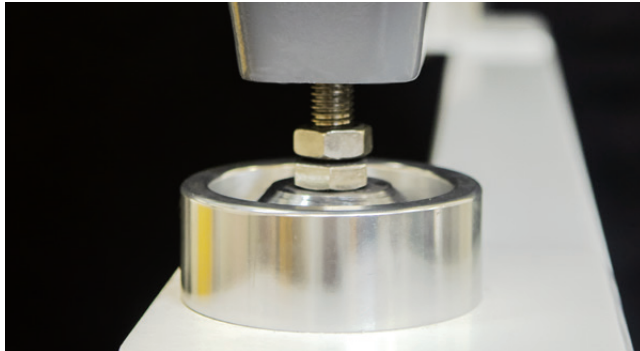


Figure 10

Once all of the pegs and wheels are in place, turn the stand right-side-up. **See Figure 9.**

Last, place the machine on the stand, aligning the machine's feet to the silver mounts on the stand. We recommend 2-3 people to complete this step. **See Figure 10.**

#### ADJUSTING THE POSITION OF THE CONTROL PANEL

Your touch-screen panel can be adjusted up and down or from side to side. To comfortably operate your machinery, you may adjust the panel using the Phillips screwdriver included in your tool box. Before adjusting the position of the panel, remove the plastic wrap that protects the panel.



Figure 11

##### How to Adjust The Panel From Side to Side

1. To move the panel from side to side, loosen the screw located on top of the panel arm. **See Figure 11.**
2. Then, adjust the control panel until it's facing the desired position, and tighten the screw.

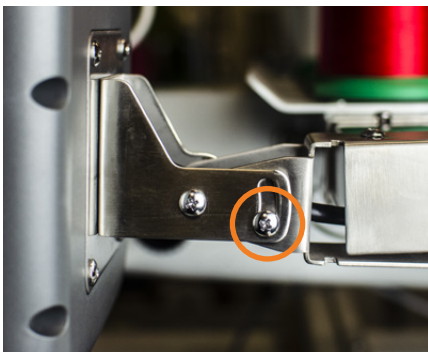


Figure 12

##### How To Adjust the Panel Up or Down

1. To move the panel up or down, loosen the screw located on the side of the panel arm. **See Figure 12.**
2. Adjust the control panel until it's facing the desired position, and tighten the screw.

#### RAISING THE THREAD RACK

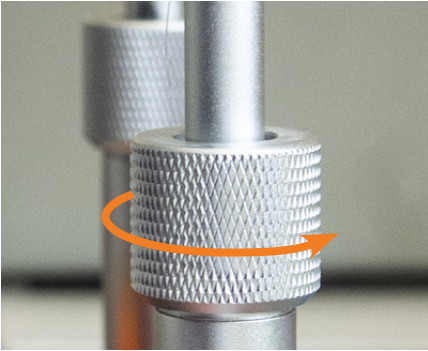


Figure 13

1. Rotate the knobs on the sides of the thread rack support counterclockwise to loosen them. **See Figure 13.**
2. Lift the thread rack as far up as possible, making sure both sides of the rack remain even as it rises.
3. Rotate each knob clockwise to secure the rack into place.

**Tip:** If possible, raise the thread rack on both sides while adjusting it. This will ensure it is positioned evenly.

#### TURNING ON THE MACHINE: POWER CORD CONNECTION



Figure 14

The power socket is located on the back left of the machine's body. Connect your power cord into the socket displayed in **Figure 14.** Then, plug the power cord into a power outlet.

We highly recommend using a power supply (surge protector) rather than connecting the cord directly into the wall. The power switch can be found above the power socket.

## THREADING

### Adding/Replacing a Spool

Your machine comes pre-threaded, which means that you will not have to thread your machine from scratch when you first receive your machine. The directions below explain how to replace a spool. Follow steps 3&4 to add a new spool when your machine arrives pre-threaded.

#### HOW TO REPLACE A SPOOL

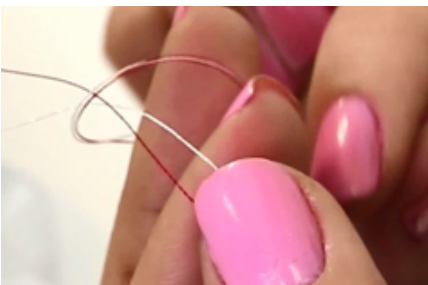


Figure 15

1. Clip the thread from the thread spool you wish to replace. Make sure you clip the thread right above the spool and not inside the thread path.
2. Remove the old spool from the spool pin, and place a new spool in its place.



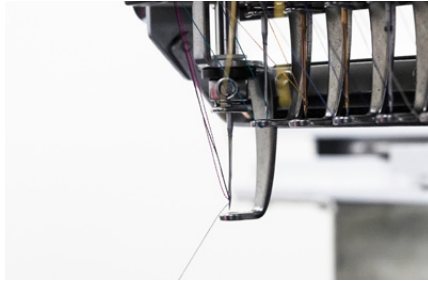


Figure 16

3. Take the loose end of the thread from the old spool and tie it to the loose end of the new spool with a tight knot. **See Figure 15.**
4. Next, grab the thread from above the presser foot and pull it carefully through until you no longer see any of the old thread. While you pull the thread, you'll see the new thread and the knot you created traveling through the thread path. Continue to pull until the knot you created passes the last point in the thread path before the needle. **See Figure 16.**

5. Last, clip the thread right above the knot. Then, pass the thread through the eye of the needle and through the presser foot. See the Threading the Needle section for more information.

## Threading the Needle

Your machine comes with needles already installed. To learn how to replace a needle, see the [Installing the Needle](#) section.

### HOW TO THREAD THE NEEDLE

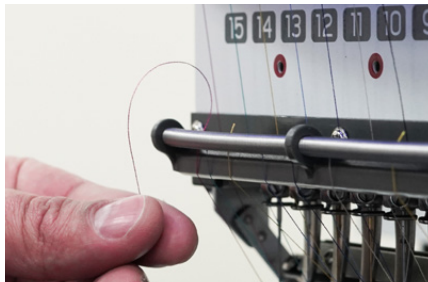


Figure 17

1. Pass the thread through the eye of the needle from the front to the back. Then, pass the thread through the presser foot.
2. Pull the thread up, and place the thread on the spring until you're ready to embroider. We recommend leaving one to two inches of thread hanging and trimming the excess. **See Figure 17.**

## Threading the Machine from Start to Finish

Before threading your machine, make sure you have raised the thread rack and properly inserted the spools and thread tubes.

### RAISE THE THREAD RACK

See [Raising the Thread Rack](#) in Machine Setup.

### ATTACH THE THREAD TUBES

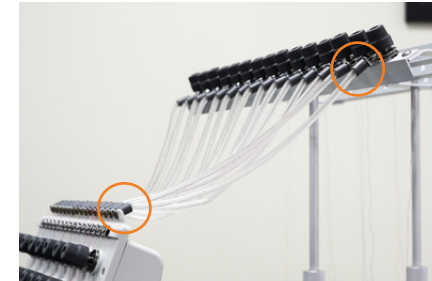


Figure 18

Attach one end of the tube to the slot just below the top thread tension knob. Attach the other end of the tube to the slot on the machine's head. Guide yourself by counting the slots on the top and bottom to make sure you are attaching the tubes to their corresponding slots. The first slot on the top connects to the first slot on the bottom and so forth. **See Figure 18.**

### PLACE THE SPOOLS

1. Remove the wrapper on the thread spool. Your welcome kit contains one box of embroidery thread to get you started. The machine can carry 15 spools of thread.



**Note:** Your machine package includes 1,000 meter thread spools. You may remove the plastic spool holders when using these smaller thread spools, as they do not require them. You may place the spool holders back on when switching to full-size 5,000 meter thread spools. These smaller thread spools do not require the plastic spool holder.

2. Release the tail of the thread by unsnapping the base of the cone, and unwinding the thread until it is completely out of the base.
3. Place each thread spool onto the spool pins.

**Tip:** To avoid using the wrong color, avoid placing similar colors like black and navy blue close to each other.

### BEGIN THREADING

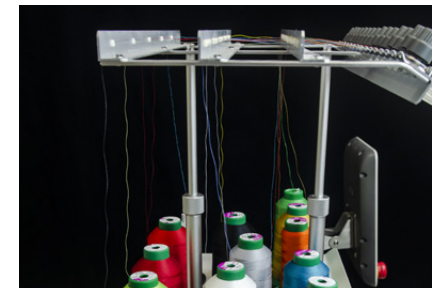


Figure 19

Before threading, you should be familiar with the thread path. The back row of thread will be threaded through the back metal rack. The middle row of threads will be threaded through the middle metal rack. The front row of threads will be threaded through the front metal rack. **See Figure 19.**

1. Thread each spool through the eyelets on the upper thread rack until they reach the top tension knobs. **See Figure 20.**

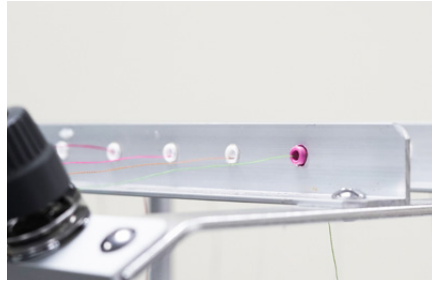


Figure 20



Figure 21

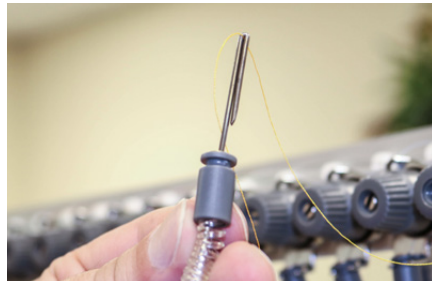


Figure 22

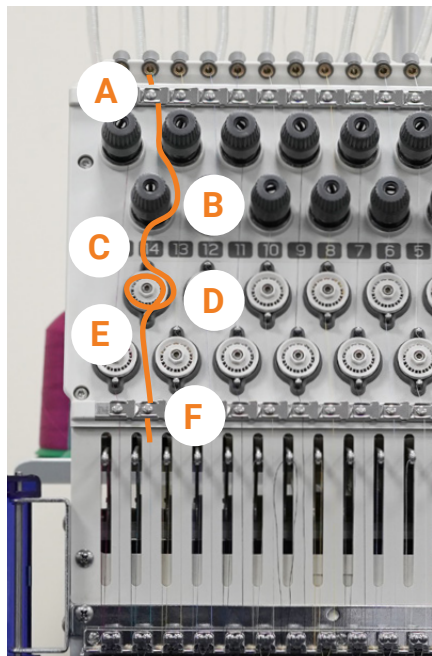


Figure 23

2. Next, pass the thread through the small eyelet located behind the first tension knob. Position the thread to the right side of the top tension knob in between the tension disks, making sure the thread is inside the tab at the 3 o'clock position. To ensure you've completed this step correctly, make sure the metal plates on the tension knob are touching after you've positioned the thread. **See Figure 21.**
3. Unhook the thread tube from each side. Next, using the included threading tool from your toolkit, hook the thread to the end of the tool and feed the thread through the plastic tube. Once the thread has been fed through the tube, unhook the thread. **See Figure 22.**
4. Reattach the thread tube to each end.
5. Pass the thread through the clip located just above the top tension knobs. Be sure to gently pull the clip up with your finger, rather than just sliding the thread under the clip to avoid damaging the thread or threading the machine incorrectly. **See point A in Figure 23.**
6. Next, pull the front disk of the tension knob toward you, and slip the thread to the right side of the knob. Use the numbers as guides to know which path to follow for each needle. The photo displays the thread path for needle 14. Notice the tension knob is aligned just above the needle number. **See point B in Figure 23.**
7. Locate the post right above the corresponding thread break wheel (these are the white wheels on the machine's head.) Pass the thread through the left side of the post. **See point C in Figure 23.** Then, guide the thread to the right and wrap it around the thread break wheel. **See the path from point C to E in Figure 23.** Make sure you make one full clockwise rotation until the thread exits through the left side of the bottom post. **See point E in Figure 23.**
8. Place the thread under the bottom clip by pulling the clip up. Slide the thread underneath. **See point F in Figure 23.**
9. Next, thread the check spring and the lever arm. Begin by lifting the spring lever to place the check spring into threading position. Now, coming down from the right side, pass the thread over the outer right side of the rollers and then in through the opening in the center. **See point G in Figure 24.**

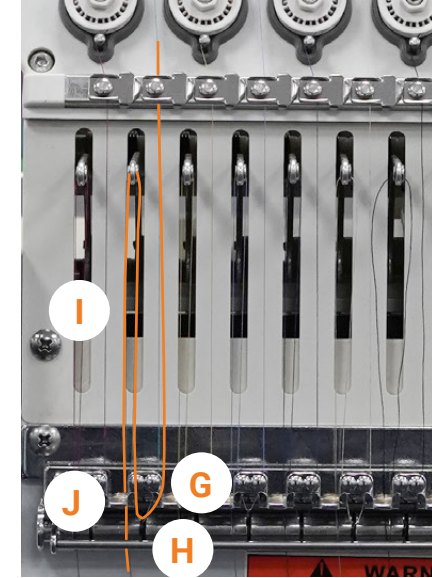


Figure 24

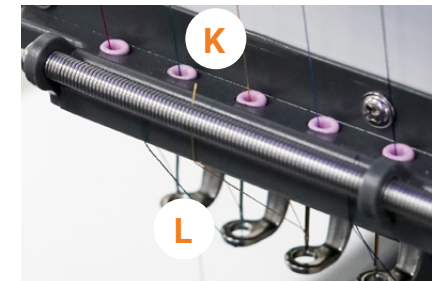


Figure 25

10. Next, pass the thread through the spring from the right to the left. **See point H in Figure 24.**
11. Then, take the thread and pull it through the opening in the center and out over the outer left side of the rollers. Continue pulling the thread up until you reach the lever arm. **See point I in Figure 24.**
12. Now, pass the thread through the opening of the lever arm from the right to the left. **See point I in Figure 24.**
13. Then pass the thread back down until it runs through the ceramic eyelet. **See point J in Figure 24.** Continue running the thread down the same path until it passes through the following ceramic eyelet. **See point K in Figure 25.**
14. Pass the thread through the eye of the needle from the front to the back, and then in through the presser foot. **See point L in Figure 25.**
15. Last, take a step back and look at the front of the machine to make sure that all needles appear to be threaded correctly. If they are uniform, you are ready to stitch a test pattern.

**Tip:** If you run out of thread completely on a needle, re-thread, matching the thread path to a correctly threaded neighboring needle.

## INSTALLING THE NEEDLES

### Selecting a Needle

Choosing the right needle is important to ensure quality stitches. Embroidering with a needle that is too small or too big for the thread and/or fabric may result in thread breaks or skipped stitches.

DBxK5 is an established needle system for machine embroidery. A DBxK5 size 75/11 sharp point needle will work for most embroidery projects. This style needle has a medium point with a larger eye, which allows the thread to flow smoothly and helps reduce thread breaks.

In some instances, you may need to choose a different size needle depending on your embroidery project. Go to the [Needles section](#) to learn more about selecting the proper needle for your embroidery.



# Installing a Needle

When changing a needle, make sure the scarf of the needle is facing away from you and toward the machine. When inserting the needle, make sure it is completely straight and not slanted. If the needle is not positioned correctly, the machine will not work properly, and the needle will break. [Refer to needle diagram on page 53.](#)

## HOW TO INSTALL THE NEEDLE



Figure 26

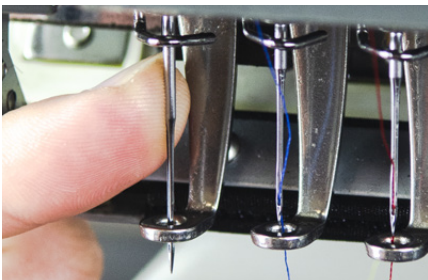


Figure 27

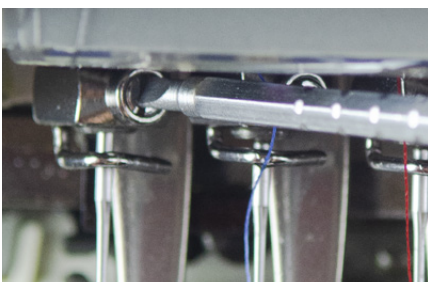


Figure 28

1. Loosen the set screw above the needle with a straight slot screwdriver. Loosen only enough to be able to remove the needle. **See Figure 26.**
2. Discard the old needle in a sharp-safe container.
3. Needles have a long groove on the front and a short half-moon-shaped section called the scarf on the rear. With the long groove facing the front of the machine, insert the new needle by placing the point through the presser foot, and then insert the shank into the needle bar all the way. **See Figure 27. [Refer to needle diagram on page 53.](#)**
4. Verify that the long groove of the needle is still facing forward. Tighten the needle screw while holding the needle firmly to keep it from slipping down. **See Figure 28.**

**Tip:** To help you place the needle correctly, you may insert a wooden toothpick into the eye of the needle. Never place a metal object in the needle's eye, as it could scratch the eye of the needle, causing thread breaks.

## INSTALLING THE BOBBIN

### The Anatomy of the Bobbin Case

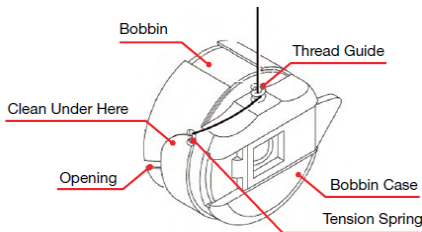


Figure 29

Before threading and inserting the bobbin into the machine, **see Figure 29** to view the parts of the bobbin case that will be referenced.

# Threading and Inserting the Bobbin



Figure 30

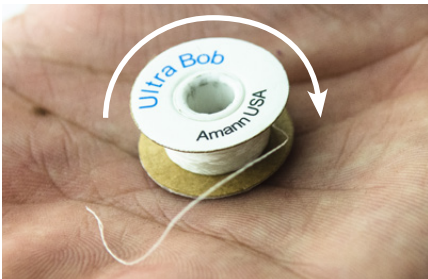


Figure 31



Figure 32



Figure 33

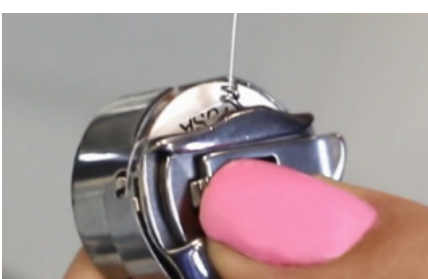


Figure 34

1. If you haven't done so yet, remove the bobbin case from the machine's bobbin housing unit. Lift the latch and pull the bobbin case toward you to remove it. **See Figure 30.**
2. If there is already a bobbin in the bobbin case, pull out the bobbin and discard.
3. Insert a new bobbin into the bobbin case, making sure the thread is running clockwise. **See Figure 31.**  
**Tip:** To ensure the bobbin is placed correctly, turn the bobbin case to the opposite side, and pull on the thread. The bobbin thread should still be running clockwise in this direction, and you should see the letters rotating clockwise.
5. Pass the bobbin thread through the bobbin case slit. **See Figure 32.**
6. Pull the bobbin thread under the tension arm, making sure the thread exits at the notch on the other end. **See Figure 33.**
7. Wrap the thread around the small pigtail on the bobbin case. **See Figure 34.**
8. Grab the bobbin case while lifting the latch, and insert it into the machine. Make sure the thread tail is no longer than 3 inches. A longer tail can wrap around the shaft and create a buildup of thread.



# HOOPS AND BRACKETS

Your machine can embroider flats and caps. Flats refer to garments like shirts and jackets that you can lay flat and hoop using your flat brackets. You will embroider caps using the cap attachment. The cap attachment is curved to match the curvature of a cap.

## Cap Attachments



Figure 35

When embroidering caps, you will need to use the included cap driver, cap station and cap ring.

The cap driver is the accessory that is mounted on the machine. **See Figure 35.** This tool holds the cap and cap ring during the sewing process.

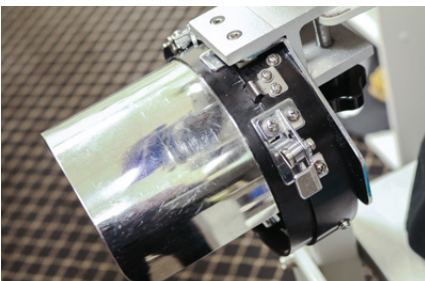


Figure 36

The cap station is the tool that holds the cap ring (the cap hoop) while hooping. The cap station should be mounted on your machine stand or on a sturdy table. **See Figure 36.** Once you have mounted the cap station, you can attach the cap ring to the cap station to begin hooping.

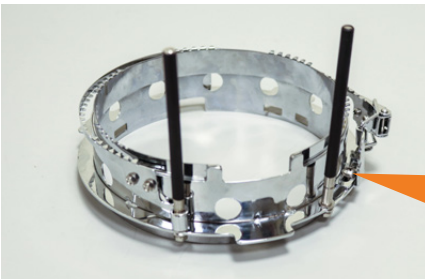


Figure 37

The cap ring is the hoop for your caps. **See Figure 37.** This ring can be adjusted according to the thickness of the cap using the screw on the right-hand side.



## Removing the Cap Driver

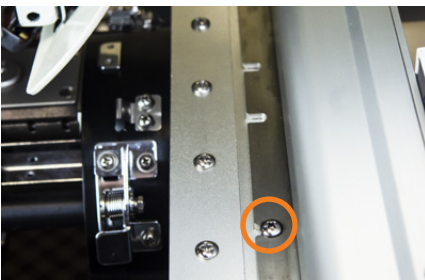


Figure 38

1. Using the Phillips screwdriver included in your toolkit, loosen the screws that connect the cap driver to the pantograph. **See Figure 38.**

2. Pull the cap driver toward you using both hands.

**Tip:** It's not necessary to completely remove the screws. It should be able to come off easily if you have loosened both screws.

## Installing the Cap Driver

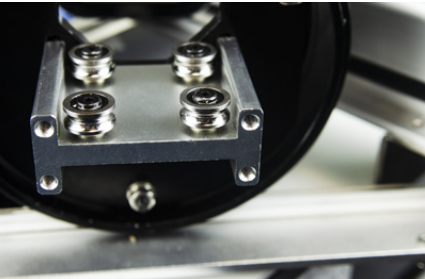


Figure 39



Figure 40



Figure 41

1. Select the cap hoop from the list of preset hoops on the control panel. Refer to the [Control Panel Overview](#) section for more information. Once you have selected the preset cap hoop, the pantograph will move forward.
2. If you haven't done so already, make sure you have removed the flat support brackets. To remove the brackets, loosen the Allen screws that attach the brackets to the pantograph rail.
3. Insert the cap driver onto the machine, making sure the sewing arm goes through the opening in the back of the cap driver.
4. The cap driver is equipped with four small wheels that slide onto the rail underneath the sewing arm of the machine. Position the cap driver in line with the railing, making sure all the wheels are aligned. **See Figure 39.**
5. Push the cap driver toward the machine until it reaches the pantograph. You will attach the cap driver to slot 6 on each end of the pantograph. **See Figure 40.**
6. Tighten the Phillip screws to secure the cap driver to the pantograph. **See Figure 41.**

## Flat Hoops and Brackets

Your Ricoma SWD Series embroidery machine includes a set of 11 hoops. There are six different hoop sizes, ranging from A to F. Hoop A is the smallest hoop and hoop F is the largest hoop.

When selecting your hoop, use the smallest hoop that your design will fit into without hitting the hoop. When you upload your design, you will be able to use the preset hoop feature on the machine to make sure your design is within the hoop.

**Tip:** Selecting the smallest hoop your design fits into creates the best hooping tension for your fabric, eliminating thread breaks, puckering and other machine embroidery issues.

## Attaching the Flat Frame Brackets

In order to run flats on your machine, you will first need to connect the flat frame brackets onto the pantograph rail. This bracket will support your hoops when embroidering on flat garments such as polo shirts.



Figure 42



Figure 43

1. Attach hoops A-E to slots 5 and 6 on each side of the pantograph rail.
2. Attach hoop F to slots 1 and 2 on each side of the pantograph rail.
3. Attach the brackets to the corresponding slots on the pantograph rail. **See Figure 42.**
4. The brackets are composed of two metal plates with a slot in between them. When you attach the brackets to the machine, make sure the pantograph rail is positioned in between the two metal plates and the screws are lined up with the slots. **See Figure 43.**

## Removing the Flat Frame Brackets

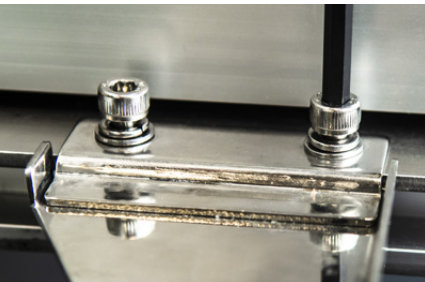


Figure 44

To remove the flat brackets, loosen the arms by rotating the screws counterclockwise with a 4mm Allen wrench. Then, pull the arms straight out toward the front of the machine. **See Figure 44.**

## Inserting the Flat Hoops

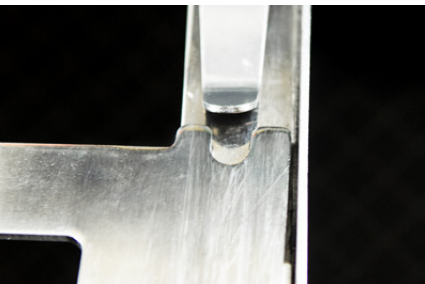


Figure 45

The metal arms of the hoops are designed to slip under the clips on the hoop brackets. To correctly insert the hoop onto the brackets, make sure the open-ended slot (the U-shaped notch) is facing the machine. **See Figure 45.**

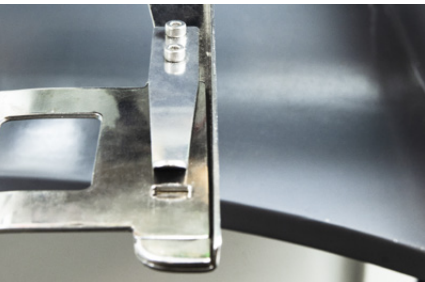


Figure 46

Insert the hoop into the brackets, making sure the edge of the hoop slips under the recessed notch at the end of the clip. The notches in the hoop should hold securely under the prongs. **See Figure 46.**

## Removing the Flat Hoops

To remove the hoop, lift the hoop arms to release the pressure on the notched areas. The hoop brackets will hold the hoops very tightly at first, but it will gradually become easier to lift the hoop from the bracket as you pull the hoop out.

# EMBROIDERING WITH THE EXTENDED TABLE

## Installing the Extended Table

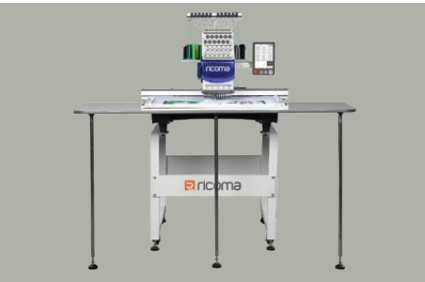


Figure 47

Your embroidery machine includes a table designed for embroidery on larger areas and heavier garments. **See Figure 47.**

1. Slide the table onto the machine body and rest it comfortably on the table support brackets. **See Figure 48.** Use the openings as a guide to help you see where to position the table. The sewing arms should rest in between the table openings. **See Figure 49.**



Figure 48



Figure 49



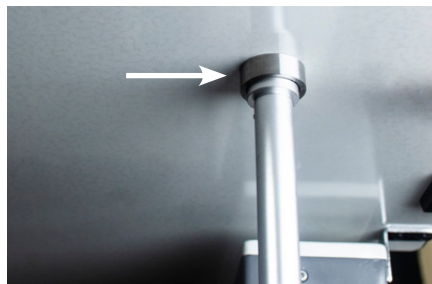


Figure 50

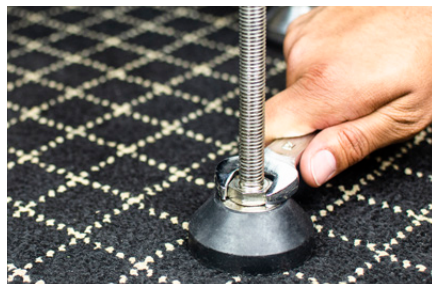


Figure 51



Figure 52



Figure 53

2. After you've made sure your table is in place, take the two magnetic table support legs, and place them in their corresponding slots underneath the table. **See Figure 50.**

3. Level the table support legs by rotating each peg counterclockwise until they reach the floor. Then, tighten each nut. **See Figure 51.**

4. Using a Phillips screwdriver, attach the brackets on each end of the table to the brackets on each side of the machine's body. **See Figure 52.**

5. Locate the security latches underneath the table. Tighten each latch until the rubber stop meets the bottom of the table. You should hear it click into place. **See Figure 53.**

## Hooping and Attaching the Sash Frame

### HOW TO HOOP THE SASH FRAME



Figure 54

1. Place the stabilizer over the frame, ensuring the stabilizer covers all areas of the frame. **See Figure 54.**

2. Place the fabric over the stabilizer, ensuring both the fabric and stabilizer cover all areas of the frame. **See Figure 55.**

3. Smooth out the surface of the fabric, and snap the metal clamps onto each of the short sides of the frame. **See Figure 56.**



Figure 55



Figure 56

4. Smooth out the surface of the fabric, and snap the remaining metal clamps onto each of the long sides of the frame. **See Figure 57.**

**Tip:** As you push the clamps into the frame, the tabs on the clamps should be facing the outside of the frame. **See Figure 58.**



Figure 57

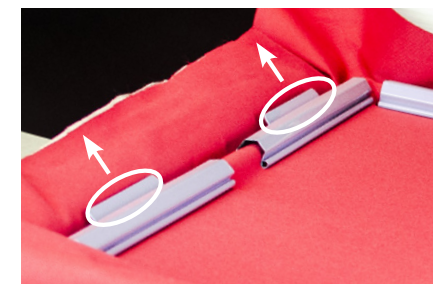


Figure 58

### HOW TO ATTACH THE SASH FRAME

1. Place the hooped sash frame over the extended table and clip back any excess fabric that may interfere with the pantograph rail. **See Figure 59.**

2. Attach the sash frame to the last two slots on the pantograph rail. Use a Phillips screwdriver to secure the screw. **See Figure 60.**

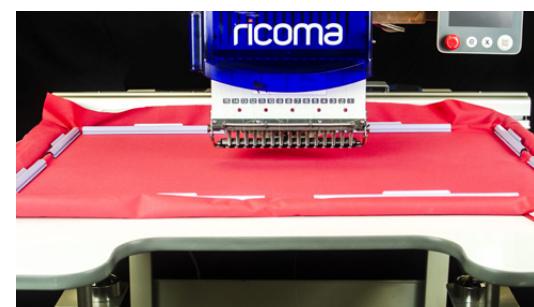


Figure 59

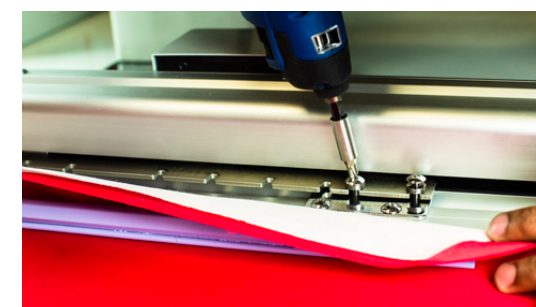


Figure 60

## HOOPING

### Centering a Left-Chest Logo

Before hooping your garment, you must determine the proper placement of the design. To determine where to place the design, you must first find the center of the design.

**Keep in mind:** The center will vary on the size of the garment you are embroidering and the size of the design you are stitching.

### LEFT-CHEST LOGO DESIGN PLACEMENT

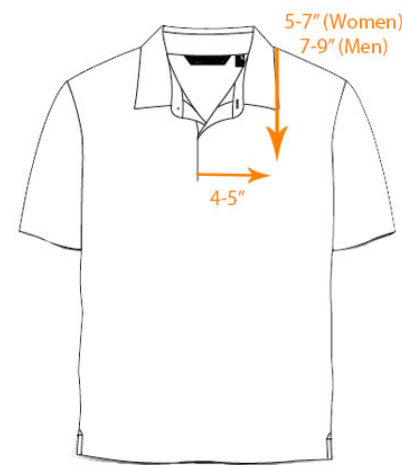


Figure 61

#### Tips to keep in mind:

- The design should always be slightly closer to the center placket (front center) than to the armhole seam.
- You can mark the center with chalk, a water-soluble pen, a piece of masking tape or painters tape.

### Hooping Recommendations

Proper hooping is a fundamental step in the embroidery process. Refer to the following tips when hooping your garments:

- When determining which size hoop to use, select the smallest hoop that will cover your design.
- Backing (or stabilizer) stabilizes your fabric, adding rigidity and guarding against stretch. When hooping your fabric, you will need to select the proper backing that corresponds with your garment. Backing should neither be too heavy nor too light. Refer to the [Stabilizer section](#) for more information on selecting the appropriate backing for the material you're using.
- When your garment is hooped correctly, you should be able to run your fingers over the fabric without it moving or rippling. If your garment is too loose, remove the hoop and repeat the process.
- Be sure you are hooping tightly enough, especially when using square hoops. Whenever you are using a square or rectangular hoop, you are only getting a good grip on the fabric in the corners. In contrast, round hoops have equal holding power throughout the entire hoop.
- Never pull the fabric or tighten the hoop to even it out. Stretching the material while hooped will cause puckering, pinching and design placement issues.

### Hooping Flat Garments

1. Place the bottom ring inside the shirt. Make sure the adjusting screw on the bottom ring is facing the bottom opening of the shirt. That way, you can quickly adjust the screw in the event that the hoop is either too tight or too loose.

2. Place the backing over the bottom ring, making sure all areas of the hoop are completely covered.



Figure 62

3. Place the top ring over the front of the garment, and align it with the bottom hoop. Push down on the hoop to insert the top ring into the bottom ring.

4. After inserting the top ring into the bottom ring, verify you've hooped the fabric correctly. Make sure the fabric is smooth and tight, but not stretched. Try to lift the fabric from the stabilizer. If it's difficult to lift, your fabric should be hooped correctly.

**See Figure 62.**

5. Last, turn the garment over to confirm that the stabilizer covers all sides of the hoop. If it does not, re-hoop the garment.

### Hooping the Front or Sides of a Cap

1. First, make sure the cap ring is connected to the cap station. To do so, connect the open metal notch on the cap ring to the center tab on the cap station. Grab the cap ring from the back, and push it forward. Make sure the cap ring snaps into all three of the spring locks on the cap station.

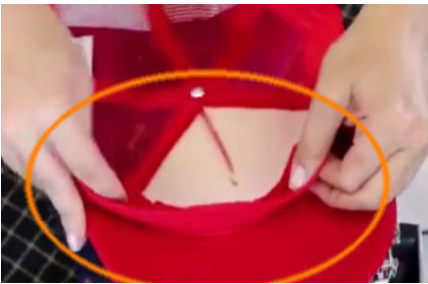


Figure 63

2. Once the cap ring is connected to the cap station, unfasten the metal band and let it rest to the left side of the cap ring.

3. To prepare the cap for embroidery, make sure the bill of the cap is as flat as possible. If the cap contains straps, unfasten the straps on the back of the cap.

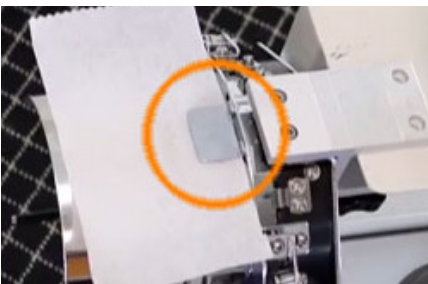


Figure 64

4. Pull back the sweatband located below the bill of the cap. Make sure the entire sweatband is pulled back from seam to seam. **See Figure 63.**

5. Place the backing under the bill stop (the metal tab on the top of the ring). **See Figure 64.**



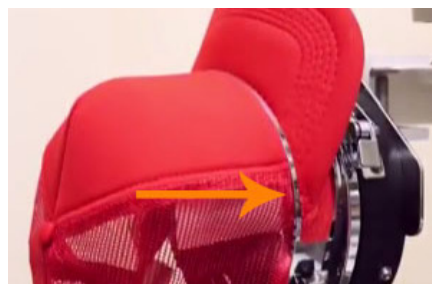


Figure 65



Figure 66



Figure 67

6. Slide the cap onto the cap frame, keeping the sweatband under the bill stop. Make sure the cap is pushed up tightly against the bill stop, not on top of it.
7. Position the flexible metal strap over the cap's bill, keeping the serrated edge of the band as close to the bill as possible. **See Figure 65.**
8. Connect the clasp to the cap ring latch and snap it into place. **See Figure 66.** Pull the sides of the cap to make sure it is tight and not wrinkled.
9. Pick up the excess fabric on the back of the cap, and secure it using the provided metal clips. Clip the fabric to the metal bars inside the cap ring to keep the cap tight. Make sure the handle of the clips face the center of the cap and toward each other. **See Figure 67.**

## Hooping the Back of a Cap Using a Round Hoop

1. Use hoop A or B.
2. Find a surface that is the width of the bottom ring of the hoop you have chosen. You can use the corner of a table. Place the bottom ring on that surface.
3. Place your backing on top of the bottom ring. It's helpful to use adhesive spray on the backing or adhesive backing.
4. Place the cap on top of the bottom ring and backing.
5. Smooth out the material, eliminating any wrinkles.
6. Place the top ring over the fabric, and align it with the bottom ring.
7. Join the top and bottom ring, as you would with flats.

## CONTROL PANEL OVERVIEW



### TRIMMING

Conducts a manual trim



### 100 DEGREE

Returns machine to 100 degrees



### EMBROIDERY STATUS

Switches between embroidery modes



### PRESET HOOPS

Displays and programs the machine's preset hoops



### COLOR SEQUENCE MENU

Displays and programs color sequence settings



### DESIGN MENU

Imports designs, displays a list of designs on the USB and machine's memory, and hosts the machine's on-board lettering feature



### DESIGN SETTINGS

Hosts design setting options such as density and rotation angle



### SPEED

Increases or decreases stitches per minute (spm)



### DIRECTIONAL ARROWS

Positions your design in the hoop



### FRAME SHIFT DIRECTION/SPEED INCREMENTS KEY

Increases or decreases the speed increments and controls how quickly the frame moves along the pantograph rail



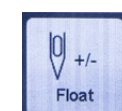
### EMBROIDERY SETTINGS

Displays important embroidery settings and parameters



### MANUAL COLOR CHANGE

Displays the current needle setting and switches between needles



### FLOAT

Rewinds or fast-forwards the design by stitch count





### STITCH MODE

Displays the machine's status, and rewinds or fast-forwards the design in low or high speeds



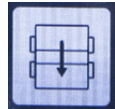
### REPORT

Displays production statistics



### TRACING

Traces perimeters of design to confirm design placement



### FRAME OUT

Offsets the frame for easy appliqué



### RETURN TO ORIGIN

Returns the design to its starting point



### RETURN TO STOP POINT

Returns the frame to the last stitch point before frame was moved manually

## Full Embroidery Process from Start to Finish

To start an embroidery job, you must follow these steps in order. In the following sections, you'll learn how to perform these functions on your control panel.

1. Remove the embroidery status. [See page 29.](#)
2. Upload and select a design from the list of designs on the machine's memory. [See page 29.](#)
3. Select a hoop from the preset hoops function. [See page 31.](#)
4. If necessary, make any changes to the design settings such as rotation angle under the Design Settings menu. [See page 32.](#)
5. Select the color sequence of the design under the Color Sequence Settings menu. [See page 35.](#)
6. Position the design using the directional arrows on the panel. [See page 38.](#)
7. Trace the design to confirm its placement within the hoop. [See page 37.](#)
8. Set a desired speed. [See page 38.](#)
9. Press start!

## Embroidery Status



Figure 68

Your embroidery machine has two embroidery statuses: preparation status (setup mode) and working status (embroidery mode). To switch from embroidery mode to setup mode, tap the Embroidery Status key.

This will allow you to access basic panel functions, such as importing a design. When you are ready to stitch, you will need to enter working status (embroidery mode) by selecting the Embroidery Status key.

## Design Menu

Under this menu, you will be able to:

- View design details
- Upload a design into your machine's memory
- Select a design for embroidery
- Delete designs from your machine's memory
- Create personalized text on your panel

### HOW TO IMPORT AND SELECT A DESIGN

Your Ricoma embroidery machine reads DST files, the most common of all embroidery file types. If your embroidery file is saved as another file type, you will need to change the file type by using the software that comes with your machine. In order to run an embroidery job, you must first import a DST file into the machine using a USB.

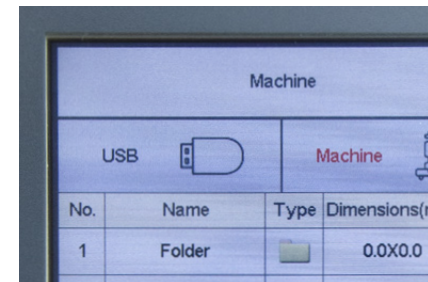


Figure 69

1. Remove the embroidery status on your machine.
2. Once you have your DST file saved onto your USB, insert the USB drive into the USB port on the right side of the panel.
3. Press the Design key to enter the USB/embroidery machine's memory interface. Select the USB icon. **See Figure 69.**
4. Your machine will now display a list of all the files in your USB's memory.
5. Select the file you wish to input, press the Save icon, and hit OK. **See Figure 70.**

1	Folder		0.0X0.0	0	0
2	USPATC~1DST	DST	692.2X89.8	78	144542
3	SWEATP~1DST	DST	299.6X60.6	11	12336
4	ZMK3DST	DST	113.7X14.8	9	2102
5	RICOMA~1DST	DST	153.4X75.4	6	29166
6	BICYCL~1DST	DST	35.8X25.6	12	2734
7	SLUCE3~1DST	DST	13.8X25.4	7	1262
8	LAB325~1DST	DST	36.7X25.2	4	1782
9	SAMPLEDST	DST	153.2X65.8	5	24275

Figure 70

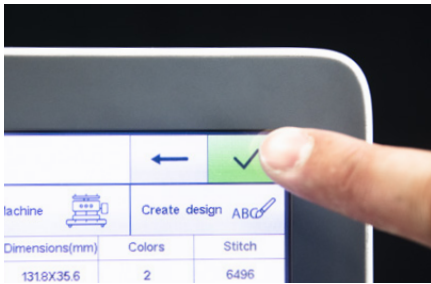


Figure 71

### HOW TO EXPORT A DESIGN

In some cases, you may want to export a design that you have saved on your machine's memory into your USB in case you no longer have it saved on your computer or have switched computers. Follow these steps to export your design.



Figure 72

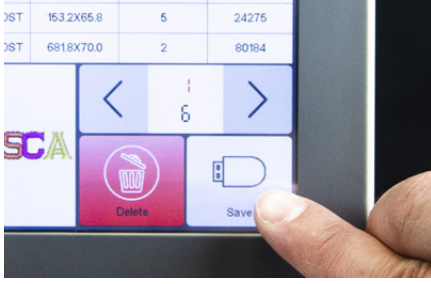


Figure 73

### HOW TO DELETE A DESIGN FROM YOUR MACHINE'S MEMORY

The machine's memory holds 20 million stitches. To clear space, delete the designs you'll no longer need. Follow these quick steps to delete a design from your machine's memory.

1. With embroidery mode unlocked, select the Design menu to enter the USB/embroidery machine's memory interface.

6. Then, click on the machine's memory icon located to the right of the USB's memory icon.

7. The design you just recently saved should now appear last on the list of the machine's saved designs.

8. Next, click on the design you wish to embroider, and click the green check mark key. **See Figure 71.**

9. The design should now appear on the main menu of the machine's panel. You're now ready to center and trace your design for embroidery!



Figure 74

### ON-BOARD LETTERING

You can create personalized text directly on your machine using the machine's on-board lettering feature. Follow these steps to add a name or title to a design.



Figure 75

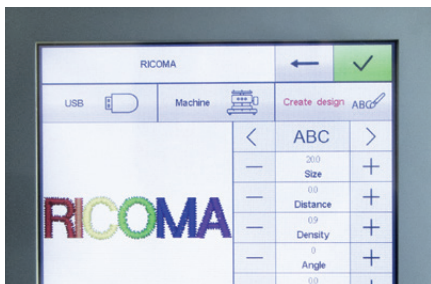


Figure 76



Figure 77

### Hoop Selection

#### SELECTING HOOPS

Before embroidering, it's important to first select the hoop on your control panel to match the hoop you're embroidering with. You may select the hoop that corresponds with the hoop you're using under the Preset Hoops key on the main menu.

2. Select the embroidery machine's memory.
3. Select the design you wish to delete from the list of designs in the machine's memory.
4. Then, select the "Delete" key to remove the file from your machine's memory. **See Figure 74.**

1. With embroidery mode unlocked, select the Design menu to enter the USB/embroidery machine's memory interface.
2. Select the "Create Design" key. **See Figure 75.**
3. Type in the word you wish to embroider. **See Figure 76.**
4. Select the design's font, density, compensation, angle and more using the row of design options on the right. Then, press the enter key on the bottom right. **See Figure 77.**
5. Press the green check mark when you have completed your design.
6. Your design will automatically upload to the machine's memory.

**Note:** In order to embroider your design, you will need to select it from your machine's memory, first. Your design will appear as the last design in the machine's memory.



To do so, follow these simple steps.



Figure 78

4. Press the green check mark key to confirm your hoop selection. Your machine will now position itself to match the preset hoop you've selected.

**Note:** If a hoop is not selected, the system will continue to use the currently selected hoop.

**Note:** Hoop G will be used for embroidery on your sash frame. The cap option will be used for cap embroidery, and the "Other" option will be used for specialty hoops that are not programmed on your machine.

## Design Settings Menu

You may access the Design Settings menu during preparation status. Under this menu, you will be able to perform the following functions:

- Resize your design
- Rotate your design
- Select a customized angle for your design
- Repeat a design
- Adjust the density of your design

### HOW TO RESIZE A DESIGN

The X & Y axes are represented by the number 100. Therefore, when you input your design, the design will be embroidered at 100 percent. However, you can increase or decrease its size by changing the X & Y measurements. These measurements can range from 50 percent to 200 percent.

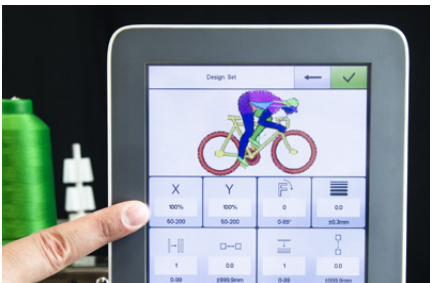


Figure 79

1. Select the Preset Hoops key on the main menu.
2. A list of all the hoops on your machine will appear.
3. Select the hoop that corresponds with the hoop you are using.  
**See Figure 78.**

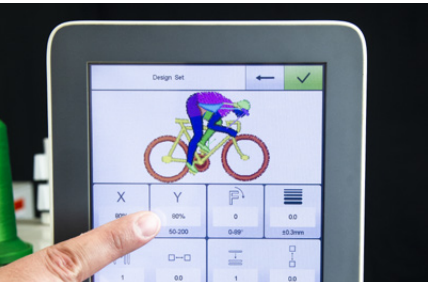


Figure 80

**Tip:** When making these changes, keep in mind the machine will not increase or decrease the number of stitches in your design. A large percentage (%) increase or decrease may distort the embroidery. We recommend adjusting this setting to no more than 115% and no less than 85%.

### HOW TO ROTATE A DESIGN

The rotate designs function allows the user to rotate the design in eight different directions.



Figure 81

2. Click on the "Y" icon, and input the same value as the X axis.  
**See Figure 80.**

**Note:** If you change the measurements of either axis, you will need to change the measurements of the opposite axis by the same amount to avoid distorting the design.

1. Select the desired rotation option from the bottom two rows of the Design Settings menu. **See Figure 81.**
2. Click on the green check mark to save your settings. The design will then appear on the screen with the changes you've made.

### HOW TO ADJUST THE ROTATION ANGLE OF YOUR DESIGN

After you've rotated your design to a desired setting, you may also customize the rotation angle anywhere from 0° to 89°.

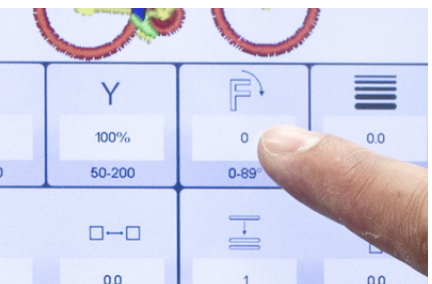


Figure 82

1. Select the third icon on the top row of options represented by an F with an arrow pointing downward. **See Figure 82.**
2. Once you select this option, a numbered keypad will appear. Input the desired degrees in which you would like to position your design, and select the green check mark on the top right of the keypad. **See Figure 83.**

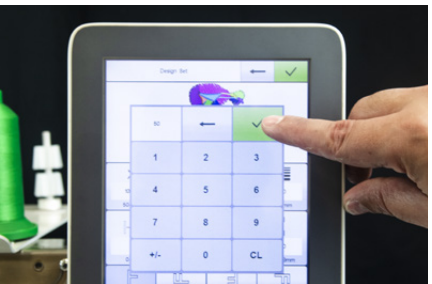


Figure 83

3. When you have finished editing your design, press the green check on the top right of your screen to save your changes.

HOW TO REPEAT DESIGN AND SELECT THE SPACE BETWEEN REPEATED DESIGNS

To begin the process, you will have to choose whether you want to repeat your designs vertically or horizontally.

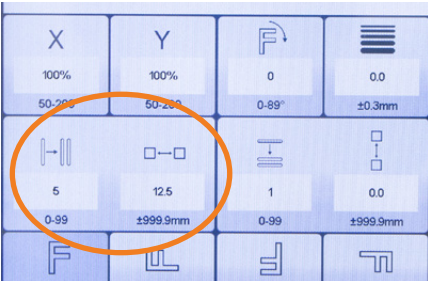


Figure 84

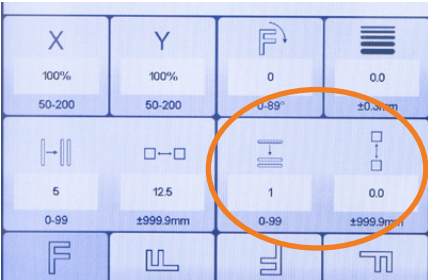


Figure 85

- To repeat the design horizontally, use the first and second icon on the second row of the Design Settings menu. The first icon is used to select the amount of designs you wish to repeat, and the second icon is used to select the space in between each design. **See Figure 84.**
  - To repeat the design vertically, use the third and fourth icon on the second row of the Design Settings menu. The third icon is used to select the amount of designs you wish to repeat, and the fourth icon is used to select the space in between each design. **See Figure 85.**
1. Select the first or third icon to repeat your design depending on whether you want to repeat the design vertically or horizontally.
  2. Clear the current value on the keypad, if any.
  3. Input the number of designs you would like to repeat, and press the green check mark.
  3. Next, select the space in between each of the designs with either the horizontal or vertical spacing icon (the second or fourth icon on the second row depending on whether you are repeating the design horizontally or vertically.)
  4. Clear the current value, if any.
  5. Input the amount of space you wish to place between your designs. These values will be represented in millimeters.
  6. Once you’ve input the measurement, select the green check mark key on the top right of the keypad.
  7. When you have finished editing your design, press the green check on the top right of your screen to save your changes.

**Note:** Embroiderers use this method to save time when running projects such as multiple patches. To do so, you will need to use the largest hoop possible, and repeat the design as many times as it fits in the hoop’s sewing area.

ADJUSTING THE DENSITY OF THE DESIGN

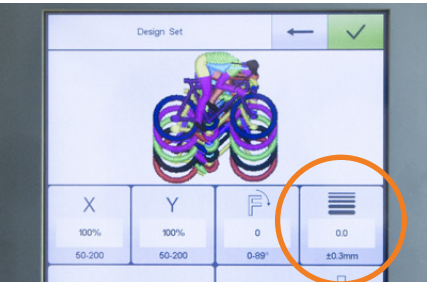


Figure 86

The fourth icon on the first row of the Design Settings menu is used to adjust the design’s density. **See Figure 86.**

1. Select the density icon and input the desired density value.
2. Next, select the green check mark on the top right of the keypad.
3. When you have finished editing your design, press the green check on the top right of your screen to save your changes.

Color Sequence Settings

You can select the colors you are going to use for your embroidery project under the Color Sequence Settings menu. In this menu, you can also offset your frame during a color stop for appliqué embroidery and slow down the speed of the machine during certain color stops.

HOW TO SELECT A COLOR SEQUENCE



Figure 87

On the bottom half of the Color Sequence Settings menu, you may select the needle numbers you wish to use. The top half of the color sequence menu will display the needles you have selected for the embroidery job. **See Figure 87.**

**Note:** You should select the needle numbers in order from the first color stop to the last color stop.

HOW TO SLOW DOWN THE SPEED DURING A COLOR STOP

The “Low Speed” key allows you to slow down the speed during a certain color stop. This is helpful when embroidering detailed parts of the design that require slower stitching speeds.



Figure 88

1. Open the color sequence settings menu.
2. Select the needle you would like to slow down.
3. Select the Low Speed key. **See Figure 88.**
4. Click on the green check mark key to save your settings.

HOW TO SELECT A COLOR CHANGE MODE

The embroidery machine’s color change mode refers to the mode in which the needle changes from one color to the next. Most of the time, you will want your embroidery machine to be on fully automatic



mode. This will command the machine to embroider the design the entire way through, without stopping between each color stop.

In some instances, you may want to **tap on the color change mode key to switch from automatic to semiautomatic or manual color change mode**. For example, you may need the machine to stop in the middle of a design so you can place appliqué fabric. If that’s the case, you should set your machine to automatic/manual to stop the machine between each color stop.



Figure 89

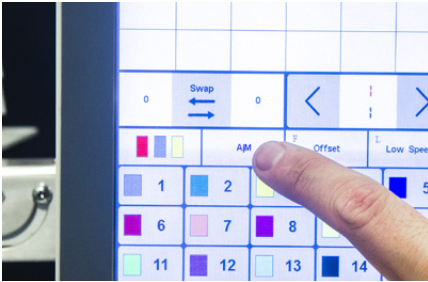


Figure 90



Figure 91

HOW TO OFFSET THE FRAME DURING A SPECIFIC COLOR STOP

Offsetting the frame during the embroidery process allows you to easily place your appliqué fabric during production. Follow these steps to offset the frame before a certain color stop begins to stitch.



Figure 92

Automatic mode

When color change mode is on auto and startup mode is on auto, the machine will automatically switch needles and continue embroidering after each color stop. **See Figure 89.**

Automatic/manual mode

When color change mode is on auto and startup mode is on manual, the machine will stop after each color stop, and you will need to hit start again for it to continue stitching in the next color stop. **See Figure 90.**

Manual mode

When color change mode is on manual and startup mode is on manual, you will have to manually select your needle and then press start after every color stop. **See Figure 91.**

4. Click on the green check mark key on the top right of the panel to confirm.

HOW TO SWITCH THE PRESET NEEDLE COLORS ON YOUR PANEL

To avoid confusion, you can customize the color that appears next to the needle number to match the thread spool that is placed on your machine.

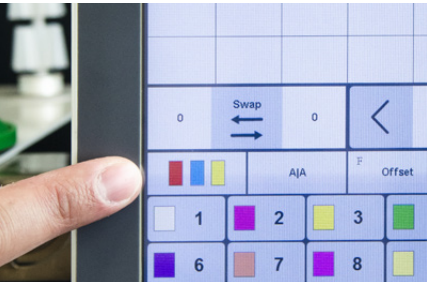


Figure 93

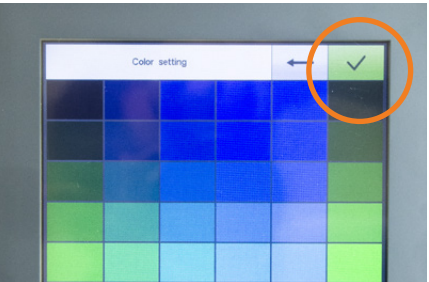


Figure 94

1. In the color sequence settings menu, select the color selection icon represented by three colored rectangles. **See Figure 93.**
2. Select the needle you wish to customize.
3. Sort through the pages of color options and select the color that best matches the corresponding thread spool. **See Figure 94.**
4. Click on the green check mark to save the settings.

Design Tracing

Before running a design, you should trace your design. This step will ensure the needle will not interfere with the hoop during embroidery and will also help you confirm the placement of your design.

While tracing, your machine will move to needle #1. Follow along needle #1 to see where your design will be embroidered. There are two types of tracing: **standard tracing** and **contour tracing**.

Standard tracing will trace around the perimeter of your design, while contour tracing will give you a more precise trace along the edges of the design.

HOW TO PERFORM A STANDARD TRACE

1. Click on the design tracing icon.
2. If the machine prompts you to enter embroidery status, select OK.
3. The machine will trace along the perimeter of your design.

HOW TO PERFORM A CONTOUR TRACE

1. Click on the design tracing icon and perform a standard trace. After the standard trace is complete, a new message will appear.
2. Select “Trace design outline” to contour trace.



**Note:** You may continue both tracing techniques as many times as needed. Once you have reached the desired placement, select OK.

## Embroidery Speed



Figure 95

You may set and adjust the embroidery speed using the plus and minus key icons on the left side of the panel.

The section in the middle will display the speed at which your machine is running. The top number is the speed you have selected, and the bottom number is the actual speed at which your machine is running. **See Figure 95.**

## Directional Arrows

The machine's directional arrows allow you to position the design to your liking. You may move the pantograph up, down, left or right using the directional arrows on the bottom right of the screen.

## Frame Shift Direction/Speed Increments

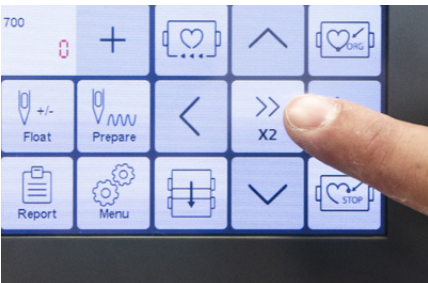


Figure 96

The frame shifting speed key appears in the center of the four directional arrow keys. Tap on this key to increase or decrease the speed key increments and to control how quickly the frame (hoop) moves. **See Figure 96.**

### If the key is displaying two arrows

- Tapping the plus or minus button will increase or decrease the speed in increments of 50 stitches per minute
- The pantograph will move at a faster speed when you adjust the frame using the directional arrows

### If the key is displaying one arrow

- Tapping the plus or minus button will increase or decrease the speed in increments of 10 stitches per minute
- The pantograph will move at a slower speed when you adjust the frame using the directional arrows

## Stitch Mode/Emb Mode



Figure 97

Your EMB mode key will display the status of the embroidery. While your machine is embroidering (in working status), the key will appear with a message that states “working” and a zig zag line. **See Figure 97.**

The EMB mode menu also allows you to set a speed in which to “float” (fast forward or rewind) through your design. When you experience a thread break, you should rewind your design a few stitches back to make sure you didn’t skip any stitches.

### HOW TO FAST FORWARD AND REWIND YOUR DESIGNS MANUALLY

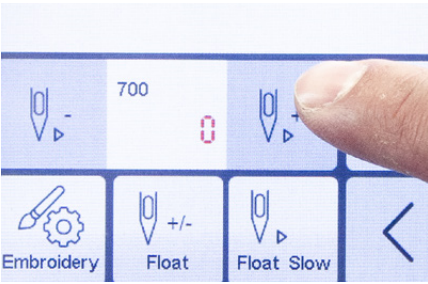


Figure 98

You can rewind and fast-forward through your stitches in low and high speeds using the EMB mode icon.

1. Tap the EMB mode icon **once to float at a low speed**, or tap the EMB mode icon **twice to float at a high speed**.
2. When you enter stitch floating mode, two needle icons will appear on the screen. Tap the needle icon **with the minus symbol to float backward**. Tap the needle icon **with the plus symbol to float forward**. **See Figure 98.**

## Floating Menu

You can rewind and fast-forward through your design by stitch count or by color stop using the floating key.

### HOW TO FAST FORWARD AND REWIND YOUR DESIGNS BY STITCH COUNT

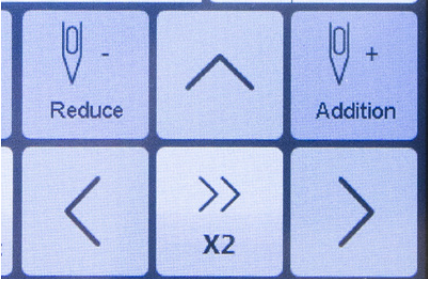


Figure 99

1. Click on the “Float” icon.
2. To rewind by stitch count, click on the “Reduce” icon. To fast-forward by stitch count, click on the “Addition” icon. **See Figure 99.**
3. Input the number of stitches you would like to rewind or forward to, and the frame will move to that point of the design.

HOW TO FAST FORWARD AND REWIND YOUR DESIGNS BY COLOR STOPS



Figure 100

1. Click on the “Float” icon.
2. To fast forward by color stop, click on the “Forward” key. To rewind by color stop, click on the “Backward” key. **See Figure 100.**
3. Each color stop will appear on the screen as you continue tapping on the “Forward” or “Backward” key. Continue clicking the key until you’ve reached the area where you wish to begin stitching again.

Manual Color Change/Needle Display

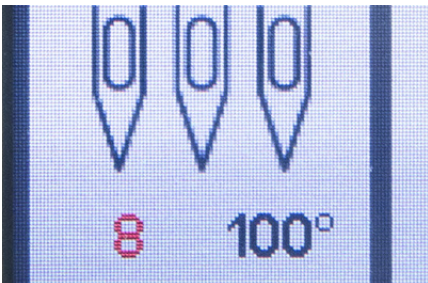


Figure 101

The needle display icon is located on the bottom left corner of the main menu and is also the manual color change key.

This icon displays two important features on your machine. The red number on the left side represents the working needle, and the number on right side displays the degree the machine is aligned to. **See Figure 101.**

To move your machine head from one needle to another manually, select this key and choose the needle you wish to move your machine to.

**Note:** In order to operate, a needle number must appear on the needle display icon, and the machine must be aligned to 100 degrees.

Return To Stop Point



Figure 102

The return to stop point key is used to return your frame to the last point where the design stitched, if you moved the frame using the directional arrows after stopping the machine. **See Figure 102.**

Before pressing the start button, click on this key and the frame will return to the last point you stitched. You may then resume the design from where you left off without losing your original placement.

Trimming



Figure 103

The trimming button is used to trim the thread of the current needle the machine has selected. This key is useful when the user needs to switch to another needle or stop the machine and remove the hoop. **See Figure 103.**

Trimming is also useful when threading a needle because it automatically inserts the thread from the needle’s eye into the presser foot. This helps speed up the threading process.

You can press the trimming button during embroidery mode or setup mode as long as the machine isn’t running.

MAINTENANCE

Some embroidery machine issues are caused as a result of improper routine care. Therefore, proper maintenance is essential to prolong the longevity of your machine. You will need to lubricate your machine with sewing machine oil, which can be found in most sewing and embroidery supply stores, and white lithium grease, which can be found in many hardware stores. Before using any other product, please ask a certified technician to confirm that the product is safe for your machine.

EVERY FOUR HOURS OF USE

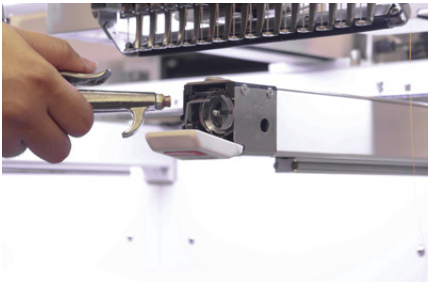


Figure 105

- Remove the bobbin case and clean the hook assembly area with a soft brush, air compressor with a moisture filter or or approved compressed air dusters like Dust Off. **See Figure 104.**

- Remove the bobbin case and apply two to three drops of sewing machine oil on the race of the rotary hook, where the two sections of the hook meet. **See Figure 105.**

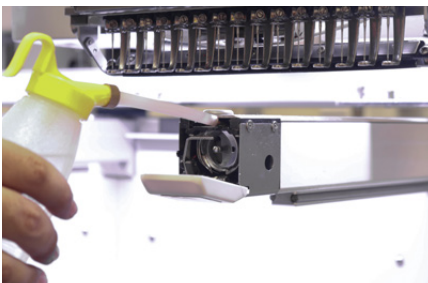


Figure 104



ONCE A DAY



Figure 106

- Remove the bobbin case and clean the hook assembly area with a soft brush, air compressor with a moisture filter or approved compressed air dusters like Dust Off. **See Figure 106.**

ONCE A WEEK

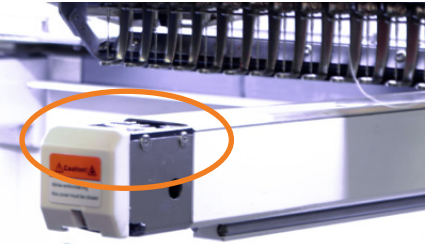


Figure 107

- Remove the needle plate located on top of the sewing arm. Once removed, clean around the trimmer knives with a soft brush or air compressor with a moisture filter or approved compressed air dusters like Dust Off. **See Figure 107.**

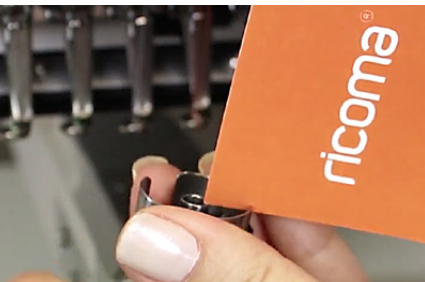


Figure 108

- Clean the lint from the slit on the bobbin case with the corner of a business card, or remove it with the bobbin thread itself like dental floss. Resist the temptation to blow the lint off, which can deposit damaging saliva onto your bobbin case. **See Figure 108.**

ONCE EVERY TWO WEEKS

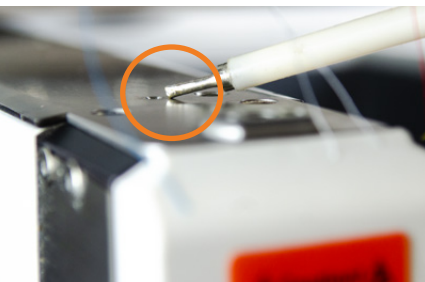


Figure 111

- Apply two to three drops of sewing machine oil to the two openings on the front and back of the sewing arm. **See Figure 111.**
- Apply two to three drops of sewing machine oil to the reciprocator.

**Note:** You will need to move the machine to needle #15 to complete this step. You will find the opening on the front side of the “t” rail right behind the screw. **See Figure 112.**

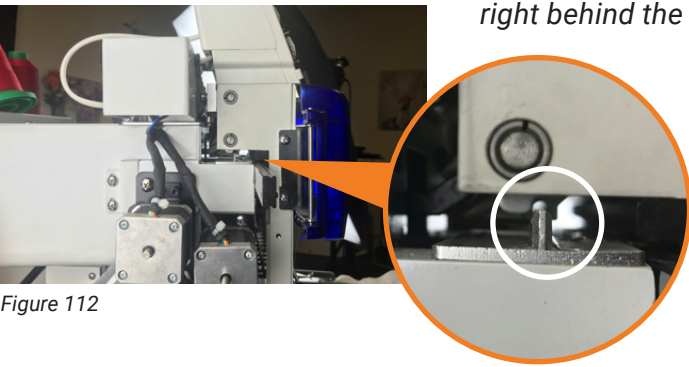


Figure 112



Figure 113

- Apply two to three drops of sewing machine oil to the three red openings on the right side of the machine's upper shaft. **See Figure 113.**



Figure 114

- Apply one to two drops of sewing machine oil through the openings on the metal cover. Note: The foam pads located behind the metal cover on the lower needle bars should soak up the oil. **See Figure 114.**

ONCE A YEAR



Figure 115

- Apply white lithium grease to the bearings (metal rollers) on the back of the head. Move the machine's head from needle #1 to needle #15 to be able to see and apply the grease on all the metal rollers. **See Figure 115.**

COMMON ERRORS

Resolving a Thread Break

If a thread break occurs, the machine will stop automatically and you will receive a thread break alert. The thread will usually break near the lower portion of the machine head.

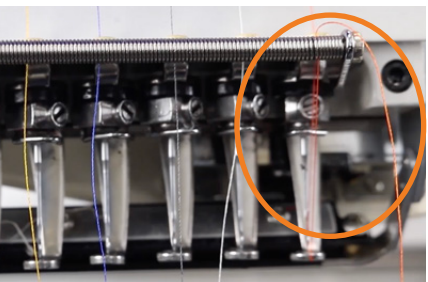


Figure 116

1. Thread the machine from where the thread break occurred all the way through the needle and down the presser foot.
2. Rest the thread on the holding spring, leaving about 1 inch of thread hanging. **See Figure 116.**
3. Rewind the design approximately 10 to 12 stitches. See the [Floating Menu](#) section for more on rewinding an embroidery design.

4. Last, press the start button to resume sewing your design.

**Tip:** Rewinding after a thread break is essential because the machine continues to run for a few stitches after the thread breaks. Therefore, you should back up the design to ensure there are no gaps in your design.

## Replacing a Needle

### Step 1: Remove and discard the broken needle

1. Remove the broken needle from the garment. If it is not on the garment, check the bobbin area.
2. Loosen the set screw above the needle with a straight slot screwdriver. Loosen only enough to be able to remove the needle.
3. Discard the spent needle into a childproof pill bottle or other sharp-safe container.

### Step 2: Insert the new needle

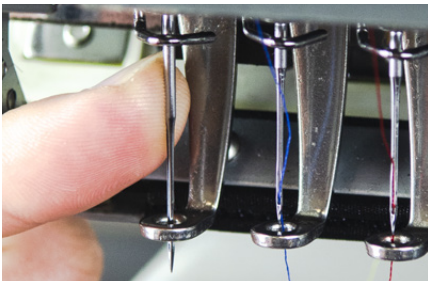


Figure 117



Figure 118

4. Needles have a long groove on the front and a short half-moon-shaped section called the scarf on the rear. With the long groove facing the front of the machine, insert the new needle by placing the point through the presser foot, and inserting the shank into the needle bar. **See Figure 117.** [Refer to needle diagram on page 53.](#)
5. Verify that the long groove of the needle is still facing forward. Tighten the needle screw while holding the needle firmly to keep it from slipping down. **See Figure 118.**

**Tip:** To help you place the needle correctly, you may insert a wooden toothpick into the eye of the needle. Never place a metal object in the needle's eye, as it could scratch the eye of the needle, causing thread breaks.

## Bobbin Running Out

If the bobbin thread runs out, the machine will automatically stop and you'll receive a thread break alert.

To differentiate a thread break from the bobbin running out, take a look at the thread from the working needle. If it's still attached to the fabric, the bobbin most likely ran out of thread.

If that's the case, replace the old bobbin with a new bobbin and place the bobbin case back inside the rotary hook. Refer to the [Threading and Inserting the Bobbin](#) section for more.

## Emergency Stop Error



Figure 119

An emergency stop error occurs when the emergency stop switch has been pushed during shipping or during an emergency situation. If you receive an emergency stop error, you can easily override it by rotating the emergency stop button clockwise, following the directional arrows shown on the button. **See Figure 119.**

## No Needle Error

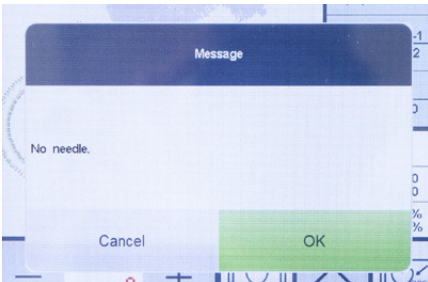


Figure 120

A no needle error occurs when the machine cannot detect which needle is over the needle plate. This may happen because the machine head is positioned between two needles or if the red knob (color change knob) on the right of the embroidery head is accidentally repositioned.

If you receive a needle error on your panel, you may see a "0" appear on your needle icon where the needle number was once displayed.

If so, press ok to clear the error message, and rotate the knob until a needle number appears on the control panel's needle icon. **See Figure 120.**

Once a needle appears, you may resume operation.

## Main Axis Not at 100

Your machine needs to be aligned to 100 degrees in order to start and stop sewing. A main axis error occurs when the main axis is not lined up to 100 degrees.

This error will appear for several reasons, such as if a needle hits the hoop or if you get a bird's nest.





Figure 121

3. Once you've made sure a working needle is selected, press the 100 degree button on your control panel once again.

Most of the time, your machine's main axis will align itself after this step, and you may continue operating your machine.

If you are still receiving an error message after performing this step, you will need to align it manually using the black knob on the right side of the machine.

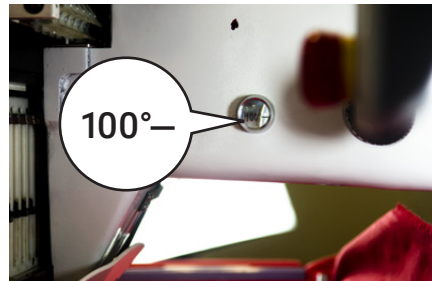


Figure 122

#### How to resolve a main axis error manually

1. Turn off the machine.
2. On the right side of the machine, you will find a window that displays the degree the machine is aligned to. **See Figure 122.**
3. Push the black knob (main axis knob) inward, and rotate the knob counterclockwise until you see the indicator in the window align to 100 degrees.
4. Turn the machine back on.
5. When the main screen loads, press the 100 degree button on your panel. At this point, the machine should be ready to embroider.

## Hook Timing

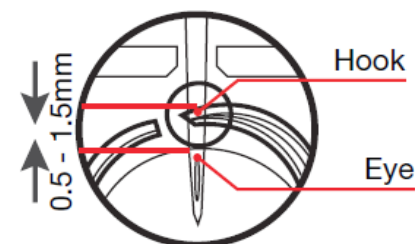


Figure 123

Hook timing refers to the synchronization of the rotary hook with the needle. Proper timing is critical to ensure embroidery quality and prevent issues. If the space between the needle and the hook point is out of range, the thread will not catch, causing thread breaks. If the space between the needle and hook point is too close, it will cause broken needles. **See Figure 123.**

You can set your rotary hook timing by rotating the main shaft of

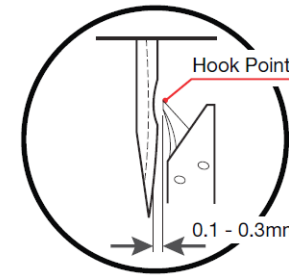


Figure 124

your machine to a specific degree and adjusting the rotary hook at that particular degree. This is known as the "timing degree."

**The SWD's timing degree is 196 degrees.**

When timing is correct, the tip of the rotary hook should be directly lined up behind the needle's scarf, and the proper space between the needle and the hook should be 0.1mm to 0.3mm. **See Figure 124.**

**Note:** If you need to reset the timing of your machine please contact Ricoma technical support.

## TENSION

Proper thread tension is necessary for quality embroidery. Improper thread tension will cause a number of embroidery issues. For instance, tension that is too loose will cause threads to loop, and tension that is too tight may cause frequent thread breaks.

Tension will depend on the complexity of your design; the fabric, thread and backing you're using; and even hooping. Before making any tension adjustments, make sure your machine is threaded correctly. Sometimes you may encounter tension issues simply because your machine is threaded improperly.

You can adjust the tension settings using the following:

- The spring lever ([See page 48.](#))
- The top tension knobs ([See page 49.](#))
- The bobbin case ([See page 50.](#))

**Keep in mind:** Before making any tension adjustments using other factors such as the bobbin case and the tension knobs, we recommend first adjusting the spring lever – as this is the quickest fix and small changes to the spring lever may regulate the tension on your design. The spring lever controls the tension of all the needles, while the tension knobs control the tension of the working needle

## Testing Tension

The tension on the bobbin case affects the stitching that comes from every needle. The most widely accepted tension test is the "I" test. This is conducted by sewing a one-inch tall satin column and examining the reverse side. The bobbin tension setting that you should aim for is shown in **Figure 125:** one-third bobbin thread running exactly down the center of the column, with one third top thread running down each side.



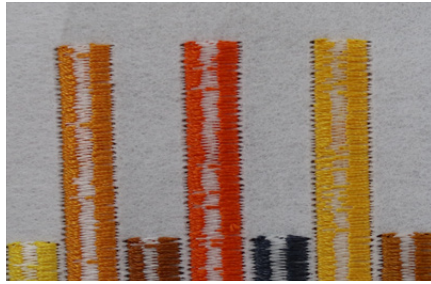


Figure 125

**When too much bobbin is showing across all needles:** Your bobbin tension is too loose. To resolve this, tighten your bobbin case by rotating the large screw clockwise.

**When too little bobbin is showing on the back of your design across all needles:** Your bobbin tension is too tight. To resolve this, loosen the bobbin case by rotating the large screw counterclockwise.

**When too little top thread is showing on all needles:** Your top thread tension may be too tight. Loosen the thread tension of all needles with the spring lever.

**When too much top thread is showing on all needles:** Your top tension may be too loose. Tighten the thread tension of all needles with the spring lever.

**When too much top thread is showing on one needle:** Your thread tension on that needle may be too loose. Tighten the tension of that needle by rotating the tension knob clockwise.

**When too little top thread is showing on one needle:** Your thread tension on that needle may be too tight. Loosen the tension of that needle by rotating the knob counterclockwise.

## Adjusting the top thread tension: Spring lever

The spring lever controls the tension of all the needles, while the tension knobs control the tension of the working needle.

Depending on the material and design you're embroidering you may need to adjust the spring lever up or down. We recommend keeping the spring lever directly aligned at a 90-degree angle. When adjusting thread tension, position the lever one or two clicks either up or down from the center.

**When embroidering heavy materials,** lower the spring lever.

**When embroidering lightweight materials,** raise the spring lever.

**If you want to tighten the tension of all the needles,** you should lower the spring lever one or two clicks. If you want to loosen the tension of all the needles, you should raise the spring lever one or two clicks.

**Note:** You should never place the spring lever neither all the way up nor all the way down, as either scenario may result in thread breaks. If the spring lever is positioned all the way up, the threads will be too loose to function properly. Conversely, if the spring lever is positioned all the way down, the threads will be too tight to function properly.

## Adjusting the top thread tension: Tension knobs

Proper tension settings will vary by thread type. While most brands tend to be similar, thread type may have an effect on tension. For instance, polyester threads require nearly twice the amount of tension as rayon.

Therefore, you may need to adjust the tension knobs until you've reached the proper tension for your specific thread.

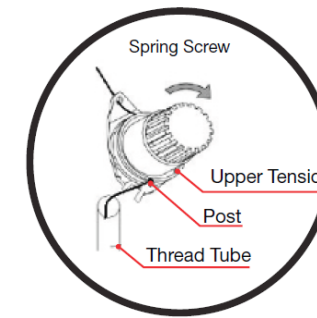


Figure 126

The top tension knobs allow you to quickly adjust tension settings on a single needle. The top tension knob is pictured in **Figure 126**.

If too much top thread is showing on the back of your design, tighten the top tension by rotating the knob clockwise.

If too little top thread is showing on the back of your design, loosen the top tension by rotating the knob counterclockwise.

**Tip:** We always recommend starting with small quarter turns either to loosen or tighten the tension. That way, you get a better idea of how each tension adjustment affects your design.

## FACTORS THAT AFFECT TOP TENSION

- Thread color is a factor that affects thread tension because the dye affects the texture of the thread. The texture of the thread affects how smoothly it slides through the machine and the needle.
- Another factor that contributes to tension is the weight of the thread. If you change the weight of the thread, you will need to adjust the tension.
- The speed of the machine may also affect tension. The slower the speed of the machine, the better the stitch quality.
- Excess dust and lint along the thread path may also affect the thread tension.

## Adjusting the bobbin tension

Proper bobbin tension is essential for quality embroidery. If tension is incorrect, you may begin to experience frequent thread breaks.

**Note:** Tension comes preset on new bobbin case and should not require adjustment.



Figure 127

You can fine-tune the bobbin tension by adjusting the large screw on your bobbin case.

Rotate the screw counterclockwise to loosen the tension, or rotate the screw clockwise to tighten the tension. **See Figure 127.**

**When too much bobbin is showing on the back of your design,** your bobbin tension is too loose. To resolve this, tighten your bobbin case by rotating the large screw clockwise.

**When too little bobbin is showing on the back of your design,** your bobbin is too tight. To resolve this, loosen your bobbin case by rotating the large screw counterclockwise.



Figure 128

Bobbin tension that is too tight may result in a narrow column, or even a single strand of bobbin thread down the center of the satin column stitched during the “I” test. This can cause the embroidery to unravel easily if the bobbin thread ever gets snagged. **See Figure 128.**

## FACTORS THAT AFFECT BOBBIN TENSION

- Erratic bobbin tension usually results from a catch in the bobbin case. Try pulling a few feet of bobbin thread to see if the rotation is smooth or if it catches. This catch can be the result of an ill-fitting bobbin that has been overfilled or that has a manufacturing defect. If you suspect the bobbin is not rotating smoothly in the machine, test it by placing the bobbin case face down on the machine table or a flat surface. Then, pull a few inches of thread out. If the bobbin isn’t spinning freely on the surface, the odds are that it isn’t spinning freely in the machine either. Retest the case with another bobbin.
- If you are still experiencing bobbin tension issues after adjusting your bobbin thread, make sure you are not using a damaged bobbin case or needle, as this may cause undesirable results.

## THREAD BREAKS

### Reasons Why Thread Breaks Occur

1. **Thick fabric:** If the fabric is too thick, needles tend to bend slightly as thread passes through. This causes the thread to scrape against the needle plate, shredding the thread. To correct this issue, replace the existing needle with a larger needle.
2. **Hidden obstructions in the garment:** Obstructions such as bulky seams, inside pockets and hidden buttons, may cause thread breaks.
3. **Improper hooping:** Make sure the item is hooped properly. If your fabric is hooped too loosely, you may experience thread breaks and other machine embroidery issues.
4. **Excessive backing:** Excessive backing results in thread and needle breaks, as it applies greater friction to the thread and needle.
5. **High-density designs:** Designs with high thread densities may cause needle deflection, which leads to thread shredding and thread breaks. Small designs with high densities pack too many stitches in a small area, causing thread breaks.
6. **Extremely short stitch lengths:** Short stitch lengths may cause thread to pile up in one area. Also called “nesting,” this issue may result in thread shredding and thread breaks. Try deleting short stitches or increasing the design by 5 to 10 percent.
7. **The needle:** If the needle has been inserted backward or slanted, you may experience thread breaks. Damaged or old needles may also cause thread breaks.

### Thread Break Prevention

1. Proper thread care is necessary to prevent thread breaks. We recommend storing thread in a dark, cool place. Old threads that have not been stored properly will cause thread breaks. Prolonged exposure to air, light, heat or aged thread will cause threads to become brittle. If this occurs, replace the old thread and store the new thread in a dark, cool place.
2. Do not use tape to tie off thread ends. Tape leaves a sticky residue that causes friction and thread breaks.
3. Check for burrs in the thread guides, needle eye, needle plate and rotary hook.



4. Oiling your machine is essential to keep your machine running smoothly. Keeping your rotary hook area clean with a hook cleaner is also vital, especially if you are using adhesive stabilizer or spray that leaves behind a residue that causes your thread to shred. Refer to the maintenance section to learn how to properly care for your machine.

## Thread Break Troubleshooting

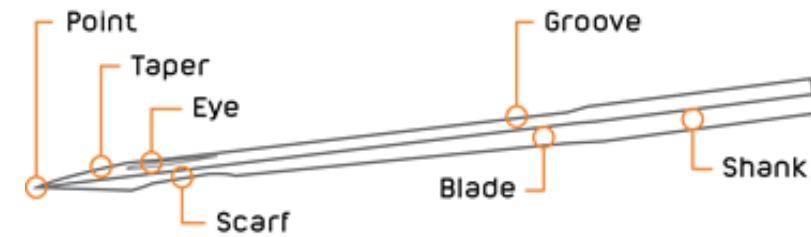
There are a number of reasons why you may be experiencing recurring thread breaks. To ensure it is not a technical issue, follow these steps.

1. Check the thread path to make sure your machine is threaded correctly. It should follow the correct path detailed in the Threading section of this guide.
2. Inspect the needle to determine if an actual thread break has occurred. Sometimes your machine may read a thread break, but the thread will still be attached to the fabric. If this is the case, check all the thread paths. Then, do a manual trim and check the bobbin supply. If the thread is broken, follow the correct thread path and rethread the needle.
3. Make sure your thread tension is correct. Tight tension may lead to missed stitches, thread breaks, pulling, puckering and thread stress. Loose tension will cause thread to pile up and loop.
4. Make sure the thread you're using is not defective. If so, pull out a few yards of thread until you've gotten rid of the defective thread. If that doesn't work, try replacing the thread with a new cone.
5. Check for defective needles or needles not inserted properly. You will be able to tell if a needle is defective or not positioned correctly by verifying if the problem is on one or a few needles and not others. Replace any damaged or bent needles.
6. Make sure the bobbin is installed properly. Remove any lint or dirt build-up in the bobbin case. Make sure the thread trimmer knife is fully retracted.
7. If thread breaks are occurring on all the needles, you need to adjust the hook timing. Refer to Adjusting the timing of a needle and hook for details.

**TIP:** Always do a sew-out on two pieces of backing or on a piece of the same material as the garment. This will help you see if the correct backing, topping and hooping methods have been applied. This will also help you verify if the tension of the thread and bobbin are correct. We recommend using 100% polyester Isacord thread.

## NEEDLES

### Anatomy of the Needle



**Shank:** The top section of the needle that attaches to the needle bar (into the machine).

**Shaft/blade:** The part of the needle that ranges from the end of the shank to the top point of the needle.

**Taper:** The narrowed end of the needle that lies below the eye.

**Point:** The very bottom of the needle. The part of the needle that pierces through the fabric.

**Eye:** The opening where the thread passes through the needle.

**Groove:** The indented surface that runs along the face (front) of the needle.

**Scarf:** The half-moon-shaped cut out on the back of the needle, located just above the eye.

### Needle Lifetime

There are several factors that determine the lifetime of a needle.

**This includes but is not limited to:**

- The material the needle is made of
- The style of the needle
- The material you are sewing on
- How often you use the needle

A basic guideline that many professional embroiderers use to determine when to change needles is the “three strikes” rule. When there have been three consecutive thread breaks on a needle, it should be changed. Several performance changes in your machine will indicate when it’s time to change a needle. This includes but is not limited to:

- Thread breaks
- Poor stitch quality
- Pulls in the fabric
- Machine making unusual noises
- Machine operating at reduced speeds

## Needle Break Causes

Needles break for a number of reasons.

**This includes but is not limited to:**

- The needle is worn out or old
- The design has too many stitches and/or too high density for the design area
- The fabric inside the hoop area is too loose (the material is not hooped tightly enough)
- The needle hit the hoop
- The fabric moved too much during embroidery

## Blade Sizes

One of the first things to consider when selecting a needle is the blade size, such as size 75/11 or 90/14.

If you have ever wondered why there are two numbers in this designation, the reason is that it is a combination of the European and Asian size designation numbering systems.

The first number, such as 75 or 90, is the European designation. This refers to the actual measurement of the blade diameter. For example, a size 80 needle has a .80mm blade width.

The second number, such as 11 or 14, is an Asian numbering system, also formerly used by Singer. In this system, a smaller number indicates a smaller blade diameter.

### Size 75/11

The 75/11 needle is a standard needle used in most embroidery projects. It is used to sew everyday items such as golf shirts, sweatshirts, dress shirts, light jackets, light canvas, aprons, holiday stockings and more.

### Size 70/10

The 70/10 needle is mainly used for moisture-wicking fabric like 100% polyester t-shirts and golf shirts.

### Size 65/9 or 60/8

If you need to embroider a very light or delicate material, the 65/9 or 60/8 needle will produce the best results. It is used to sew silks and fine linens, as well as detailed designs on small areas, such as intricate patches or very small lettering.

### Size 80/12

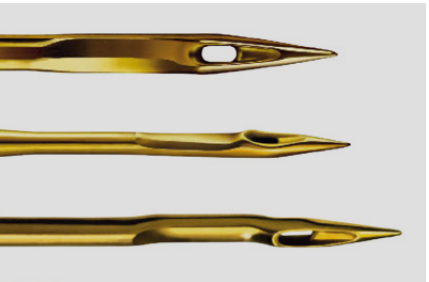
Heavier materials require a specific type of needle that can puncture through the fabric. The 80/12 needle is usually recommended when embroidering on thicker, heavier fabrics. It is commonly used to sew heavy canvas, vinyl, light leather, ball caps, visors and more.

### Size 90/14

90/14 needles are most commonly used when you want to embroider a design with a thicker thread like metallic thread. Since this needle has a larger eye, it allows the thread to easily pass through the eye. Also, it is a very stiff needle, so embroiderers tend to use it to sew items like canvas and belts.

***Tip:** The point must be able to pierce through the fabric easily to avoid deflecting when the needle contacts the material. Otherwise, the needle will strike the surrounding metal or the needle plate, potentially causing damage to the needle or the machine. Choose a finer blade for more fine-woven or knit fabrics. Use a larger blade for tough fabrics that could cause needle deflection.*

## Needle Finishes

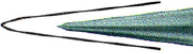





Most sewing and embroidery needles have chromium plating that enhances durability and appearance. Titanium-coated needles are more expensive than chromium-plated needles, but they can last as much as five to seven times longer than their chromium-plated counterparts. These types of needles also reduce thread friction. Reduced thread friction lessens the frequency of thread breaks, and saves time and labor. Titanium needles are a beautiful golden color and are available in the most popular sizes.



Types of Needlepoints

In order for the needle to penetrate cleanly through the fabric, it is necessary to choose the correct point type. The types of needlepoints used for commercial embroidery include:

SPI	Acute Round	
R	Normal Round (Sharp)	
SES	Light Ball Point	
SUK	Med Ball Point	

- 1. Acute round point – designation SPI
  - Has a slender sharp point
  - Used on fabric with high thread counts, microfibers and certain synthetics
- 2. Normal round point – designation R
  - Has a normal sharp point
  - Used on woven fabrics, including finished caps
- 3. Light ball point – designation SES
  - Designed to spread yarn in knitted fabrics rather than piercing them to maintain the structural integrity of the knit
  - Most popular needle type and is considered a universal point type
  - Suitable for most knit and woven fabrics.
- 4. Medium ball point – designation SUK
  - Used to spread heavier yarns such as those used in heavier knitted fabrics

THE DIFFERENCE BETWEEN SHARP POINT AND BALL POINT NEEDLES

The two primary point types used for sewing and embroidery are sharp point and ball point.

**Sharp point needles** are used to sew woven materials. These needles will cut the material when they need to, but often find their way into the existing holes of the fabric, just like the ballpoint needles. Made on a loom, woven materials consist of many individual threads. Therefore, if one thread is broken, other threads will remain intact. Your starter kit comes with sharp point needles.

*Tip: We recommend using Groz-Beckert brand needles. The designation for sharp point Groz-Beckert needles is RG.*

**Ball point needles** are used to sew knit materials. These needles are non-cutting and work by finding their way into the holes that already exist in the material. If you pierce holes on knit material, it will unravel due to the fact that knits are made of one continuous thread.

*Tip: We recommend using Groz-Beckert brand needles. The designation for ball point Groz-Beckert needles is FFG.*

The Relationship Between Needles and Thread

Because the eye of the needle will be smaller or larger depending on the size you choose, you will need to change the size of the thread as well in some cases. For instance, a small 65/9 or 60/8 needle will require a lighter weight thread such as a size 60 thread, which is thinner and can easily pass through the needle’s eye. The chart below displays which size needle corresponds with which size thread.

Size of a Needle			Size of a Thread			
U.S.A.	Japan	Germany	Cotton	Silk	Nylon	Rayon
0.25	9	65	70~80	100~120	130~150	70~100
0.27	10	70				
0.29	11	75	50~60	80~100	100~130	100~130
0.32	12	80				
0.34	13	85	50~60	60~70	80~100	130~150
0.36	14	90				

THREAD

Thread Consumption

Thread consumption varies according to the type of stitch being made. Longer stitch lengths, such as long satins or jump stitches, use more top thread than shorter stitch lengths like fill stitches. Using an average mix of stitch types, a 5,000-yard cone yields about 9 million stitches. If the cone costs \$9, this would be about one cent per thousand stitches. Bobbin thread yield is about 35,000 to 42,000 stitches for size “L” bobbins. The amount of yardage per bobbin varies according to the thread type and stitch length of your design.

# The Bobbin

When it performs well, we take the bobbin for granted. But when you have trouble with bobbin thread, it confounds all efforts toward efficient production. That’s because the bobbin affects all needle bars. This makes it impossible to achieve better sewing by simply switching to another needle. Such a vital element commands closer examination.

You have the choice of winding your own bobbins or buying pre-wound commercial bobbins in disposable cartridges. Self-wound bobbins tend to be inconsistent in the way the thread releases from the spool. For high-speed commercial embroidery machines to function properly, a smooth and consistent release of thread is required. Commercial pre-wound bobbins are a cost-effective and efficient solution to ensure bobbin thread runs smoothly.



Figure 129

**Your Ricoma machine requires an “L” size bobbin.** Polyester bobbin thread is preferred over cotton bobbin thread, as it tends to leave less lint. **See Figure 129.**

There are two types of polyester bobbins: spun and filament.

**Spun:** In this process, small fibers are spun together to form the thread. We do NOT recommend using spun bobbins, as they have the tendency to shear off and collect under the tension spring of the bobbin case. This may cause tension issues over time.

**Filament:** Under this process, the thread consists of one long filament. Filament bobbins run cleaner in the bobbin case and are significantly stronger.

## TYPES OF BOBBIN SIDES

Some bobbins have sides that are designed to support the bobbin as it rotates.

**Paper-sided:** These are the most common.

**Side-less:** These bobbins consist entirely of thread and do not have sides for support.

**Plastic-sided:** Some embroiderers say plastic-sided bobbins rotate more easily in the bobbin case and run smoother.

**Magnetic bobbins:** Magnetic bobbins do not have sides but have magnets for support. Magna Glide bobbins have a magnet in the center, which helps maintain the consistency of the bobbin thread tension. This can help the bobbin run smoother and prevent birdnesting. When using magnetic bobbins, you may need to take out the gunmetal-colored piece on the bobbin case, known as the brake.

## Bobbin Fiber Choices

### Cotton

Although not as strong as its synthetic counterparts, cotton is valued for its friendly texture, which allows a wider range of adjustments for bobbin tension settings. One of its downfalls is that it produces too much lint, which has a tendency to collect under the bobbin tension plate. Lint build-up can lead to “springing” the tension plate, causing it to fail to hold any tension on the bobbin thread.

### Nylon

Nylon bobbin thread exhibits almost exactly the opposite characteristics from cotton. One advantage of using nylon thread is that very fine nylon is still quite strong, so a bobbin can hold many yards of thin nylon thread. The cons of using nylon thread: Its small diameter and slick texture make it tricky to keep consistent tension on bobbin cases. It’s also extremely slippery, which makes it difficult to maintain tension.

### Continuous Filament Polyester

This fiber is the most popular among U.S. embroiderers. It is strong, thin, reliable, and does not produce lint. It’s known for its consistency and high quality. It also allows 127 yards to be held on a standard size “L” bobbin. For this reason, U.S. embroiderers use this bobbin fiber more than any other. Fewer bobbin changes or breaks maintain efficiency because it allows for less machine downtime.

### Spun Polyester

Spun polyester has a number of benefits that make it the number one bobbin fiber choice of many. Its texture is similar to cotton, without the lint issue. It is also the most economical. Spun polyester bobbins require less plate pressure. However, they leave a lint build up in the bobbin case, which needs to be removed and maintained.

One reason that it has been overlooked is that many people mistakenly believe that a size “L” bobbin will hold only 94 yards of this thread. While that’s true of size 100 spun polyester, several suppliers carry size 120 spun polyester. This size yields 120 yards per bobbin, only seven yards shy of continuous filament polyester.



## Top Thread Fiber Choices



Size 60, 70, and 80 threads are **lightweight threads**. This specialty thread is used on fine fabrics, small delicate details and small fonts. If you are using this type of thread, increase the density by 5 to 10 percent.

Size 30 and 40 threads are **medium-weight threads**. This specialty thread can be used to fill larger designs with fewer stitches. If you are using this type of thread, decrease the stitch count by 15 percent. This will save production time. Size 35 threads are commonly used for multi-color threads. Your welcome kit includes size 40 threads.

Size 12 threads are **heavyweight threads**. This specialty thread creates the look of hand embroidery. If you are using this type of thread, use long floating stitches. There is special set-up time required for this thread. We recommend adjusting the tension when using this type of thread.

### Rayon thread

Rayon thread is widely used by U.S. embroiderers. It is available in sizes 30, 40 and 60. Rayon is a very beautiful, supple and natural fiber made from cellulose. Its handling properties are superior to other fibers used for embroidery thread, and it looks very rich when sewn onto fabric. Unfortunately, it is not one of the stronger fibers. Even slight equipment problems may cause an unacceptable number of thread breaks when using rayon thread. Rayon is more expensive than other fibers and is susceptible to damage by environmental factors, such as temperature and light. Black and white Rayon threads tend to break more frequently because of the bleaching and dying processes. White is heavily bleached to reach its brilliant white color, and black is weakened by the amount of pigment it must absorb to obtain its rich black color.

### Polyester thread

Years ago, polyester embroidery thread was very hard to handle because this fiber is very stretchy by nature. This resulted in looping, which caused operators to tighten down on tensions. This compounded the problem because this stretched the polyester fiber even more. When the thread's memory caused it to regain its original length, the embroidery was often puckered. Today's polyesters

are greatly improved and many have excellent sew-ability. The color ranges have also improved, making it a good choice for embroiderers. It may be too strong for certain lightweight, delicate goods, but its resistance to thread breaks can increase production efficiency. We recommend 100% polyester thread for all embroidery projects.

Polyester is one of the two embroidery fibers that can accept neon dyestuffs. The neon colors that you are using in your shop are very likely to be polyester fiber. With excellent resistance to abrasion and bleaching, polyester thread is a great choice for items that will be subjected to sunlight, chlorine or harsh laundering.

***Tip:** Polyester is stiffer than rayon, and may require some tension or check spring adjustments. Experiment with different tension settings using the spring lever to make tension suitable for this type of thread.*

### Cotton thread

For a homespun look, or when creating small personalization on dress shirts, cotton is ideal. Cotton thread makes it easy to adjust tensions. It also has a matte finish that is sometimes preferred over the shiny finish of other thread types. It is available in a broad range of sizes, from very large to very fine. At one time, it was the favored thread for detailed golf logos. Today, it is used for appliqués that are intended to have a homemade look.

### Metallic thread

Avoided by many embroiderers, metallic threads are sometimes difficult to handle. The good news: This beautiful thread type can be tamed.

This thread is stiffer than other varieties, and has an interesting construction. Metallic threads are actually a metallic film glued to a nylon or polyester core. The quality varies widely among manufacturers, so we recommend talking to other embroiderers to find a brand that performs well.



If you have experienced difficulty in sewing with metallic threads, try:

- Using a smaller size thread
- Using a needle with a larger eye
- Checking your digitizing
- Making sure the densities are appropriate for metallic threads
- Checking if there are too many shorter stitches, or small turning stitches

## STABILIZER



Also known as backing, stabilizer is the foundation for good embroidery. Designed to support or even replace the fabric, it helps keep the fabric as flat as possible to prevent distortion of the embroidery design.

There are different types of backing/stabilizer used in embroidery. The proper backing to use depends on the fabric you will be using.

There are three factors you need to consider when selecting backing:

**Stability of fabric:** Stretchy or loose fabrics need a heavy backing. On the other hand, stable and tight woven fabrics need a light or medium backing.

**Stitch density:** The higher the density, the heavier the backing should be.

**Wash-ability:** If the fabric will be washed frequently, use a heavy backing. Backing will gradually become softer after many washes.

### Stabilizer Colors

Backing is available in both black and white colors. White is the most common, and is used for most embroidery projects. Some embroiderers use black backing on darker garments, especially if there is any chance the backing might be seen or bleed through, such as on pique knit shirts.

Backing is available in large reels or pre-cut. Embroiderers opt for large reels when sewing large areas. Meanwhile, pre-cut backing is more convenient for smaller logos such as the typical left-chest logo.

### Stabilizer Weights

Backing is available in different weights. The weight of the backing should correspond with the type of garment you are embroidering. Basically, the backing depends on how much you need to stabilize the fabric. The goal is to eliminate the stretch. The more the garment stretches, the heavier the backing needs to be. The general rule of thumb for selecting your backing: *For lightweight garments, use heavier backing. For heavyweight garments, use lighter backing.*

### Common stabilizer weights

**Lightweight:** 1 to 1.5 oz.

**Medium-weight:** 2 to 2.75 oz.

**Heavyweight:** 3 to 3.5 oz.

***Tip:** Embroidery is all about experimenting until you feel comfortable with your design. If necessary, you may use multiple pieces of backing or a combination of different-sized backing.*

### Types of Stabilizer

There are several categories of backing used in embroidery. Each has its own use and is suitable for different types of garments.

#### Cut-away

Cut away backing is used for permanent support, as it provides the most stability. It comes in light to heavy weights and is heat set fusible. It offers the sharpest embroidery on highly detailed designs, including small lettering.

Cut-away backing remains permanently affixed to the fabric, and the excess is cut away with scissors, which is how cut-away backing has earned its name. It is available in 1 oz. (light) to 3.75 oz. (heavy). Cut-away is best used on materials that stretch (such as knits) and fabrics that will be worn and washed frequently, as it prevents the design from stretching. It is also used on loosely woven and unstructured caps. Select a lightweight cut-away for designs with light stitch-density and a heavyweight cut-away for dense designs.



**Tear-away**

Less stable than cut-away backing, tear-away backing is used for light support. It’s available in light to heavy weight and comes with an adhesive version. Like cut-away, tear-away backing is true to its title. Embroiderers tear this backing away from the garment, hence the name. Tear-away backing is typically used on firmly woven, natural-fiber fabrics that don’t stretch, such as terry cloth, robes, blankets, leather and more. In addition to being suitable for very strong and stable fabrics, tear-away is also used when you don’t want the backing to show on the other side of the design, such as back of towels, caps and bags. When your fabric requires strong support, you may use several layers of lightweight to medium-weight tear-away.

**Specialty backings**

Poly mesh or no show backing is a lightweight woven cut-away that is soft, thin and strong. It is designed to provide additional stability to knit shirts. This type of stabilizer does not show through light-colored garments, hence its name. It is used on polos and t-shirts with low stitch count designs. For best results, we recommend combining a no-show backing with a tear-away backing. No-show backing can be removed with water or heat.

**Topping**

Aqua-top topping is a water-soluble plastic film used on the top of an embroidery design to prevent stitches from sinking into textured fabrics. It is used for temporary support on delicate, mesh-like and difficult-to-mark fabrics like pique, fleece, terry cloth or corduroy. Topping is also highly recommended when embroidering towels, as it allows the stitches to stand out as much as possible. When using topping, it is still necessary to apply backing on the back of the fabric to stabilize the garment. Topping may be removed by tearing it away, spraying water on it, or a combination of both methods.

**Foam**

Foam is used to add dimension to lettering or designs on caps for a 3D effect. It is available in a variety of colors in sheets up to 3 millimeters thick. The foam sheet is laid on top of the desired area and then stitched over with a column fill that uses short stitches to cut the foam. The excess foam will need to be pulled away. Some stray pieces of foam that remain can be removed by applying a hot hair dryer over the area.

**Poly mesh backing**

While extremely thin, poly mesh backing is exceptionally strong because of the fibers it consists of. This backing is used for adding maximum stability if you don’t want to handle the bulkiness of a heavyweight cut-away. Poly mesh is great for the newer tech garments, as they are very thin and have a lot of fluidity to the fabric. Poly mesh will add support without compromising the stability of the garment. You may use this backing when embroidering a stretchy tech golf shirt. In this case, you may layer two sheets of poly mesh.

**Fusible backing**

Fusible backing is used on very stretchy materials. Once fused to the garment, the fabric and the backing become one stable material. It is also used to cover up a finished piece of embroidery, such as an infant’s onesie, where the stitches and the backing would otherwise irritate the baby’s skin.

**EMBROIDERY TECHNIQUES**

**Specialty Hoops**



Figure 130



Figure 131

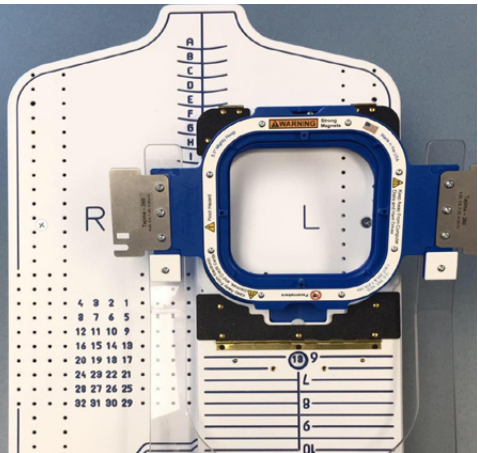


Figure 132

**Magnetic Hoops**

Magnetic hoops are a great solution for hooping very thick material such as bags. These hoops provide much stronger support to your garment and ensure the fabric is held securely within the hoop. They are also great for thin materials, like satin, that are prone to hoop burns, the marks your hoops leave behind on your fabric. **See Figure 130.**

**8-in-1 Device**

A solution for difficult-to-hoop items, the 8-in-1 device consists of eight frames that are compatible with one master bracket. These frames are designed to be hooped with adhesive stabilizer, which allows you to embroider your material directly over a thin frame. These narrow frames allow you to embroider hard-to-reach areas such as pockets, shirt sleeves and more. **See Figure 131.**

**Hoop Master**

Embroiderers use this hooping board to attain a uniform placement of the hoop and garment to maintain consistency when hooping multiple items. The board holds the outer ring of the hoop, so you can easily place the garment over the board and cover it with the outer hoop ring. Because it’s custom-made for your hoops, the HoopMaster is known to be the easiest to use embroidery hooping aid to achieve simple, quick and consistent design placement.

**See Figure 132.**

# Cap Embroidery

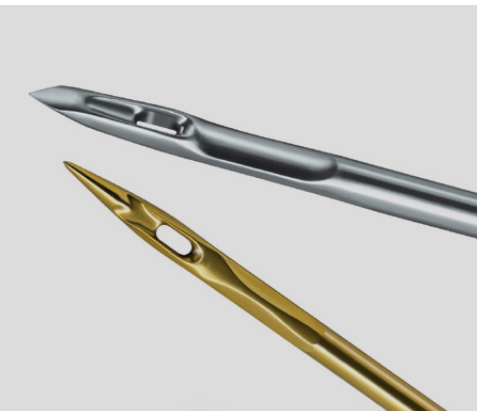
## CAP SELECTION TIPS

- Choose a cap that fits your frame. The shape of the visor board inside your cap should match as closely as possible to the curvature of your cap frame. If there are large gaps at the center or sides, registration problems are likely to occur in these locations.

## CAP SEWING TIPS



- For best results, apply the appropriate backing. Many embroiderers like to use a 3-ounce tear-away backing and adhesive spray on unstructured caps for better clarity on lettering and detail. On structured caps, use a light to medium-weight tear-away backing depending on the complexity of the design. More complex designs will need heavier backing.
- Topping is beneficial on textured caps like heavy twill and corduroy. It also helps to increase the clarity of designs with small details and lettering.
- You may need to tighten the tension on the bobbin case when embroidering on caps. When your fabric is not completely flat, the bobbin may tend to pull to the top side of the work. It helps to use a spun polyester bobbin on caps because it has more texture and is easier to maintain balanced. Many embroiderers keep a set of bobbin cases adjusted for caps.
- When embroidering caps, change needles often. The tough fabric on caps dulls needles quickly. Replace the needle about once every eight hours of continuous use or when you get three consecutive thread breaks. Titanium needles last longer on caps.



## CAP DIGITIZING TIPS

- Reduce or eliminate details and outlining whenever possible.
- Increase column width. The X-axis columns tend to sew narrower on caps than on flat goods.
- Increase fill stitch length to reduce needle penetrations and stress on caps to reduce run time.
- Enlarge lettering to at least 3/8" high if possible.
- Digitizing one section at a time results in more color changes, but improves registration on many designs.

## Operating Speeds for Caps and Flats

Operating speed is determined by the quality of the design and the type of material you are sewing on. To ensure the quality of the product, you need to run your machine at certain speeds when embroidering different types of material.

*Tip: While sewing, inspect your stitches. Make sure your design is embroidering without any loose or looping stitches. If stitches seem to be loose or poor quality, lower the speed of the machine until you have nice, clean stitches.*

If you are experiencing an excessive amount of thread breaks, try reducing the speed of the machine if you've already ensured the following:

- Your design has been digitized correctly and contains the proper stitch count for its size
- You have hooped the garment correctly
- You have proper thread tension
- Your machine is threaded correctly

## SPEED RECOMMENDATIONS

- When embroidering caps, we recommend running the machine between 450 to 650 stitches per minute.
- When embroidering flats, we recommend running the machine between 650 to 850 stitches per minute.



# Hooping Placement Recommendations

## Beach towels

- Designs should be centered 5 inches above the hem
- Monogram size should be 4 to 5 inches

## Bath towels

- Design should be 2 inches above the border or 4 inches above the hem
- Monogram size should be 3 to 4 inches

## Hand towels

- Design should be 1 to 1 ½ inches above the border or 2 inches above the hem
- Monogram size should be 2 ½ inches to 3 inches

## Fingertip towels

- Design should be centered 2 ½ inches from the hem
- Monogram size should be 2 ½ inches

## Washcloths

- Design should be 2 inches above the hem or 1 ½ inches above the border
- Monogram size should be 1 to 2 inches

## Napkins

- Design should be centered in the corner of the napkin on the opposite side of the label
- Monogram size should be 1 to 2 inches

## Pillowcases

- Design should be placed 3 inches above the hem
- Monogram size should be 1 ¼ to 2 ¼ inches

## Sheets

- Design should be centered 2 inches above the sewn band of the sheet, but sewn on the reverse side so it’s visible when the sheet is folded over (many customers prefer full names – especially on children’s sheets)
- Monogram size should be 3 inches on the hem or 3 to 5 inches above the hem

## Robes – Men’s

- Design should be 7 to 10 inches from the shoulder seam and 3 to 5 inches from the center

## Robes – Women’s

- Design should be 4 to 6 inches from the shoulder seam and 3 to 5 inches from the center

# Backing and Needle Recommendations

## Canvas

- Light to medium tear-away backing
- 75/11 sharp or normal round point needle
- Sharp needles are better for longer runs

## Canton Fleece

- Use light tear-away polyester backing to maintain color if a garment is subjected to extensive sunlight, chlorine, salt water or industrial laundering and bleaching
- 75/11 light ball point needle

## Coated or Waterproofed Fabrics

- 75/11 or 80/12 sharp or light ball point needle

## Corduroy

- Use a medium topping and light to medium tear-away
- 75/11 light ball point needle

## Cotton Sheeting

- Use a heavy cut-away or tear-away/wash-away
- Cotton-on is great for children’s clothing
- 75/11 light ball point needle

## Denim

- Use a heavy cut-away or tear-away/wash-away
- 75/11 light ball point needle

**Dress Shirt (Woven)**

- Use a heavy cut-away or tear-away/wash-away
- 75/11 or 70/10 light ball point needle
- 80/12 needle for small details

**Golf Shirt**

- Use a light to heavy cut-away
- Heavy knits require a medium to heavy cut-away
- Medium knits require a light cut-away
- 75/11 light ball point needle

**Headwear**

- Use a medium to heavy tear-away
- 75/11 or 80/12 sharp needle

**Leather and Vinyl**

- Use a light tear-away
- 75/11 or 80/12 light ball point on stiff or spongy leather (upholstery luggage)
- 70/10 or 80/12 sharp on soft, supple garment leathers

**Lingerie or Silk**

- Use a water-soluble tear-away backing
- 70/10 or 80/12 light ball point needle depending on thread

**Lycra or Spandex**

- Use a medium cut-away or water-soluble tear-away
- 70/10 medium ball point needle

**Nylon Windbreaker**

- Use a light to heavy cut-away
- 5/11 light ball point needle

**Satin Jacket**

- Use a light to heavy cut-away
- 75/11 light ball point needle

**Sweater Knit**

- Use a medium to heavy cut-away
- 75/11 light ball point needle

**Sweatshirt**

- Use a heavy tear-away or cut-away
- 75/11 light ball point needle

**T-Shirt**

- Use a light, water-soluble tear-away or medium cut-away
- 75/11 light ball point needle

**Terry Cloth**

- Use a medium weight, water-soluble tear-away and topping
- 75/11 or 80/12 light ball point needle



THINK BEYOND

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