

SWIFT^{XL}

Quick Start Guide

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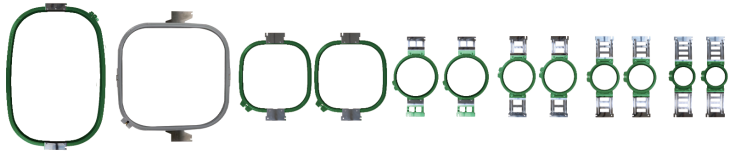
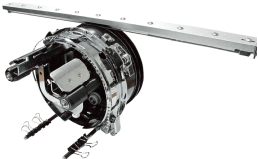
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Getting Started: Machine Overview

Machine Directory

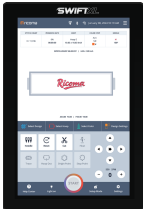
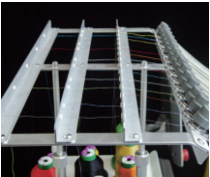
■ Packing Contents

	
Embroidery Frame x 12	
	
Flat Embroidery Frame x 1	Cap Ring x 1
	
Cap Holder x 1	Cap Drive x 1
	
Frame Handle x 1	Power Cord
	
Network Cable	Tool Kit and Starter Accessories Pack

■ Tool Kit Contents

		
Needle x 1	Thread Snips x 1	Double-Ended Wrench x 3
		
Phillips Screwdriver x 1	Flat-head Screwdriver x 1	9-Piece Allen Key Set
		
Long Nose Pliers	Small Oil Can	Sewing Machine Oil
		
USB Flash Drive	Bobbin Case	Cleaning Brush
		
Spare parts include but are not limited to screws, springs, links, needle bar guide bushing, threading aid, bobbins, etc.		

■ Core Components

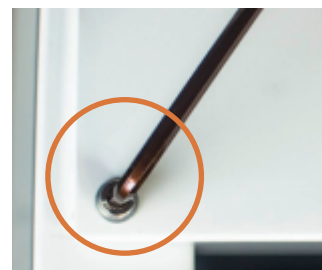
	Lower Frame The embroidery machine comes with a load-bearing frame designed to support the machine during embroidery. If you plan to use this frame, please assemble it first. If not using the frame, ensure the machine is placed on a stable tabletop with sufficient embroidery working space.
	Touchscreen Control Panel The embroidery machine is equipped with a touch panel for operation. Before operating, adjust the control panel position to your preference. For more details on panel functions, refer to the Control Panel Overview chapter.
	Thread Stand The embroidery machine is equipped with a thread stand for holding embroidery thread cones and guiding threads through the machine's threading path. Before threading, always raise the thread stand.
	Emergency Stop Button In an emergency, press the red Emergency Stop button located at the lower left of the control panel. To restart the machine, turn the button knob clockwise in the direction of the arrow until it releases, then press the Start key.
	Head Indicator Light The head indicator light is located on the upper right side of the embroidery head. It is green during normal operation. If a thread break occurs during embroidery, the light will flash red.

Machine Installation

■ Frame Assembly

Step 1: Install Connecting Plate

- Unpack and remove left and right frame legs, connecting plate, and tools. Remove all protective wrapping and plastic film.
- Place the frame assembly upside down.
- Using hex-head screws with spring and flat washers, install the connecting plate upside down onto the frame leg posts, and tighten with an Allen key.



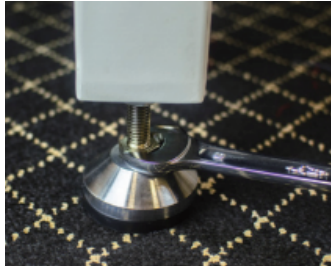
Step 2: Install Casters

- Remove protective caps from caster screws. Secure each caster to its corresponding mounting hole (located on the horizontal crossbar plane of the left and right frame legs).
- After turning the caster clockwise, use the included open-end wrench to tighten the hex screw.
- Repeat these steps for the remaining three casters.



Step 3: Install Leveling Feet

- Remove all four leveling feet from the machine stand. Turn counterclockwise by hand until they touch the floor. Once touching, adjust the frame to be level, then continue turning with the open-end wrench to lock them in place.



- After all four leveling feet are locked, the casters will be lifted off the ground, and the machine stand will no longer roll on the casters.

Tip

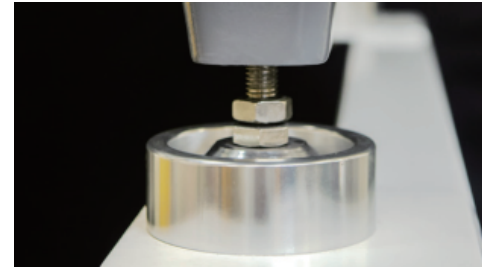
- After frame assembly, ensure the frame is installed vertically and parallel before tightening all screws.

Step 4: Machine Frame Installation

- After all leveling feet and casters are installed, flip the frame assembly to an upright position.



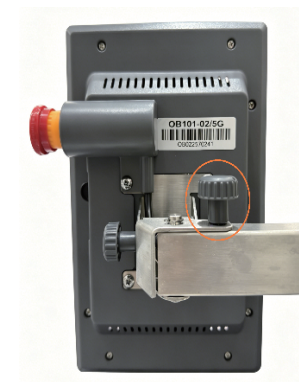
- Finally, place the machine onto the frame, aligning the machine feet with the silver stopper rings on the frame. We recommend 2-3 people perform this step.



■ Adjusting the Control Panel Position

Your touch panel can be adjusted up / down and left / right. Before adjusting, remove the protective plastic film from the panel.

- To move the panel left or right, loosen the thumbscrew located at the top of the panel support arm.



- Then adjust the control panel to the desired orientation and tighten the thumbscrew.

How to Adjust Panel Up / Down Position

- To move the panel up or down, loosen the thumbscrew on the side of the panel support arm.



- Adjust the control panel to the desired angle, then tighten the thumbscrew.

■ Raising the Thread Stand

- Loosen the knobs on the sides of the thread stand support posts by turning them counterclockwise.



- Lift the thread stand upward to its highest position, ensuring it remains level on both sides while lifting.
- Tighten the knobs by turning them clockwise to secure the thread stand in place.



Tip

- When adjusting, try to lift the thread stand evenly from both sides to ensure horizontal alignment.



■ Power On and Energizing

- The power socket is located on the left rear of the machine body. Connect the power cord to the socket, then plug the power cord into a power outlet.



Threading Operation

Replacing Thread Cones

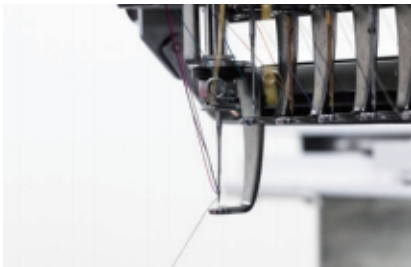
The following steps explain how to replace thread cones. If the machine is factory-pre-threaded, perform only steps 3 and 4 when installing a new cone.

■ Method for Replacing Thread Cones

1. Position the new thread cone on its spindle. Do not remove the thread already threaded through the machine.
2. Tie the end of the new thread cone's thread to the thread from the corresponding needle position.



3. Pinch the thread above the presser foot and gently pull until the old thread is completely drawn out. Continue pulling until the knot passes through the last guide before the needle.



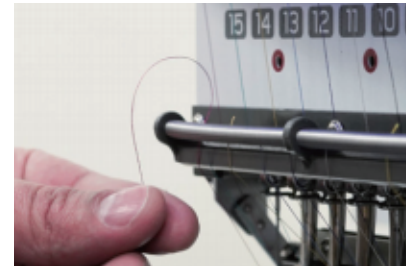
4. Finally, cut the thread directly above the knot. Then thread the thread end through the needle's eye and pull it out from below the presser foot.

Needle Threading

The needle comes pre-installed from the factory. To learn how to change the needle, refer to the Needle Installation section.

■ Needle Threading Method

1. Pass the thread from front to back through the needle's eye, then bring it out from below the presser foot.
2. Pull the thread upward and catch it in the tension spring, ready for embroidery. Leave a 1-2 inch tail and trim any excess.



Complete Thread Path Setup

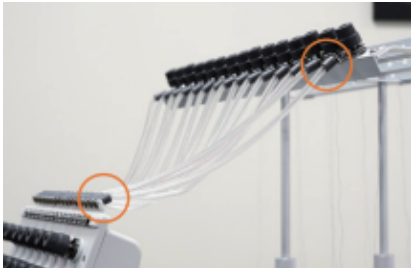
Before threading, ensure the thread stand is raised, and thread cones and tubes are correctly installed.

■ Raising the Thread Stand

Refer to the "Raising the Thread Stand" section under Machine Installation.

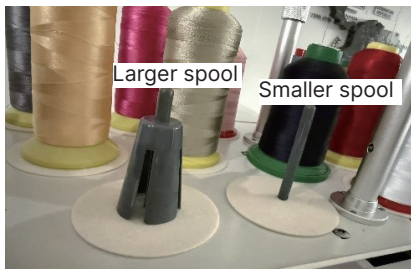
■ Installing Thread Tubes

Connect one end of the thread tube to the clip slot directly below the top tension knob, and the other end to the clip slot on the embroidery head. Install tubes by matching the numbered slot positions: Top slot 1 to Bottom slot 1, etc.



■ Placing Thread Cones

1. Remove the packaging from the thread cone.
2. Release the catch at the bottom of the thread cone, free the thread end, and pull the thread out completely from the bottom.
3. Place each thread cone onto its designated spindle in order.

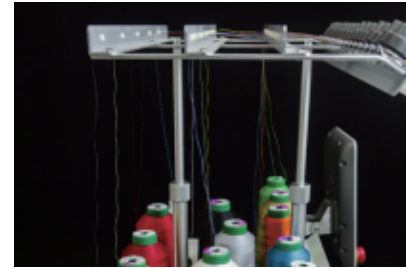


Tip

- To avoid using the wrong thread color, do not place cones of similar colors (e.g., black and navy blue) next to each other.

■ Begin Threading

Before threading, familiarize yourself with the thread path: Rear spooler thread guide hole → through the rear hole on the middle thread stand → through the front hole on the middle thread stand → through the front thread stand guide holes.



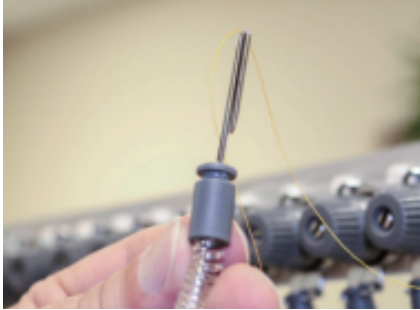
1. Pass each thread in sequence through the guide holes on the upper thread stand until it reaches the top tension knob area.



2. Next, pass the thread through the small guide hole behind the first tension knob. Place the thread between the disks on the right side of the top tension knob, ensuring it's engaged in the 3 o'clock notch. To confirm correct operation: after threading, the metal disks on the tension knob should be closed and gripping the thread.



3. Remove the thread tubes from both ends. Using the threader from the tool kit, hook the thread onto one end and pass it through the plastic tube. Once through, remove the thread from the threader.



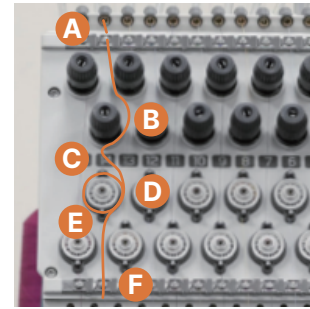
4. Reinstall the thread tube, correctly connecting both ends to their respective slots.

5. Pass the embroidery thread through the thread clamp directly above the top tension knob. To do this, gently lift the clamp upwards with your finger to open it, then place the thread inside. Do not force the thread into the closed clamp to avoid damaging the thread or incorrect threading. See point A in the figure.

6. Pull the front disk of the tension knob towards you, and slide the embroidery thread into the right side of the knob. Thread according to the needle position numbers, ensuring each thread follows the path for its corresponding needle number. The diagram shows the path for needle #14. The tension knob numbers align vertically with the needle numbers below. See point B.

7. Locate the thread post directly above the corresponding thread break detector wheel (the white wheel on the head). Pass the embroidery thread into the post from its left side, see point C in the figure. Route it to the right and wrap it clockwise completely around the thread break detector wheel one full turn, finally exiting from the left side of the lower thread post. See path from point C to E.

8. Lift the lower thread clamp upwards, pass the embroidery thread in from below, and secure it in place. See point F.



9. Lift the intermediate threading spring to set the detection spring into the threading position. Pass the embroidery thread from the right, around the outside of the roller, then through the center opening to complete threading through the detection spring and swing arm. See point G.

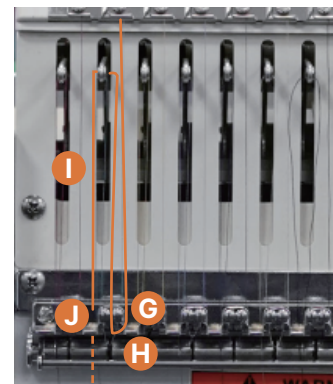
10. Pass the embroidery thread through the spring from right to left. See point H.

11. Next, bring the embroidery thread out from the center of the roller, then wrap it around the left outside of the roller, and continue pulling the thread upward to the swing arm position. See point I.

12. Now, pass the thread from right to left through the open round hole of the take-up lever. See point I.

13. Then pass the embroidery thread downward through the ceramic guide hole. See point J. Continue downward along the same path, through the next ceramic guide hole. See point K.

14. Pass the embroidery thread from front to back through the needle's eye, then through the presser foot. See point L.



15. Finally, inspect all needles from the front of the machine to ensure threads are neatly and uniformly threaded. Once confirmed, you can perform a pattern test embroidery.

Tip

- If the thread for a particular needle is completely depleted, when re-threading, refer to an adjacent, correctly threaded needle and follow the same path.

Needle Head Installation

Needle Selection

Selecting the proper needle is crucial for embroidery quality. If the needle type/size does not match the thread and fabric (too thick or too thin), problems like thread breakage and skipped stitches are likely.

DBxK5 is the standard needle system commonly used for embroidery machines. The DBxK5 75/11 sharp point needle is suitable for the vast majority of embroidery scenarios. This needle has a medium point and a relatively large eye, allowing thread to pass through smoothly and effectively reducing breakage.

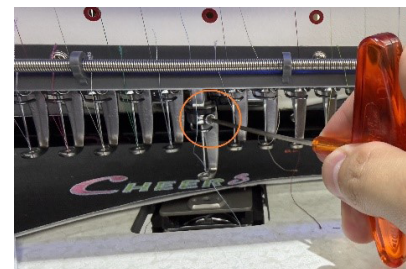
For certain special embroidery work, you may select other needle specifications based on actual needs. See the "Needles" chapter for details to choose the model that matches your embroidery project.

Needle Installation

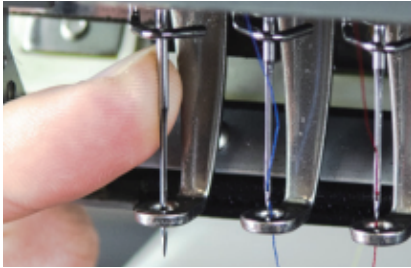
When changing needles, ensure the long groove side of the needle faces the machine body and is away from the operator. When inserting the needle into the needle bar, it must be inserted completely upright and straight, all the way to the top. Improper needle installation can cause the machine to malfunction and may result in needle breakage or thread breakage.

■ Needle Installation Method

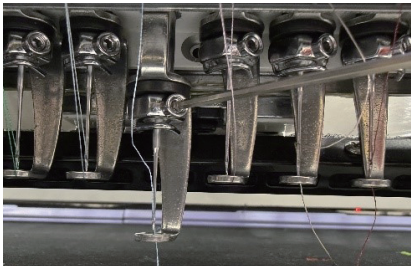
1. Use a screwdriver to loosen the set screw above the needle just enough to allow the needle to be removed; there is no need to completely remove the screw.



2. Properly dispose of the old needle in a safe sharps container.
3. The needle has a long groove on the front and a short "scarf" (curved indentation) on the back. When installing, the long groove must face the front of the machine. Guide the needle point through the presser foot, then push the needle shank fully upward into the needle bar.



4. Confirm the needle's long groove still faces directly forward. Hold the needle steady with one hand to prevent it from slipping down, and with the other hand tighten the needle set screw.



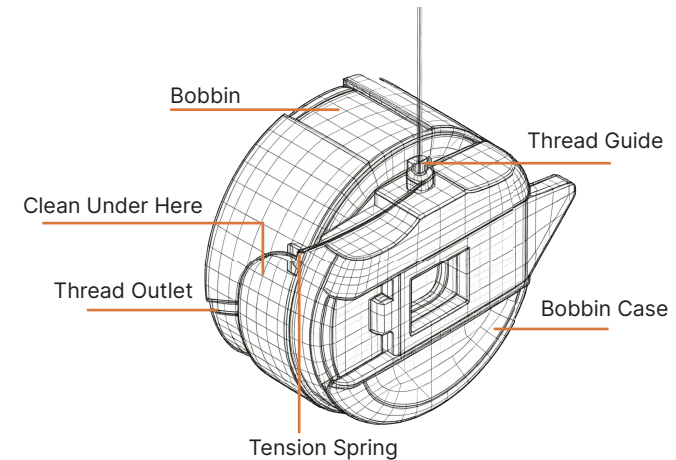
Tip

- When installing the needle, you may use a wooden toothpick inserted into the needle eye to assist with positioning. Do not use any metal object to insert into the needle eye, as it can scratch the eye and cause thread breakage.

Bobbin Installation

Bobbin Case Structure

Before threading and loading the bobbin into the machine, refer to the figure below to familiarize yourself with the bobbin case parts mentioned in these instructions.

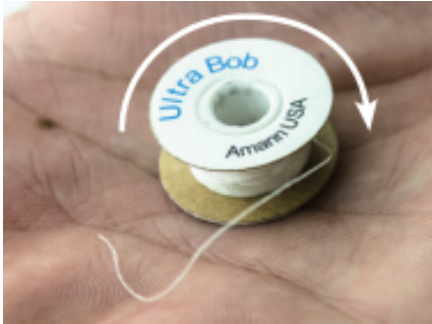


Threading and Inserting the Bobbin

1. If not already removed, lift the latch and pull the bobbin case towards you to remove it.



2. If there is an old bobbin in the case, remove it.
3. Place the new bobbin into the bobbin case, ensuring the thread unwinds clockwise.



Tip

- To verify correct bobbin installation, flip the bobbin case over and gently pull the thread. The bobbin thread should still unwind clockwise, and the letters on the bobbin will also rotate clockwise.

4. Pass the bobbin thread through the slot in the bobbin holder.



5. Pull the bobbin thread out from under the tension arm, ensuring the thread passes out through the groove at the other end.



6. Wrap the thread around the pigtail on the bobbin case.



7. Hold the bobbin case and lift the latch to insert it back into the machine. Ensure the thread tail length does not exceed 3 inches, as longer tails can wrap around the spool and cause thread accumulation.

Embroidery Frames and Holders

This machine can perform flat embroidery, garment embroidery, and cap embroidery.

Flat Embroidery: Equipped with dedicated embroidery frames, it can embroider larger areas of fabric.

Garment Embroidery: Refers to garments that can be laid flat, such as shirts, jackets, etc., using left and right armrests for framing and embroidery.

Cap Embroidery: Requires the use of a cap embroidery device. This accessory has a curved design to match the curvature of caps.

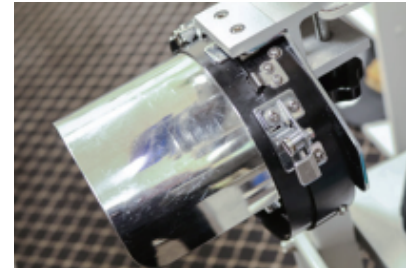
Cap Embroidery Accessories

When embroidering caps, you need to use the matching cap drive frame, cap holder, and cap ring.

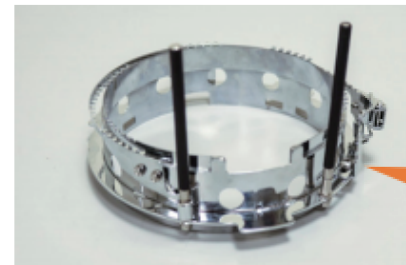
Cap Drive Frame: An accessory installed on the machine, used to secure the cap and cap ring during the embroidery process.



Cap Holder: A tool used to support the cap embroidery frame during hooping. It needs to be installed on the machine frame or a stable tabletop. Once installed, the cap embroidery frame can be mounted on the workbench for hooping operations.

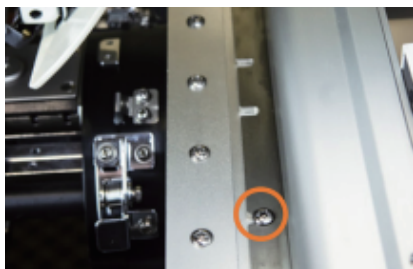


Cap Frame: A dedicated embroidery frame for caps. It can be adjusted according to the thickness of the cap using the screw on the right side.



Cap Drive Frame Installation and Removal

1. Use the Phillips screwdriver from the tool kit to loosen the screws connecting the cap embroidery drive seat to the embroidery machine frame.



2. Use both hands to pull the cap embroidery drive seat towards you to remove it.

Tip

- There is no need to completely remove the screws. If the screws on both sides are already loose, they can be easily unscrewed.

Cap Holder Installation

1. Select the cap embroidery frame from the preset frame list on the control panel. Refer to the control panel instructions chapter. After selection, the embroidery machine frame will automatically move.

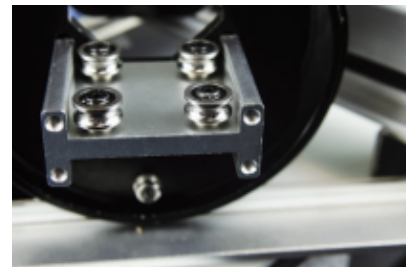
Tip

- The cap drive frame should not be installed before selecting the cap embroidery frame.

2. If other types of embroidery frames have not been removed, remove the corresponding frames first.

3. Insert the cap embroidery drive seat into the machine, ensuring the hook case passes through the opening on the back of the drive seat.

4. The cap embroidery drive seat has four small wheels that can slide into the guide rail below the hook case. Align the drive seat with the guide rail, ensuring all wheels are properly aligned.



5. Push the cap embroidery drive seat towards the machine until it is snug against the embroidery machine frame, installing the drive seat into the No. 6 slots at both ends of the frame.



6. Tighten the Phillips screws to secure the cap embroidery drive seat to the embroidery machine frame.



Flat Embroidery Frames and Holders

Your Ricoma SWIFTXL series embroidery machine comes with 11 embroidery frames, including six different sizes from A to F. Among them, size A is the smallest, and size F is the largest.

When selecting a frame, choose the smallest frame that can accommodate the design without causing frame collision. After importing the design, you can use the machine's preset frame function to confirm the design fits within the frame area.



Tip

- Using the smallest frame suitable for the design provides the best hooping tension for the fabric, reducing embroidery issues such as thread breakage and puckering.



■ Frame Handle Installation

To perform garment embroidery on the machine, first install the frame holder onto the embroidery machine frame rails. This holder is used to support the embroidery frame and is suitable for embroidery processes on garments like shirts.

1. Install A-E type embroidery frames into slots No. 5 and No. 6 on both sides of the embroidery machine frame rails.
2. Install the F type embroidery frame into slots No. 1 and No. 2 on both sides of the embroidery machine frame rails.



3. Install the handle holder into the corresponding slots on the rails.

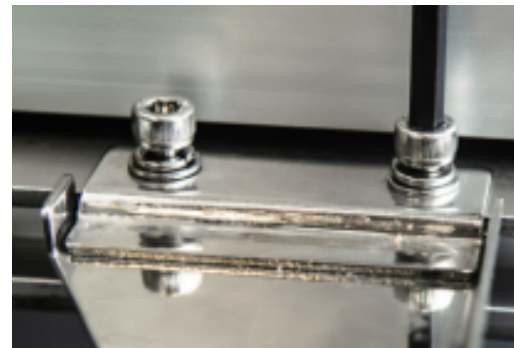


4. The handle holder consists of two metal plates with a slot in the middle. During installation, ensure the embroidery machine frame rail is secured between the two metal plates and that the screws align with the slots.



■ Removing the Frame Holder

To remove the flat embroidery frame holder: Use a 4 mm Allen key to loosen the screws counterclockwise, release the holder arm, then pull it straight out towards the front of the machine.

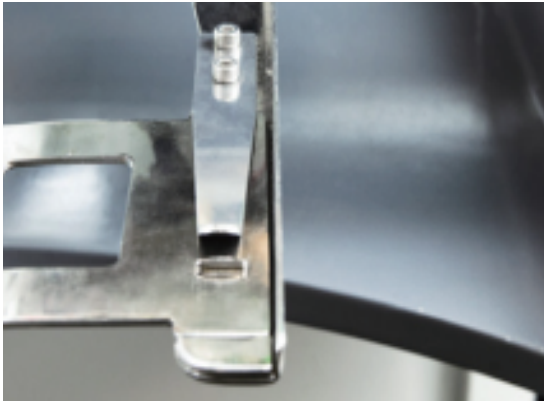


■ Loading the Embroidery Frame

The metal bracket of the embroidery frame can snap under the latch of the frame holder. When correctly loading the frame into the holder, ensure the U-shaped open slot faces the machine side.



Load the embroidery frame into the handle holder, ensuring the frame edge snaps into the groove at the end of the latch. The slot on the frame should securely engage under the latch's protrusion.



■ Removing the Embroidery Frame

Lift the frame holder to release pressure on the slot area. New frame holders may be tight initially; as you pull outward, lifting the frame will gradually become easier.

Tabletop Installation and Use

Installing the Tabletop

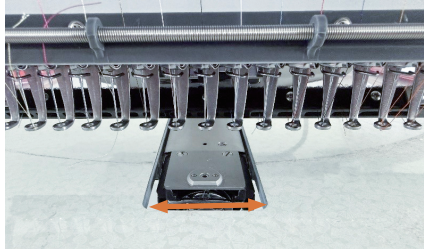
This machine comes with a tabletop for embroidering larger areas and heavier garments.



1. Slide the tabletop onto the machine body and place it steadily on the tabletop stopper brackets.



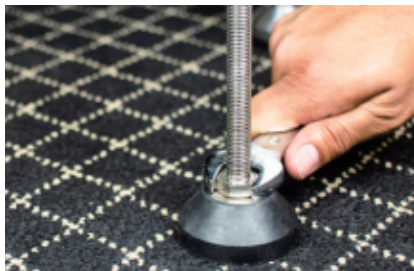
2. Use the tabletop opening as a guide to help you determine the placement position. The hook case should be positioned between the tabletop openings.



3. After ensuring your tabletop is in place, take the tabletop support legs and insert them into the corresponding slots under the tabletop.



4. Use a wrench to turn the nuts counterclockwise, leveling the tabletop support legs until they touch the ground, then tighten each nut.



5. Align the tabletop mounting holes with the studs on both sides of the machine body, then secure them using a Phillips screwdriver.



6. Locate the safety locks under the table. Tighten each lock until the rubber stopper contacts the bottom of the table. A click sound should be heard.



Using the Flat Embroidery Frame

■ How to Install the Flat Embroidery Frame

1. Lay the backing paper on the embroidery frame, ensuring it completely covers all areas of the frame.



2. Lay the fabric on the backing paper, ensuring the fabric, together with the backing paper, completely covers the embroidery frame.



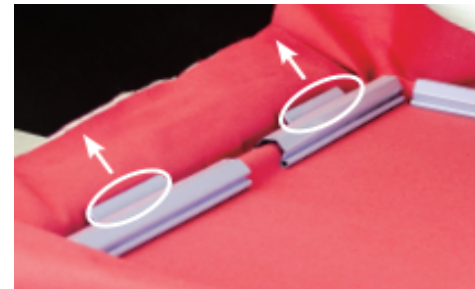
3. Smooth the fabric surface and fasten the metal clips onto the short sides of the embroidery frame.



4. Smooth the fabric again and fasten the remaining metal clips onto the two long sides of the embroidery frame.

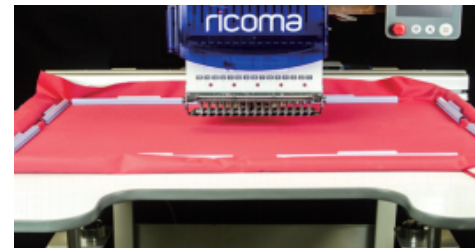


5. When pressing the clips into the embroidery frame, the lugs on the clips should face outward from the frame.



■ Flat Embroidery Frame Installation Method

1. Place the flat embroidery frame with fabric on the tabletop, and clamp any excess fabric that may interfere with the embroidery machine frame rails towards the back.



2. Install the flat embroidery frame onto the last two slots of the embroidery machine frame rails, and tighten the screws with a Phillips screwdriver to secure it.



Fabric Hooping

Centering a Left Chest Logo

Before hooping a garment, you must first determine the appropriate position for the design. To determine the placement, first find the center point of the design.

Tip

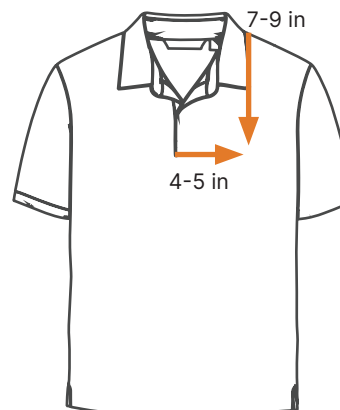
- The center position will vary depending on the size of the garment you are embroidering and the size of the design you are embroidering.

Left Chest Logo Design Placement

Women's Style: Mark a point approximately 5 to 7 inches below the intersection of the shoulder seam and neckline. Then mark another point approximately 4 to 5 inches from the shirt's center line. Place the design's center point at the intersection of these two marks.



Men's Style: Mark a point approximately 7 to 9 inches below the intersection of the shoulder seam and neckline. Then mark another point approximately 4 to 5 inches from the shirt's center line. Place the design's center point at the intersection of these two marks.



Tip

- The design position should be slightly closer to the front placket, not the armhole seam.
- The center point can be marked using tailor's chalk, water-soluble pen, masking tape, or painter's tape.

Hooping Suggestions

Correct hooping is the most fundamental and important step in embroidery. When hooping, refer to the following key points:

- When selecting an embroidery frame, prioritize the smallest size frame that can just cover the design.
- Backing is used to stabilize the fabric, add stiffness, and prevent stretching. When hooping, choose appropriate backing based on the garment; the weight should not be too thick or too thin. For more backing selection, refer to the backing-related chapter.

- After the fabric is hooped, running your hand over it should show no shifting or wrinkles. If the fabric is too loose, re-hoop it.
- Always hoop the fabric taut, especially important for square frames. Square/rectangular frames have stronger clamping force only at the corners, while circular frames distribute force evenly overall.
- Do not forcibly pull the fabric or rely on tightening the frame to flatten the fabric. Stretching the fabric during hooping can cause puckering, fabric catching, and design misplacement.

■ Flat Garment Hooping

1. Place the lower frame of the embroidery hoop inside the garment, ensuring the adjustment screws face the shirt hem opening. This allows for quick screw adjustment if the garment is too tight or too loose.
2. Cover the lower frame with backing material, ensuring all areas of the frame are completely covered.
3. Place the upper frame on the right side of the garment and align it with the lower frame. Press down on the frame body to insert the upper frame into the lower frame.
4. After inserting the upper frame into the lower frame, check if the garment is flat and taut, ensuring the fabric is smooth and firm but not stretched. Try lifting the fabric from the backing; if it's difficult to lift, the hooping is satisfactory.



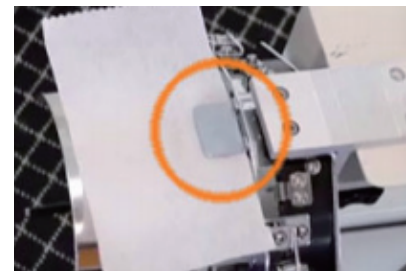
5. Finally, turn the garment over to confirm the backing covers all sides of the embroidery frame. If not covered, re-wrap the garment loop.

■ Cap Hooping

1. First, install the cap frame onto the cap holder. Specifically, align the open metal groove on the cap frame with the center latch on the cap holder. Hold the cap frame from the back and push forward, ensuring it snaps into the three spring latches on the cap holder.
2. After securing the cap frame to the cap holder, release the metal band and let it rest naturally on the left side of the cap frame.
3. When preparing a cap for embroidery, ensure the visor is as flat as possible. If the cap has an adjustable strap, unfasten the strap at the back of the cap.
4. Fold the sweatband under the visor backward. Ensure the entire sweatband is folded back from the seam to the other side.



5. Place backing under the cap stop (the metal tab at the top of the frame).



6. Place the cap onto the cap frame, positioning the sweatband under the visor stop. Ensure the cap fits snugly against the inside of the visor stop, not directly covering it.

7. Place the flexible metal band over the visor, with the serrated edge of the band as close to the visor as possible.



8. Fasten the buckle to the cap frame latch and secure it. Tighten the sides of the cap to ensure it is snug and wrinkle-free.



9. Organize the excess fabric at the back of the cap and secure it using the provided metal clips. Clip the fabric onto the metal rod inside the cap frame to keep the cap tight. Ensure the clip handles face the center of the cap and are close to each other.



■ Hooping with a Circular Embroidery Frame

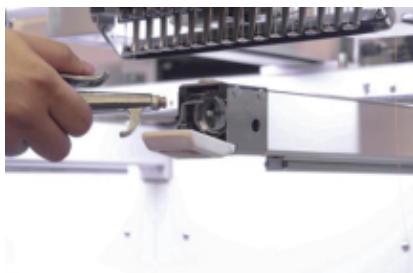
1. Use an A or B type embroidery frame.
2. Find a flat surface equal in width to the selected embroidery frame. You can use a table corner as a reference. Place the lower frame of the embroidery hoop on this surface.
3. Place backing on top of the lower frame. It is recommended to spray adhesive on the backing or use adhesive-backed backing.
4. Place the cap on top of the lower frame and backing.
5. Smooth the fabric to eliminate all wrinkles.
6. Place the upper frame over the fabric and align it with the lower frame.
7. Following the method for flat garment hooping, fasten the upper and lower frames together.

Maintenance

Some malfunctions in embroidery machines are caused by improper daily maintenance. Therefore, proper maintenance is crucial for extending the machine's service life. Maintenance requires sewing machine-specific oil (available at most sewing and embroidery supply stores) and white lithium grease (available at hardware stores). Before using other products, be sure to consult a technician to confirm their compatibility with the equipment.

Every 8 Hours

Remove the bobbin case and clean the hook area using a soft brush, an air pump with a dehumidifying filter, or a qualified compressed air duster can.



Remove the bobbin case and apply 2-3 drops of sewing machine oil to the edge of the hook (where the hook and bobbin case meet).



Remove the bobbin case and clean the hook area using a soft brush, an air compressor with a dehumidifying filter, or a qualified compressed air duster can.

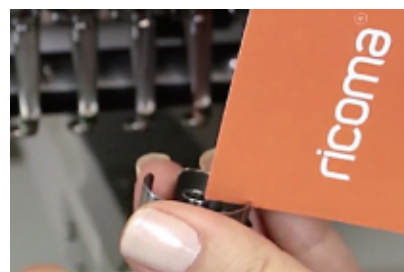


Weekly

Remove the needle plate above the hook box and clean around the trimmer knife using a soft brush, an air compressor with a dehumidifying filter, or a qualified compressed air duster can.

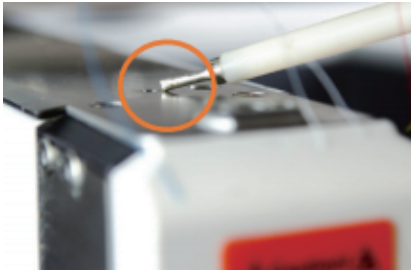


Use a corner of a business card or use the bobbin thread as dental floss to clean lint and thread ends from the gaps in the bobbin case. Do not blow with your mouth to avoid saliva getting on the bobbin case.



Every Two Weeks

Apply 2-3 drops of sewing machine oil into each of the two oil holes on the hook box needle plate, front and back.

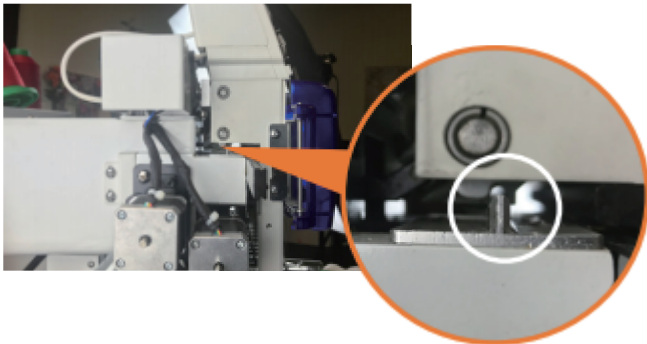


Apply 2-3 drops of sewing machine oil onto the guide plate.

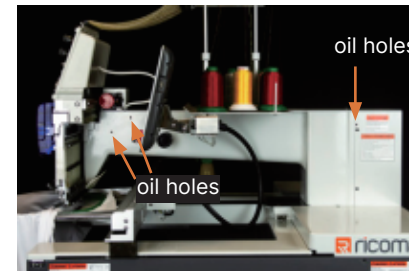


Tip

- The machine must be moved to the last needle position to complete this step. The oil holes are located on the front of the T-rail, directly behind the screws.



Apply 2-3 drops of sewing machine oil into each of the three red oil holes on the right side of the machine.



Apply 1-2 drops of sewing machine oil through the oil hole on the metal cover plate. Note: The sponge pad inside the metal needle bar guard below will absorb the oil.



Annually

Apply white lithium grease to the bearings (metal rollers) at the rear of the carriage. Move the machine carriage from needle 1 to the last needle to lubricate all metal rollers.

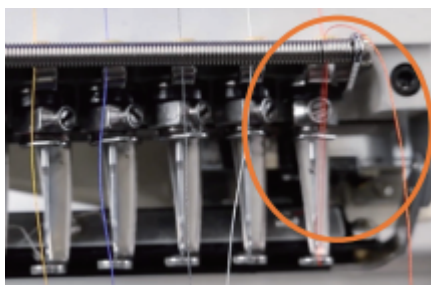


Common Faults

Solving Thread Breakage

When a thread break occurs, the machine will automatically stop and sound a thread break alarm. The break usually occurs in the area below the carriage.

1. Re-thread from the break point, re-thread through the needle eye and through the presser foot.
2. Hook the thread onto the holding spring, leaving about 1 inch of thread tail.



3. Back up the pattern by about 5-10 stitches. Refer to the embroidery pattern backup operation.
4. Finally, press the start key to continue embroidering.

Tip

- It is necessary to back up stitches after a thread break because the carriage usually travels a few extra stitches after the break. Therefore, backing up prevents gaps in the pattern.

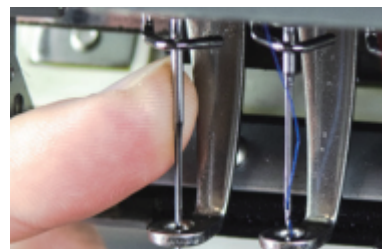
Replacing the Needle

Step 1: Remove and Discard the Broken Needle

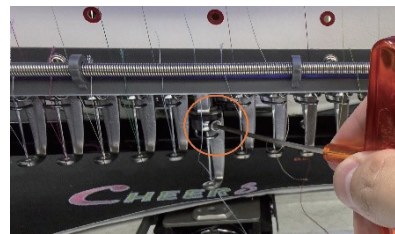
1. First, remove the broken needle from the garment; if not on the garment, check the hook box area.
2. Use a hex key to loosen the fixing screw above the needle, just enough to remove the needle.
3. Place the used broken needle in a puncture-proof container for disposal.

Step 2: Install the New Needle

1. The front of the needle has a long groove, and the back has a crescent-shaped short groove called the scarf. Orient the needle with the long groove facing the front of the machine, pass the needle tip through the presser foot, and insert the needle shank into the needle bar.



2. Confirm the needle's long groove is still facing forward, hold the needle steady with one hand to prevent it from slipping, and tighten the needle fixing screw with the other hand.



Tip

- To facilitate correct needle placement, a wooden toothpick can be inserted into the needle eye. Never place metal objects in the needle eye, as this may scratch the eye and cause thread breakage.

Bobbin Thread Run Out

When the bobbin thread runs out, the machine will automatically stop and sound a thread break alarm.

To differentiate between top thread breakage and bobbin thread run out: Check the top thread on the working needle. If the top thread is still connected to the fabric, it is most likely that the bobbin thread has run out.

If this is the case, replace the old bobbin with a new one and reinstall the bobbin case into the hook.

■ Emergency Stop Alarm

Pressing the emergency stop switch during transport or in an emergency triggers the emergency stop alarm. When the emergency stop alarm occurs, simply rotate the button clockwise as indicated by the arrow on the emergency stop button to clear the alarm.



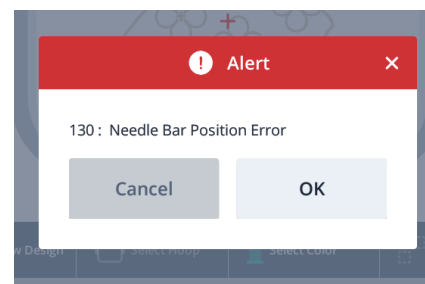
■ Color Change Error

A color change error is triggered when the machine cannot detect the corresponding needle above the needle plate. This is usually because the carriage stopped between two needles, or the red knob (color change knob) on the right side of the embroidery carriage was

accidentally turned.

If a "No Needle" error appears on the control panel, the needle icon position will display "0" instead of the normal needle number.

At this point, press [Confirm] to clear the error, and turn the knob until the needle number icon on the control panel displays a normal number.



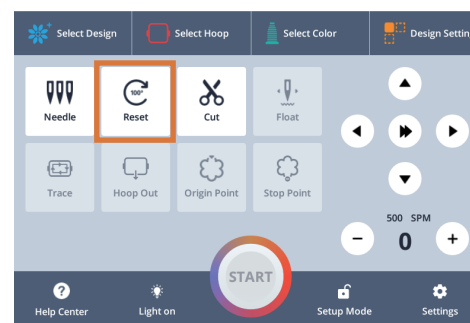
Once the needle number displays normally, operation can be resumed.

■ Spindle Not at 100°

The machine must be calibrated to 100° to properly start and stop embroidery. A spindle error occurs when the spindle is not aligned to the 100° position.

This error can be caused by various reasons, such as the needle hitting the embroidery frame, or bobbin thread nesting (bird's nest).

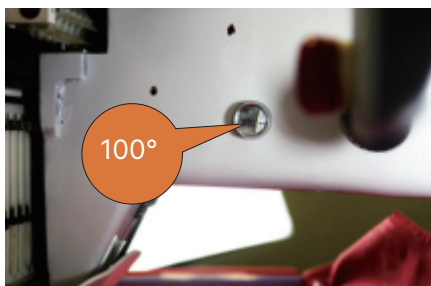
1. Press the reset key on the panel, and the machine will automatically align the spindle to the 100° position.



2. Confirm that a valid needle number is displayed on the needle icon. If no needle number is displayed, refer to the Color Change Error section.
3. After confirming a valid needle number is selected, press the reset key on the panel again. Usually, after performing this step, the spindle will automatically align, and normal operation can continue. If the error persists, manual calibration using the black knob on the right side of the machine is required.

■ Manual Calibration Method for Spindle Not at 100°

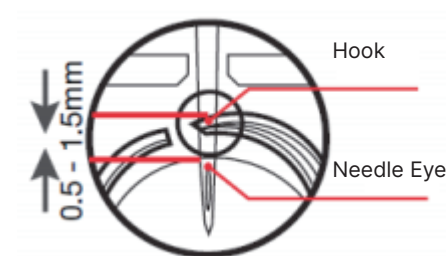
1. Turn off the machine power.
2. Locate the viewing window showing the spindle angle on the right side of the machine.



3. Press the black knob (spindle knob) inward and turn it counterclockwise until the pointer in the viewing window aligns with 100°.
4. Restart the device.
5. After the main interface loads, press the reset key on the panel. The machine can then resume embroidery.

■ Hook Timing

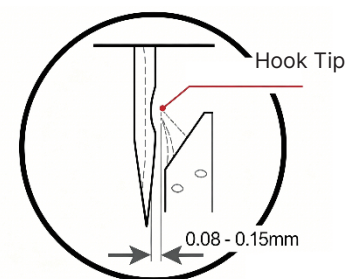
Hook timing refers to the synchronized movement between the hook and the needle. Correct timing is crucial for ensuring embroidery quality and preventing malfunctions. If the gap between the needle and the hook tip is too large, the top thread cannot be caught, causing thread breakage; if the gap is too small, it can lead to needle breakage.



The method to adjust hook timing is: rotate the machine spindle to a specific angle, and adjust the hook position at this angle. This angle is called the timing angle.

The timing angle for the SWIFT XL model is 196°.

When timing is correct, the hook tip should align precisely with the scarf position on the back of the needle and maintain an appropriate gap. The standard gap between the needle and the hook is 0.08 mm to 0.15 mm.



If machine timing needs to be readjusted, please contact Ricoma Technical Support.

Thread Tension

Proper thread tension is essential for high-quality embroidery. Improper tension can cause various embroidery faults, for example: tension that is too loose can cause loops to appear, while tension that is too tight can cause frequent thread breakage.

Tension depends on design complexity, fabric used, thread and backing material, even winding method. Before making any tension adjustments, first confirm the machine is threaded correctly. Often, tension issues are simply due to incorrect threading.

Tension settings can be adjusted via the following methods:

- Spring adjustment lever
- Top thread tension knob
- Bobbin case



Tip

• Before adjusting tension via other components like the bobbin case or tension knobs, we recommend adjusting the spring lever first—it's the quickest way. Making small adjustments to the spring lever can improve the thread tension of the embroidery. The spring lever controls the overall tension for all needles, while the tension knob only controls the tension for the currently working needle.



Tension Check

The tension of the bobbin case affects the stitch quality of all needles. The most common and recognized tension test method is the "I-Test". Test method: Embroider a solid column stitch about 1 inch (approx. 2.54 cm) high, then examine the back. The ideal bobbin tension result is as shown in the diagram: 1/3 of the bobbin thread runs straight down the center of the column, with 1/3 top thread on each side.



If the bobbin thread shows excessively on the back of stitches for all needles: Indicates bobbin tension is too loose. Solution: Turn the large screw on the bobbin case clockwise to tighten the bobbin tension.

If the bobbin thread shows insufficiently on the back of stitches for all needles: Indicates bobbin tension is too tight. Solution: Turn the large screw on the bobbin case counterclockwise to loosen the bobbin tension.

If the top thread shows insufficiently on the stitches for all needles: Indicates top thread tension is too tight. Use the spring lever to loosen the top thread tension for all needles.

If the top thread shows excessively on the stitches for all needles: Indicates top thread tension is too loose. Use the spring lever to tighten the top thread tension for all needles.

If the top thread shows excessively on the stitches for a single needle: Indicates that needle's tension is too loose. Turn the corresponding tension knob clockwise to tighten the tension.

If the top thread shows insufficiently on the stitches for a single needle: Indicates that needle's tension is too tight. Turn the corresponding tension knob counterclockwise to loosen the tension.

Top Thread Tension Adjustment: Spring Adjustment Lever

The spring adjustment lever controls the overall tension for all needles, while the tension knob only controls the tension for the currently working needle.

Depending on the embroidery fabric and design requirements, it may be necessary to adjust the spring lever up or down. It is recommended to keep the spring lever at a 90-degree angle to the embroidery direction. When adjusting tension, simply move it 1-2 notches up or down from the center position.

When embroidering heavy fabrics, lower the spring adjustment lever.

When embroidering lightweight fabrics, raise the spring adjustment lever.

To tighten tension for all needles: Lower the spring lever 1-2 notches.

To loosen tension for all needles: Raise the spring lever 1-2 notches.

Tip

- Never adjust the spring lever to the very top or very bottom, as both can cause thread breakage. Setting it to the very top makes the thread too loose to function properly; conversely, setting it to the very bottom makes the thread too tight, also preventing proper operation.

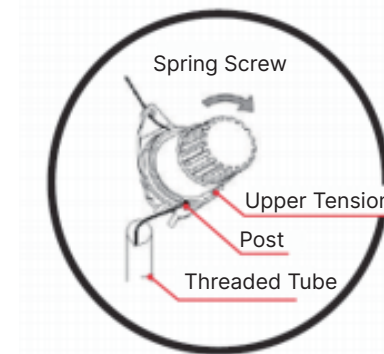
Top Thread Tension Adjustment: Tension Knob

The appropriate tension setting varies with the type of embroidery thread. While most thread brands are similar, the material type of the thread still affects tension. For example, polyester thread requires almost twice the tension of rayon thread.

Therefore, you may need to adjust the tension knob until you achieve the proper tension suitable for the current embroidery thread.

Therefore, you may need to adjust the tension knob until you achieve the proper tension suitable for the current embroidery thread.

The top thread tension knob can be used for quick adjustment of a single needle's tension. The tension knob is shown in the diagram.



If the top thread shows excessively on the back of the embroidery: Turn the knob clockwise to tighten the top thread tension.

If the top thread shows insufficiently on the back of the embroidery: Turn the knob counterclockwise to loosen the top thread tension.

Tip

- It is recommended to make fine adjustments of only a quarter turn at a time, whether tightening or loosening. This allows you to more clearly observe the actual effect of each tension change on the embroidery.

■ Factors Affecting Top Thread Tension

- Thread Color: Dyeing processes can change the surface texture of the thread, affecting its smoothness through the machine and needle, leading to tension variations.
- Thread Thickness: When switching to a different thickness of embroidery thread, tension must be adjusted accordingly.
- Machine Speed: Lower speeds generally result in better stitch quality.
- Dust and Lint Buildup in the Thread Path: Excessive debris can directly affect thread tension.

Bobbin Tension Adjustment

Proper bobbin tension is key to ensuring high-quality embroidery. If the tension is set incorrectly, frequent thread breakage may occur.

Tip

- New bobbin cases have their tension preset at the factory and usually do not require adjustment.

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

Turning the screw counterclockwise loosens the tension, turning it clockwise tightens the tension.



If the bobbin thread shows excessively on the back of the embroidery, it indicates the bobbin tension is too loose.

Solution: Turn the large screw on the bobbin case clockwise to tighten the bobbin thread.

If the bobbin thread shows insufficiently on the back of the embroidery, it indicates the bobbin tension is too tight.

Solution: Turn the large screw on the bobbin case counterclockwise to loosen the bobbin thread.

When bobbin tension is too tight, column stitches may become too narrow, or even only a thin line of bobbin thread shows in the middle of the solid column stitch in the "I-Test". In this case, once the bobbin thread is caught, the embroidery can easily unravel.

■ Factors Affecting Bobbin Tension

- Unstable bobbin tension is often due to the bobbin catching inside the bobbin case. Try pulling out several feet of bobbin thread to check if the bobbin rotates smoothly without catching. Causes of catching may include: mismatched bobbin size, overfilled bobbin, or manufacturing defects in the bobbin itself. If you suspect the bobbin is not rotating smoothly inside the machine, you can perform the following test: Place the bobbin case face down on a workbench or flat surface, then pull out several inches of bobbin thread. If the bobbin cannot rotate freely even on a flat surface, it likely won't rotate smoothly inside the machine either. It is recommended to replace with another bobbin and retest.
- If tension abnormalities persist after adjusting the bobbin, check if the bobbin case and needle are damaged, as damaged components can cause poor results.

Thread Breakage Faults

Causes of Thread Breakage

- 1. Fabric Too Thick:** When fabric is too thick, the needle can bend slightly, causing the thread to rub against the needle plate, fuzz, and break. Solution: Change to a larger needle size.
- 2. Hidden Obstacles in Garment:** Obstacles such as heavy seams, inner pockets, and hidden buttons can cause thread breakage.
- 3. Improper Hooping:** Ensure the fabric is hooped firmly. Hooping too loosely can cause thread breakage and other embroidery faults.
- 4. Excessive Backing:** Too much backing material increases friction between the thread and needle, leading to thread breakage and needle breakage.
- 5. High-Density Designs:** Excessively high stitch density can cause the needle to deflect, leading to thread fuzzing and breakage. Small areas with high-density stitches are too concentrated and prone to breakage.
- 6. Stitches Too Short:** Excessively short stitches cause thread to pile up in the same spot (also called "bird's nest"), leading to thread fuzzing and breakage. Delete overly short stitches or enlarge the pattern by 5%–10%.
- 7. Needle Issues:** Needles installed backwards or crooked can cause breakage; damaged or dull needles can also cause breakage.

Thread Breakage Prevention

- 1. Store Thread Properly:** It is recommended to store in a cool, dark place. Old thread stored improperly becomes brittle and prone to breakage. Thread exposed to air, light, and high temperatures for long periods ages and should be replaced with new thread and stored correctly.

2. Do Not Use Tape to Secure Thread Ends: Tape leaves adhesive residue, increasing friction and causing thread breakage.

3. Check the thread path, needle eye, needle plate, and hook for burrs.
4. Regularly oiling the machine is key to ensuring smooth operation. Also, keeping the hook area clean using hook cleaning tools is very important, especially when using adhesive backing or spray, as residual adhesive can cause thread fuzzing and breakage. Refer to the Maintenance chapter for proper machine maintenance methods.

Thread Breakage Troubleshooting

If thread breakage occurs frequently, follow these steps to rule out machine technical issues:

1. Check the threading path. Confirm threading is correct, strictly following the path described in the threading chapter of the manual.
2. Check the needle and the actual break situation. Sometimes the machine indicates a break, but the thread is still connected to the fabric. When this happens, check the entire threading path, manually cut the thread, and check the bobbin thread remaining. If a break actually occurred, re-thread following the correct path.
3. Confirm thread tension is normal. Tension too tight can cause skipped stitches, thread breakage, fabric puckering, and excessive stress on the thread; tension too loose can cause thread nesting and loops appearing.
4. Check the embroidery thread for defects. If defects exist, pull out several meters of thread to remove the damaged section. If ineffective, replace the entire spool with new thread.
5. Check if the needle is damaged or improperly installed. If only a single or a few needles are breaking thread, it's usually a needle issue. Replace damaged or bent needles.
6. Confirm the bobbin is installed correctly. Clean out accumulated lint

and dust inside the bobbin case, ensure the trimmer knife fully retracts.

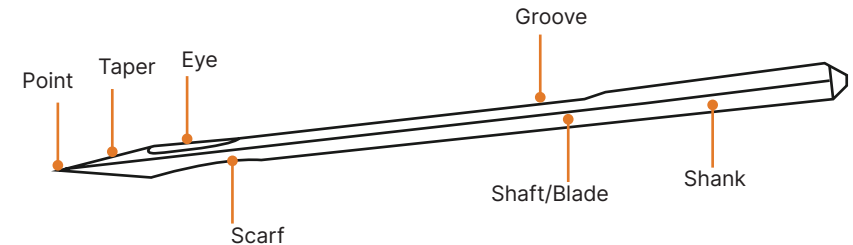
7. If all needles are breaking thread. Hook timing adjustment is needed, refer to the Needle and Hook Timing Adjustment chapter.

Tip

• It is recommended to first test embroider using two layers of backing, or the same fabric as the garment. This confirms if the backing, topping, and hooping method are suitable, while also verifying if the top and bobbin thread tensions are normal. Using 100% polyester Isacord embroidery thread is recommended. Isacord embroidery thread is recommended.

Needle

Needle Structure



Shank: The top part of the needle head, used to insert into the needle bar and connect to the machine.

Shaft/Blade: The main body part extending from the lower end of the shank to the upper end of the tip.

Point: The area below the needle eye that tapers to a point.

Taper: The very bottom of the needle, used to pierce the fabric.

Eye: The hole in the needle through which the thread passes.

Groove: The longitudinal groove on the front of the needle.

Scarf: The crescent-shaped indentation on the back of the needle, above the eye.

Needle Lifespan

The lifespan of a needle is affected by various factors.

Including but not limited to:

- Needle material
- Needle model and specifications
- Fabric material used for embroidery
- Frequency of needle use

Many professional embroiderers follow a basic rule for determining when to replace a needle called the "Three-Break Rule". When three consecutive thread breaks occur on the same needle, the needle should be replaced promptly. If multiple performance abnormalities occur during machine operation, the needle should also be replaced promptly. Specific manifestations include but are not limited to:

- Frequent thread breakage
- Deteriorating stitch quality
- Fabric snagging or pulling
- Machine making unusual noises
- Reduced machine operating speed

Causes of Needle Breakage

Needle breakage is caused by various factors.

Including but not limited to:

- Needle wear and aging
- Excessive stitches in the design, or localized high density
- Fabric is too loose within the embroidery frame (hooping not tight enough)
- Needle hitting the embroidery frame
- Severe fabric shifting during embroidery

Needle Specifications

When selecting a needle, the primary consideration is the needle shank diameter specification, such as 75/11, 90/14, etc. If you've ever wondered why this designation contains two numbers, it's because this numbering system combines European and Asian size identification codes.

The first number (e.g., 75 or 90) is the European standard number. It represents the actual diameter of the needle shank. For example, an 80-size needle has a blade width of 0.80 mm.

The second number (e.g., 11 or 14) uses the Asian standard numbering system, which was also used by Singer. In this system, the smaller the number, the finer the needle shank diameter.

75/11 Needle

General-purpose embroidery machine needle, suitable for most standard projects, such as golf shirts, sweatshirts, dress shirts, lightweight jackets, light canvas, aprons, holiday stockings, etc.

70/10 Needle

Primarily used for quick-drying fabrics, such as 100% polyester T-shirts, golf shirts, etc.

65/9 or 60/8 Needle

Best suited for embroidery on extremely lightweight, delicate fabrics. Used for silk, high-quality linen, and small, intricate designs such as complex appliqué and very small lettering.

80/12 Needle

Suitable for thicker, stiffer fabrics, capable of penetrating the material smoothly. Commonly used for heavy canvas, vinyl, thin leather, baseball caps, brims, etc.

90/14 Needle

Often used for thick thread embroidery, such as metallic thread embroidery. The needle eye is larger, allowing the thread to pass through smoothly; the needle body is rigid, also commonly used for items like canvas and belts.



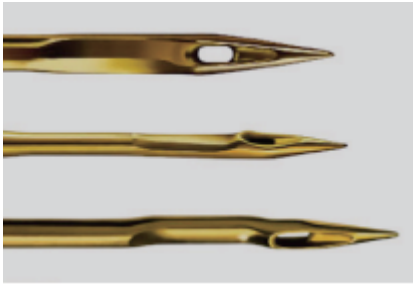
Tip

- The needle point must have the ability to easily penetrate the fabric to avoid needle deflection when the needle contacts the fabric. Otherwise, the needle tip may hit surrounding metal parts or the needle plate, causing needle or machine damage. For tightly woven or knitted fabrics, finer needles should be selected; for tough, thick fabrics that easily cause needle deflection, thicker needles are required.



Needle Surface Treatment

Most sewing and embroidery machine needles are chrome-plated to enhance durability and appearance. Titanium-coated needles, although more expensive than chrome-plated ones, can last 5 to 7 times longer. These needles also reduce thread friction, thereby decreasing thread breakage frequency and saving time and labor costs. Titanium-coated needles have a gold-like appearance and are available in various common specifications.



Needle Point Types

To allow the needle to penetrate the fabric cleanly, the appropriate needle point type must be selected. The point types used in commercial embroidery include:

1. Precision Round Point, Marking: SPI

- Needle point is slender and sharp.
- Suitable for high-count, high-density fabrics, microfibers, and some synthetic fabrics.

2. Regular Round Point, Marking: R

- Needle point has standard sharpness.
- Suitable for woven fabrics, including finished caps.

3. Light Ball Point, Marking: SES

- Used to push aside the yarns of knitted fabrics rather than piercing directly, to maintain the integrity of the knit structure.

- The most commonly used point type, can be considered a universal point.
- Suitable for most knitted and woven fabrics.

4. Medium Ball Point, Marking: SUK

- Used to push aside thicker yarns, such as those in heavy knitted fabrics.

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

■ Difference Between Sharp Point and Ball Point Needles

The two most commonly used needle point types in sewing and embroidery are sharp point and ball point needles.

Sharp point needles are used for woven fabrics. These needles can slightly pierce the fabric when necessary and can also enter the gaps between yarns like ball point needles. Woven fabrics are constructed from warp and weft threads; even if one thread is broken, the overall structure remains intact. The needles included in your initial accessory kit are sharp point needles.

Tip

- We recommend using Groz-Beckert brand needles. The model marking for Groz-Beckert sharp point needles is RG.

Ball point needles are suitable for knitted fabrics. These needle points do not cut the fabric but rather pass through the fabric's inherent pores. If a hole is punched in knitted fabric, it can easily unravel because knitted fabric is made from a single continuous yarn.

Tip

- We recommend using Groz-Beckert brand needles. The model marking for Groz-Beckert ball point needles is FFG.

Needle and Thread Compatibility

The size of the needle eye varies with the needle size, so in some cases, it's necessary to change to a correspondingly thinner or thicker embroidery thread. For example: 65/9 or 60/8 size needles require finer thread (e.g., 60-weight thread) to pass smoothly through the needle eye. The following table shows the correspondence between common needle sizes and thread weights:

Needle Size			Thread Weight			
USA	Japan	Germany	Cotton	Silk	Nylon	Rayon
0.26	9	65	70-80	100-120	130-150	70-100
0.27	10	70				
0.29	11	75	50-60	60-70	100-130	100-130
0.32	12	80				
0.34	13	85	50-0	60-70	60-100	130-160
0.36	14	90				

Embroidery Thread

Thread Consumption

Thread consumption varies with stitch type. Longer stitches (such as long satin stitches, jump stitches) consume more top thread than short stitches (such as fill stitches). The actual number of stitches a bobbin can embroider varies with thread type and pattern stitch length.

Bobbin

When the machine runs well, we often overlook the role of the bobbin. But once bobbin thread issues arise, they can severely impact production efficiency. This is because the bobbin affects all needle bars; simply changing the needle cannot improve sewing results. Such a crucial component must be inspected carefully.

You can choose to wind your own bobbins or purchase commercial pre-wound bobbins (disposable bobbins). Self-wound bobbins often have poor thread payout stability. For high-speed commercial embroidery machines to operate normally, thread payout must be smooth, even, and stable. Commercial pre-wound bobbins are a cost-effective choice that ensures stable bobbin thread operation.

Your Ricoma machine requires L-type bobbins. Polyester bobbin thread is preferred over cotton because polyester produces less lint.



Polyester bobbin thread is mainly divided into two types: spun polyester and filament polyester.

Spun Polyester: In this process, the thread is made by twisting short fibers together. Not recommended, as this type of thread is prone to breakage and can accumulate under the bobbin case tension spring, leading to tension abnormalities over time.

Filament Polyester: In this process, the thread is made from a single continuous filament. This bobbin thread runs more smoothly in the bobbin case and has higher strength.

■ Bobbin Side Types

Some bobbins have side structures to support the thread during rotation.

Paper-Sided Bobbin: This is the most common type.

Side-Less Bobbin: Consists only of the thread body, without any side support structure.

Plastic-Sided Bobbin: Some embroiderers believe plastic-sided bobbins rotate more smoothly and run more steadily in the bobbin case.

Magnetic Bobbin: Magnetic bobbins have no sides and rely on magnets for support. Magna Glide brand bobbins have a magnet built into the center, which helps maintain stable bobbin tension, allows the bobbin to run more smoothly, and prevents bobbin nesting. When using magnetic bobbins, the gunmetal-colored brake (tension spring) on the bobbin case usually needs to be removed.

Bobbin Thread Material Selection

■ Cotton Thread

Although cotton thread is not as strong as synthetic fibers, its skin-friendly texture is favored, allowing for more flexible bobbin tension adjustment. However, cotton thread has a significant drawback: it produces a large amount of lint, which easily accumulates under the

bobbin tension spring. Lint buildup can cause the tension spring to "bounce," ultimately preventing effective maintenance of bobbin tension.

■ Nylon Thread

The characteristics of nylon thread are almost the opposite of cotton thread. The advantage of using nylon thread lies in its high strength, allowing a single bobbin to hold many yards of nylon thread. Disadvantages of using nylon thread include: its small diameter and smooth texture make it difficult to maintain constant tension within the bobbin case, and its extremely slippery nature makes tension control even more challenging.

■ Filament Polyester

This thread is the most commonly used bobbin thread material in the American embroidery industry, offering advantages such as high strength, moderate fineness, durability, reliability, and low lint production. It is known for its uniform texture and excellent quality. A standard "L" size bobbin can hold 127 yards of this thread. For this reason, American embroiderers widely choose this bobbin thread material. Reducing bobbin changes or thread breakage can effectively decrease downtime and improve efficiency.

■ Spun Polyester

Spun polyester has many advantages, making it the preferred bobbin thread material for many manufacturers. Its texture is similar to cotton thread but without the lint issue, and it offers the best economy. Spun polyester bobbins require lower tension spring pressure. However, it still produces some lint buildup, requiring regular cleaning and maintenance.

The reason this issue has been overlooked for a long time is that many people mistakenly believe L-size bobbins can only hold 94 yards of this thread. While this is true for 100-weight spun polyester, several

suppliers actually offer 120-weight spun polyester. This specification yields 120 yards per bobbin, only 7 yards less than filament polyester.

Top Thread Material Selection

60, 70, and 80-weight threads are fine threads. These threads are suitable for delicate fabrics, tiny intricate designs, and small font sizes. When using these threads, the pattern density needs to be increased by 5%–10%.

30 and 40-weight threads are medium threads. This specialized thread can be used to fill large areas with fewer stitches. When using this type of thread, the stitch count can be reduced by 15%, saving production time. 35-weight thread is typically used for multi-color threads. The factory-supplied thread set is 40-weight.

12-weight thread is a thick thread. This specialized thread can achieve a hand-embroidered effect. When using this type of thread, long float stitches need to be employed. This thread requires additional setup and debugging; it is recommended to adjust the tension simultaneously.



■ Rayon Thread

Rayon thread is widely used in the American embroidery industry,

available in 30, 40, and 60 weights. This thread is made from cellulose, with a soft, flexible texture, beautiful sheen, and smooth feel. This thread has better running performance than other commonly used embroidery threads and presents a very rich visual effect when embroidered on fabric. Unfortunately, it is not the strongest. When using rayon, even minor equipment malfunctions can lead to a significant increase in thread breakage. Compared to other embroidery threads, rayon is not only more expensive but also susceptible to environmental factors such as temperature and light.

Black and white rayon threads are more prone to breakage due to the bleaching and dyeing process: white yarn requires deep bleaching to achieve bright whiteness, while black yarn needs to absorb a large amount of pigment to achieve a rich black, resulting in reduced thread toughness.

■ Polyester Thread

Early polyester embroidery thread was difficult to use because the fiber itself is very elastic, prone to loose loops, leading operators to set the tension too tight. This repeated stretching exacerbated the problem, causing the polyester thread to stretch and deform further. When the thread relied on its own elasticity to return to its original length, the embroidery would pucker and the fabric would shrink. Today's polyester thread performance has greatly improved. Many products offer excellent embroidery performance and a richer color range, making them a high-quality choice for embroidery practitioners. For some lightweight, delicate fabrics, its strength might be a bit high, but its resistance to breakage can effectively improve production efficiency. We recommend using 100% polyester thread for all embroidery projects.

Polyester is one of the two embroidery fibers that can use fluorescent dyes. The fluorescent-colored embroidery thread used in your shop is most likely polyester. Polyester thread has excellent abrasion resistance and bleach resistance, making it particularly suitable for items that will be exposed to sunlight for long periods, come into contact with chlorine water, or require harsh washing.

Tip

- Polyester thread is stiffer than rayon and may require appropriate tension or thread take-up spring adjustment. Try different tensions using the spring adjustment lever to find the most suitable parameters.

■ Cotton Thread

If you desire a rustic, handmade feel or are doing small personalized lettering on dress shirts, cotton thread is an ideal choice. Cotton thread is easy to adjust for tension, has a matte finish, and some people prefer it over other shiny embroidery threads. This thread material comes in a wide range of weights, from extremely thick to very fine. In the past, it was the preferred thread for making fine golf logos. Today, this thread material is mostly used for creating appliqué with a handcrafted style.

■ Metallic Thread

Many embroiderers try to avoid metallic thread because it is often difficult to handle. The good news is: this beautiful embroidery thread can actually be tamed for use.

This metallic thread is stiffer than other varieties and has a special structure. Metallic thread is essentially made by bonding a metallic foil layer to a nylon or polyester core. Product quality varies among different manufacturers, so it's recommended to communicate with peers and choose a brand with stable performance.



If problems occur when using metallic thread, you can try the following methods:

- Use a finer gauge metallic thread.
- Choose a needle with a larger eye.
- Check the digitizing file.
- Ensure the embroidery density is suitable for metallic thread.
- Check if there are too many short stitches or small corner stitches.

Backing



Backing (also called stabilizer) is the foundation of quality embroidery. It is designed to support or even replace the fabric, keeping the fabric flat to prevent embroidery pattern distortion. Various types of backing/stabilizer are used in embroidery, and which one to choose depends on the fabric you are using.

Three factors should be considered when selecting backing material:

Fabric Stability: Fabrics with high elasticity or loose texture require heavy backing; structurally stable, tightly woven fabrics can use light or medium-weight backing.

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

Washability: If the fabric requires frequent washing, heavy backing should be used. After multiple washes, the backing will gradually soften.

Backing Color

Backing mainly comes in two colors: black and white. White is the most common and suitable for most embroidery projects. Some embroiderers use black backing on dark-colored garments, especially when the backing might be visible or show through, such as with pique mesh knitwear.

Backing comes in two forms: large rolls and pre-cut pieces.

Embroiderers typically choose large rolls for embroidering large areas. Pre-cut backing pieces are more suitable for smaller logos, such as the common left-chest logo.

Backing Weight

Backing is available in various weight specifications, and its weight needs to match the type of garment being embroidered. When selecting backing, the primary consideration is the fabric's stability requirement. The core goal is to eliminate the fabric's stretch—the greater the fabric's elasticity, the heavier the backing weight should be. Follow this general principle when choosing backing: for lightweight fabrics, thicker backing is recommended; for heavy fabrics, thinner backing is needed.

■ Common Backing Weights

Lightweight: 1 to 1.5 ounces

Medium-weight: 2 to 2.75 ounces

Heavyweight: 3 to 3.5 ounces

Tip

- Embroidery results often require multiple adjustments. If necessary, multiple layers of backing can be stacked, or backings of different weights can be used in combination.
-

Types of Backing

The backing used in embroidery can be divided into several categories, each with its specific purpose, suitable for different types of fabrics.

■ Cut-Away Backing

Cut-away backing is used for permanent support and offers the best stability. This backing comes in various weights from light to heavy, some being heat-bondable. It provides clearer and crisper embroidery on fine designs, including small lettering.

This backing remains permanently on the fabric after use, and the excess needs to be trimmed away with scissors, hence the name "cut-away." Its weight range covers 1 ounce (lightweight) to 3.75 ounces (heavyweight). Cut-away backing is most suitable for stretchy fabrics (like knits) and garments that require frequent wearing and washing, effectively preventing pattern distortion. It is also suitable for loosely woven fabrics and unstructured cap styles. It is recommended to use lightweight cut-away backing for designs with lower stitch density, while heavyweight cut-away backing is needed for designs with higher stitch density.

■ Tear-Away Backing

Tear-away backing has lower stability than cut-away backing and primarily provides light support. This backing comes in various weights from light to heavy and is available in self-adhesive versions. Similar to cut-away backing, tear-away backing lives up to its name—after embroidery is complete, the embroiderer can tear it away from the garment, hence the name. This backing is typically used for non-stretch, tightly woven natural fiber fabrics (such as towels, hats, bags, etc.). Besides being suitable for highly stable fabrics, tear-away backing is also commonly used in design scenarios where backing visibility needs to be avoided. If the fabric requires stronger support, multiple layers of light to medium-weight tear-away backing can be stacked.

■ Water-Soluble Backing

Water-soluble backing / non-show backing is a lightweight woven cut-away backing, soft, thin, and strong. This backing is specifically designed to provide extra stability for knitwear and gets its name

because it doesn't show through on light-colored garments. It is commonly used for low-stitch-count designs on polo shirts and T-shirts. For best results, it is recommended to use water-soluble backing in combination with tear-away backing. Water-soluble backing can be removed by spraying with water or applying heat.

■ Topping

Water-soluble topping is a water-soluble film placed on the surface of the embroidery design to prevent stitches from sinking into textured fabrics. This topping is suitable for delicate, mesh, and hard-to-stabilize fabrics, such as pique mesh, fleece, terry cloth, corduroy, etc. It is highly recommended for embroidering towels, as it makes the stitches more three-dimensional and prominent. When using this topping, backing is still needed on the back of the fabric for added stability. This topping can be removed by tearing, spraying with water, or a combination of both.

■ 3D Foam

3D foam is used for lettering or designs on caps to create a 3D effect. This backing comes in various colors and can be up to 3 mm thick. To use it, first place the 3D foam on the embroidery area, then use short column fill stitches to embroider while cutting the foam. After embroidery is complete, remove the excess foam. If any foam residue remains, it can be removed by heating with a heat gun/hairstyler.

■ Polyester Mesh Backing

Polyester mesh backing is extremely lightweight, yet its strength performance is particularly outstanding. It is used to achieve maximum stability when heavy cut-away backing is not desired. Polyester mesh backing is very suitable for lightweight, highly elastic technical sportswear fabrics, providing good support without affecting the

garment's original hand feel. When embroidering elastic technical golf shirts, this backing material can be used, and it is recommended to use it double-layered.

■ Heat-Bonded Backing

Heat-bonded backing is suitable for highly elastic fabrics. After being ironed and bonded onto the garment at high temperature, the fabric and backing become one, resulting in a more stable structure. It can also be used to cover the back of finished embroidery, for example, on baby onesies, to prevent the bobbin thread from rubbing against the backing and irritating the infant's skin.

Embroidery Craft Techniques

Special Embroidery Frames

■ Magnetic Embroidery Frame

Magnetic embroidery frames are an ideal solution for sewing ultra-thick fabrics like bags. This type of frame provides stronger support for the fabric, ensuring it is firmly secured within the frame. It is also suitable for thin fabrics prone to hoop marks, such as satin, effectively preventing hoop marks from damaging the fabric.



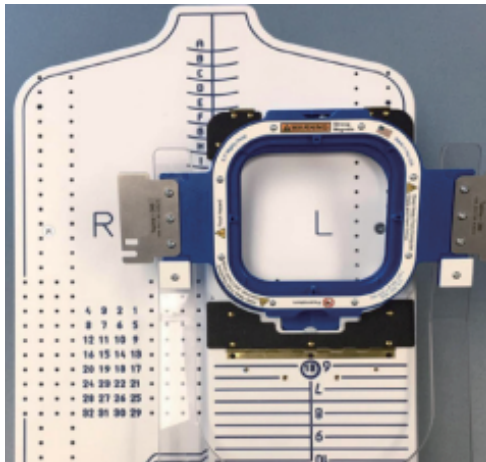
■ 8-in-1 Device

This 8-in-1 device is specifically designed for items difficult to hoop. It consists of eight different sized frames paired with one universal main holder. It needs to be used with adhesive backing, allowing fabric to be directly fixed on top of the narrow frame for embroidery. The narrow frame structure facilitates sewing in tight, hard-to-reach areas like pockets and sleeves.



■ Hoop Positioning Plate

Embroidery operators use this device during batch embroidery to standardize the placement of the embroidery frame and garment, ensuring consistent positioning for each finished piece. The positioning plate can secure the outer frame; simply lay the garment and fasten the outer frame to complete hooping. It is compatible with dedicated frames, offering simple, fast, and efficient operation, greatly improving the uniformity of pattern positioning.



Cap Embroidery

■ Key Points in Cap Selection

Select caps that are compatible with the cap frame. The curvature of the inner visor stiffener of the cap should closely match the bending curvature of the cap frame. If the gap in the middle or on the sides is too large, pattern misalignment is highly likely to occur at those positions.

■ Key Points in Cap Embroidery Operation

For best results, pair with appropriate backing. Most embroidery operators recommend: Use 3 oz (approx. 80g) tear-away backing on unstructured caps (no top stiffener), combined with spray adhesive to enhance the clarity of small text and fine details; For structured hard-top caps, use light to medium-weight tear-away backing depending on the complexity of the design; the more complex the design, the heavier the backing required.

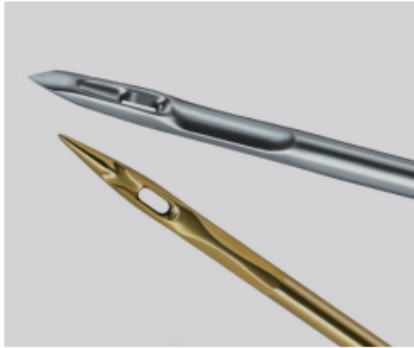


When embroidering caps made of textured fabrics like twill or corduroy, it is recommended to use water-soluble topping to enhance the clarity of small patterns and text.

When embroidering caps, it is recommended to slightly tighten the bobbin case tension. If the fabric in the embroidery area of the cap is not flat enough, it can easily cause the bobbin thread to be pulled to the front of the embroidery. It is recommended to use spun polyester bobbin thread because its texture provides moderate friction, making it easier to maintain tension balance, which is very suitable for cap embroidery. It is recommended to set up and calibrate a dedicated set of bobbin cases specifically for cap embroidery.



Needles need to be changed frequently when embroidering caps. The dense fabric on caps can easily cause needle tip wear. It is recommended to change the needle after approximately eight hours of continuous use or after three consecutive thread breaks. Titanium alloy needles are more wear-resistant and better suited for long-term cap embroidery work.



■ Digitizing and Punching Tips for Cap Embroidery

- Simplify or eliminate unnecessary details and outline stitches as much as possible.
- Appropriately widen the column stitch width. When embroidering on the curved surface of a cap, column stitches in the X-axis direction will be narrower than when embroidering on flat fabric.
- Increase the fill stitch length to reduce the number of penetrations, lessen the load on the fabric, and shorten embroidery time.
- Try to enlarge text height to more than 3/8 inch.
- Use a segmented digitizing approach. Although this increases the number of color changes, it can significantly improve the registration accuracy for most patterns.

Operating Speed: Cap Embroidery vs. Flat Embroidery

Machine operating speed depends on the quality of the digitized pattern and the type of fabric. To ensure finished product quality, adjust the machine speed promptly according to different fabrics.

Tip

- Continuously check the stitches during embroidery to ensure there are no issues like floating threads, skipped stitches, or looping. If stitches are loose or the embroidery effect is poor, reduce the machine operating speed until the stitches are flat and clean.

If thread breakage is frequent and the following conditions have been confirmed correct, it can be improved by reducing speed:

- The pattern digitizing is standard, and the stitch count ratio is reasonable.
- The fabric hooping is proper and secure.
- The thread tension is adjusted correctly.
- The threading path is correct.

■ Recommended Operating Speeds

- When embroidering caps, we recommend controlling the machine operating speed between 450 and 650 stitches per minute.
- When embroidering flat fabrics, it is recommended to control the machine operating speed between 650 and 850 stitches per minute.

Hoop Positioning Reference Standards

■ Beach Towel

- Center the design, with the center point 5 inches from the bottom edge.
- Lettering design size: 4 ~5 inches.

■ Bath Towel

- Position the design 2 inches above the hem, or 4 inches from the bottom edge.
- Lettering design size: 3 ~4 inches.

■ Hand Towel

- Position the design 1 ~1.5 inches above the hem, or 2 inches from the bottom edge.
- Lettering design size: 2.5 ~3 inches.

■ Fingertip Towel

- Center the design, 2.5 inches from the bottom edge.
- Lettering design size: 2.5 inches.

■ Washcloth

- Position the design 2 inches from the bottom edge, or 1.5 inches above the hem.
- Lettering design size: 1 ~2 inches.

■ Napkin

- Center the design and embroider it in the corner diagonal to the napkin label.
- Lettering design size: 1 ~2 inches.

■ Pillowcase

- Position the design 3 inches from the bottom edge.
- Lettering design size: 1.25 ~2.25 inches.

■ Bed Sheet

- Center the design 2 inches above the sewn-on fabric band on the bed sheet, embroidered on the reverse side; the design should be visible after the sheet is turned down (most customers prefer full names embroidered, especially common on children's bed sheets).
- Design size at the bottom edge: 3 inches; area above the bottom edge: 3 ~5 inches.

■ Men's Bathrobe

- Design position: 7 ~10 inches from the shoulder seam, and 3 ~5 inches left/right from the garment center line.

■ Women's Bathrobe

- Design position: 4 ~6 inches from the shoulder seam, and 3 ~5 inches left/right from the garment center line.

Backing and Needle Recommendations by Fabric

■ Canvas

- Backing: Light to medium-weight tear-away backing.
- Needle: 75/11 Sharp point / Regular ball point needle.
- Suggestion: For long, continuous embroidery sessions, prioritize sharp point needles for better durability.

■ Polyester Velour

- Backing: Lightweight polyester tear-away backing; suitable for long-term sun exposure, chlorine washing, salt water, industrial washing, and bleaching environments, effectively locking in color and protecting the fabric.
- Needle: 75/11 Fine ball point needle.

■ Coated Fabric / Waterproof Fabric

- Needle: 75/11 or 80/12 Sharp point / Fine ball point needle.

■ Corduroy

- Backing: Use medium-weight water-soluble topping combined with light to medium-weight tear-away backing.
- Needle: 75/11 Fine ball point needle.

■ Cotton Plain Weave

- Backing: Heavy cut-away backing, or a combination of tear-away / water-soluble backing.
- Needle: 75/11 Fine ball point needle.
- Suggestion: Cotton thread has good compatibility and is suitable for children's wear embroidery.

■ Denim

- Backing: Heavy cut-away backing, or a combination of tear-away / water-soluble backing.
- Needle: 75/11 Fine ball point needle.

■ Dress Shirt (Woven)

- Backing: Use extra-heavy cut-away backing, or a combination of tear-away / water-soluble backing.
- Needle: 75/11 or 70/10 Fine ball point needle.
- Suggestion: When embroidering fine details, it is recommended to switch to an 80/12 needle.

■ Golf Shirt

- Backing: Light to extra-heavy cut-away backing; for heavy knit fabrics, use medium to heavy cut-away backing; for medium-weight knit fabrics, use light cut-away backing.
- Needle: 75/11 Fine ball point needle.

■ Hat Fabric

- Backing: Medium to heavy-weight tear-away backing.
- Needle: 75/11 or 80/12 Sharp point needle.

■ Leather & Synthetic Leather

- Backing: Lightweight tear-away backing.
- Needle: For stiff / foamed leather (upholstery, bags) use 75/11 or 80/12 Fine ball point needle; for soft garment leather use 70/10 or 80/12 Sharp point needle.

■ Underwear & Intimate Apparel / Silk

- Backing: Water-soluble tear-away backing.
- Needle: Select 70/10 or 80/12 Fine ball point needle based on the embroidery thread specification.

■ Lycra / Spandex Stretch Fabric

- Backing: Medium-weight cut-away backing or water-soluble tear-away backing.
- Needle: 70/10 Medium ball point needle.

■ Nylon Windbreaker Jacket

- Backing: Light to extra-heavy cut-away backing.
- Needle: 75/11 Fine ball point needle.

■ Knitted Sweater

- Backing: Medium to heavy-weight cut-away backing.
- Needle: 75/11 Fine ball point needle.

■ Athletic Hoodie

- Backing: Heavy-weight tear-away backing or cut-away backing.
- Needle: 75/11 Fine ball point needle.

■ T-Shirt

- Backing: Thin water-soluble tear-away backing or medium-weight cut-away backing.
- Needle: 75/11 Fine ball point needle.

■ Terry Cloth / Looped Fabric

- Backing: Use medium-weight water-soluble tear-away backing, combined with water-soluble topping (topping).
- Needle: 75/11 or 80/12 Fine ball point needle.



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