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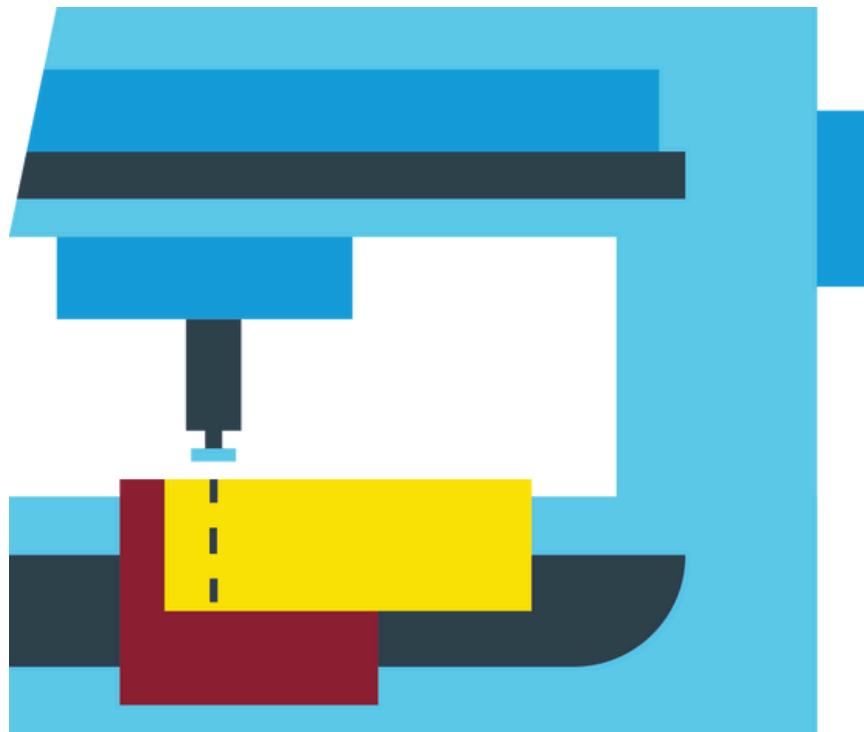
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MAKERSPACE

SEWING MACHINE GUIDE

Singer 4423 Heavy Duty



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What is Machine Sewing?

It is the craft of joining fabrics using a mechanized needle and thread. It's used for making clothes, accessories, repairs, home décor, and creative projects.



This guide includes:

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Safety



Watch out for broken needles.

When sewing thick fabric, go slowly and don't pull the material through. If a needle breaks, carefully find and remove the broken tip—it often gets stuck in the fabric.



Keep your fingers away from the needle.

Always guide the fabric with your hands at a safe distance to avoid pricking or sewing your finger.



Never sew over pins.

This can cause the needle to break and may damage the machine.



Be careful with pins.

Pins are sharp! Pin along the seam, with the pinheads on the right side so you can pull them out easily while sewing. Use a pin cushion to store pins as you go.



Be mindful of the foot pedal.

Take your foot off the pedal when not sewing to avoid accidentally starting the machine.



Turn off the machine before changing needles or parts.

This keeps your hands safe and prevents any accidents.



Pick up dropped pins.

Use a magnetic wand to safely collect pins from the floor or workspace.

FAQs

What kind of materials can I use with the Singer Heavy Duty 4423?

Thin cotton, voile, silk, muslin, interlocks, cotton knits, tricots, jerseys, crepes, woven polyester, shirt & blouse fabrics, satin, kettle cloth, sailcloth, double knits, lightweight woolens, cotton duck, woolen, heavier knits, terrycloth, denim, canvas, woolens, outdoor tent and quilted fabrics, denim, upholstery material (light to medium), Heavy woolen, overcoat fabrics, upholstery fabrics, some leathers and vinyl.

What materials are available in the Makerspace?

The Makerspace has thread and a selection of donated fabrics that you can use for sewing projects. You're also welcome to bring your own material to use with the sewing machine. It is always a good idea to test sewing on a scrap of the same fabric as your project fabric.

How do I identify fabrics?

This can be challenging even for advanced sewers. The most important thing to note is whether a fabric is a stretch or a woven by gently pulling length wise and width wise (the diagonal direction will always stretch), if the material does not stretch it is a woven fabric and will be more beginner friendly. For more advanced identification refer to the textile kit in the sewing area.

I am a beginner, where do I start?

For very beginners it is helpful to practice on paper with an unthreaded machine. The Makerspace has several paper templates to follow. See pg.13 for more instructions.

Diagrams

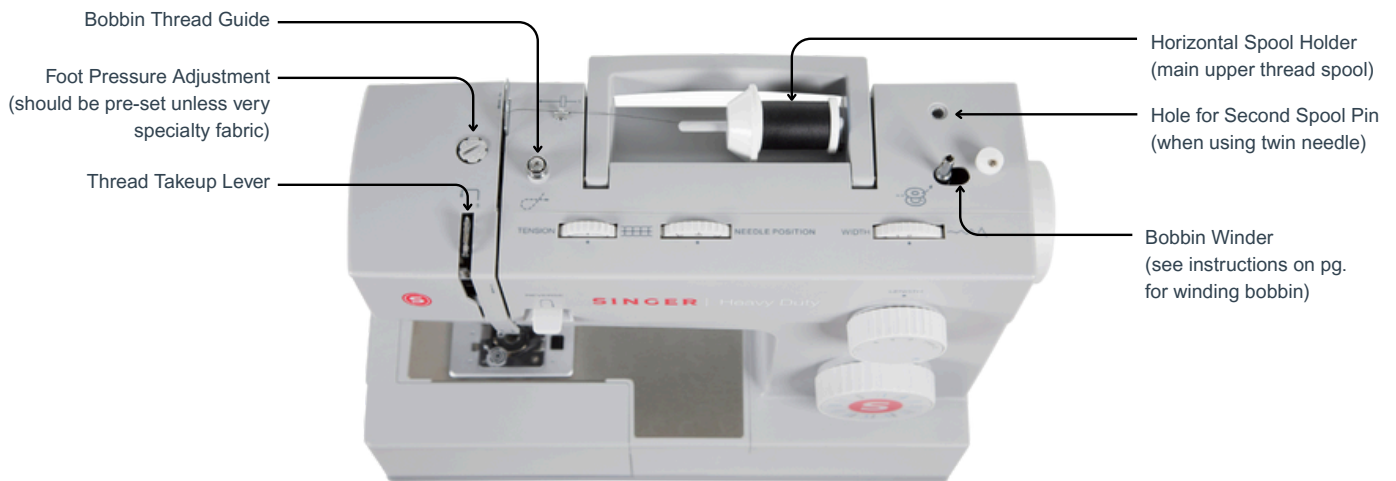
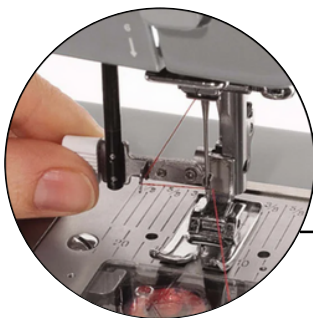


Photo Credit: Singer Sewing Company
<https://www.singer.com/en-ca/products/singer-4423-heavy-duty-sewing-machine>



Automatic Threader

See guide for use on pg.



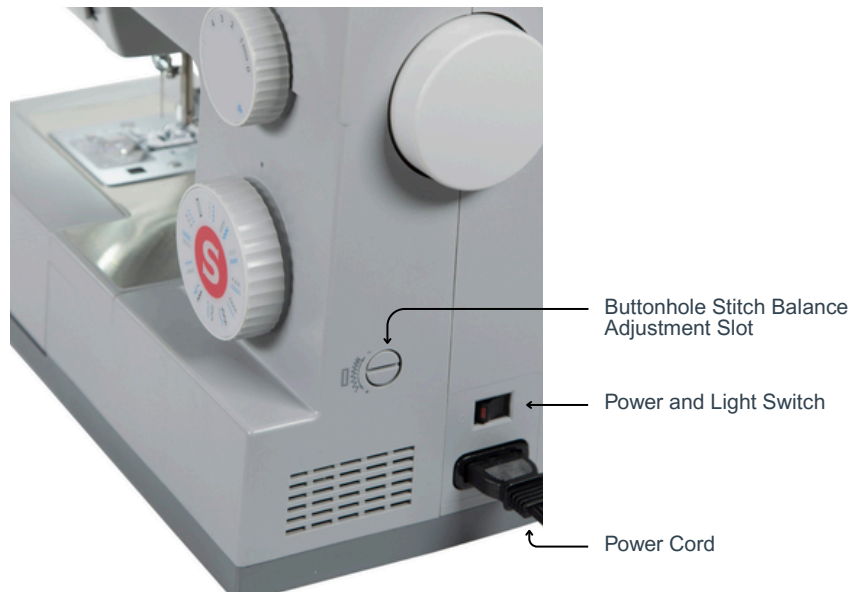
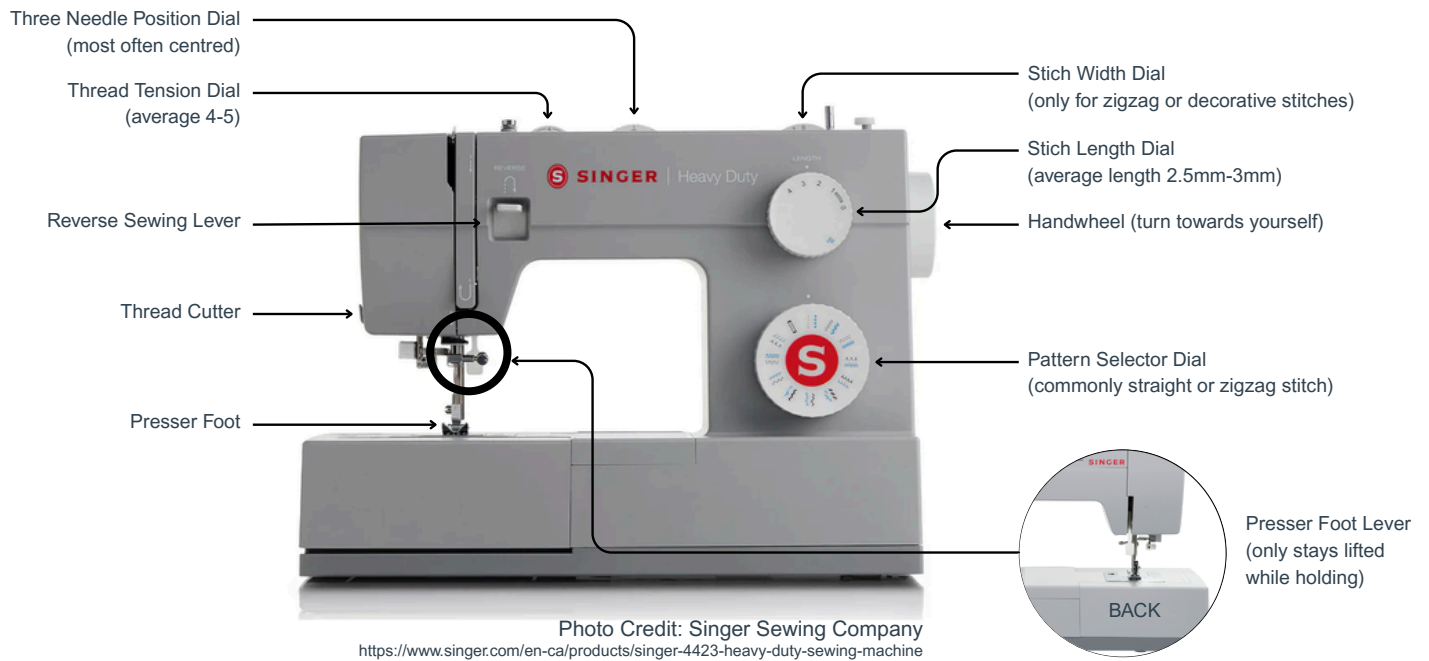
One Step Buttonhole Lever

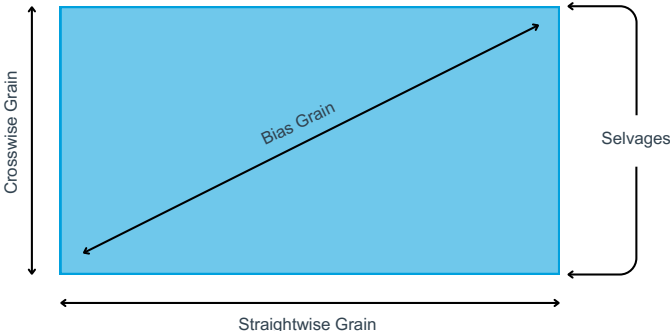
See guide for use on pg.



Photo Credit: Singer Sewing Company
<https://www.singer.com/en-ca/products/singer-4423-heavy-duty-sewing-machine>

Diagrams



Terminology	
Term	Definition
Seam	The line where two pieces of fabric are sewn together.
Seam Allowance	The space between the fabric edge and the stitch line (usually $\frac{5}{8}$ " for American patterns and 1.5cm for Canadian/European patterns).
Right Side / Wrong Side	The side you want visible of the fabric / the back side where the seams are.
Backstitch	Sewing backward for a few stitches to lock stitches in place.
Hem	The finished bottom edge of fabric, folded and sewn.
Topstitch	Visible stitching on the outside of the project, often decorative.
Grainline	<p>The weave the fabric which indicates the direction of the threads.</p> <p>Straight Grain – runs parallel to selvage (fabric edge), best for stability. Cross Grain - perpendicular to straight grain, can also be quite stable if a plain weave. Bias – diagonal, stretchy and flexible.</p>  <p>The diagram shows a rectangular piece of fabric. A vertical double-headed arrow on the left is labeled 'Crosswise Grain'. A horizontal double-headed arrow at the bottom is labeled 'Straightwise Grain'. A diagonal line from the bottom-left corner to the top-right corner is labeled 'Bias Grain'. On the right side, two horizontal arrows pointing outwards from the fabric edge are labeled 'Selvages'.</p>

Essential Supplies

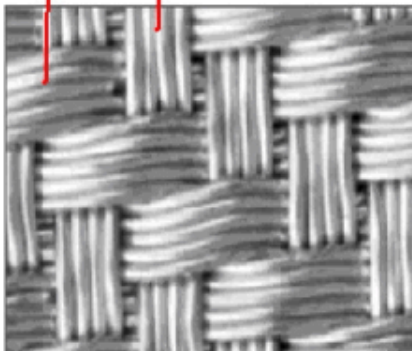
Item	Purpose
Fabric Scissors	Sharp scissors used to cut fabric cleanly. Don't use fabric scissors on paper as it will dull them!
Thread Snips	Smaller scissors to snip machine threads.
Pins/Clips	Used to hold fabric pieces together before sewing. Clips are useful when pins will leave visible holes in fabric.
Seam Ripper	Removes stitches if you make a mistake (your best friend).
Measuring Tape	For accurate sizing. See this video from Simplicity McCall's UK for how to take your own measurements.
Tailor's Chalk or Fabric Pen	Mark cut line, guidelines or sewing lines. Always test your marking device on a swatch of your fabric to avoid damage to material.
Sewing Machine Needles	Multiple types designed for specific fabric types. See needle guide if using a specialty material.
Iron & Ironing Board	Press seams and fabric for a clean finish. Essential to a quality project.
Bobbin	Small spool that holds the bottom thread of the machine. Needs to be wound using bobbin winder (pg.20) to match the top thread.

Materials

Main Types of Fabric

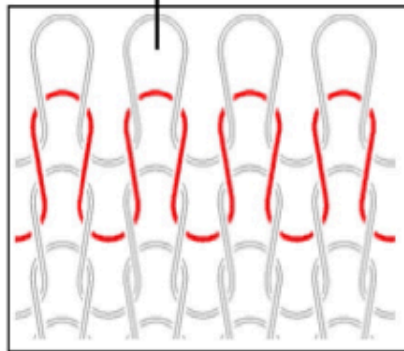
Woven (non-stretchy)	Knit (stretchy)	Non-woven
like cotton, linen. Easier for beginners.	like jersey. Needs special needles and settings. Use zigzag stitch to allow for stretch.	like felt or interfacing.
Tip: Pre-wash or steam fabric to prevent shrinking after sewing.		

Weft Warp

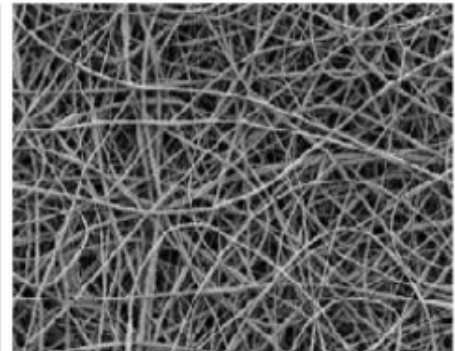


Woven fabric

Loop



Knitted fabric



Nonwoven fabric

Image Credit: Song, Guowen. (2016). Thermal Protective Clothing for Firefighters
https://ebrary.net/85855/engineering/structural_properties_weaveknit_design_porosity

See Textile Kit located in the sewing area in the Makerspace for more labeled examples of fabric swatches.

Material Limitations

Use Caution

Sew slowly and use a heavy-duty needle when working with tougher materials like:

- 2–3 layers of denim
- Heavy canvas (up to 2 layers)
- Faux leather or vinyl
- Thin real leather
- Quilt corners and thick seams
- Folded hems or bulky layers

Avoid Sewing

These materials may damage the machine:




- More than 4 layers of denim or very thick leather (2mm+)
- Upholstery foam, rubber, or stiff plastic sheets
- Metal zippers (unless sewing by hand wheel)

Tip: Reduce seam bulk when possible. If the machine hesitates, strains, or skips stitches:

- Slow down or use the hand wheel (always turn it toward you)
- Double-check that you're using the right needle for the job

If issues continue, stop sewing. Forcing the material through can break needles, jam feed dogs, or knock the machine out of alignment which may require repair.

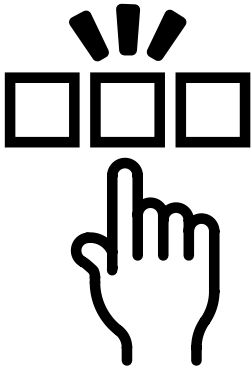
Another quick way to test thickness before sewing is to stack quarters or nickels beside your fabric and follow the below recommendations below.

Fabric Height	Recommendations
 1–2 coins tall	Safe to sew normally
 3 coins tall	Use caution—go slow, use proper needle
 4+ coins tall	Too thick—risk of damage or needle breakage

Checklist for Use

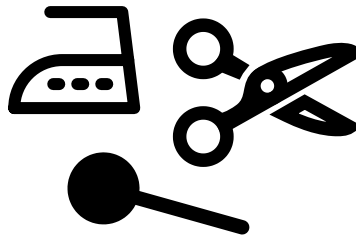
Follow this helpful overview of steps

6 Easy Steps for using the sewing machine



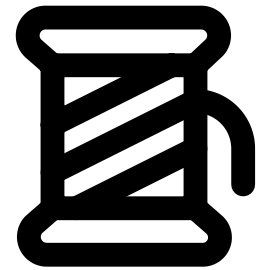
1. Select

Choose your fabrics.



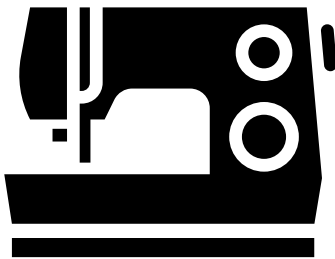
2. Prepare

Iron, cut and pin your fabric pieces.



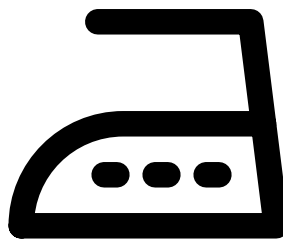
3. Thread

Wind your bobbin and thread your machine.



4. Sew

Using appropriate needle, stitch and method connect fabric together.



5. Press

Use your iron to press seams.



6. Finish

Trim threads and complete any hand finishes.

For more detailed instructions continue to pg.13

Learn to Sew with Paper

BE SURE TO PRACTICE WITH THE MACHINE UNTHREADED!

Practicing with paper is a good way to simplify sewing and practice sewing straight lines, curves, corners and understanding seam allowance. In the sewing area there are several documents to use as practice.

1. Turn the power switch on (located on the right side).
2. Raise the presser foot using the lever behind the needle.
3. Place the paper under presser foot, lining up either the markings to the tip of the needle, or the edge of the paper to the indicated seam allowance.
4. Lower the presser foot lever.
5. Gently press the foot pedal to sew.



Photo Credit: LearnCreateSew

<https://learncreatesew.com/learn-to-sew/level-1-lessons/lesson-3-machine-stitching-practice/>



YouTube Video Tutorial

[Practicing on paper \(start at 8:46\)](#)

Learn to Sew with Paper Continued

BE SURE TO PRACTICE WITH THE MACHINE UNTHREADED!

6. To sew corners, stop with the needle down, lift the presser foot, pivot the fabric, lower the foot, and continue sewing. Tip: It's hard to stop exactly at a corner using the pedal—stop a bit early and turn the handwheel toward you to reach the corner precisely.
7. When you reach the end of the marking or paper sheet take your foot off the pedal.
8. Raise the needle to the highest position by turning the hand wheel towards you.
9. Raise the presser foot.
10. Pull the paper out of the machine.

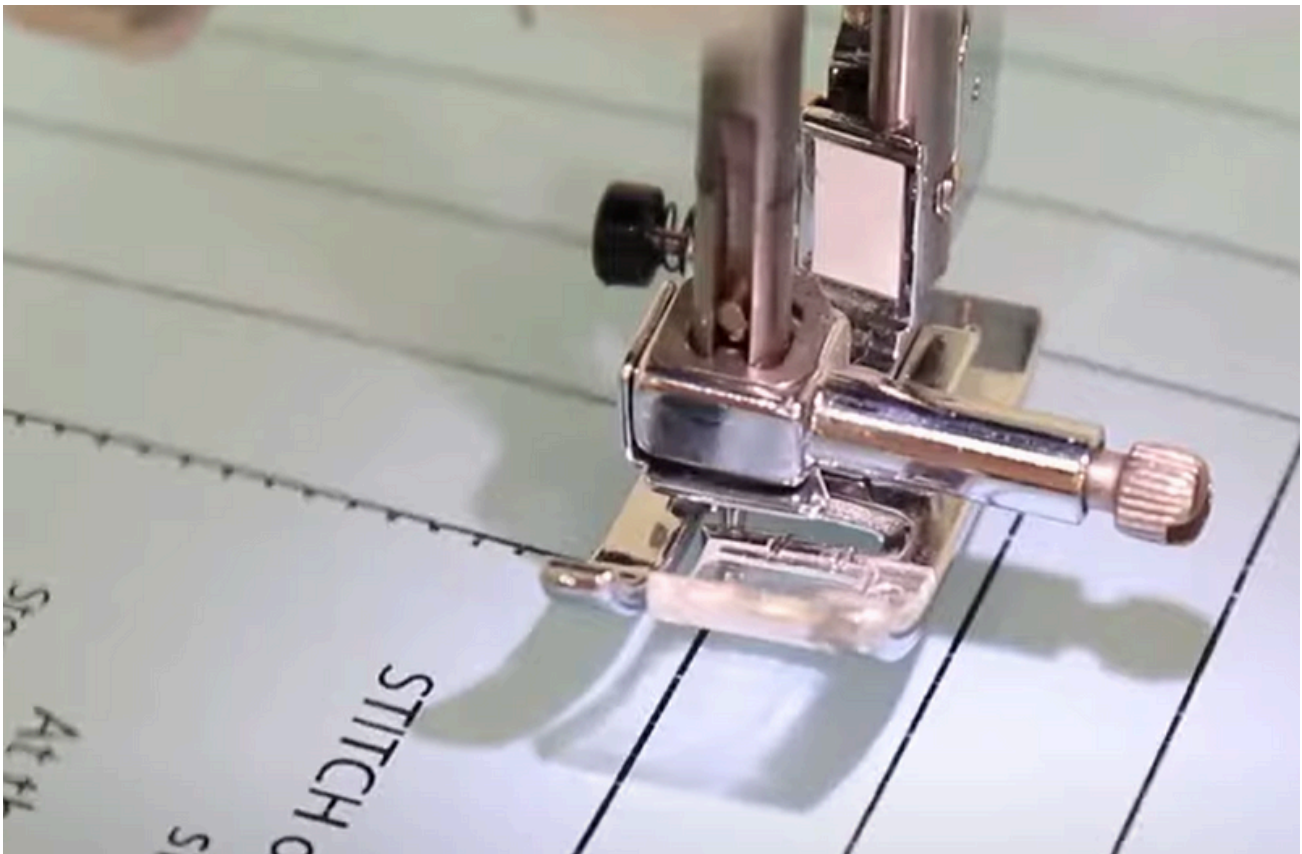


Photo Credit: LearnCreateSew

<https://learncreatesew.com/learn-to-sew/level-1-lessons/lesson-3-machine-stitching-practice/>

Starting to Sew

Beginning using Fabric - Creating a 5/8" Seam

1. Select

- a. Start by choosing a stable, non-stretch fabric (cotton works best). Test by gently pulling it in both directions—if it doesn't stretch, it's good to use! See pg.8

Note: If the material is wrinkled or folded, make sure to iron before using.

2. Prepare

- a. Mark and cut two equally sized 30cm X 30cm rectangles from the non-stretch material.
- b. Place rectangles good side to good side lining up corners.
- c. Pin every 1-2inches along the right side with the sharp edge of the pin facing left (see image).

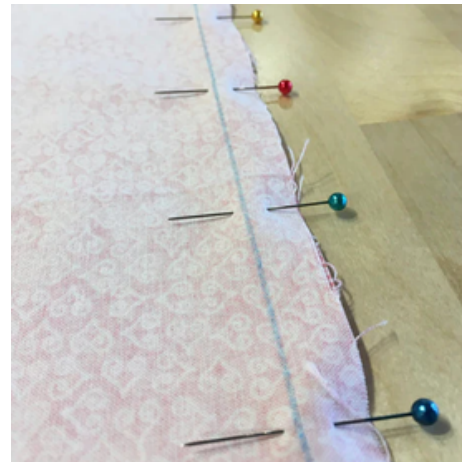


Photo Credit: The Stitchery Studio
<https://thestitcherystudio.ca/blogs/stitched/5-tips-for-sewing-the-perfect-seam>

3. Thread

- a. Identify the thread you plan to use and wind the bobbin with this thread following the directions on pg.20.
- b. After winding the bobbin thread the upper thread using the directions on pg.19.
- c. If you are having difficult threading the machine needle use the automatic needle threader as directed on pg.21.



YouTube Video Tutorial

[Sewing a 5/8" seam](#)

Starting to Sew

Beginning using Fabric - Creating a 5/8" Seam

4. Sew

- a. Turn the power switch on (located on the right side).
- b. Raise the presser foot using the lever behind the needle.
- c. Place fabric under the presser foot, lining up the right edge of the fabric to the 5/8" line marking and keeping the fabric straight (yellow line). You can use masking tape to make this line more obvious.
- d. Lower the presser foot lever.
- e. Hold both threads (top and bobbin) without pulling for the first few stitches.
- f. Use the reverse lever to backstitch for a few stitches.
- g. Sew forward for a few stitches to lock the stitches in place.

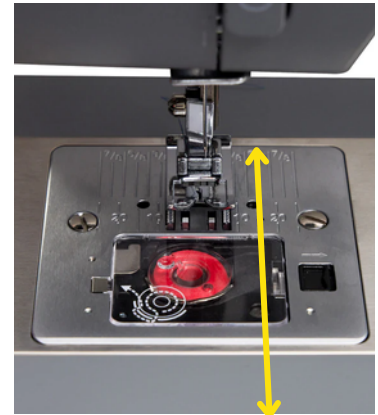


Photo Credit: Singer Sewing Company
<https://www.singer.com/en-ca/products/singer-4423-heavy-duty-sewing-machine>



Photo Credit: Craftsyt
<https://www.youtube.com/watch?v=Fku0cwrPZIo>

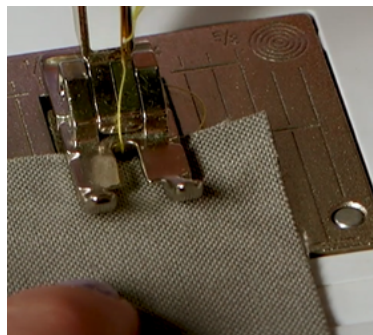


Photo Credit: Craftsyt
<https://www.youtube.com/watch?v=Fku0cwrPZIo>

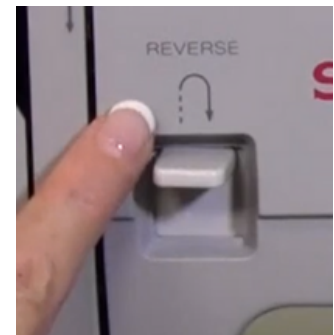


Photo Credit: SewingMastery.com
<https://www.youtube.com/watch?v=oGOix6HuL78>

- h. Place your hand on the left side of the fabric to guide it straight. Keep this gentle, do not pull the fabric - this will cause skipped stitches or broken needles.
- i. As you sew watch the edge of the fabric not the needle to keep the seam straight.
- j. Remove the pins as you go, placing them in a pin cushion. **DO NOT SEW OVER PINS.**

Starting to Sew

Beginning using Fabric - Creating a 5/8" Seam

4. Sew Continued

- k. When you get close to the end of the material slow down. You can be more precise by turning the handwheel towards you for the last few stitches.
- l. Use the reverse lever to backstitch for a few stitches.
- m. Sew forward for a few stitches to lock the stitches in place. Use the handwheel for more precise control.
- n. Raise the needle to the highest position by turning the hand wheel towards you.
- o. Raise the presser foot.
- p. Pull the sewn fabric towards the back left of the machine.
- q. Trim the threads leaving extra on both the fabric and the machine using thread snips.



Photo Credit: Instructables
<https://www.instructables.com/Meet-Your-Sewing-Machine/>

Starting to Sew

Beginning using Fabric - Creating a 5/8" Seam

5. Press

Note: Pressing is critical for sewing projects to look professional and finished. There are multiple ways to press a seam but one of the most common is pressing it open. To do so follow the directions below.

- Turn on the iron to the cotton setting with full steam and let it preheat.
- Once iron is hot place fabric with seam facing upwards on the ironing board.
- Gently spread open seam with your fingers and carefully move the iron tip along the seam as you spread it open. Watch your fingers as to not burn yourself.
- Once you have done an initial press move your hand out of the way and run the iron over the seam again with firm pressure using steam.

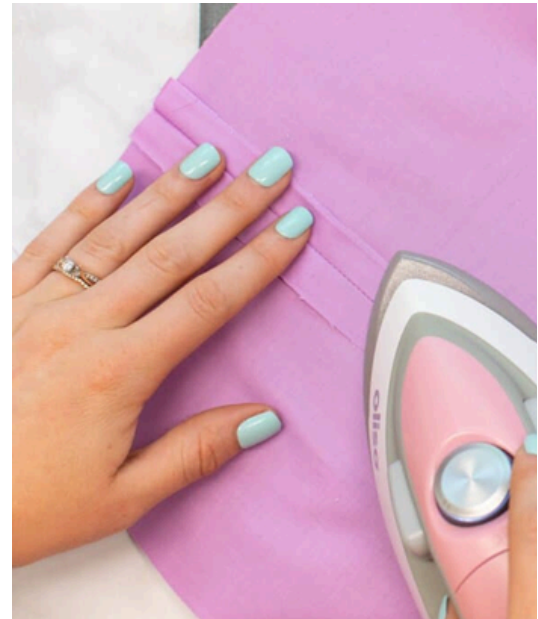


Photo Credit: Sweet Red Poppy
<https://sweetredpoppy.com/how-to-finish-seams-without-a-serger-3-great-seam-finishes/>

6. Finish

Note: Finishing is where you refine your project and add final details. While this seam doesn't require much finishing, it's a good habit to include this step in your sewing routine.

- Trim any loose threads.



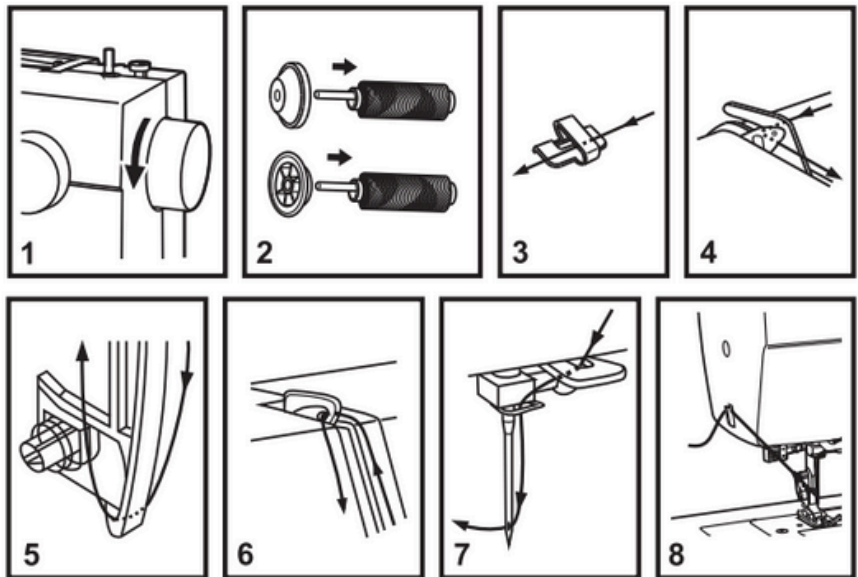
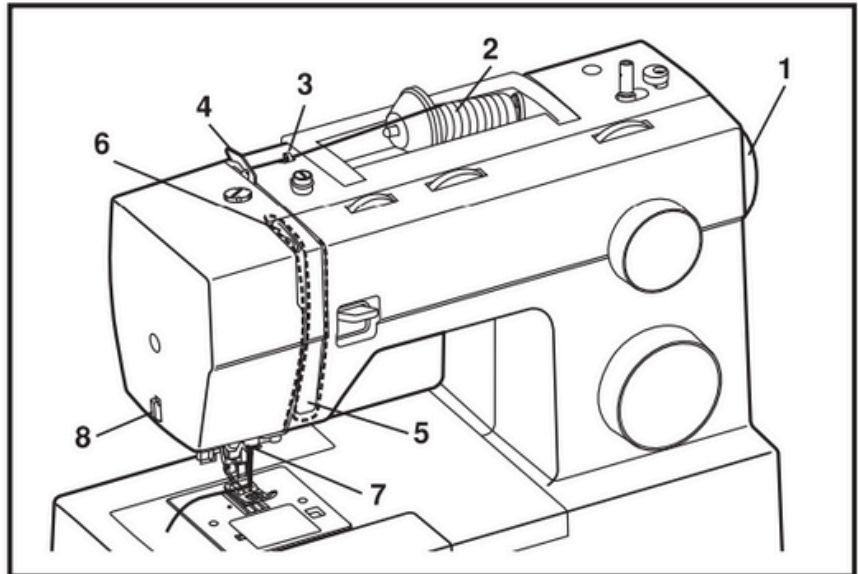
YouTube Video Tutorial

[Pressing open seams](#)

Threading the Upper Thread

1. Make sure the power is off.
2. Raise the needle to the highest position by turning the handwheel toward you. Raise the presser foot to release the tension discs.
2. Place your thread on the spool holder with the thread coming off the spool toward the back. Place the spool cap to keep in place securely.
3. Draw thread from spool through the upper thread guide (3) and pulling thread through pre-tension spring as illustrated. (4)
4. Lead thread down tension module. (5) During this process it is helpful to hold the thread between the spool and thread guide, as this will help to seat the thread between the tension discs.
5. Pass the thread right to left through the slotted eye of the take-up lever and then downwards again. (6)
6. Now pass the thread behind the horizontal thread guide, and then behind the thin wire needle clamp guide (7) and then down to the needle which should be threaded from front to back.
7. Pull 6-8 inches of thread under the presser foot to the back of the machine.

Note: Always turn the handwheel towards you (counterclockwise).



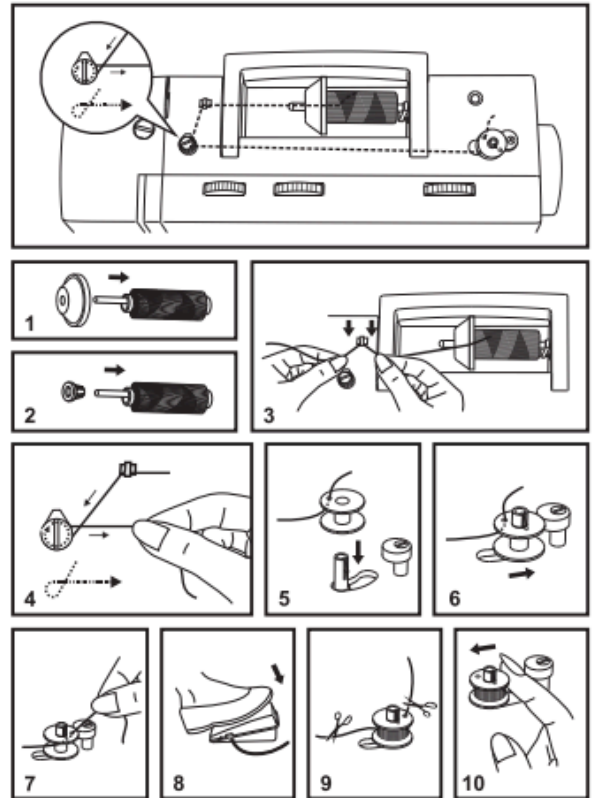
YouTube Video Tutorial

[Threading the machine & winding a bobbin.](#)

See written bobbin winding instructions on pg.20

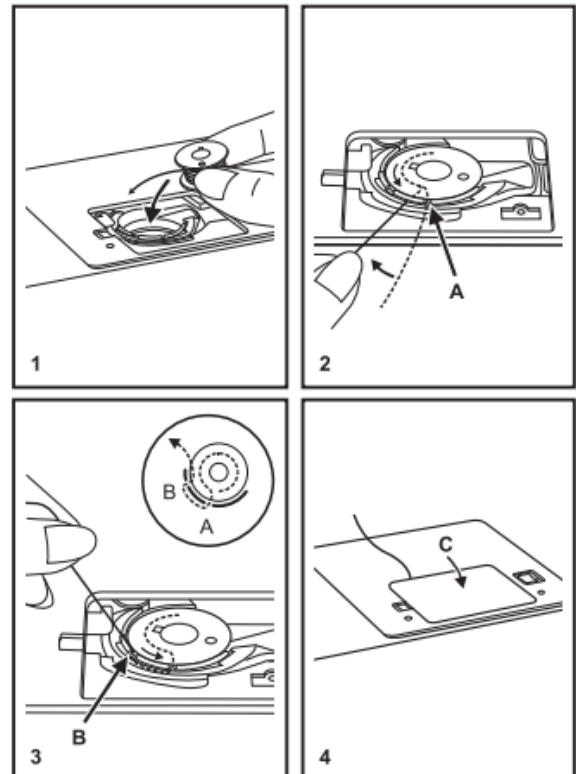
Winding the Bobbin

1. Place thread on spool holder and follow the thread guide making sure to wind the thread clockwise around the tension disc (4).
2. Thread empty bobbin as illustrated and place on the bobbin winder spindle.
3. Push it to the right (engaged position).
4. Hold the thread end securely.
5. Press the foot pedal — the bobbin will start winding.
6. Once full, push the bobbin left to disengage and cut the threads. Note: the machine will not sew while the bobbin spindle is engaged!



Inserting the Bobbin

1. Make sure the power is turned off.
2. Remove the bobbin cover plate by pushing the small tab to the right.
3. Insert the bobbin into the case with the thread running counterclockwise direction (arrow).
4. Pull the thread through the slit(A) and draw the thread into the notch(B).
5. Pull out about 15cm (6 inches) of thread towards the back of the machine and attach the cover plate.

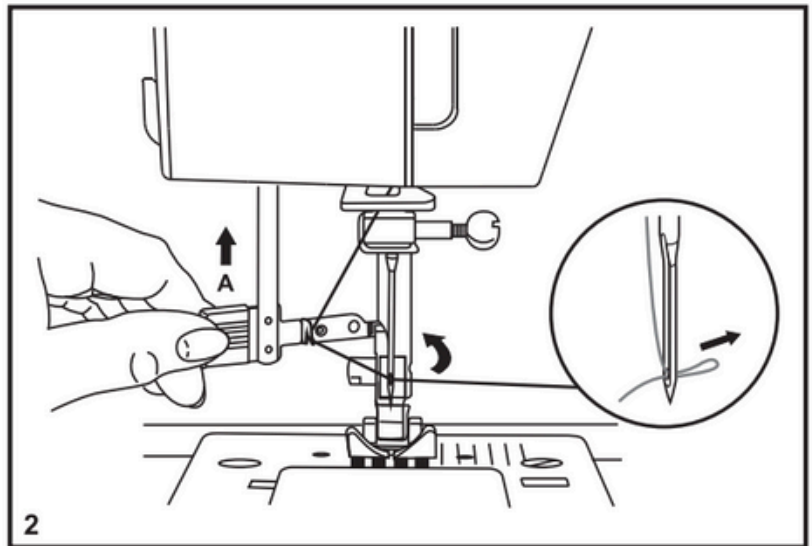
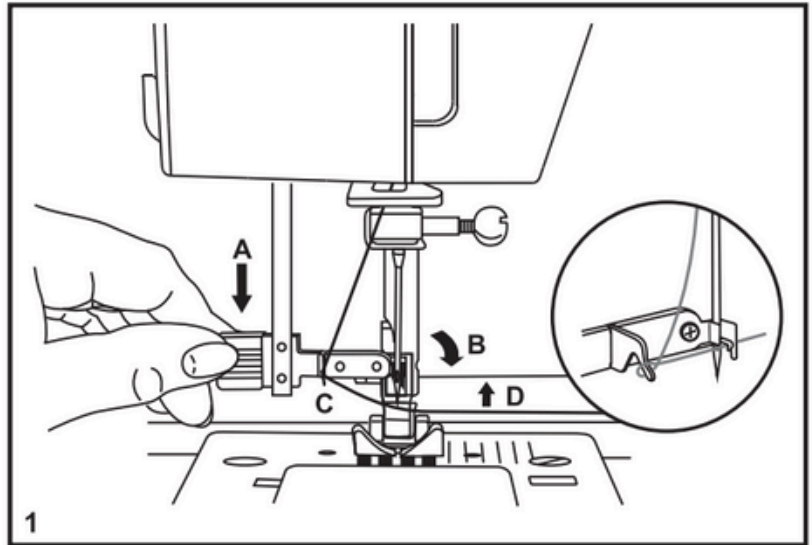


YouTube Video Tutorial

[Inserting the bobbin](#)

Automatic Needle Threader



1. Make sure the power is off.
2. Thread upper tension of machine up to the thin wire in front of the needle clamp.
3. Raise the needle to its highest position.
4. Set machine to straight stitch.
5. Press lever (A) down as far as it will go, and gently insert the hook of the threaded into the eye of the needle by swinging the lever towards you when it is fully lowered.
6. The threader automatically swings to the threading position (B).
7. Pass thread under thread guide (C), from left to right.
8. Pass the thread in front of the needle around the hook (D) from bottom to top.
9. Release lever (A), by swinging it away from you & then pushing it back up to the resting position.
10. Pull the thread to the needle eye.

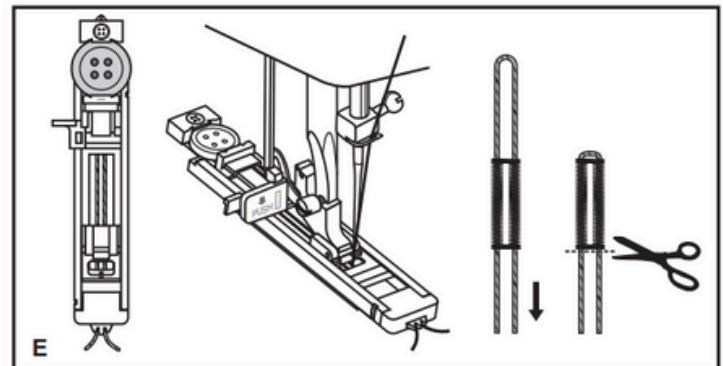
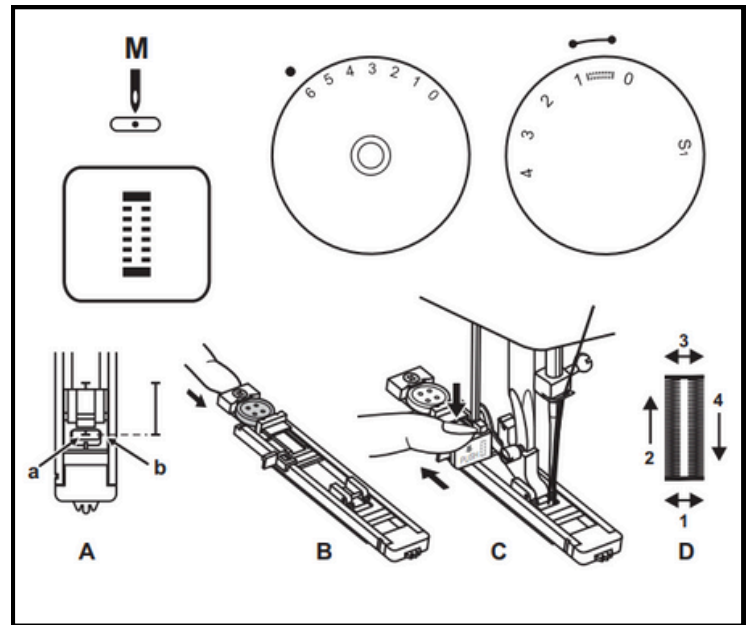


YouTube Video Tutorial

[Automatic needle threader](#)

Sew 1-step Buttonholes

1. Mark the position of the buttonhole on the fabric with a non permanent marking tool (ex. tailor's chalk).
2. Attach the buttonhole foot and set the pattern selector dial to . Set the stitch length dial to . Set the stitch width at "6". The width may need to be adjusted according to the project. Sew a test first to determine this.
4. Lower the presser foot aligning the marks on foot with the marks on the fabric (A). (The front bar tack will be sewn first.) (Align the mark on the fabric (a) with the mark on the foot (b).)
5. Open the button plate and insert the button (B).
6. Lower the buttonhole lever and gently push it back (C).
7. While lightly holding the upper thread, start the machine. Buttonhole stitching is done in the order (D).
8. Stop the machine when the buttonhole cycle has completed.



Making a Buttonhole on Stretch Fabric (E)

When sewing buttonholes on stretch fabric, hook heavy thread or cord under the buttonhole foot. When the buttonhole is sewn the legs will overcast the cord.

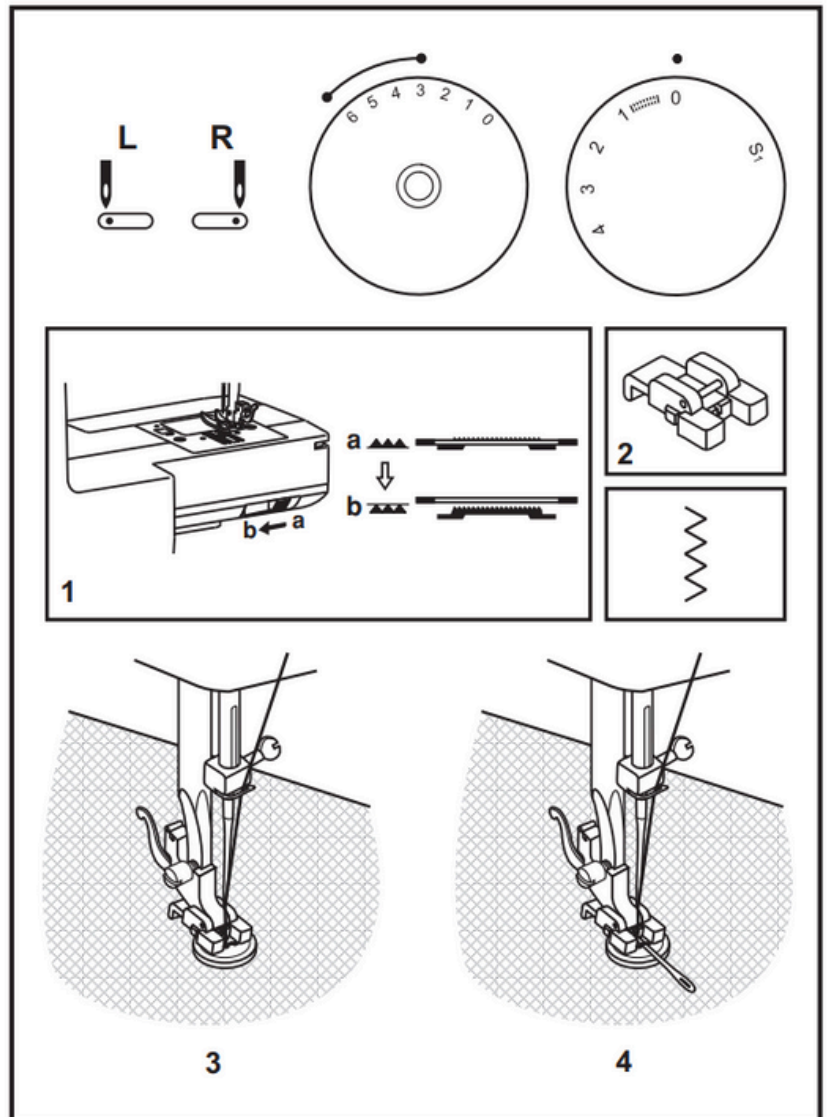
1. Follow above steps 1-2. Hook heavy thread onto the back end of the buttonhole foot, then bring the two heavy thread ends to the front of the foot, insert them into the grooves and temporarily tie them there.
3. Lower the presser foot and start sewing. *Set the stitch width to match the diameter of the heavy thread.
4. Once sewing is completed, gently pull the heavy thread to remove any slack, then trim off the excess.



YouTube Video Tutorial
[Regular Buttonhole](#)

Sewing on Buttons Using Button Sewing Foot

1. Move the drop feed control to right side to lower the feed dogs. (1)
2. Change the all purpose foot to the button sewing foot. (2) Set the stitch length to "0".
3. Place the button and fabric under the Button Sewing foot, as illustrated in (3).
4. Set the machine for zig-zag stitch, then set the width to number "3" - "6". Turn the handwheel to check that the needle goes cleanly into the left and right holes of the button. Adjust the stitch width, as needed, according to the distance between the holes of the button. Slowly sew on the button with about 10 stitches.
5. Raise the needle out of the fabric. Set the machine for straight stitch again, then sew a few securing stitches to finish.
6. If a shank is required, place a darning needle on top of the button and sew. For buttons with 4 holes, sew through the front two holes first, push the work forward and then sew through the back two holes.



YouTube Video Tutorial

[Machine sewing on buttons](#)

Tension

What is tension in sewing?

Tension controls how tightly the top thread and bobbin thread are pulled while stitching. If one is too tight or loose, your stitches may look messy or will not hold properly.

Why is it important?

Getting the thread tension right is important for even, smooth stitches.

What is an ideal stitch?

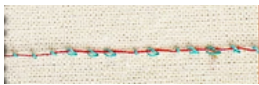
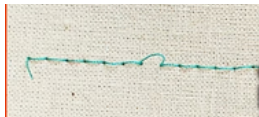

There should be no loops or puckering on either side.

Adjusting Tension on the Singer Heavyweight 4423

Use the **tension dial** (0–9) on the front of the machine.

- **Normal setting:** usually around **4 or 5**
- Lower numbers (2–4) = less tension (looser top thread) – can be better for thicker fabrics.
- Higher numbers (6–9) = more tension (tighter top thread) – can be better for lighter fabrics.

Common Tension Problems

Problem	Example	Likely Cause	Fix
Loops on the bottom	 Photo Credit: Sewing Julie	Top thread tension too loose	Increase tension
Loops on the top	 Photo Credit: Sewing Julie	Top thread tension too tight or bobbin issues	Decrease tension / rethread bobbin
Puckered seams	 Photo Credit: Tilly and the Buttons	Tension too high or wrong needle/thread	Lower tension, check materials

Tip: Always test tension on scrap fabric first before starting your project.

Needle Types & Sizes

Needle Type	Recommended Sizes	Best For	Notes
Universal	70/10, 80/12, 90/14	Woven cotton, polyester, blends	Great all-purpose needle for most basic sewing
Ballpoint (Jersey)	70/10, 80/12, 90/14	Knits, stretch fabrics	Rounded tip prevents snags and holes
Stretch	75/11, 80/12, 90/14	Spandex, Lycra, elastic fabrics	Prevents skipped stitches on very stretchy material
Sharp (Microtex)	60/8, 70/10, 80/12	Fine fabrics like silk, tulle, microfiber	Very sharp tip for clean, precise stitching
Denim/J Jeans	90/14, 100/16, 110/18	Denim, canvas, duck cloth	Strong needle for thick, tightly woven fabrics
Leather	90/14, 100/16, 110/18	Leather, vinyl, faux leather	Cuts through non-woven material—do not use on fabric
Quilting	75/11, 80/12, 90/14	Quilting cotton + batting	Designed for multiple layers and seams
Embroidery	75/11, 80/12, 90/14	Embroidery with rayon or polyester thread	Larger eye reduces thread shredding or breakage

Tip: A 90/14 Universal needle is the most common size and works well with many basic fabrics.

Using the right needle type and size makes sewing easier, improves stitch quality, and helps prevent broken needles and skipped stitches.

Troubleshooting

If you are unable to make a stitch or your stitches don't look right go through the following checklist.

- ☐ Is the Machine threaded correctly? (pg.19)
- ☐ Is the bobbin inserted and wound? (pg.20)
- ☐ Is this the right needle for fabric? (pg.25)
- ☐ Is the right stitch selected?
- ☐ Did you have the presser foot lowered?
- ☐ Is the tension set correctly? (pg.24)

If all of the above looks right but stitching is still off, check the needle:

Your needle may be dull or damaged.

- With the machine turned off, carefully feel the needle tip:
 - If it feels rough or has a tiny burr, it's worn out.
 - Replace the needle with a new, sharp one—needles should be changed regularly (about every 8 hours of sewing).

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