

MARQUEE

Quick Start

Guide

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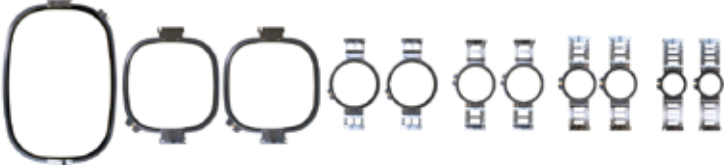
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Getting Started: Machine Overview

Machine Content

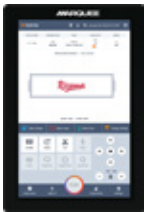
Package Contents

 Embroidery Hoops x 11/22 (depending on model)	
 Flat Embroidery Hoops x 1(optional)	 Cap Ring x 1
 Hooping Station x 1	 Cap Driver x 1
 Embroidery Hoop Armrest x 1	 Power Cord
 Ethernet Cable	 Tool Kit & Starter Accessory Pack

Tool Kit Contents

 Machine Needle x 1	 Thread Snips x 1	 Double-Ended Wrench x 3
 Phillips Screwdriver x 1	 Flathead Screwdriver x 1	 Hex Key Set x 9
 Needle-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, connecting rods, needle bar bushings, threaders, bobbins, etc.		

■ Core Components

	Machine Stand The embroidery machine is equipped with a load-bearing stand designed to support it during operation. If you plan to use this stand, assemble it first. If not, place the machine on a sturdy table with adequate working space.
	Touchscreen control panel The machine is equipped with a touch panel for operation. Before operating, adjust the panel position according to your preference. Refer to the control panel overview chapter for more details.
	Thread stand The machine includes a thread stand for placing spools and guiding thread through the machine. Always raise the thread stand before threading.
	Emergency stop button In case of emergency, press the E-stop button on the lower left of the control panel. To restart, rotate the knob clockwise as indicated until it pops out, then press the start button.
	Head indicator light Located at the upper right of each head. Under normal operation, the light is green. If a thread break occurs during embroidery, the light flashes red.

Machine Installation

■ Stand Assembly

Step 1: Install connecting plates

- Unpack and remove the left/right stands, connecting plates, and tools. Remove all protective packaging and plastic film.
- Place the stand upside down.
- Use hex head screws with spring washers and flat washers to mount the connecting plates upside down onto the stand columns. Tighten with a hex key.



Step 2: Install casters

- Remove protective caps from caster screws and fasten casters into the mounting holes on the horizontal columns of the left/right stands.
- Rotate casters clockwise, then lock the hex screws using the supplied open-end wrench.
- Repeat for the remaining three casters.



Step 3: Install leveling feet

- Remove all four leveling feet from the stand. Turn counterclockwise by hand until they contact the floor. Level the stand, then use the open-end wrench to lock them in place.



- Once all feet are locked, the casters will lift off the floor, and the stand will no longer slide.

Tip

- After assembling the stand, ensure it is vertical and parallel before tightening screws.

Step 4: Attach the machine to the stand

- After all feet and casters are installed, flip the stand upright.



- Place the machine onto the stand, aligning the machine feet with the mounting holes on the stand. Secure with screws. This step is recommended to be performed by 2-3 people.



■ Adjusting the Control Panel Position

Your touchscreen can be adjusted up / down and left / right. Remove the protective plastic film before adjustment.

How to adjust left/right position

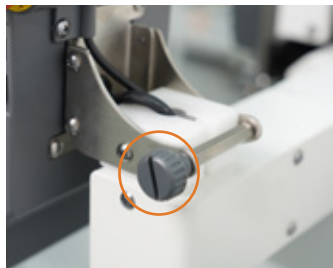
- Loosen the star knob on top of the panel arm.



- Move the panel to the desired orientation, then tighten the knob.

How to adjust up / down position

- Loosen the star knob on the side of the panel arm.



- Adjust the panel to the desired angle, then tighten the knob.

■ Raising the Thread Stand

- Loosen the knobs on the side of the thread stand supports by turning counterclockwise.



- Raise the thread stand to its highest position, keeping both sides level.
- Tighten each knob clockwise to secure the stand.



Tip

- Raise both sides simultaneously to ensure level alignment.



■ Powering on and Connecting Power

- The power socket is located on the right side of the main unit. Attach the power cord to the socket, and then insert the plug into the power outlet.



Threading Operations

Replacing Thread Spools

The following steps explain how to replace a spool. If the machine is pre-threaded from the factory, start from Step 3.

■ How to Change a Thread Spool

1. Place the new spool on the corresponding position. Do not remove thread already on the machine.
2. Tie the new thread end to the old thread of the corresponding needle.



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



4. Cut the thread just above the knot. Then pass the thread end through the needle eye and under the presser foot.

Needle Threading

The machine comes with pre-installed needles. Refer to the needle installation section for replacement.

■ Needle Threading Method

1. Pass the thread from front to back through the needle eye and then under the presser foot.
2. Pull the thread upward and snap it into the spring clip. Leave 1–2 inches of thread and trim the excess.



Full Machine Threading

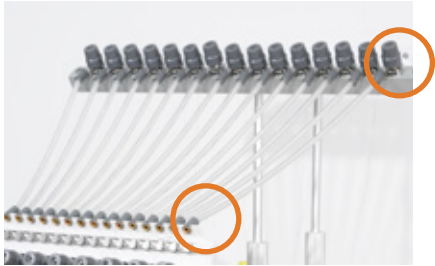
Before threading, raise the thread stand and install spools and thread tubes correctly.

■ Raising the Thread Stand

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

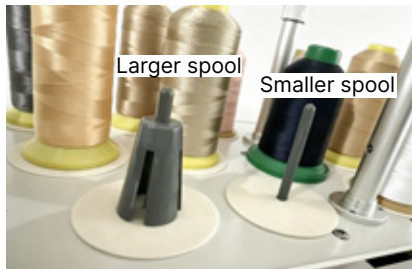
■ Installing Thread Tubes

Connect one end of each tube to the slot directly below the top tensioner on the stand, and the other end to the slot on the head. Align the upper and lower slots by number: upper slot 1 → lower slot 1, etc.



■ Placing Thread Spools

1. Remove all external packaging from the spool.
2. Unfasten the clip at the base of the cone to release the thread end, and pull the thread completely from the bottom.
3. Place each spool onto the spool pins.



Tip

- To avoid color confusion, do not place spools of similar colors (e.g., black and navy) next to each other.

■ Starting the Threading Process — 12/15 Needle

Familiarize yourself with the thread path: rear guide holes → middle rear guide holes → middle front guide holes → front guide holes.



1. Pass each thread through the guide holes on the upper thread stand until reaching the top tensioner.



2. Pass the thread through the small guide hole behind the first tensioner. Place the thread between the tension discs on the right side of the tensioner, ensuring it snaps into the 3 o'clock clip. Correct threading is confirmed when the metal discs close together.



3. Remove both thread tubes. Use the threader from the tool kit to hook the thread and pull it through the tube. Remove the thread from the threader.



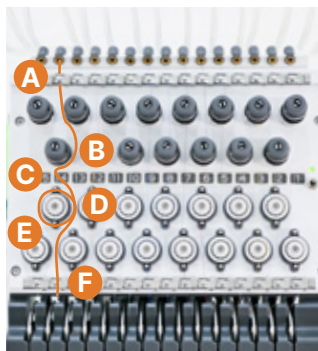
4. Reinstall the tubes, aligning both ends correctly.

5. Pass the thread through the clip directly above the top tensioner. Lift the clip gently with your finger; do not force the thread in. **See Point A.**

6. Pull the front disc of the tensioner toward you and slide the thread to the right side of the knob. Follow the needle number alignment. The illustration shows needle #14. **See Point B.**

7. Locate the thread post directly above the thread break detection wheel (white wheel on the head). Pass the thread from the left side of the post (**Point C**), wrap it clockwise around the wheel, and exit from the left side of the bottom post. **See Points C to E.**

8. Lift the bottom thread clip, insert the thread from below, and snap it in. **See Point F.**



9. Raise the middle thread spring to the threading position. Pass the thread around the outside of the roller from the right and through the center opening. **See Point G.**

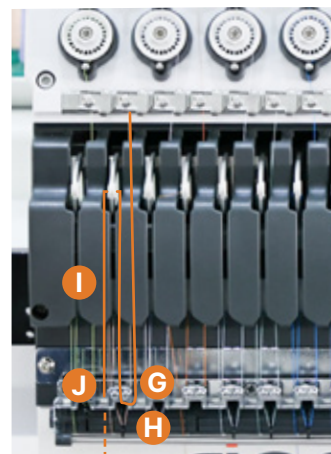
10. Pass the thread from right to left through the spring. **See Point H.**

11. Pass the thread out through the center of the roller, then around the left side, and pull up to the take-up lever. **See Point I.**

12. Pass the thread from right to left through the hole of the take-up lever. **See Point I.**

13. Pass the thread down through the ceramic guide. **See Point J.** Continue down through the next ceramic guide. **See Point K.**

14. Pass the thread from front to back through the needle eye and under the presser foot. **See Point L.**



15. Finally, check all needles from the front to ensure threading is neat and consistent. The machine is now ready for a test sew.

Tip

- If a needle runs out of thread completely, follow the same path as an adjacent correctly threaded needle.

■ Starting the Threading Process — 20 Needle

Familiarize yourself with the thread path: rear guide holes → middle rear guide holes → middle front guide holes → front guide holes.



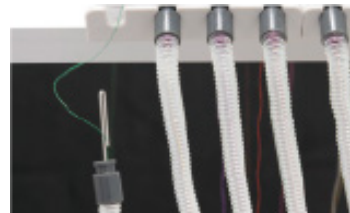
1. Pass each thread through the guide holes on the upper thread stand until reaching the top tensioner.



2. Pass the thread through the small guide hole behind the first tensioner. Place the thread between the tension discs on the right side of the tensioner, ensuring it snaps into the 3 o'clock clip. Correct threading is confirmed when the metal discs close together.



3. Remove both thread tubes. Use the threader from the tool kit to hook the thread and pull it through the tube. Remove the thread from the threader.



4. Reinstall the tubes, aligning both ends correctly.

5. Pass the thread along the felt pad to remove any excess oil that may have accumulated during maintenance.

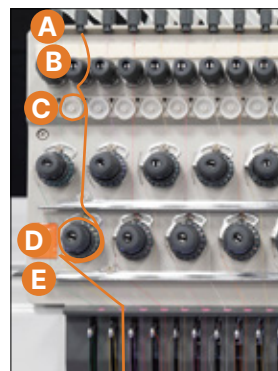
6. Pull the front disc of the tensioner toward you and slide the thread to the right side of the knob. Follow the needle number alignment. The illustration shows needle #19. **See Point B.**

7. Locate the thread break detection wheel (white wheel on the head). Pass the thread to the right and wrap it clockwise around the wheel, exiting from the right side. **See Points B to C.**

8. Pass the thread through the guide hole corresponding to the thread break detection wheel.

9. Pass the thread to the right and wrap it clockwise around the tensioner knob, exiting from the left side.

10. Pass the thread through the tensioner spring lever, then through the guide hole below. **See Point E.**

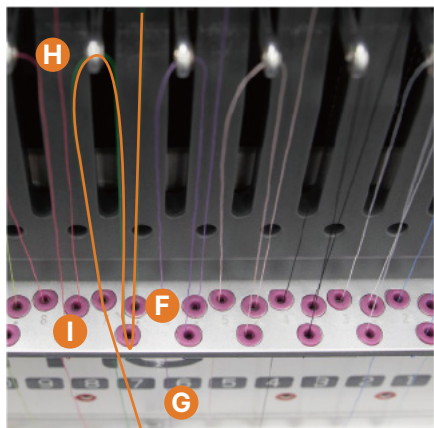


11. Pass the thread down through the ceramic guide. **See Point F.**

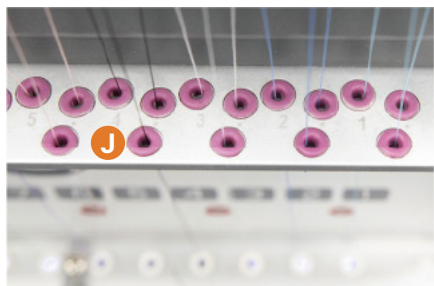
Then route it back through the next ceramic guide. **See Point G.**

12. Pass the thread from right to left through the hole of the take-up lever. **See Point H.**

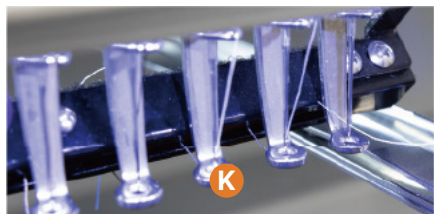
13. Pass the thread down through the ceramic guide. **See Point I.**



14. Continue down through the next ceramic guide. **See Point J.**



15. Pass the thread from front to back through the needle eye and under the presser foot. **See Point K.**



16. Finally, check all needles from the front to ensure threading is neat and consistent. The machine is now ready for a test sew.

Tip

- If a needle runs out of thread completely, follow the same path as an adjacent correctly threaded needle.

Needle Installation

Needle Selection

Choosing the correct needle is critical for quality embroidery. An incorrect needle (too thick or too thin) can cause thread breaks or skipped stitches.

DBxK5 is the standard needle system for embroidery machines. DBxK5 75/11 sharp point is suitable for most embroidery applications. It features a medium point and large eye, allowing smooth thread passage and reducing breaks.

For special applications, other needle sizes may be used. Refer to the Needles chapter for details.

Needle Installation

When replacing a needle, ensure the long groove faces the front of the machine (away from the operator). Insert the needle fully and vertically into the needle bar. Improper installation can cause machine malfunction, needle breakage, or thread breaks.

■ Needle Installation Method

1. Loosen the set screw above the needle using a screwdriver. Loosen just enough to remove the needle.



2. Discard the old needle in a safe container.

3. The needle has a long groove on the front and a short scarf on the back. Insert the needle with the long groove facing front, pass the tip through the presser foot, and push the shank fully up into the needle bar.



4. Ensure the long groove remains facing front. Hold the needle steady and tighten the set screw.



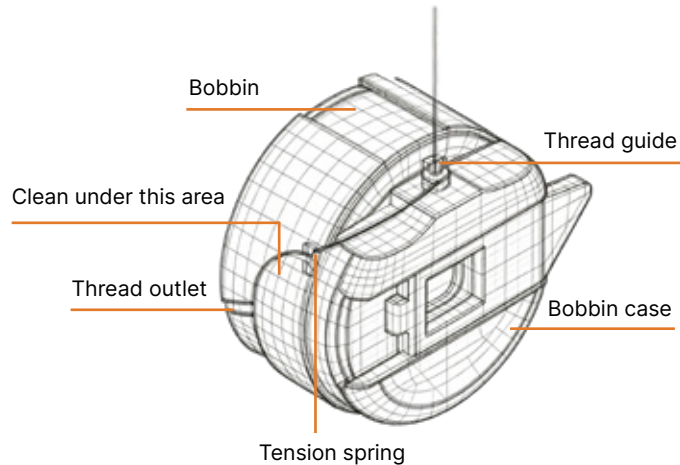
Tip

- Use a wooden toothpick inserted into the needle eye to assist with alignment. Never use metal objects, as they may scratch the eye and cause thread breaks.

Bobbin Installation

Bobbin Case Structure

Before threading and installing the bobbin into the machine, please refer to the diagram below to familiarize yourself with the various parts of the bobbin case that will be mentioned in these instructions.



Threading and Inserting the Bobbin

1. If the bobbin case has not been removed, lift the latch and pull it forward to remove it.



2. If a bobbin is already in the bobbin case, remove it.

3. Place the new bobbin into the bobbin case, ensuring the thread unwinds clockwise.



Tip

- To verify correct bobbin placement, flip the bobbin case and pull the thread gently. The bobbin should still unwind clockwise, and the letters on the bobbin should also turn clockwise.

4. Pass the bobbin thread through the slit in the bobbin case.



5. Pull the thread under the tension spring, ensuring it exits through the notch on the opposite side.



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



7. Hold the bobbin case and lift the latch, then reinsert it into the machine. Ensure the thread tail is no longer than 3 inches; longer tails may cause tangling.

Hoop and Bracket

This machine supports flat embroidery, garment embroidery, and cap embroidery.

Flat embroidery: Uses dedicated hoops for larger fabric areas.

Garment embroidery: For flat-lay garments such as shirts and jackets, using left and right arm supports.

Cap embroidery: Requires a cap embroidery attachment, which is curved to match the shape of caps.

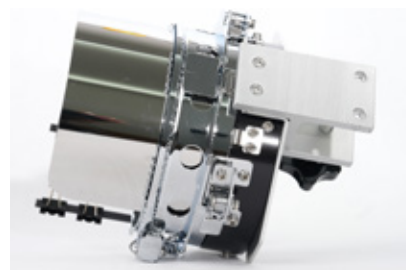
Cap Embroidery Accessories

Cap embroidery requires the cap driver, hooping station, and cap ring.

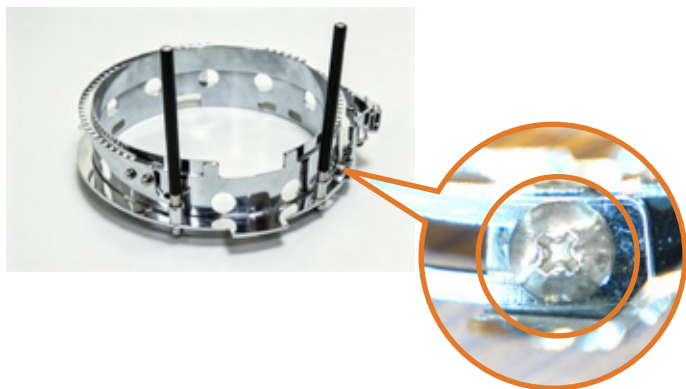
Cap driver: Attaches to the machine and secures the cap and hoop during embroidery.



Hooping station: Supports the cap ring during hooping. Installed on the machine stand or a sturdy table.



Cap ring: Dedicated hoop for caps. Adjustable via screws on the right side to accommodate cap thickness.



Cap Driver Installation and Removal

1. Use a Phillips screwdriver to loosen the screws connecting the cap driver to the machine stand.



2. Pull the cap driver forward with both hands.

Tip

• It is not necessary to fully remove the screws. If both sides are loose, the frame can be easily removed.

Hooping station Installation

1. Select the cap ring in the control panel's preset hoop list. The machine will move automatically.

Tip

• Do not install the cap driver before selecting the cap ring.

2. Remove any other hoop type already installed.

3. Install the cap driver onto the machine, ensuring the hook case passes through the opening in the back of the frame.

4. The cap driver has four small wheels that slide into the rail under the hook case. Align the frame with the rail, ensuring all wheels are engaged.



5. Push the cap driver toward the machine until it is flush with the embroidery stand, engaging it into slot 6 on both sides.



6. Tighten the Phillips screws to secure the cap driver to the embroidery stand.



Flat Embroidery Hoops and Supports

Your Ricoma MARQUEE series machine includes 11 / 22 hoops (depending on model), ranging from size A (smallest) to F (largest).

Always use the smallest hoop that accommodates the design without hitting the frame.

After importing a design, use the machine's preset hoop function to verify clearance.



Tip

- Using the smallest suitable hoop provides the best fabric tension, reducing thread breaks and wrinkling.



■ Hoop Arm Installation

To embroider on garments, first install the hoop support arms onto the embroidery stand rail. These arms support the hoop for shirt and garment embroidery.

1. Install A–E size hoops into slots 5 and 6 on both sides of the stand rail.
2. Install F size hoops into slots 1 and 2 on both sides.



3. Mount the arm brackets into the corresponding slots on the rail.

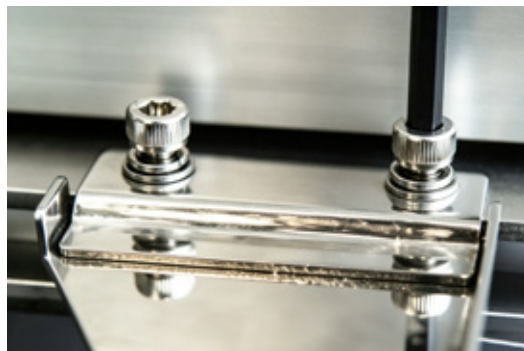


4. Each arm bracket consists of two metal plates with a slot in between. Ensure the rail fits between the plates and that the screws align with the slot.



■ Removing the Hoop Support Arm

To remove the flat hoop support arm: Use a 4mm hex key to loosen the screws counterclockwise, then pull the arm straight forward.



Insert the hoop into the arm brackets, ensuring the hoop edge snaps into the notch at the end of the clip. The hoop's slot should lock securely under the clip's tooth.



■ Installing the Hoop

The metal tab on the hoop slides under the clip on the hoop support arm. When installed correctly, the U-shaped opening faces the machine.



■ Removing the Hoop

Lift the hoop support arm to relieve pressure on the slot. New brackets may be tight at first; pulling outward while lifting will make removal easier.

Table Installation and Use

Installing the Table

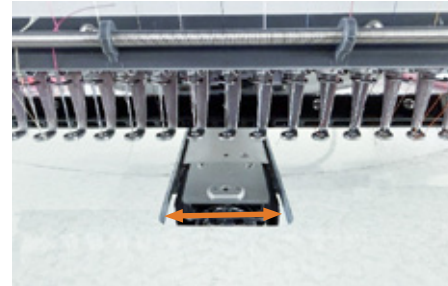
The machine includes a table for large or heavy garments.



1. Slide the table into the machine and rest it on the table support brackets.



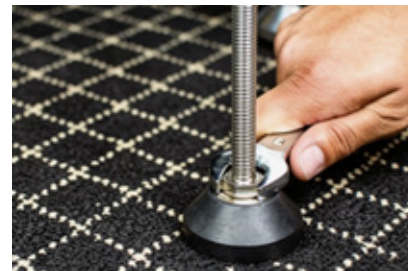
2. Use the table openings as a guide to position the table. The hook cases should sit between the openings.



3. Once the table is in position, pick up the table support legs and insert them into the corresponding slots under the table.



4. Use a wrench to turn the nuts counterclockwise, level the support legs until they contact the floor, then tighten each nut.



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



Using Flat Embroidery Hoops

■ How to Install a Flat Embroidery Hoop

1. Place backing on the hoop, covering the entire area.



2. Place fabric over the backing, ensuring both fully cover the hoop.



3. Smooth the fabric and fasten the metal clips on the short sides of the hoop.



4. Smooth again and fasten the remaining clips on the long sides.



5. When pressing the clips onto the hoop, ensure the tabs face outward.



■ Flat Hoop Installation Method

1. Place the hooped fabric on the table. Pull any excess fabric that may interfere with the rail toward the back and secure it.



2. Mount the flat hoop onto the last two slots of the embroidery stand rail and tighten the screws with a Phillips screwdriver.



Fabric Hooping

Centering a Left Chest Logo

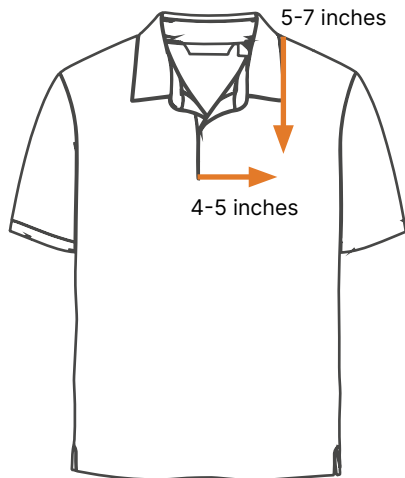
Before hooping a garment, determine the correct placement for the design. First, locate the center of the design.

Tip

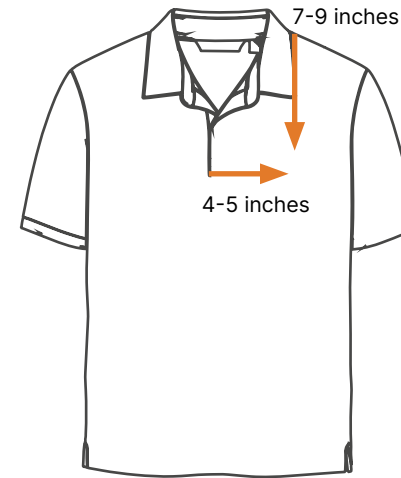
- Center placement varies depending on garment size and design size.

■ Left Chest Logo Placement Guidelines

Women's garment: Mark 5–7 inches down from the intersection of the shoulder seam and the neckline. Mark 4–5 inches from the center line of the shirt. Place the design center at the intersection.



Men's garment: Mark 7–9 inches down from the intersection of the shoulder seam and the neckline. Mark 4–5 inches from the center line of the shirt. Place the design center at the intersection.



Tip

- The design should be slightly closer to the center front than the armhole seam.
- Use chalk, water-soluble marker, masking tape, or spray adhesive tape to mark the center.

■ Hooping Recommendations / Tips for Hooping

Proper hooping is the most fundamental step in embroidery. Keep the following in mind:

- Select the smallest hoop that fully contains the design.
- Backing stabilizes fabric, adds stiffness, and prevents stretching. Choose the appropriate backing for the garment. Refer to the Backing chapter for more information.
- After hooping, the fabric should be smooth and free of wrinkles or shifting. If too loose, re-hoop.

- Always hoop fabric tightly, especially with square/rectangular hoops, which grip only at the corners. Round hoops distribute tension evenly.
- Never pull fabric tightly or overtighten the hoop to flatten it. Stretching during hooping causes wrinkles, shifting, and misalignment.

■ Hooping for Flat Garments

1. Place the inner hoop inside the garment, with adjusting screws facing the shirt opening. This allows quick adjustment if the garment is too tight or loose.
2. Cover the inner hoop completely with backing.
3. Place the outer hoop over the garment and align it with the inner hoop. Press down to snap them together.
4. Check that the fabric is smooth and tight, but not stretched. Try to lift the fabric from the backing; if it is difficult to lift, hooping is correct.



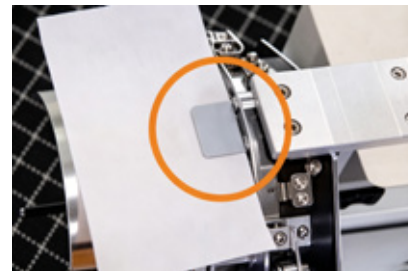
5. Turn the garment over to ensure backing covers the entire hoop perimeter. If not, re-hoop.

■ Hooping for Caps

1. Mount the cap ring onto the cap mount. Align the metal slot on the hoop with the center latch on the mount. Push the hoop forward until it snaps into the three spring locks.
2. Once secured, loosen the metal strap and let it rest on the left side of the hoop.
3. Prepare the cap by flattening the brim as much as possible. If the cap has a back strap, unfasten it.
4. Fold the sweatband inside the cap backward from the seam to the other side.



5. Insert backing under the cap flaps (metal tabs at the top of the hoop frame).



6. Place the cap onto the hoop so the sweatband sits under the brim flap. Ensure the cap fits tightly inside the brim flap, not over it.

7. Place the flexible metal strap over the brim, with the serrated edge as close to the brim as possible.



8. Snap the buckle onto the hoop latch and tighten. Pull the cap sides taut to remove wrinkles.



9. Secure excess fabric at the back of the cap using the provided metal clips. Attach the fabric to the metal rod inside the hoop frame. Ensure the clip handles face the center of the cap and point toward each other.



■ Hooping with Round Hoops

1. Use hoop size A or B.
2. Find a flat surface as wide as the hoop (e.g., a table edge). Place the inner hoop on the surface.
3. Place backing on the inner hoop. Spray adhesive or use adhesive-backed backing.
4. Place the cap over the inner hoop and backing.
5. Smooth the fabric to remove wrinkles.
6. Place the outer hoop over the fabric and align it with the inner hoop.
7. Snap the hoops together as with flat garments.

Maintenance

Some machine issues are caused by improper maintenance. Correct maintenance is essential for long machine life. Use sewing machine oil (available at most sewing and embroidery supply stores) and white lithium grease (available at hardware stores). Consult a technician before using other products.

Every 8 Hours

Remove the bobbin case and clean the rotary hook area with a soft brush, air compressor with moisture filter, or compressed air duster.



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

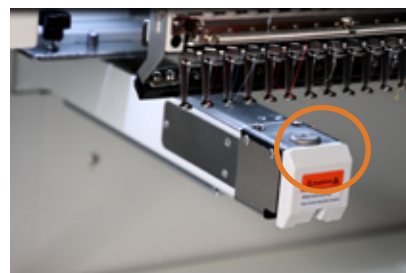


Remove the bobbin case and clean the rotary hook area with a soft brush, filtered air compressor, or compressed air duster.



Weekly

Remove the needle plate above the hook case and clean around the thread trimmer with a soft brush, filtered air compressor, or compressed air duster.

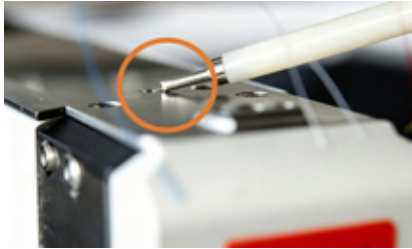


Use the edge of a business card or use bobbin thread as floss to clean lint from the bobbin case slot. Do not blow with your mouth, as saliva may cause buildup.



Every 2 Weeks

Apply 2–3 drops of sewing machine oil to the front and rear oil holes on the hook case needle plate.



Apply 2–3 drops of sewing machine oil to the guide plate.



Tip

- Move the machine to the last needle position to access the oil hole. The oil hole is located on the front of the T-rail, directly behind the screw.



Apply 1–2 drops of sewing machine oil through the oil hole in the metal cover.

Note: The foam pad inside the metal cover under the needle bar will absorb the oil.



Yearly

Apply white lithium grease to the bearings (metal rollers) at the back of the head. Move the head from needle 1 to the last needle to grease all rollers.

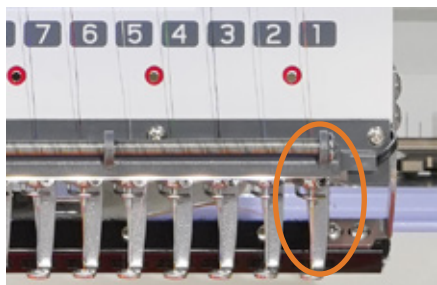


Common Issues

Resolving Thread Breaks

When a thread break occurs, the machine stops automatically and alarms. The break is typically near the head area.

1. Rethread from the break point through the needle eye and presser foot.
2. Snap the thread into the spring clip, leaving about 1 inch of thread.



3. Back the design out by 5 – 10 stitches.
4. Press the start button to resume embroidery.

Tip

- Always back out after a thread break, as the head may have taken extra stitches. This prevents gaps in the design.

Replacing a Needle

Step 1: Remove and discard the broken needle

1. Remove the broken needle from the garment if embedded; otherwise, check the hook area.
2. Loosen the set screw above the needle with a hex key. Loosen just enough to remove the needle.
3. Discard the broken needle in a puncture-proof container.

Step 2: Install a new needle

1. The needle has a long groove on the front and a short scarf on the back. Insert the needle with the long groove facing front, pass the tip through the presser foot, and push the shank fully into the needle bar.



2. Ensure the long groove remains facing front. Hold the needle steady and tighten the set screw.



Tip

- Insert a wooden toothpick into the needle eye to assist with alignment. Never use metal objects, as they may scratch the eye and cause thread breaks.

Bobbin Thread Empty

When the bobbin thread is empty, the machine stops and alarms.

To distinguish between upper thread break and empty bobbin: Check the upper thread at the working needle. If it is still attached to the fabric, the bobbin is likely empty.

If so, replace the empty bobbin with a new one and reinsert the bobbin case.

Emergency Stop Alarm

Pressing the E-stop button during transport or an emergency triggers an E-stop alarm. To clear, rotate the E-stop button clockwise as indicated by the arrow.

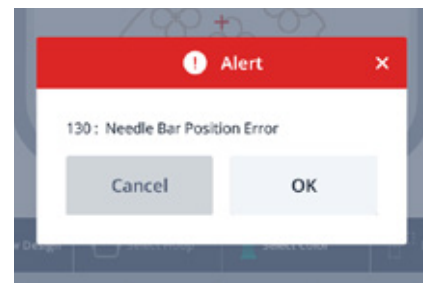


Color Change Error

A color change error occurs when the machine cannot detect the correct needle above the needle plate. This is often caused by the head stopping between two needles or the red color change knob on the right side of the head being moved accidentally.

If the control panel shows a "no needle" error, the needle icon will display "0" instead of a normal needle number.

Press Confirm to clear the error, then turn the knob until the control panel displays a normal needle number.



Once a valid needle number appears, the machine can resume operation.

Main Shaft Not at 100°

The machine must be calibrated to 100° to start and stop embroidery correctly. A main shaft error occurs when the shaft is not at 100°.

This can be caused by the needle hitting the hoop, birdnesting, or other issues.

1. Press the Reset button on the panel. The machine will automatically align the shaft to 100°



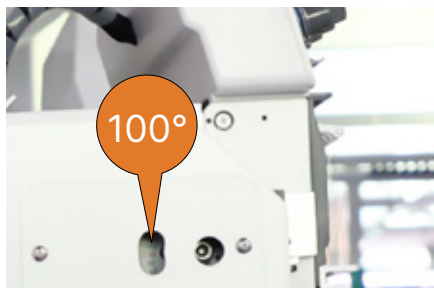
2. Confirm that a valid needle number is displayed. If not, refer to the Color Change Error section.

3. After confirming a valid needle number, press Reset again. This usually resolves the issue. If the error persists, manually calibrate using the black knob on the right side of the machine.

■ Manual Calibration for Main Shaft Not at 100°

1. Turn off the machine.

2. Locate the viewing window on the right side of the machine that displays the shaft angle.



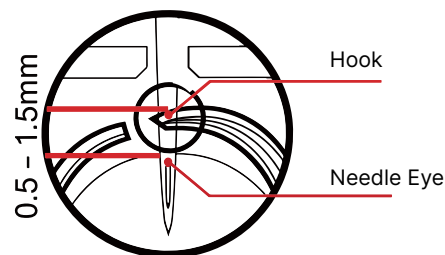
3. Using the hex key, rotate counterclockwise until the indicator needle in the sight glass points to 100°.

4. Restart the machine.

5. After the main screen loads, press the Reset button. The machine should now resume embroidery.

■ Rotary Hook Timing

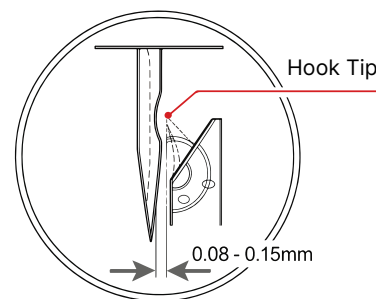
Rotary hook timing refers to the synchronization between the hook and the needle. Proper timing is critical for quality and to avoid issues. If the gap between the needle and hook tip is too large, the hook will miss the thread, causing breaks. If too small, the needle may break.



To adjust timing, rotate the main shaft to a specific angle and adjust the hook position. This angle is called the timing angle.

The timing angle for MARQUEE models is 201°

When timing is correct, the hook tip should align exactly with the needle scarf at the correct spacing. The standard gap is 0.08mm–0.15mm.



For retiming, contact Ricoma Technical Support.

Thread Tension

Proper thread tension is essential for high-quality embroidery. Incorrect tension can cause loops, thread breaks, and other issues.

Tension depends on design complexity, fabric, thread, backing, and even winding. Before adjusting tension, verify that the machine is threaded correctly.

Many tension issues are caused by incorrect threading. Tension can be adjusted using:

- Spring adjuster lever
- Upper thread tension knobs
- Bobbin case



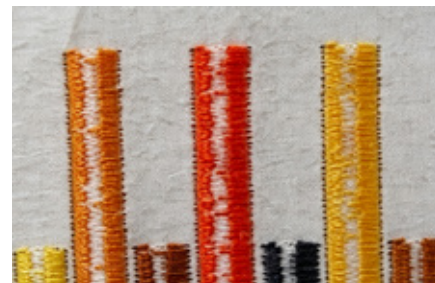
Tip

- Before adjusting via the bobbin case or tension knobs, try adjusting the spring adjuster lever first. Small adjustments here can improve tension across all needles. The spring lever controls overall tension; the knobs control individual needles.



Tension Testing

Bobbin case tension affects all needles. The most common tension test is the "1-inch column test." Sew a solid column of stitches 1 inch tall and examine the back. Ideal tension shows 1/3 bobbin thread centered down the column, with 1/3 upper thread on each side.



If too much bobbin thread shows on the back for all needles: Bobbin tension is too loose.

Solution: Tighten by turning the large screw on the bobbin case clockwise.

If too little bobbin thread shows: Bobbin tension is too tight.

Solution: Loosen by turning the screw counterclockwise.

If too little upper thread shows: Upper tension is too tight.

Solution: Use the spring lever to loosen all needles.

If too much upper thread shows: Upper tension is too loose.

Solution: Use the spring lever to tighten all needles.

If one needle shows too much upper thread: That needle's tension is too loose.

Solution: Tighten its tension knob clockwise.

If one needle shows too little upper thread: That needle's tension is too tight.

Solution: Loosen its tension knob counterclockwise.

Upper Thread Tension Adjustment: Spring Adjuster Lever

The spring lever controls overall tension; the knobs control individual needles.

Adjust the lever up or down depending on fabric and design. Keep the lever at a 90° angle to the embroidery direction. Adjust 1–2 notches from the center position.

For heavy fabrics, move the lever down.

For light fabrics, move the lever up.

To tighten all needles: Move the lever down 1–2 notches.

To loosen all needles: Move the lever up 1–2 notches.



Tip

- Never set the tension spring lever to its extreme top or bottom position, as this may cause thread breakage. The top position will make the thread too loose for normal operation, while the bottom position will make it overly tight and lead to malfunctions as well.

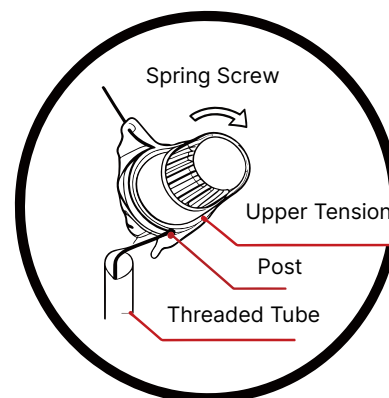


Upper Thread Tension Adjustment: Tension Knobs

The optimal tension setting varies by embroidery thread type. Thread material has a noticeable effect on tension, even among products from most mainstream brands. For instance, polyester thread requires nearly twice the tension of rayon thread.

Adjust the tension knobs until you achieve the proper tension for the thread in use.

Top thread tension knobs allow quick tension adjustment for individual needles. See the figure below for reference.



If too much upper thread shows on the back: Tighten clockwise.

If too little upper thread shows: Loosen counterclockwise.



Tip

- Adjust by 1 / 4 turn increments to observe changes clearly.



■ Factors Affecting Upper Thread Tension

- Thread color: Dyeing changes surface texture and smoothness.
- Thread thickness: Different thicknesses require different tensions.
- Machine speed: Lower speeds generally yield better stitch quality.
- Lint and dust buildup: Directly affects tension.

Bobbin Thread Tension Adjustment

Proper bobbin tension is critical for quality. Incorrect tension can cause thread breaks.

Tip

- New bobbin cases are preset at the factory and usually require no adjustment.

Adjust bobbin tension via the screw on the bobbin case.

Turn counterclockwise to loosen, clockwise to tighten.



If too much bobbin thread shows on the back: Tension is too loose.

Solution: Tighten clockwise.

If too little bobbin thread shows: Tension is too tight.

Solution: Loosen counterclockwise.

When the bobbin tension is too tight, the column stitches will appear too narrow, or only a thin bobbin thread will be visible in the center of the solid column stitches in an "I-Test". In this case, if the bobbin thread gets snagged, the embroidery can easily unravel.

■ Factors Affecting Bobbin Tension

- Unstable bobbin tension is usually caused by the bobbin sticking inside the bobbin case. Try pulling out several feet of bobbin thread to check if the bobbin rotates smoothly without sticking. Causes of sticking may include: mismatched bobbin specifications, overfilled bobbins, 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 a few inches of bobbin thread. If the bobbin cannot rotate freely on the flat surface, it is highly likely that it will not rotate smoothly inside the machine either. It is recommended to replace it with another bobbin and retest.

- If tension abnormalities persist after adjusting the bobbin thread, please check if the bobbin case or needle is damaged, as damaged parts can lead to poor results.

Thread Break Issues

Causes of Thread Breaks

1. **Thick fabric:** Needle may bend slightly, causing friction and breakage.
Solution: Use a larger needle.
2. **Hidden obstacles in garment:** Thick seams, inner pockets, hidden buttons.
3. **Improper hooping:** Loose fabric causes breaks and other issues.
4. **Excessive backing:** Increases friction.
5. **High-density designs:** Needle deflection causes fuzzing and breaks.
6. **Short stitch lengths:** Causes birdnesting and breaks. Delete short stitches or enlarge the design 5–10%.
7. **Needle issues:** Reverse or tilted installation, dull or damaged needle.

Preventing Thread Breaks

1. Store thread in a cool, dark place. Old, improperly stored thread becomes brittle.
2. Do not use tape to secure thread ends; adhesive increases friction.
3. Check thread path, needle eye, needle plate, and rotary hook for burrs.
4. Regular oiling is critical. Keep the hook area clean, especially when using adhesive-backed backing.

Thread Break Troubleshooting

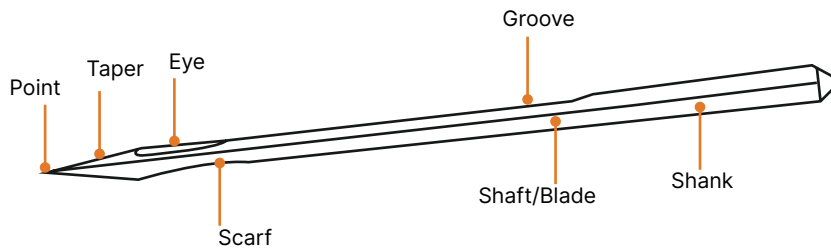
1. Verify threading path.
2. Check needle and actual break location. If the machine indicates a break but thread is still in fabric, check all paths, trim, and check bobbin.
3. Confirm tension is correct.
4. Check for thread defects. Pull out several yards to remove damaged sections.
5. Check needle for damage. Replace if bent or worn.
6. Verify bobbin installation. Clean lint from bobbin case and ensure the trimmer is fully returned.
7. If all needles break, adjust rotary hook timing.

Tip

- Test with two layers of backing or sample fabric before production to verify backing, hooping, and tension.
-

Needles

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 Service Life

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:

- Wear or aging
- High stitch density
- Loose fabric in the hoop
- Needle hitting the hoop
- Excessive fabric shifting during embroidery

Needle Specifications

The first consideration when selecting a needle is the blade diameter, such as 75/11 or 90/14. The number system combines European and Asian sizing.

The first number (e.g., 75 or 90) is the European standard, representing the blade diameter in hundredths of a millimeter. For example, size 80 has a diameter of 0.80 mm.

The second number (e.g., 11 or 14) uses the Asian standard, also used by Singer. Smaller numbers indicate thinner blades.

75/11 Needle

Universal embroidery needle for most standard projects, such as golf shirts, sweatshirts, dress shirts, light jackets, light canvas, aprons, holiday stockings, etc.

70/10 Needle

Primarily used for performance fabrics, such as 100% polyester T-shirts and golf shirts.

65/9 or 60/8 Needle

Best for very lightweight, delicate fabrics such as silk, fine linen, and small, detailed designs (e.g., complex appliqués, tiny lettering).

80/12 Needle

Suitable for thicker, stiffer fabrics. Commonly used on heavy canvas, vinyl, thin leather, baseball caps, and brims.

90/14 Needle

Often used for thicker threads such as metallic thread. The larger eye allows smooth thread passage, and the stronger blade is also used for canvas, belts, etc.

Tip

- The needle point must easily penetrate the fabric to avoid deflection. Otherwise, the needle may hit metal parts or the needle plate, causing damage. Use thinner needles for tightly woven or knit fabrics, and thicker needles for tough, heavy fabrics.

Needle Surface Treatments

Most sewing and embroidery needles are chrome-plated for durability and appearance. Titanium-coated needles cost more but last 5–7 times longer than chrome-plated needles. They also reduce friction and thread breaks. Titanium needles have a gold appearance and are available in common sizes.



Needle Point Types

The correct point type is essential for clean fabric penetration. Types used in commercial embroidery include:

- 1. Precision Round Point (SPI)
 - Very sharp, elongated tip
 - Suitable for high-thread-count fabrics, microfiber, and some synthetics.
- 2. Regular Round Point (R)
 - Standard sharpness
 - Suitable for woven fabrics, including finished caps.
- 3. Light Round Point (SES)
 - Pushes yarns aside instead of cutting, preserving knit structure.
 - Most common point type; can be considered universal.
 - Suitable for most knit and woven fabrics.
- 4. Medium Round Point (SUK)
 - Pushes aside thicker yarns, such as those in heavy knits.

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

Sharp vs. Ballpoint Needles

The two most common needle point types in sewing and embroidery are sharp and ballpoint.

Sharp needles are used for woven fabrics. They can slightly cut into the fabric if necessary but also fit between yarns. Woven fabrics remain stable even if one thread is cut. Your initial accessory kit includes sharp needles.

Tip

- We recommend Groz - Beckert needles. Groz - Beckert sharp points are identified as RG.

Ballpoint needles are used for knit fabrics. They do not cut the fabric but pass through the natural gaps. Cutting a hole in knit fabric can cause it to unravel, as knits are made from continuous yarns.

Tip

- We recommend Groz - Beckert needles. Groz - Beckert ballpoints are identified as FFG.

Matching Needles to Threads

Needle eye size varies by needle size. In some cases, you must also change thread thickness. For example, size 65/9 or 60/8 needles require finer threads (e.g., #60) to pass through the eye. The table below shows common matching:

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 Threads

Thread Consumption

Thread consumption varies by stitch type. Longer stitches (e.g., long satin stitches, jumps) consume more upper thread than short stitches (e.g., fill stitches). Actual stitch count per bobbin varies by thread type and design stitch length.

Bobbin

When the machine runs well, the bobbin is often overlooked. But bobbin issues seriously affect productivity. The bobbin affects all needle bars; changing needles will not improve stitch quality. This critical component must be checked carefully.

You can wind your own bobbins or purchase pre-wound bobbins. Hand-wound bobbins typically provide less consistent thread delivery. High-speed commercial machines require smooth, uniform, consistent delivery. Pre-wound bobbins are a cost-effective choice for consistent bobbin thread performance.

Your Ricoma machine uses L-style bobbins. Use polyester bobbin thread rather than cotton, as polyester generates less lint.



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

Spun polyester is made by twisting short staple fibers together. This type is not recommended, as the thread tends to break easily and accumulate under the tension spring of the bobbin case, which may cause tension irregularities over time.

Filament polyester, on the other hand, is made from a single continuous filament. This type of bobbin thread runs more smoothly inside the bobbin case and offers higher tensile strength.

■ Bobbin Flange Types

Some bobbins come with side flanges that support the thread during rotation.

Paper-flanged bobbin: This is the most common type.

Flangeless bobbin: This type has no side support structure; only the thread core is present.

Plastic-flanged bobbin: Some embroiderers believe that plastic-flanged bobbins rotate more smoothly and run more steadily inside the bobbin case.

Magnetic bobbin: Magnetic bobbins are flangeless and rely on a built-in magnet for support. For example, the Magna Glide brand features a magnet embedded in the center of the bobbin, which helps maintain consistent bottom thread tension, ensures smoother operation, and prevents bobbin tangling. When using a magnetic bobbin, it is usually necessary to remove the gunmetal-colored brake spring from the bobbin case.

Bobbin Thread Material Selection

■ Cotton Thread

Although cotton thread is not as strong as synthetic fibers, its skinfriendly 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

■ 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 is the most common bobbin thread in the U.S. embroidery industry. It offers strength, moderate thickness, reliability, and low lint. An L-style bobbin holds approximately 127 yards. Reducing bobbin changes improves 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.

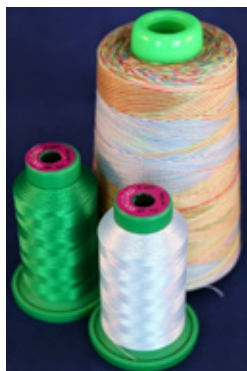
The reason this issue has been overlooked for a long time is that many people mistakenly believe L-size bobbins can only hold 94 yards of this thread. While this is true for 100-weight spun polyester, several suppliers actually offer 120-weight spun polyester. This specification yields 120 yards per 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

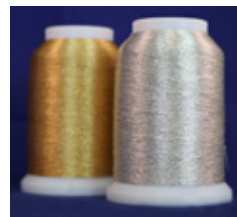
Early polyester embroidery thread was difficult to use because the fiber itself is very elastic, prone to loose loops, leading operators to set the tension too tight. This repeated stretching exacerbated the problem, causing the polyester thread to stretch and deform further. When the thread relied on 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 highquality 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.



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.

■ 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.

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 "cutaway." 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

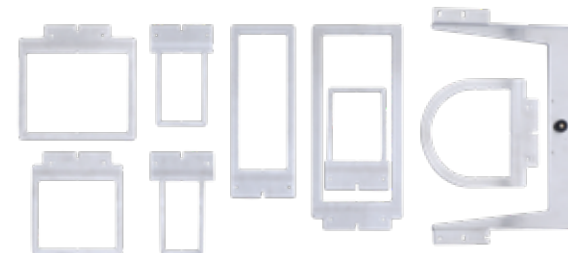
■ Magnetic Embroidery Frame

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.



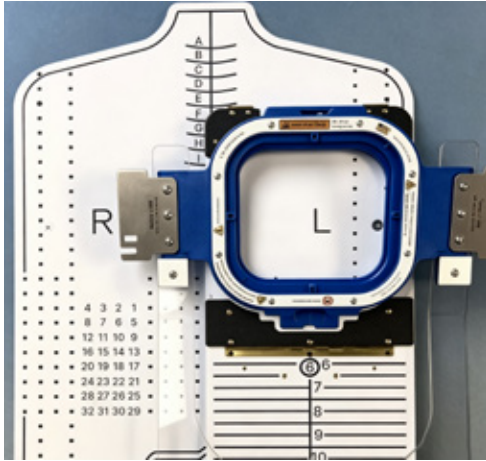
■ 8-in-1 Device

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 hardtop 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 ar-resistant and better suited for long-term cap embroidery work.



■ Digitizing 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 longterm 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 earaway / 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 tearaway 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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