



# The Sewing Machine

This is a general all purpose guide regarding the sewing machine. It is here to help you understand the different parts of a sewing machine, feet, stitches, and even has some troubleshooting tips. Now, this guide is NOT meant to replace your sewing machine manual. Always refer back to your manual with any questions regarding your particular model or brand or sewing machine. Lost your manual? Try searching the Internet for a free downloadable copy.

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# PARTS

**(1) Spool Pin:** This can be either plastic or metal, upright or horizontal but either way it's designed to hold your spool of thread.

**Bobbin:** A small circular spool that lives under your needle plate. Not all bobbins are created equal, in fact there are 3 sizes in common use and they are not interchangeable. Check your sewing machine manual to see what size fits your machine.

**Bobbin Case:** A little metal housing that your bobbin snaps into which then goes in your machine's shuttle race so you can sew. Many modern day machines do not have bobbin cases.

**(2) Bobbin Winder:** A smaller metallic or plastic prong typically found on the top right of the sewing machine. Your bobbin snaps onto this prong in order to wind thread onto it.

**(3) Stitch Library:** Typically printed on the front of your machine and tells you what kind of stitches your machine is capable of. Can range from a few to hundreds.

**(4) Hand Wheel:** A wheel on the right hand side of your sewing machine that will spin towards you as you're sewing. You can manually turn this wheel to walk stitches.

**(5) Stitch Dial/Button:** This is how you select what kind of stitch you're going to use. Some models are very simple with a rotating dial button, and computerized models will often have a few buttons and a screen to show you your selections.

**(6) Removable Free Arm:** The lower portion of your sewing machine may slide off of the main body to reveal a narrower sewing surface for mending knees, elbows, and sleeves. There's often a storage compartment inside too!

**(7) Threading Guides:** A series of metal eyes and hooks that show you how to thread your machine from the top of the spool all the way down to the eye of the needle.

**(8) Tension Dial:** This adjusts the tension that is put on the thread. You will have to adjust this if your stitch does not look identical on both sides of the fabric.

**(9) Reverse Lever/Button:** Push this to make your sewing machine stitch in reverse.

**(10) Stitch Width Level/Button:** Adjusts the width of your stitches.



**(11) Buttonhole Sensor:** A little pull-down lever that is adjacent to the needle, featured on all sewing machines with buttonhole capabilities.

**(12) Automatic Needle Threader:** Some machines feature an automatic needle threader, which is a slide down style lever that rests adjacent to your presser foot and needle.

**(13) Presser Foot:** The presser foot snugs down on the surface of your fabric.

**Feed dogs:** Metal “teeth” that are located underneath your presser foot in the needle plate and feed fabric through the machine. Not pictured (use imagination here).

**(14) Presser Foot Lever:** This move the presser foot up and down, enabling you to secure fabric.

**(15) Shank:** The metal prong you attach your needle to.

**(16) Needle Plate:** The silver metal plate underneath your presser foot that has a hole for your needle to pass through. It features seam allowance markings from 1/8”-1”.

**(17) Bobbin Compartment:** This is where you drop in your bobbin prior to sewing.



# FEET

**(1) Standard Foot:** This is the most basic sewing machine foot, and has a slit down the middle and a circular cutout to accommodate the needle. Many standard feet are combined with a zigzag and blind hem foot so you don't have to switch feet as often (as shown above). Use a standard foot on any straight seam.

**Zigzag Foot:** This looks a lot like your standard foot but has a rectangular window, to accommodate the needle as it travels left to right to create the zigzag stitch. Use this foot for any zigzag stitch.

**(2) Overcast Foot:** This foot has a small central bar that lets the needle hop back and forth to allow the thread to wrap around the raw edge of the fabric, and a guideline that shows you exactly where to feed the fabric. Use it with the zigzag stitch whenever you need to 'serge' and edge but do not have a serger.

**(3) Open Toe Foot:** This foot is extremely handy for applique, or sewing along curvy guidelines for free-motion embroidery. It looks similar to a standard foot but is open in the front. This is a popular foot in quilting.

**(4) Narrow Rolled Hem Foot (Picot Foot):** Used to sew (you guessed it) a narrow rolled hem and comes in different sizes that range from 1/16" to 1/4". Use this foot on sheer or lightweight fabrics only.

**(5) Blind Hem Foot:** All blind hem feet have a guide on the right side designed to guide the fold of the fabric while it is being sewn. The leftmost swing of the needle catches the fold of the fabric, while the right catches the edge of it creating an almost-invisible hem.

**(6) Zipper Foot:** This foot is used to attach zippers, and comes in either a multipurpose zipper foot that does both left and right (as shown) or one specifically for the right or the left side.

**Invisible Zipper Foot:** A very specialized foot used exclusively for invisible zippers. Has a narrow channel on the bottom of the foot that the zipper coil is fed through.

**(7) Quarter Inch Seam Foot:** This foot has a narrow 1/4" right side, acting as a guide for seams. Just line up the cut edge of your fabric with the edge of the foot, and fire away for perfect seams. This is a popular foot in quilting.

**(8) Quilting Foot (Stitch in the Ditch Foot):** This foot has a narrow channel down the center of the foot in line with the needle, and otherwise looks a lot like a standard foot. The one shown is made of clear acrylic.

**(9) Roller Foot:** This foot has a large roller in the front and typically two smaller rollers on the underside towards the back. This gives your fabric more traction than it would get from just the feed dogs. Use this foot when working with leather, suede, vinyl, or any other finicky fabric.

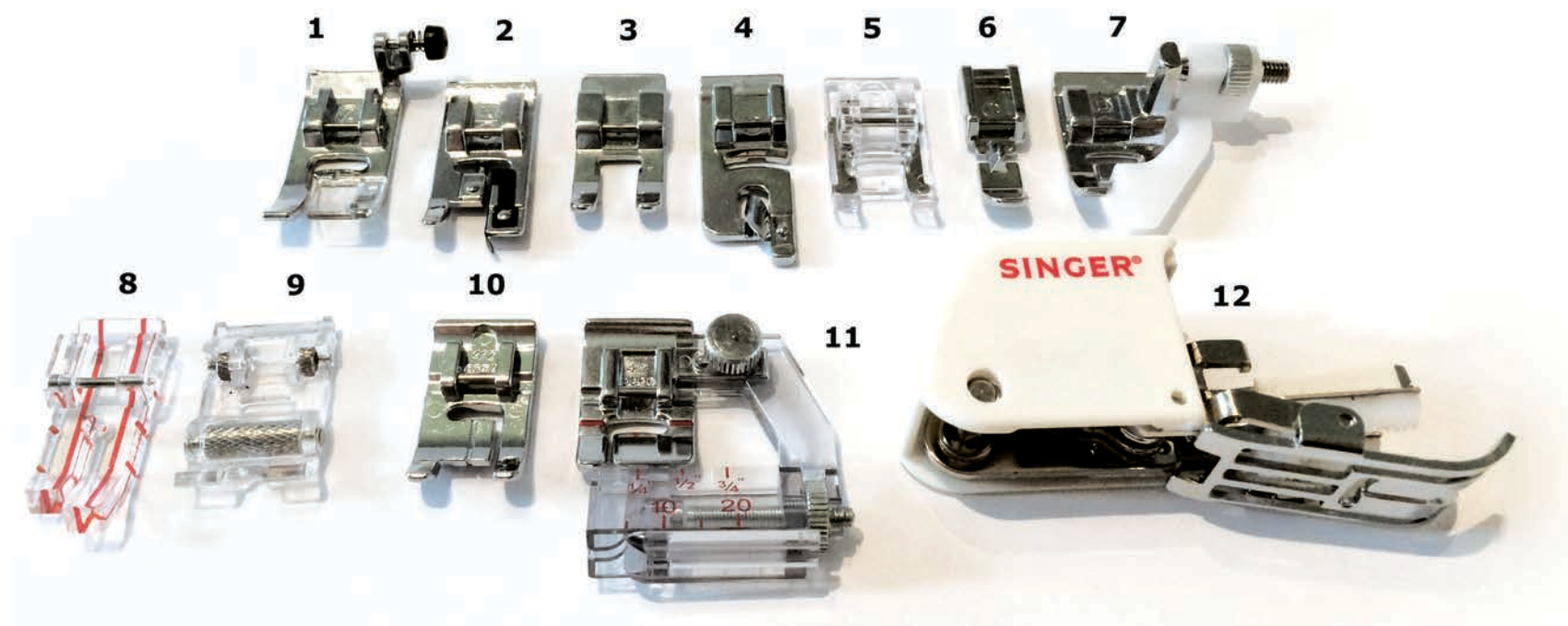
**Teflon Foot:** This foot looks like a stand foot but is made of Teflon. It was made to combat leather and vinyl's tendency to stick and get caught between the feed dogs and the presser foot.

**(10) (11) Cording or Piping Foot:** Features a wide channel on the bottom to accommodate decorative cords and piping, this foot is used a lot in home decoration. It comes in a wide variety of widths, usually 1/8"-3/8" for apparel, and as large as 3/4" for attaching welt piping to pillows.

**Gathering Foot:** This foot is square shaped and has a little window that works with your feed dogs to create even gathers.

**(12) Walking Foot:** This foot has feed dogs that grab fabric from the top and help fabric feed through evenly. It's really helpful when sewing bulky fabric or a lot of layers.

**Buttonhole Foot:** Used to make buttonholes and typically comes with sewing machines with buttonhole functions. Check your manual to see how to use your buttonhole foot.



# NEEDLES

When was the last time you changed your sewing machine needle? If you answered “When it broke last” or “Never”, we need to have a little talk. On average, you should be changing your needle ideally at the end of each project (small mending’s and mini projects don’t count). Although it can’t be seen with the naked eye, your needle will start to develop snags and burs in it the more you use it, and you don’t want your needle to damage your seam as you’re sewing it.

There is a needle for every type of fabric or style you can think of, below is a list of the different kinds of sewing machine needles. Your sewing machine’s manual will inform you what size of needles are compatible with your model.

**Sharp Needle:** This is the most basic of all needle types, made just for woven fabrics and other stable fabric weaves.

**Ballpoint Needle:** Where as other needles are designed to pierce or punch through the fabric, the ballpoint needle gently glides between the fibers in knit fabrics, preserving the integrity of the fabric so that your seam doesn’t begin its life already damaged.

**Universal Needle:** Made to be a combination of a sharp and ballpoint needle so it can be used on woven and knit fabric. In our opinion, only use a universal needle if you’re desperate and don’t have a sharp or ballpoint needle.

**Stretch Needle:** Sometimes your ballpoint needle just isn’t enough to tackle the springiest of swimwear, lycra, and elastane fabrics, and it may even cause skipped stitches. This needle is great for fabrics with a high percentage of lycra or elastane.

**Self-Threading Needle:** This needle has a tiny slit on one side to make threading a little easier for those who are not so stellar in the threading category. They only come in sharp and ballpoint needles.

**Twin and Triple Needles:** These needles are two (or three) needles joined together as one by a little plastic crossbar, so that only one shank goes into your machine. They are great for top-stitching and decorative. You will need to make sure your machine’s needle plate will accommodate a double needle (If your plate can accommodate a zigzag stitch, you can most likely use a double needle).

**Wing Needle:** This specialty needle has a flared shaft that when paired with one of your machine’s decorative quilting stitches, can create a sort of eyelet effect that looks beautiful on hems and lightweight natural fabrics. Is used in heirloom sewing.

**Leather Needle:** This needle has a sturdy, wider shaft and a wedge shaped point that punches holes in the surface of the leather when you sew, rather than piercing a smaller hole like a sharp needle. Use it for leather or suede.

**Heavy Duty Needle:** This needle has a sturdy, wider shaft and a wedge shaped point that punches holes in the surface. It’s similar to a leather needle, but is used for heavy-duty canvas and thick non-leather fabrics.

**Jean/Denim Needle:** This needle has a strong shank and an extra sharp point that is perfectly suited to working with many layers of denim, like you’d find in a pair of jeans.

**Embroidery Needle:** The eyes on these needles are wider to accommodate the thicker gauge of rayon and silk threads used in embroidery machines and means no shredded or broken threads!



**Needle Size:** Needle packages are marked with two size numbers. The higher number is European and marks the needle shaft diameter in millimeters. The lower number is the American sizing. Most needles are packaged with a size number in addition to a type to give you another way to see what kind of needle you need at a glance. The finer your fabric, the lower the number of needle you will want.

Size 8-9 (European 60-65): For the very lightest fabrics, like silk chiffon and voile.

Size 9-10-11 (European 65-70-75): Light fabrics like jersey, and cotton organdy.

Size 12-14 (European 80-90): Medium weight fabrics, such as light twills, quilting cottons and broadcloths.

Size 14-16 (European 90-100): Medium-heavy fabrics, like denim, coat-weight fabrics, and thin leathers.

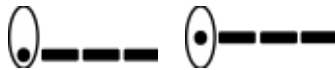
Size 16-18 (European 100-110): Heaviest of fabrics, such as leather and multiple layers of denim.

\*For twin or triple needles the first number is the distance between the needles in millimeters, the second is the European size.

# STITCHES

That long line of stitches can seem a little daunting at first, but we'll break the most frequently encountered ones down and explain them. Below we discuss the families of machine stitches, and their uses.

**Basic Stitches:** This includes your most basic straight stitch and its permutations. Also in this family is the triple stretch stitch, which is a little more complex, but still a straight stitch and found on most modern machines.



The **straight stitch** is of course your bread and butter, and what you will be using about 90% of the time. You can adjust the stitch length to create stitches for gathering and basting stitches too.



The **triple stretch stitch** is used when a little extra stability and security is required, such as in armholes, inseams, and occasionally in joining knits. It requires a special needle and three spools, and can be used with just two needles to create a double stitch effect.

**Overcast/Zigzag Stitches:** This family of stitches features the zigzag stitch and all its variations. Make sure to use a zigzag foot when sewing these stitches.



The **one-step zigzag stitch** is used for decoration, attaching heavy elastics, sewing knits, and couching cords and pearls to the surface of fabrics.



The **three-step zigzag stitch** is much like the normal zigzag, only it is broken up into three stitches per repeat of the pattern. It can also be used in attaching elastics and makes a great overcast stitch for medium weight fabrics.



The **overcasting stitch** has a pine-tree triangular like motif with a broken line of stitching on the left hand side of the stitch. It makes a great all-purpose overcasting stitch because of its stability.



A **heavy overcasting stitch** is used with burly, thick fabrics and tackles them well with its long, horizontal triangle motifs.



The **knit overcast stitch** doesn't quite fit in with the rest of the family, but it is still a zigzag style stitch. It is used to overcast knit fabrics and can make a clever riff on an applique stitch.

**Buttonhole Stitches:** All buttonhole stitches are done with a special foot, so remember to switch out. Sometimes the foot will have a slotted gauge to slide a button into which means a perfect sized buttonhole every time! Regardless, it is always a good idea to test, test and test again when you're making buttonholes.



A **square buttonhole stitch** is the most suitable buttonhole for medium weight fabrics and fabrics with backings. Some buttonhole feet have attachments to make this type of buttonhole corded, so check out your manual.



A **keyhole buttonhole stitch** is used in thicker fabrics and those with any sort of pile. The slotted shape lets shank buttons get through with ease, despite the thickness of the fabric.



A **round buttonhole stitch** is used for thin and single weight fabrics, as it has a low profile and won't twist delicate fabrics.

**Hem Stitches:** Decorative in some cases while others are purely functional only, these stitches will let you treat hems in a variety of ways. You can even blind hem on a machine with a little patience and practice. These will require your zigzag or blind hem foot.



The **blind hem stitch** comes in two different weight-uses and is a clever way of blind hemming without the use of highly specialized machinery. The fold of the hem must be partially open so that the right side of the stitch clings to the cut edge of the hem and the left side of the stitch just barely pricks the fold of the face fabric.



The **flat-lock stitch** has the appearance of a zigzag stitch flanked on either side with a column of stitches. It is chiefly a decorative hemming stitch applied from the face of the garment.

**Applique and Quilting Stitches:** These stitches are used almost exclusively in quilting and other textile arts, but that's not to say you shouldn't try to find some excellent uses in apparel!



The **applique stitch** consists of a snug edge stitch and a series of perpendicular stitches that hold the applique in place. This is not a subtle stitch, and you are very much aware of its presence when it is used.



The **joining stitch** is ideal for attaching patches and other flat details to the face of fabric and can also be used for basting.

**Quilt Stippling** is an amorphous squiggly pattern used to attach batting to the cotton backing of the quilt. It's a highly textural stitch that can be used to create large scale patterns.

**Stretch Stitches:** These are specialized knitwear stitches that exist on some newer machines, and are a little better than just a plain zigzag stitch.

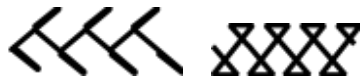


The **stretch stitch** is like a steeper zigzag stitch at a canted angle. A stitch is taken at the apex of each line, which allows the fabric to stretch.



A **three-step zigzag** stretch stitch is very similar to the stretch stitch, only each line of the zigzag is broken into three individual stitches. This makes it more suitable for sewing medium weight knits and attaching elastics.

**Heirloom/Decorative Stitches:** These are an odds and ends collection of stitches has a few different uses, most of which are partially decorative in nature. Some faggoting stitches can be used to join two folded over abutted pieces.



The **faggoting stitches** come in a few different motifs, some like sprawling plant vines, some more geometric, but all are used to join abutted pieces and can make really beautiful hem treatments today.



The **shell tuck stitch** is used to create a more orderly overcast stitch, but would also make an excellent accent to the edge of any project.



The **scallop stitch** is used to create decorative edges on single layers of fabric. Just stabilize your edge prior to stitching, and then carefully clip around the stitching once the edge is complete.



**Decorative stitches** come in many styles, shapes, and uses. The majority of stitches on machines that have 500+ stitches are decorative.

# SHOPPING

When it comes to purchasing a sewing machine, there are a few things to consider. Show rooms will have many models from several manufacturers to show you, so it can be really easy to become overwhelmed. Keep these tips in mind, and do a little research before you hit the stores, and you'll be just fine!

Sewing machines can cost anywhere from \$50-\$2000 just depending on the brand and what you're looking for. The most important thing on any machine regardless of its cost is its stitch quality. If you can get a consistent and reliable straight stitch you are golden. Keep in mind that expense doesn't guarantee quality. We have seen plenty of expensive machines produce bad stitches.

The next question to ask yourself when shopping is what is the intended use. Are you starting your own business or just sewing for fun? Sewing heavy-duty items like handbags and denim or cute summer dresses? These things will determine what kind of machine you need. Just do your research when shopping and you will be fine.

Test test test! Once you're actually in the store, sit down at a few machines, and see how they feel. Ask to test sew on a scrap of fabric once you've narrowed down your selections to a couple models. You'll want to see how the plain stitch looks, how the stitch length is adjusted, and see what happens when you change up the tension. If possible, try out a few of the extra stitches, like the zigzag or the buttonhole. How does the motor sound? Do the feed dogs effortlessly pull the fabric forward, or do they seem to be struggling? Is the work-light nice and bright, illuminating the stitching? If the salesperson won't let you test the merchandise, politely thank them for their time, and leave. Its critical before you invest to know exactly what you're getting into.



# TROUBLESHOOTING

It happens to all of us, sooner or later. You're merrily sewing along when suddenly your machine starts acting up for seemingly no reason. Maybe your bobbin thread won't come up, or your tension is suddenly crazy, and no matter how many times you re-thread and check it over, it won't cooperate.

Here's an overview of some possible issues that can commonly arise. When in doubt, check out your sewing machine manual- many of these have troubleshooting sections that have the benefit of being specific to your model.

## First Things to Try

- A good sewing machine can go from squeaky clean to a linty nightmare in the space of just one project, so it's a good idea to open your machine up and check it regularly. If it's looking fuzzy and there's a lot of thread scrap, a soft brush and some canned air will clean it right up. Once you've cleaned it out again, you'll want to apply some lubricant if your manual advises it.
- First and foremost, check and double check that your sewing machine is threaded properly by completely unthread your machine, and then carefully rethread the entire thing. You shouldn't be surprised to hear that your sewing machine is a temperamental creature and missing even one step in your threading will cause the entire thing to be out of whack. Don't forget to rethread the bobbin.
- Examine your needle, and make sure it's right for the fabric you are going to sew. If you can't remember the last time you changed it, chances are it's been too long and it's time for a new one.

- Is your thread suitable for the project you're working on? Maybe it is brittle with age, or of poor quality.
- Whenever you begin or end a seam with backtacking, make sure your threads are swept up and towards the back of your machine. This should take care of any bunching causes at the tops of your seams.
- Is your presser foot in the down position? I know it sounds obvious, but it happens to the best of us!
- Is your tension properly adjusted? Too far in either direction is usually ill advised, so do some test stitches to troubleshoot your tension.

## Skipped Stitches

- The most common culprit in the case of skipped stitches is the needle. If your machine starts skipping stitches out of the blue, change the needle and see if that helps.
- The machine needle may have become bent inadvertently during sewing, either from hitting a pin (Hey! Remember, no sewing over those!), or from pulling on the fabric while you sew. Needles are strong, but can be flexible, which means they can be bent. If you suspect your needle is bent, change it.
- Let your feed dogs do the work! If you're changing your needles frequently, it might be that you're pushing or pulling on your fabric too much, which can bend your needle. It's okay to hold your fabric taut, but let the fabric run over the feed dogs at the machine's pace.
- Maybe you aren't using the right tension for your fabric type, or you knocked into the tension dial. Adjust the tension if it doesn't appear to be the needle.

## **Knotting or Breaking Thread**

- What kind of thread are you using? Is it appropriate for your fabric type? Is it a quality thread? Bargain bin thread is nice, but it can become shredded more quickly, and often isn't worth the trouble. Thread also has a shelf life, so if you suspect your thread is 10 years or older, it's probably not fit for use.
- Double check that your machine is threaded properly. Unthread it entirely, and walk through each of your steps, from spool to needle. Always thread your machine with the presser foot up, and pull the thread towards the back of the machine.
- Make sure your bobbin is properly wound, snug with no loops or snags. Make sure that the bobbin case is also properly threaded, and inserted correctly, facing the right direction, in your machine.
- Bobbins with high mileage, especially the plastic types, can often wear down in time. The wear and tear can be so minute that you might not be able to perceive it, but even the slightest decrease in circumference can make the bobbin wiggle and bounce inside the case, messing up your thread.

## **Fabric Not Feeding/Jammed Machine**

- If the fabric doesn't feed smoothly onto the feed dogs, or doesn't feed at all, it indicates a greater problem than most home sewers can tackle. You may have managed to get some fabric caught in the feed dogs, or a wad of thread caught in the bobbin workings. Unless you are confident you can unscrew and take your machine apart to rid yourself of the snag, leave this to the professionals.

## **Needle Keeps Breaking**

- First off, make sure that the shank of your needle is slid into the housing in the correct direction. Most domestic sewing machines have needles with a flat side on the back, which will guide the needle into the right position. When you place your needle, it should smoothly slide in—never should it have to be forced or jammed in.
- Some machines have needle placement selectors, allowing you to adjust the position of your needle, either right, center, or left. Reset it by setting it to "center". Gently turn the handwheel with your presser foot up, and watch carefully as you turn to see if the needle is striking the presser foot, the needle plate, the bobbin or bobbin case.
- Your needle is not aligned properly where the shank attaches to your machine if the presser foot or needle plate is being struck by the needle. Remove the needle and put it back in so that the flat of the needle is aligned to the back.
- If the needle is striking the bobbin or bobbin case, pull your bobbin case out, carefully rethread and reinstall it.
- When your needle is clearing all the pieces of your machine and is catching the bobbin thread, but is STILL breaking, you are likely using a needle that is too delicate for the fabric type that you are using. Switch it up to a denim or heavy duty needle.
- Sometimes when you're sewing particularly thick seams, such as in denim or leather, the presser foot goes nose-up in the front, which can cause the needle to catch and break. As soon as you see this happening, stop sewing, and plant your needle by gently turning the handwheel. Roll up a little bit of scrap, and lift your foot up and tuck the scrap roll underneath it, so that your foot sits evenly. Now your foot will rest on an even keel while you finish sewing up your seam.

- It's possible you are attempting to sew simply too many layers for your machine to handle. Rather than try to bully over the layers, which will wear your machine down into an early grave, think about alternate solutions to your design challenge, such as handsewing.
- Double-check your stitch settings. Sometimes if you are on too small a stitch length on too many layers, you can see some breakage.
- Whenever you begin or end a seam with backtacking, make sure your threads are swept up and towards the back of your machine. This should take care of any bunching causes at the tops of your seams.
- Turning the knob to the right, you will tighten the spring and thereby the tension. Adjust your tension and do some test stitching if you are having difficulty finding a balance.