The Sailrite Yachtsman Guidebook

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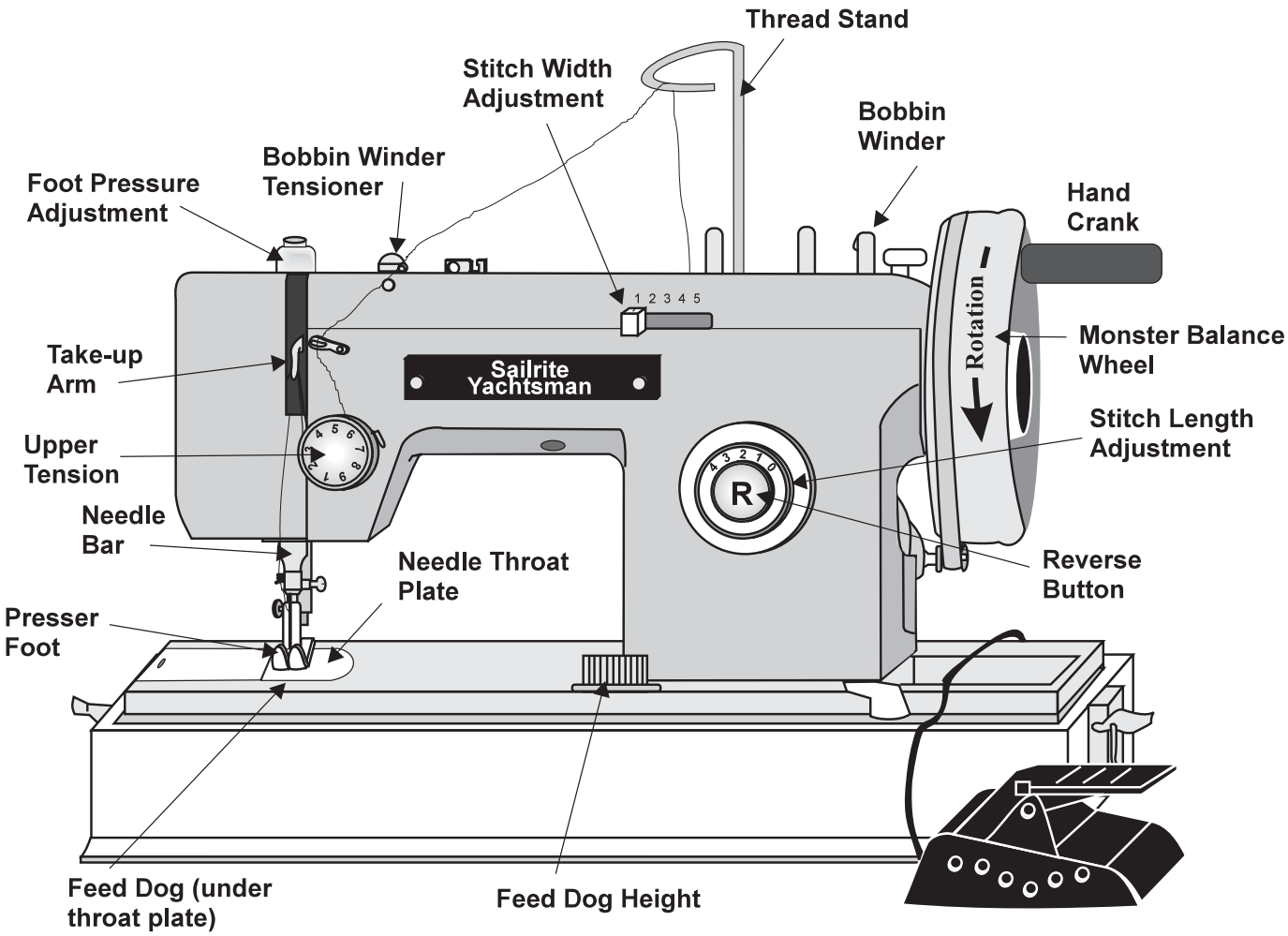
Self-Reliance Under Sail

The North American, 12 Volt, & Universal Yachtsman Instruction Manual

Fine Tuning Your Sailrite Yachtsman



You have purchased a no-nonsense sewing machine perfectly suited for the sort of work that needs to be done around a sailboat or around the home. It is a heavy machine with a cast iron frame and metal parts. The machine is also very simple. That is, there are no fancy stitches — it just zigzags and straight stitches. There is a knob on the front to control the length of the stitch from 0 to 4 millimeters and there is a lever to control the width of the stitch from 0 to 5 millimeters. There is also a button in the center of the length knob that is pushed and held in place to reverse the machine for short distances.

The simplicity of this machine and its weight are actually its virtues. This is the "Model T" of the sewing machine industry. It is a machine to be tinkered with. Anyone can use it and use it effectively even with heavy materials. And it will last for years.

CAPABILITIES

What are the Yachtsman's capabilities? This is an important question because, like any machine, it has been designed with certain parameters in mind which limit and define its performance "envelope". Trying to make the machine

perform outside that envelope is likely to be fruitless and very frustrating. So let us focus first on what the machine will and will not do.

The machine has enormous range in straight stitch mode. It will sew fabrics nearly as thick as can be slipped under the presser foot (about 3/16 inch thick). Note that this height is defined by the downward movement of the needle bar and the length of the needle itself—if the presser foot were lifted higher than it is, the needle bar could not be rotated to bottom dead center. But so long as cloth can be comfortably inserted under the presser foot the needle can complete its travel and a good straight stitch will result. What this means to you is that as many as ten layers of 9.5 ounce acrylic cover cloth (Sunbrella) can be sewn.

In zigzag mode the fabric thickness that can be sewn is still about 3/16 inch. You may hear a popping noise from time to time. This is because the size of the machine (it is, after all, a normal home sewing machine) requires that the final tensioning of the stitch be completed while the needle is on its way down. It is the upper thread that is pulled tight by the machine and, of course, that tension must be applied through the needle. This means that when the needle is on the right side (as you face the machine), the tension will actually bend the needle to the left. If tension has not been eased enough by the time the needle enters the fabric, that bend will be captured by the fabric and the point of the needle will be deflected a good deal from where it should be. The result will be a popping noise, a skipped stitch on the right side and possibly a broken needle. On the left side, tension on the way down is not a problem because the placement of the last thread guide at the top of the needle is such that the thread will be pulled tight on a nearly direct line from the last stitch through the needle to the thread guide and, as a result, the needle is not bent.

But this limitation, so long as it is understood, should not cause concern. It will still be possible to zigzag five layers of nine ounce sailcloth or eight layers of eight ounce sail material and that is generally more than sufficient. There may be too much thickness in the clew corner of large headsails (for boats over 35 feet or so), especially where layers of webbing are used to secure D-rings. Not to worry, just use a straight stitch over these extra thick areas—a straight stitch is actually normal anyway when webbing straps are secured.

We have included sewn samples (from your machine) of the maximum thicknesses recommended. I think that you will be impressed by the range of possibilities that this machine opens to you. After reading this manual go ahead and experiment with the fabric samples. Remember that it is not wrong to push the machine beyond its limits—you will not hurt anything except for breaking or bending needles. And, indeed, you may even be able to exceed our limits if you are very careful and "hold your mouth just right." But knowing the limits will hopefully reduce any frustration if you cannot "master the mouth."

I cannot overemphasize the statement above about not being able to hurt the machine. There is no sewing task that will cause serious harm to your machine. Needles are made to break and that is just about the worst thing that you should expect to happen if you push the machine beyond its limits or make some mistake in the way you use it.

SETTING UP YOUR MACHINE

The Yachtsman head comes in a custom designed shipping container which protects it from damage. This container must be saved and used if the machine is sent in for service. Insurance cannot be collected on improperly packaged machines if there is shipping damage.

The Case

Installing the machine in its case is simply a matter of slipping it onto the case hinges and then tightening the screws on the bottom of the machine to lock the hinges in place. This operation is easily accomplished with a helper. Otherwise it is a little awkward.

The Power System

The Sailrite Yachtsman comes with one of the three power systems described below. Read and follow the instructions for the system you choose.

The 110 Power System — Setting up the 110 power system is simply a matter of plugging the cords for the motor and foot pedal into the light block in the bottom of the case. The two sockets are marked (one motor and the other light). To determine which cord is which trace the cord coming from the motor to the plug end. The other cord is hard to trace because it goes through the inside of the machine.

The 12 Volt Power System — Three components—a solid state controller, a 12 volt motor, and an electronic foot control—make up the 12 volt system.

Connect the motor cord to the control box. The cords from each are keyed so they can only be connected properly. Simply push them together when aligned.

Then connect the foot control to the control box. Look for the notch on the collar of the foot wire terminal and align it with the hole in the back of the control box. Push it in. The 12 volt light is also connected in the same manner.

The final step is to connect your system to a 12 volt power supply. Alligator clips are used to accomplish this. They are color coded and stamped for easy identification. The red or plus sign side (positive) matches up with the corresponding side of the power source. The black or minus sign side (negative) attaches to the other terminal. If they are hooked up wrong, the motor simply will not run. No harm will be done. Turn on the switch found on the front of the control box and the machine will run when the foot pedal is pressed.

After reading this manual run the machine through some sample material to test the system out. If you have some slipping in the belt you may need to lower the motor. If the motor is lowered too far, the motor will emit a low pitch growling sound and / or run rough. No harm will be done, but power will be reduced. *Note: the 12 volt motor will emit a whistle sound when operating, this is normal.*

All machines are set up and tested at Sailrite; so, everything should be adjusted properly. If you have any questions concerning the 12 volt power system, please feel free to contact us here at Sailrite Kits.

The Universal Power System — The Universal Yachtsman allows for 12 volt DC or 110 volt operation. This system comes with a 12 volt motor, an electronic foot control, and a solid state controller with a transformer. Power cords for 12 volt DC and 110 volt AC usage are included.

Connect the motor cord to the control box. The cords are keyed so they can only be connected properly. Simply push them together when aligned. Then connect the foot control to the control box. Look for the notch on the collar of the foot wire terminal and align it with the hole in the back of the control box. Push it in. The 12 volt light is also connected in the same manner.

Then connect the correct power cord to the conversion box. Each cord has been individually designed to work with the conversion box. Even though the pins inside are different, the plug fits on only one way. After aligning the plug, make sure you push the plug in all the way. On the collar of the plug there is a locking nut which should be tightened around the outside of the receptacle. Tighten the nut until it clicks. There is a switch in the front of the control box that must be in the "ON" position before it will run.

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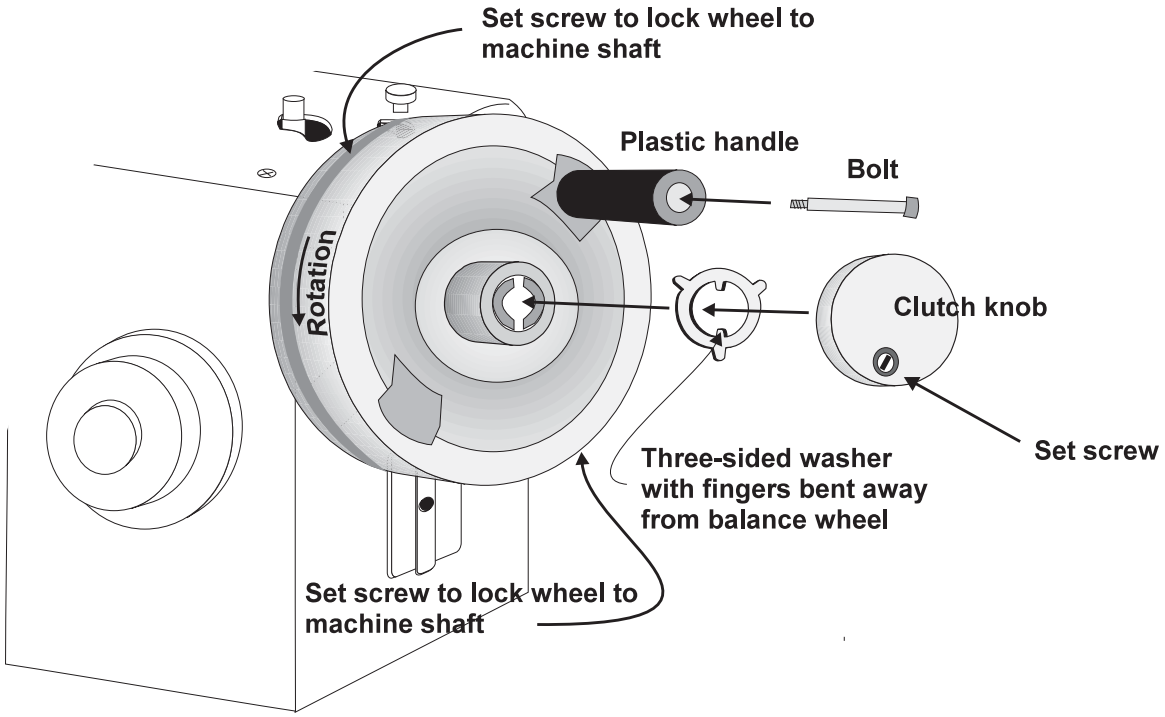
Installation of Handcrank



The Balance Wheel

One of the reasons the Yachtsman is so powerful relative to most home sewing machines is because of the heavy balance wheel that we have mounted on it (we also give it a motor about twice as powerful as normal). The inertia of that balance wheel is very important in giving the machine the ability to power through heavy materials at a relatively slow speed. That inertia will be greatly reduced if there is any slippage of the balance wheel on its shaft. **Power is increased greatly if the balance wheel is locked securely** and, so, Sailrite has made it possible to lock the "MONSTER" balance wheel onto the shaft. Notice the two threaded holes on the wheel. By tightening down the set screws provided in the balance wheel, we can eliminate slippage all together on the shaft. We recommend that this be done to increase power. Of course, that makes it unhandy to loosen the knob for bobbin winding. So I wind bobbins as I sew. This is easily done. Just place a second cone of thread next to the base of the thread stand and use it to feed a new bobbin on the winder as you use the bobbin already in the machine.

The "Monster" balance wheel also acts as a handcrank. Handcranking is a good deal of fun. You will be able to sew just as many thicknesses with it as you can with power. The new Sailrite "MONSTER" Handcrank Balance Wheel has a hole in its rim which provides a means by which the hand crank is attached. To use the hand crank portion of the balance wheel all you need to do is install the handle. Place the large bolt through the center of the plastic hand grip and tighten it in place with the Allen wrench provided.

To operate the handcrank pull it forward toward you through the top of its stroke. (*Counter clockwise as you face the machine from the right*). If it is turned backwards, thread may jam in the shuttle hook assembly.

We recommend removing the clear plastic belt when you want to use the handcrank. (*If it is left in place, you will have to exert extra effort to spin the motor as you handcrank. But, if the belt is left on, you will still be able to wind bobbins. It is up to you.*) To remove the belt push it to the side on the small pulley and rotate the wheel to twist it off. To put the belt on, place it over the small pulley first and

then turn the balance while guiding it into place (*just like you would a bicycle chain)*. If these operations are difficult for you, the screws holding the motor can be loosened to slide the motor up and ease tension on the belt.

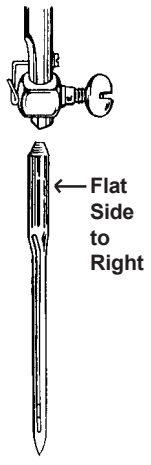
MACHINE USAGE

The capabilities of any machine are related to the way the machine is used. We all know about the carnival "pitchers" who show all the amazing things a vegetable peeler will do. It sure looks easy until we take it home and try it out. It is a shame we can't buy the skill of the operator along with the veggie tool.

I want to impart a little of the skill with this sewing machine that we have developed after long hours of tinkering. What follows are minor hints that may seem insignificant until they are all taken together. Pay attention, we may call on you some day to give one of our boat show pitches!

The Importance of Needles

First the size of the needle is important. It will not seriously affect the quality of the stitch if it is too big or too small, but it will have other effects. If the needle is to small, it will bend too much causing the machine to either break needles or skip stitches. A small needle also requires more upper tension than would otherwise be necessary. A large needle, on the other hand, makes the machine work very hard in pressing through the cloth—it has the effect of making the machine seem less powerful than it actually is. So keep the needle as small as possible without actually breaking very many.



SELECTION GUIDE
Fabric, Needle, Thread*

Fabric Weight	Needle Size	Thread Weight
to 1 1/2 or 2 ozs.	#12 (80) or #14 (90)	V-30 polyester
to 3 or 4 ozs.	#14 (90) or #16 (100)	V-46 polyester
to 6 or 7 ozs. & 9.5 acrylics	#16 (100) or #18 (110)	V-69 polyester
to 10 ozs. & 9.5 acrylics	#18 (110) or #20 (120)	V-92 polyester

*See the Sailrite Catalog for an article on polyester thread.

Broken needles, by the way, can often be reduced to a minimum by an operator who keeps a couple of simple rules in mind. First, never change the width of the stitch without first lifting the needle out of the cloth—otherwise you will bend it. Second, be careful when turning tight circles at slow sewing speeds. This, too, can bend needles if the cloth turns very much while the needle is in the cloth. Most sail sewing is straight line work. With covers there will be turns but they can either be made very sharp by stopping your sewing, burying the needle, lifting the presser foot, and making a drastic change of direction or they can be done gradually at a steady moderate speed.

No matter how careful you are, there will be jams when you sew. One of the most common is when the needle is on the left side of its travel in zigzag mode and it is bent to the right by movement of the fabric after the needle enters the cloth. As the gib hook (the sharp point on the shuttle that picks up the thread in the needle and pulls it around the bobbin) swings back it will force the needle out of its way but as soon as it is past the hook the needle will return to its original bent condition on the wrong side of the hook. The gib hook cannot get past the needle on the wrong side. Yet, because of the oscillating movement of the hook, it must pass the needle whether the machine is turned forward or backward. Thus, everything locks up. Normally you can free the machine by lifting the presser foot and pulling or pushing the cloth to the right or

left gently while turning the balance wheel forward. If this does not work, it may be necessary to remove the shuttle gib hook and the gib hook retainer ring. To do so, turn the machine on its back and locate the shuttle assembly. Release the two retaining clips and the parts will pop out freely. (Refer to Figures 5 and 12.) Rotate the fly wheel until the needle bar is at the top of its travel and then reinsert the gib hook and retainer ring. Now insert a new needle and continue. If the jamming persists see the section on timing the hook.

The Importance of Lubrication

Listen carefully to the machine as you sew. If there is a roughness to the sound, you can be sure that there is a problem that will show up sooner or later even if your stitch quality is currently good. A lack of oil is often the cause of this roughness. Keep the machine well lubricated. Oil anything that moves where it touches some other part. We oil our loft machines every morning whether they need it or not. You don't need more than a drop or two of oil in any one spot, but you do need some everywhere there is friction. Indeed, it is this thin coating of oil that prevents corrosion in a marine environment. Do not use WD-40 or any other miracle lubricant. These lubricants often are designed to penetrate and that makes them too light in body. Just use a high quality machine oil like that sent with each machine (3 in 1 oil is just a little too viscous but it will work in a pinch). See the illustrations on page 17 for oiling locations.

If oil does not make the machine sound better, it may be time to check the timing of the machine as described on page 10 under "Machine Adjustment". But first change the needle just to be sure that it has not been bent.

The Importance of Thread

The smaller the thread, the easier it is for the machine to perform. And, of course, the less frequently the bobbin has to be rewound. I like to use V-69 on the Sunbrella acrylic cloth. It holds up just fine even though there are many lofts that use V-92. We provide rules of thumb in the Sailrite Catalog regarding thread usage for other fabrics. The important thing to keep in mind is that stitches usually provide ample warning prior to letting go in a catastrophic way. When signs of wear and intermittent failure begin to appear, it is an easy matter to simply restitch the seam. So err on the side of a smaller thread whenever a question arises.

The Importance of Proper Threading

While on the subject of threading the machine, note that we have left our last test thread in the machine to illustrate the way we thread it. Proper threading is essential. We have included a threading guide illustration which you should study carefully. Note that when you thread the machine you should open the front hinged cover. After threading, close the cover with the thread trapped on the inside. Thus the cover acts like a large thread guide. See Figure 2.

Raising the Lower Thread

It is important to pull the bobbin thread up through the throat plate to help prevent "Bird-Nests" (thread jamming up due to excess thread being caught up by the hook). To raise the lower thread hold the upper thread loosely with your left hand. Turn the balance wheel towards you with your right hand until the needle and the thread take-up lever move down and up again, both to their highest point, then stop the balance wheel and pull the upper thread slowly to bring up the lower thread through the needle hole. Place both ends of the thread back under the presser foot. See Figure 3.

Threading Guide

Figure 2

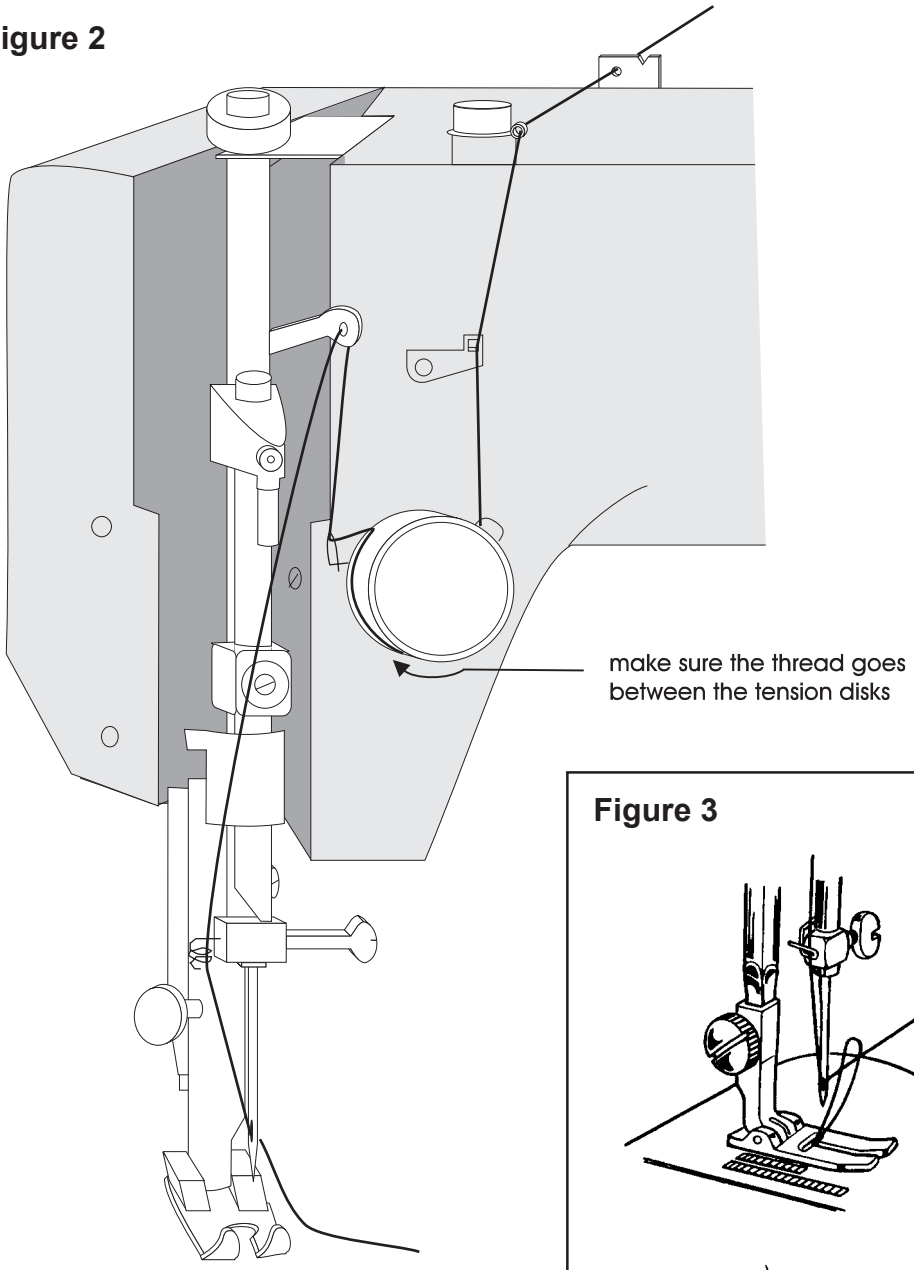
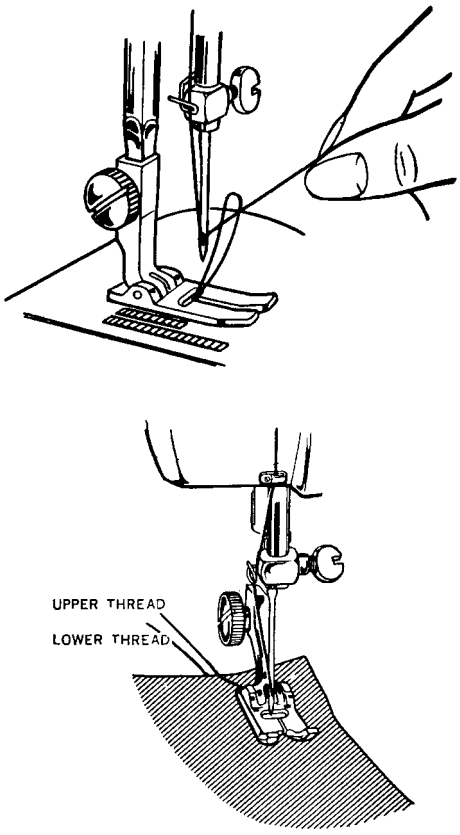
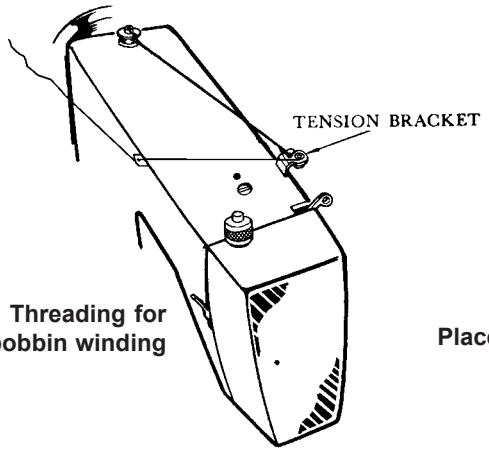
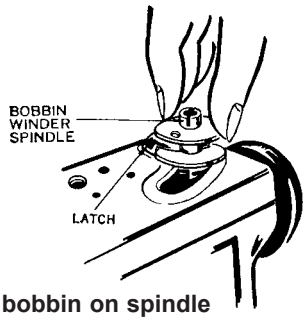


Figure 3

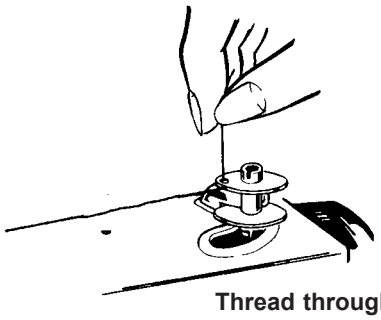




Threading for bobbin winding



Place bobbin on spindle



Thread through the hole in bobbin

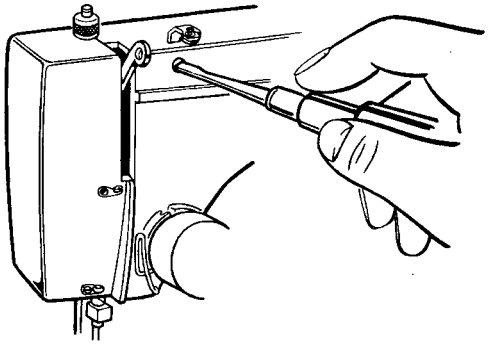
Winding Bobbins

Your balance wheel has been locked to the machine shaft for optimum performance. With the balance wheel locked on the shaft you can no longer loosen the clutch knob to wind bobbins.

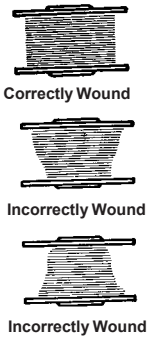
We suggest one of the following:

1. Wind bobbins while you sew, this can be done with an extra cone of thread.
2. Remove the thread from the needle and let the needle move up and down while you wind bobbins.
3. Loosen the set screws which lock the balance wheel to the shaft and just use the clutch knob to tighten the balance wheel to the shaft (Note that this will result in an apparent loss of power).

To wind bobbins place a bobbin on the bobbin winder spindle, pass the thread through the hole in the bobbin from inside to outside. Push the bobbin towards the balance wheel. Hold the thread with your right hand, turn the balance wheel to wind the thread several times. Then cut the free end of the thread and wind the bobbin till full.



To wind bobbins evenly loosen the thread guide set screw and raise or lower the guide

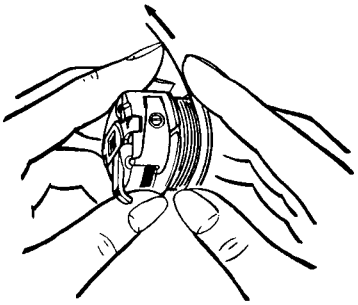


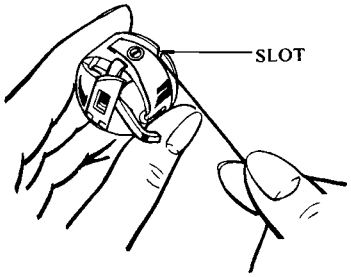
Correctly Wound

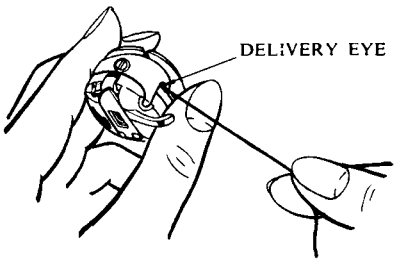
Incorrectly Wound

Incorrectly Wound

Threading the Bobbin Case



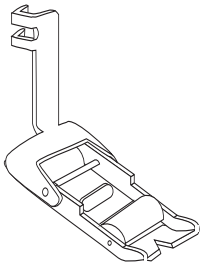




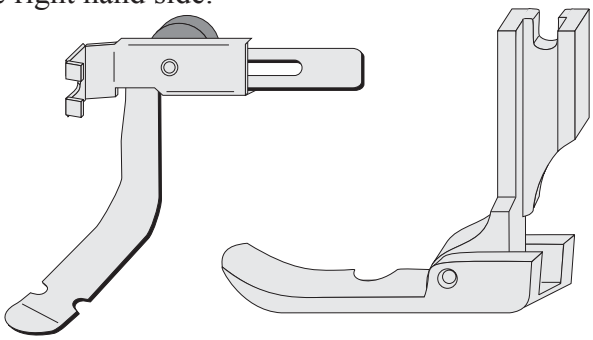
ATTACHMENTS

There are several attachments that you will find packed inside your case. These attachments are illustrated below:

1. The *roller foot* is included to make "sticky" fabrics like vinyl, plastipane, and leather slide more evenly under the machine. This tool can be very helpful but there are times when it actually makes smooth feeding more difficult (usually when the sewn material is thick and relatively soft or "spongy"). The best course of action is to experiment with this foot and use it only when it actually helps.

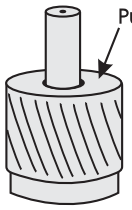


2. Two *zipper feet* come with the machine—an adjustable foot shown of the left below and an industrial right hand foot illustrated on the right below. Zipper feet are used to place a row of straight stitches right next to a bulge in the material such as a boltrope or zipper teeth. The adjustable foot can be used for left or right hand work. By loosening the screw on the top of the foot, it can be moved from one side of the needle to the other. Place the foot so that the needle penetrates in one of the cutouts found on either side of the foot. The nonadjustable right hand foot is included because it is more rigid and tends to work better. All boltroping is done on the right hand side.



When using a roping/zipper foot it is necessary in most cases to decrease the foot pressure (push down on outside ring of the foot pressure adjustment assembly) and increase the thread tension. In some cases we have found that

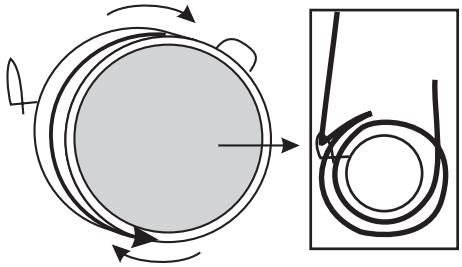
The Foot Pressure Setting For Roping/Zipper Foot



a) Pop the pressure adjustment plunger all the way out by pushing down on the outside ring, this decreases foot pressure

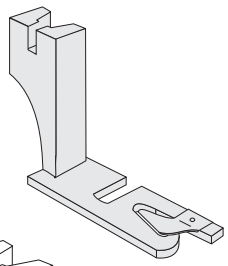
to get enough thread tension a double-wrap around the tension dial is necessary. Double-wrapping is illustrated in Figure 4. In fact, any time you are not getting a tight enough stitch on the underside of the material, thread the machine with a double wrap. Sailmaker's thread is very stiff and has a tendency to pop out of the tension assembly. The double wrap forces it to stay in.

Figure 4 **The Double-Wrap Set-Up For More Tension**

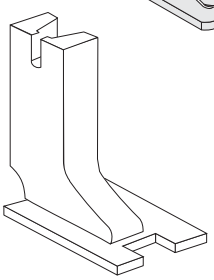


b) Double-wrap the tension dial and set dial at around 1 turn *from* maximum

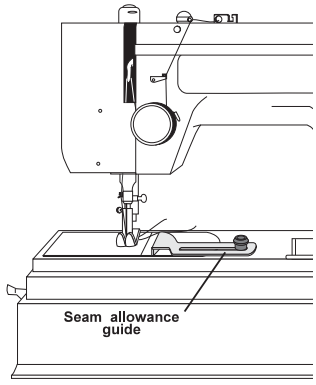
3. The *rolled hem foot* is used to place a very narrow hem in very light, soft cloth. It is the hem that is used for handkerchiefs. You will not find it helpful in sailmaking.



4. The *plastic button hole foot* can be used for installing buttons and for placing the reinforcing stitches around a button hole. (See the factory guide book for use).



5. The *seam allowance guide* can be screwed in place in one of the two tapped holes on the bed of the machine to the right of the needle bar. It can then be used to place an accurate row of stitches a consistent width inside the edge of the fabric.



MACHINE ADJUSTMENT (Timing)

The sailmaker's best friend or worst enemy is the sewing machine. Fortunately, each one of us can make sure that the relationship is "friendly." The more we understand our machines, the better they work for us.

It is surprising that sewing machine companies do not make information concerning their machines' mechanical needs available. Their handbooks are written as though companies expect mechanical skills are completely beyond the user. The fact is that sewing machines are relatively simple. Their adjustment is easy for the average user willing to acquire a little knowledge. The following will help in this regard.

The Class 15 Machine

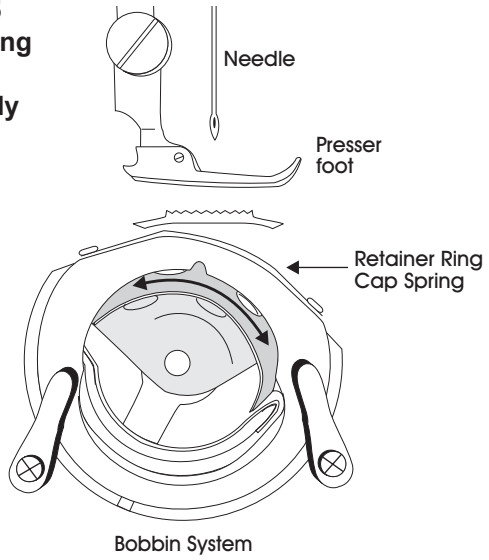
The Sailrite Yachtsman has a class 15 shuttle hook system. The gib hook in the bottom of the machine moves around the bobbin case back and forth (Figure 5). It oscillates half way round and then back the other way a half turn. The purpose of the hook is to pick up the upper thread at the needle and carry it down around the bottom of the bobbin case where the upper thread loop is pulled up and tight by the take up arm above the needle bar. Once this task is completed, the oscillating hook reverses its direction and returns to its original location. This movement is created by a simple yoke and cam arrangement on the top shaft of the machine. It is a relatively inexpensive design but quite reliable and wholly satisfactory for sail work.

The Two Most Common Sewing Machine Problems

But no matter how good the machine is there will be times when you want to throw it out the window. When this happens just pick up these instructions and let us help. There are two problems which occur frequently with most machines: *skipped stitches* and *inconsistent stitch tension*. There are a number of mechanical adjustments that can overcome these problems. In order to utilize them properly, let us again review the fundamental operation of a lock stitch sewing machine.

A sharp "hook" (the gib hook) rotates around the cage that holds the bobbin thread under the machine. See Figure 5. This hook passes right next to the rising needle and catches a loop formed in the upper thread by the needle as it comes up. After catching this loop, the hook pulls it down until it circles around the entire bobbin of lower thread. The two threads are thus

Figure 5
Class 15 Oscillating Hook Assembly



interlocked and a stitch is formed. As the needle continues to rise, a "take-up arm" also rises to pull the excess thread up from the bottom of the fabric. The thread comes up out of the cloth because of the tension disks that tightly clamp the thread on the spool side of the take-up arm.

Skipped Stitches

If your machine is skipping stitches your zigzags may appear like a straight stitch on either the right or left side with a proper zig stitch being formed only once in a while. We know from the discussion above that the hook is not catching the thread consistently.

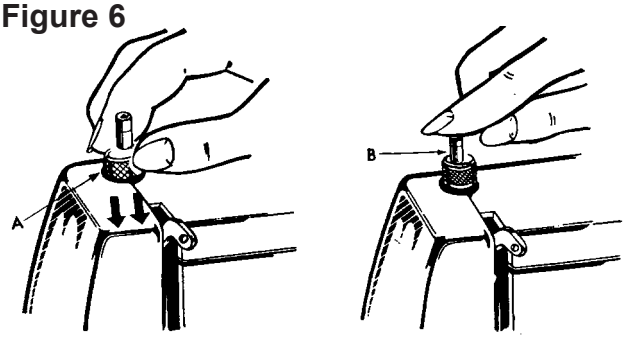
It is usually because either the thread is not being held down by the fabric as the needle is withdrawn and, thus, a loop of thread is not formed for the hook as it passes the needle. Or the hook may not be passing the needle at the proper time, i.e., it may be passing the needle before a loop is formed or, at the opposite extreme, after the thread has been pulled upward out of the path of the hook.

What to Do

1. The first thing to do is simply change the needle. A bent needle will cause skipped stitches because the loop is not where the hook "expects" it to be. The old needle could also have become fouled with adhesive if you are using basting tape or sewing insignia cloth. In either case, the new needle will resolve these problems.
2. Next check for adequate pressure foot adjustment. Heavy, closely-woven materials like sailcloth and canvas can make the withdrawal of the needle from the fabric difficult. If the presser foot is lifting as the needle comes out of the cloth the effect is the same as if the needle were not going far enough into the cloth — the loop that it forms will be too small. To test if this is the problem, hold your finger (with care to avoid the needle) on the presser foot so that it cannot "bounce" as the needle is withdrawn. If there are no longer any skipped stitches, you know that more pressure down on the foot is required.

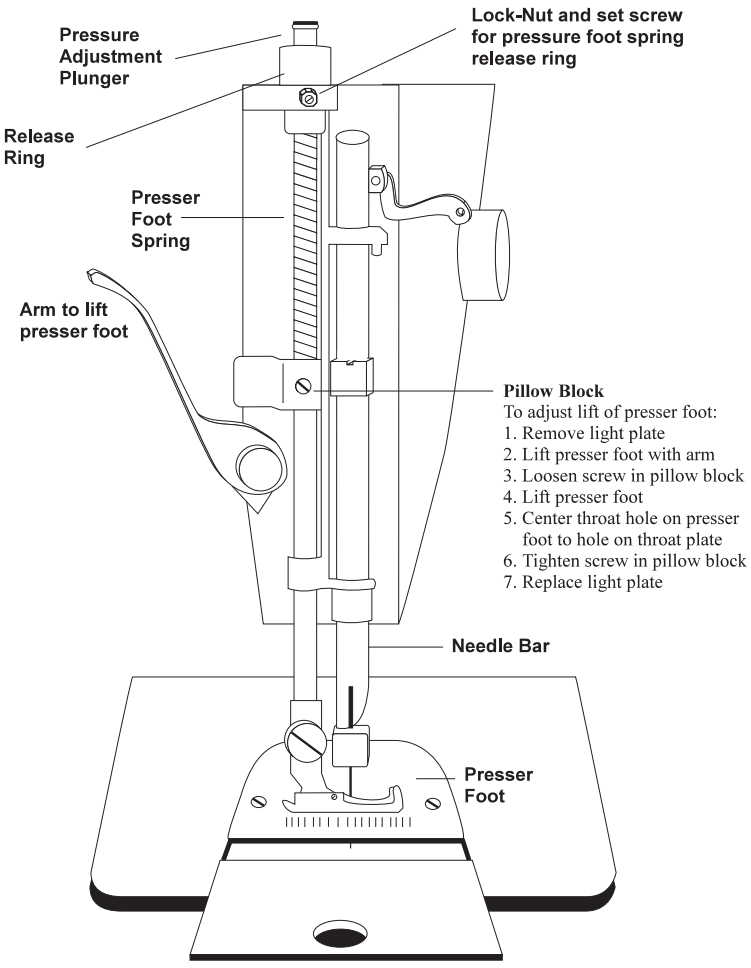
The presser foot is spring loaded and it is possible to adjust the pressure in two ways. The first means of adjustment is limited but it is generally sufficient. There is a roughly 1/2 inch plunger that protrudes out of the top of the case just above the presser foot (Figure 6). Push down on the ring at the base of the plunger and

Figure 6



Push down on A to release foot pressure.
Push down on B to increase foot pressure.

Figure 7



the plunger will snap up to its full height. At this point pressure down on the presser foot is minimal. Pushing the plunger down will increase presser foot pressure by compressing the spring underneath. Most sail and canvas work will benefit from a good deal of pressure.

The second means of adjustment is to change the presser foot spring itself. The machine comes with a heavy duty presser foot spring in place. A lighter presser foot spring is included. It should be used with delicate fabrics if you find that the normal spring mars their surface. To change springs, loosen the lock nut and then the set screw to the left side of the upper presser foot bearing (just under the plunger release ring described above). See Figure 7. That will make it possible to remove (lift up) the release ring. The presser foot spring can then be pulled out and the smaller one inserted in its place. Tighten the set screw and the lock nut after replacing the plunger release ring. Do not over tighten the lock nut. Its purpose is simply to keep the set screw from working its way out. Tightening the lock nut to a snug position is adequate.

3. If skipped stitches continue to be a problem., it is almost certainly a matter of the machine's having gone out of time.

To adjust the timing of a class 15 machine you should first reset the height of the needle bar. The needle bar height is adjusted by loosening a single set screw that locks the bar in place in a collar that moves up and down. See Figure 8. This set screw is accessed from the front of the machine after opening the hinged door over the needle bar assembly.

Lower the needle bar to its lowest position by turning the fly wheel. To determine the proper height of the needle bar measure from the top of the needle bar to the top surface of the upper needle bar guide (see Figure 8). This measurement should be about 3/16 inch. *Because this measurement varies we indicate the proper height for your machine by putting a small scratch on the needle bar.* An alternate technique is to measure the distance between the top of the needle eye and the gib hook when the gib hook is directly behind the needle and the needle is on its way up. This distance should be 3/32 of an inch as illustrated in Figure 9.

After having adjusted the needle bar height continue sewing. *If stitching problems still exist go on to step 4 "gib hook timing".*

4. If the needle bar height is set properly as described above, and poor stitching still results then turn to the timing or the positioning of the gib hook. The hook rotation on the Sailrite

Figure 8

Proper Needle Bar Height

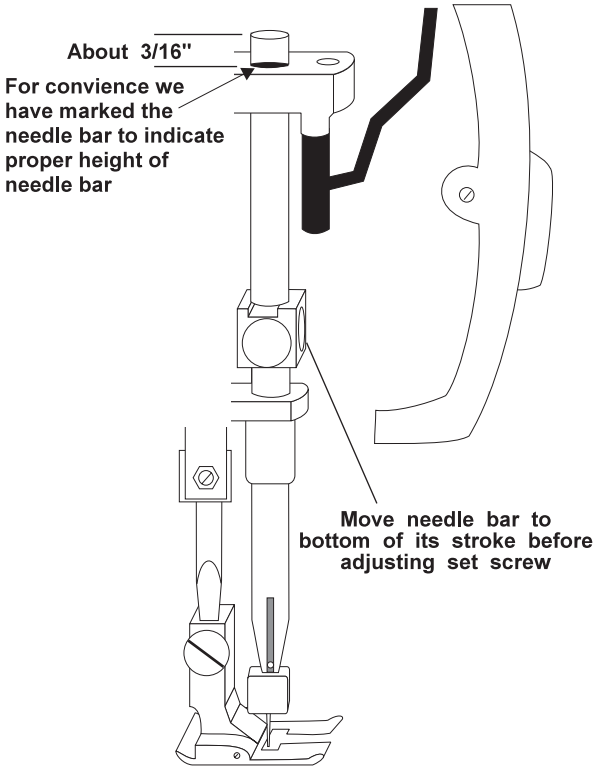
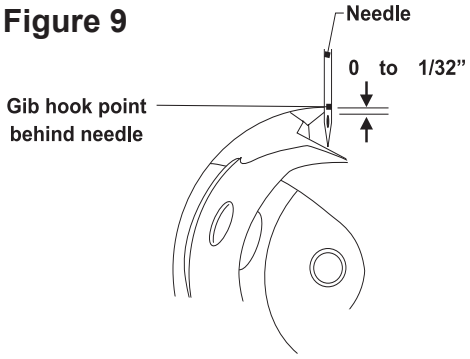


Figure 9



Yachtsman is pinned in place but it is possible to move the whole shuttle assembly left and right to keep it close to the right hand side of the needle.

First set the machine to straight stitch. To provide a reference point, make a mark on the bearing surface just to the left of the large oil hole in the shuttle shaft. Now, if the shaft accidentally rotates, you can realign the mark with the oil hole (Figure 10). Adjustment of the gib hook is carried out by loosening the screw on the compressible clamp that drives the entire assembly back and forth with the zigzag movement of the needle. See Figure 10. Once the screw is loosened, light taps will move the shuttle assembly in either direction. Get the hook as close to the needle as possible without actually touching it. Note that the entire shuttle cage can be rotated through 10 degrees or so when the bushing screw is loose. Take care to keep it oriented so that the needle moves down through the center of the triangular opening in the top of the shuttle cage or match up your mark on the bearing surface with the oil hole. Once this adjustment has been made, it will remain constant even when larger or smaller needles are used.

The best way to see the clearance of the gib hook and the needle is to remove the presser foot, needle plate and the feed dog. A flashlight to illuminate the area is also helpful. As you turn the machine over with the balance wheel, you will see the gib hook swing back past the needle and then forward past it. As you look down through the feed dog from the top of the machine, the hook should be as close as possible to the needle on its right side but it should not deflect the needle at all (Figure 11). It is best to carry out this adjustment with the machine in straight stitch mode although this is not absolutely necessary.

Another way to adjust the hook position relative to the needle is to remove only the bobbin and gib hook retainer ring. (Removing the foot, feed dog and the throat plate is not necessary). Now with your left hand hold the gib hook in place and with your right hand rotate the fly wheel. You should be able to judge the distance between them by looking at the needle and hook from the bottom. Again they should be as close as possible without causing needle deflection. See Figure 12. Earlier we spoke of a possible 10 degrees of shuttle cage rotation. A

Figure 10 The Underside of the Machine

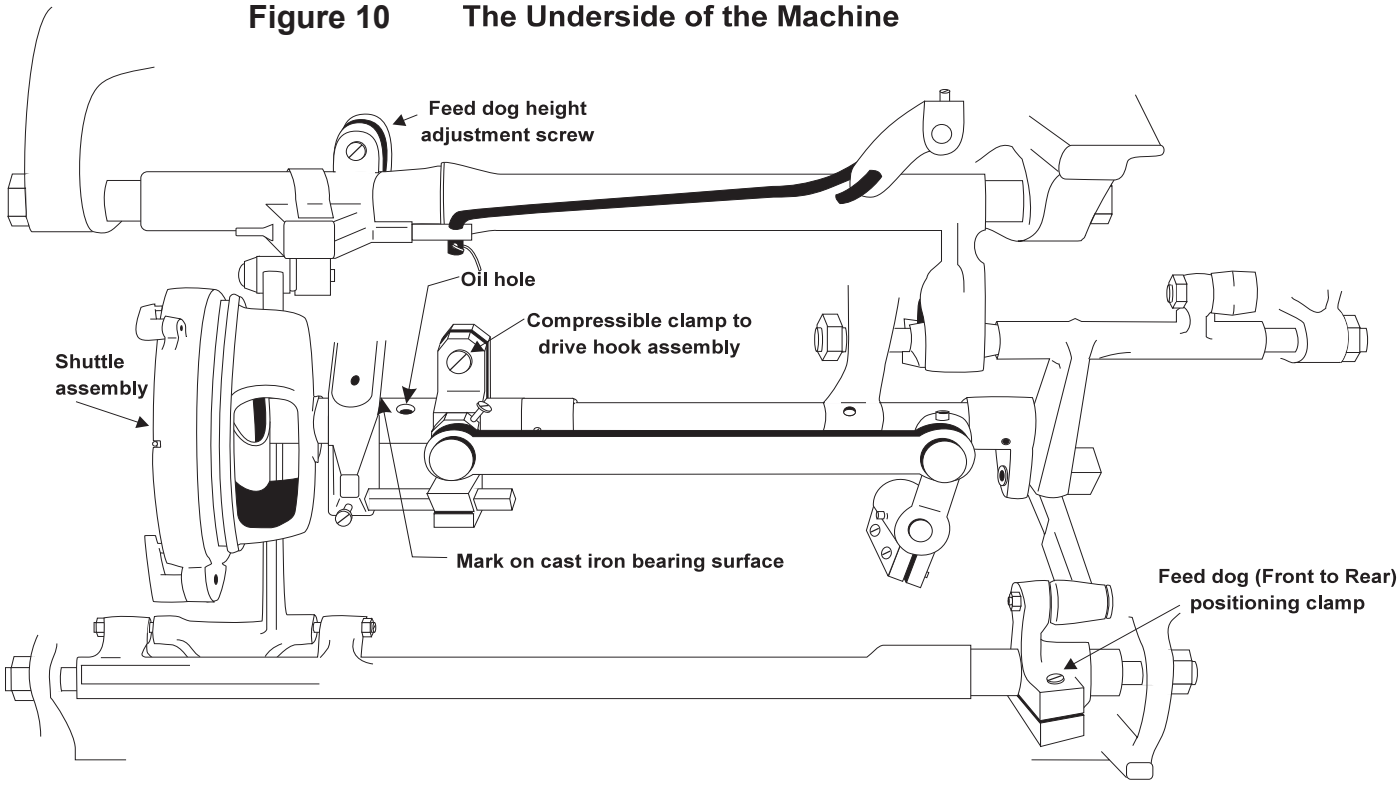


Figure 11
Gib Hook and Needle from top with Feed Dog Removed

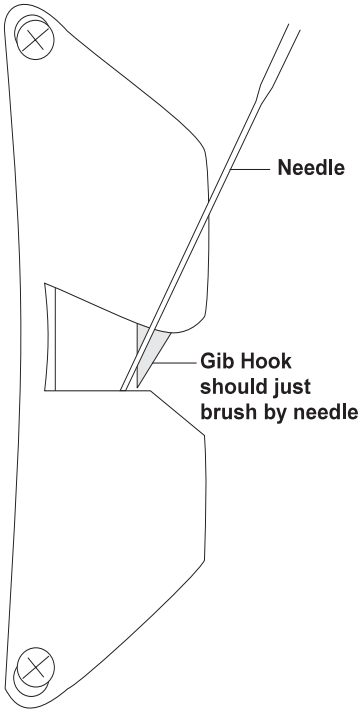
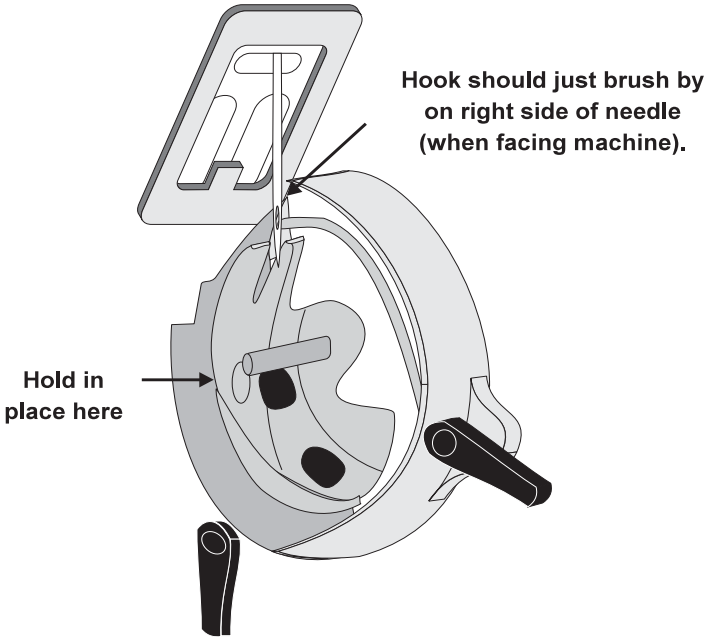


Figure 12
Gib Hook and Needle with Shuttle Cage Removed



nifty little trick to avoid this problem is to mark the main shaft relative to the head casting. Then when you adjust the left and right movement be sure to match up your marks.

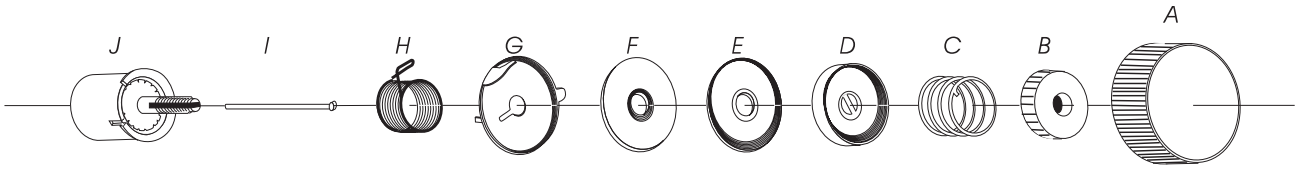
Tension Adjustment

Once the machine is set up to sew without skipping stitches, adjustments may still be needed to improve stitch quality. The primary problem when using a heavy thread in a home machine is inadequate upper thread tension. When stitch tension is a problem, it is usually a consequence of too much or too little tension on the upper thread. Tension changes on the bobbin thread are of little consequence because the lower thread does not actually tension the stitch — just a two ounce or so drag on this thread is enough to keep it under control. The Yachtsman has a limited upper tension adjustment: a knob on the front can be turned about five revolutions to compress a spring that squeezes two disks together through which the upper thread runs. Note that when the presser foot is lifted the upper tension disks are pushed apart. This is to release the top thread tension so that fabric can be removed from under the machine foot without fighting thread tension. If your upper tension is tightened all the way down and you raise the presser foot, you may bend the lever inside the machine that separates the disks. This will prevent them from opening correctly. *Avoid lifting the presser foot when the upper tension knob is more than approximately 1/2 turn from maximum (maximum being the point of no clockwise rotation left)* .

If the stitch remains loose on the bottom even after the upper thread tension has been tightened all the way (1/2 turn from maximum clockwise rotation), the upper tension device can be double wrapped as shown on page 9. Note that upper tension must be reduced a good deal when the double wrap is employed or the thread may break.

NOTE: Although bobbin tension generally should not be adjusted, when sewing light weight fabrics it is sometimes necessary to increase the bobbin tension.

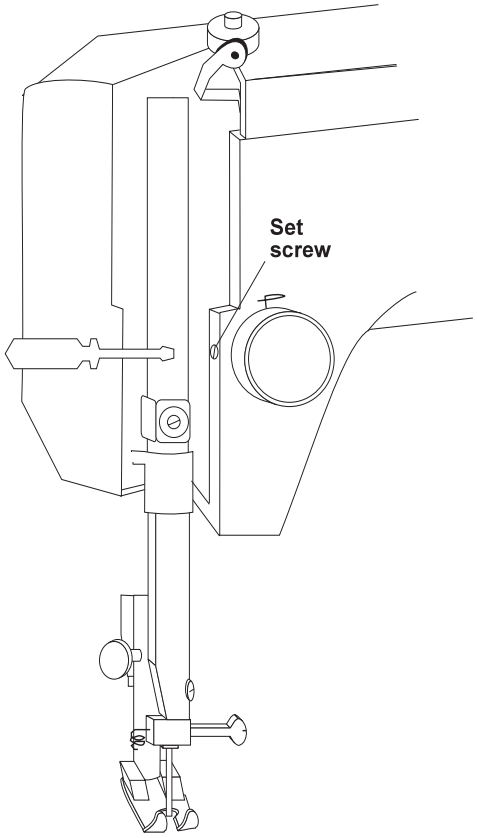
Figure 13
Upper Tension Assembly Detail



The machine should now be performing well, but there is one final adjustment that can put the finishing touch on stitch quality and that is the adjustment of the takeup or "check" spring (Part "H" in Figure 13). In normal use the spring should tension the thread until the point of the needle hits the fabric. The small "v" shaped cutout on part "G" will normally be located at 12 o'clock. For superlight material, it is helpful to move the spring so that it relaxes sooner. For heavy material, it should be moved so that it tensions the thread until well after needle penetration. On the Yachtsman, the takeup spring is adjusted by turning the whole tension assembly an 1/8" or so counterclockwise to increase its effect and the other way to decrease it. The assembly can be turned by loosening a set screw accessed just inside the hinged cover over the needle bar. See Figure 14.

The tension on the takeup spring can be increased in order to improve stitch quality slightly with very heavy fabrics. Remove the upper tension knob (part "A" in Figure 13) by pulling it off. Unscrew the small nut (B) under it and remove all the other parts (C through G) down to the spring. Pull the spring out and turn it counterclockwise an eighth to a quarter of a turn and reinsert it so that the little wire near its base locks into one of the holes in part "J". Tension on the takeup spring can vary from between one-half of an ounce to three ounces or so.

Figure 14
Upper Tension Locking Screw



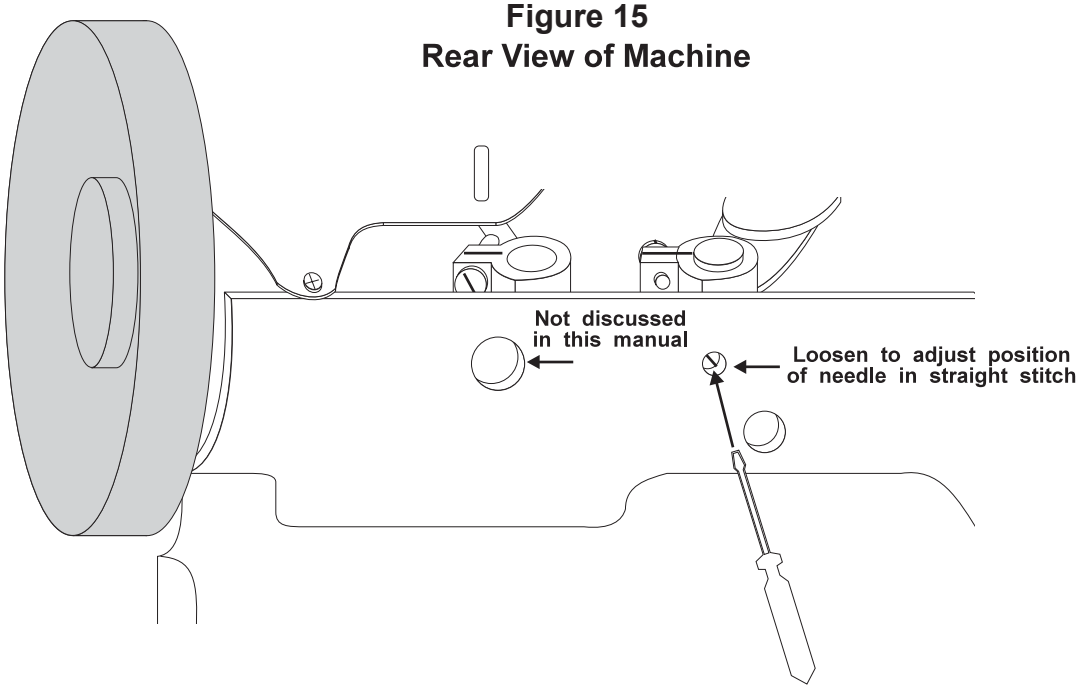
OTHER ADJUSTMENTS

There are a couple of adjustments that can make your sewing look more professional. The first allows closer positioning of a straight stitch to a zipper or a boltrope. The second improves feed consistency with some heavy, coarse fabrics.

1. The position of the needle when in straight stitch can easily be moved from the center of the presser foot to one side or the other. This can be helpful when sewing zippers or boltropes in place since it will place the stitch closer to the edge of the presser foot. To make this adjustment, change the machine to straight stitch and find the hole in the center of the machine on its upper back side. There is a set screw in this hole that locks a shaft that determines the position of the needle when it is in straight stitch. With the screw loosened, move the needle wherever you want it over its normal zigzag travel. Then tighten the screw again. See Figure 15.
2. The feed dog teeth should normally rise above the throat plate about 1/32-inch. The knob on the right front side of the bed that has markings of 0, 1, and 2 can be used to lower the feed dog. At position "2" the feed dog will come up to its normal height. At position "1", it will only come up about half as high. And, at position "0", it will not rise above the throat plate. When sewing very heavy or coarse materials, feeding may be improved by raising the feed dog height to its maximum. To change the height of the feed dog, rotate the machine until the feed dog is at its highest position and in the middle of its travel from front to back. Then loosen the set screw under the machine that locks in place the lever arm indicated in the Figure 10. Take hold of the lever arm and rotate it one way or the other to raise or lower the feed dog. And tighten the set screw again to lock everything in place. For sail work many prefer to increase the height of the dog to about 1/16-inch. Then they leave the dog knob in position "1" for normal sewing and use "2" only for difficult work. *Note: Sailrite has already made this adjustment to the Yachtsman.*

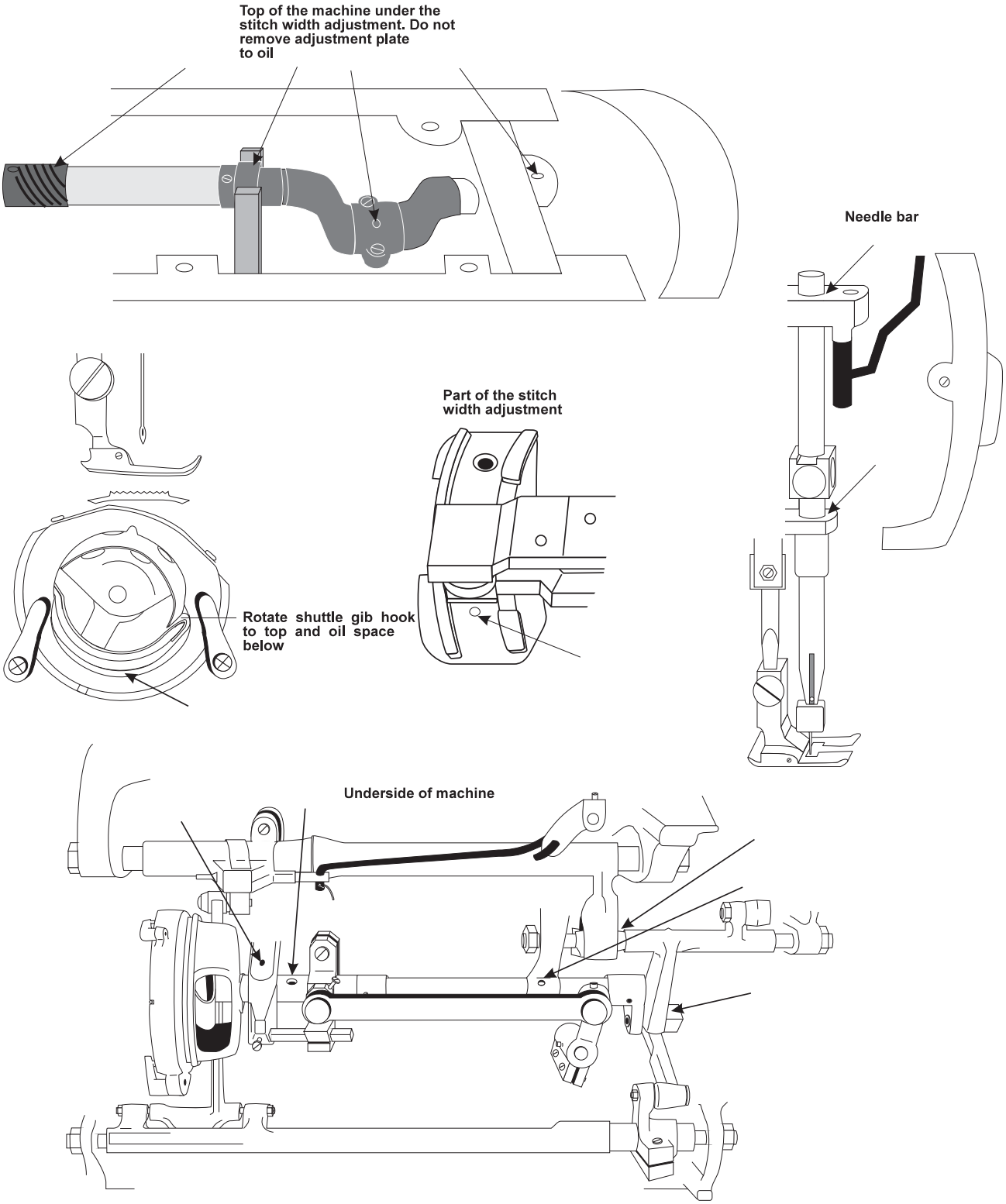
Understanding and using these techniques will enable you to use and enjoy your Sailrite Yachtsman Sewing Machine to its fullest potential. Doing sail and canvas work has advantages far beyond the money saved — it also provides a confidence and satisfaction that comes from self-reliance. And it is surprisingly easy to move from simple repair work to recutting to sailmaking itself. Each step in this progression is an important step on the way to becoming a better sailor.

Figure 15
Rear View of Machine



Lubrication of the Sailrite Yachtsman

We have illustrated below the parts to oil frequently—at least once a month even when not in use. If you are using the machine hard, oil more frequently. DO NOT USE WD40. It is a penetrant instead of a lubricant, i.e., it contains kerosene and will evaporate too quickly.



TROUBLE SHOOTING

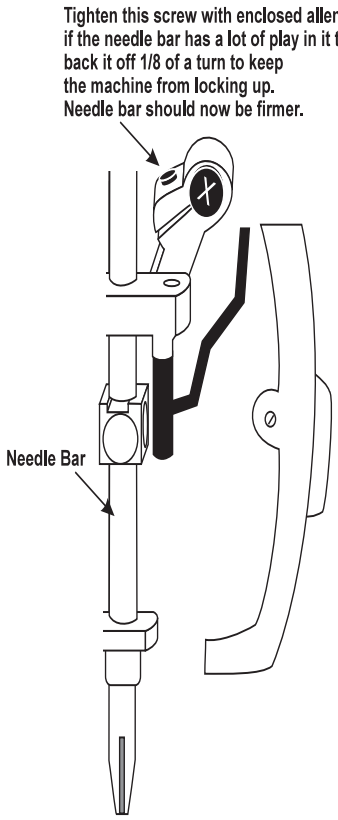
The illustrations and tips in this section are for the purpose of helping you solve problems. They also help us communicate better with you when problem solving.

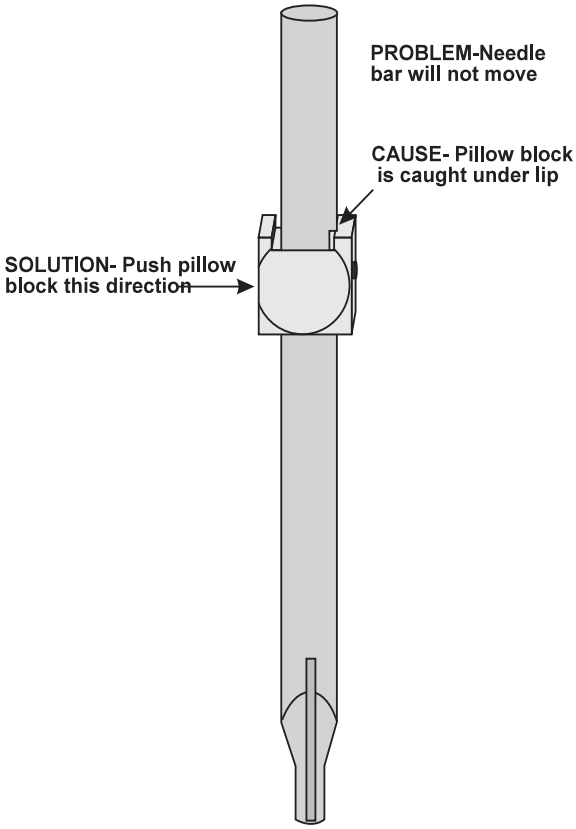
1. *My foot pedal (rheostat) crackles.*
The rheostat attracts moisture and that moisture is burned off when the rheostat get warm. This makes a crackling sound which is normal and expected.

2. *The thread is balling at the needle.*
First check to be sure that your needle size and thread weight are compatible. Use the SELECTION GUIDE found on page 5 or see the thread section of your Sailrite Catalog.

If they are compatible, check to see if there is play in the needle bar when you wiggle it. See the illustration below for eliminating play.

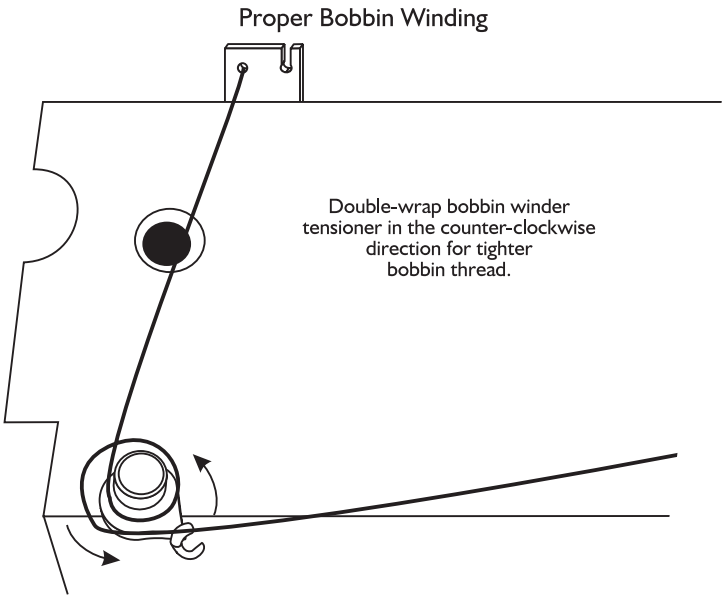
If the balling continues, improper timing is generally the culprit. The gib hook is too close to the needle and is spearing the thread or the needle bar is too high and the thread is getting speared. See the illustration below for moving a stubborn needle bar. Turn to the section on timing found in the text and read it carefully before timing your machine. Note in most cases the needle bar has slipped upward. Reposition the needle bar and, then, test the machine.





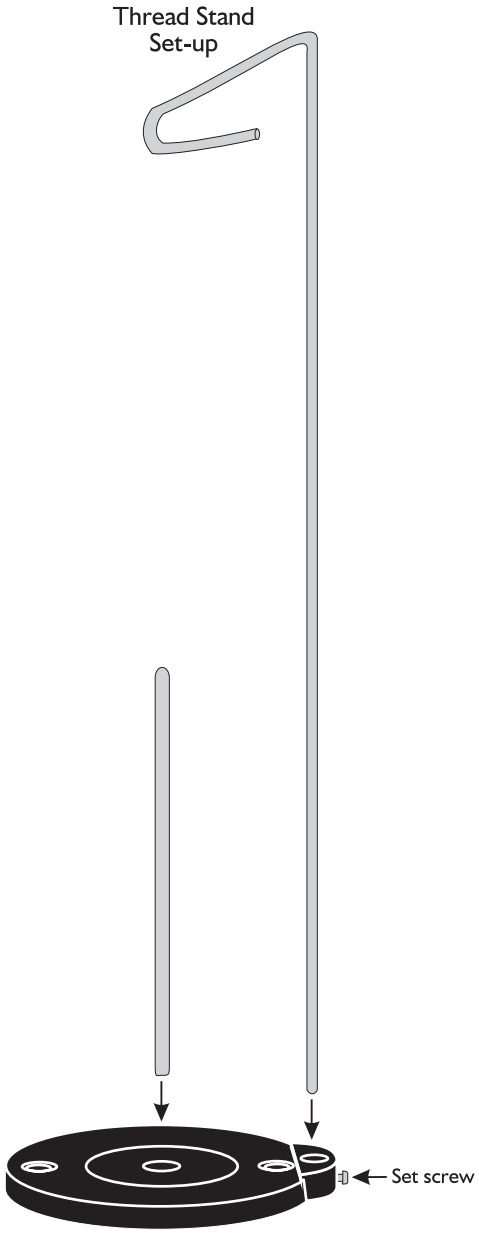
3. *There are loops on the underside of the fabric.*
If you get a tangle on the bottom side of the fabric, there is not enough upper tension. More than likely the thread has not been pulled snugly between the tension disks on the upper tension assembly. Release the tension about 3 or more turns from maximum. Thread the machine, then increase the tension to near maximum. Releasing the dial tension makes it easier to wrap the thread between the disks. Or you can double wrap the thread on the upper tension assembly. See page 9 in this manual.

4. *My bobbin thread has knots and tangles.*
This is an indication that the bobbin has not wound tightly. Double-wrapping the bobbin winder tensioner when winding a bobbin will eliminate this problem. See the illustration below.

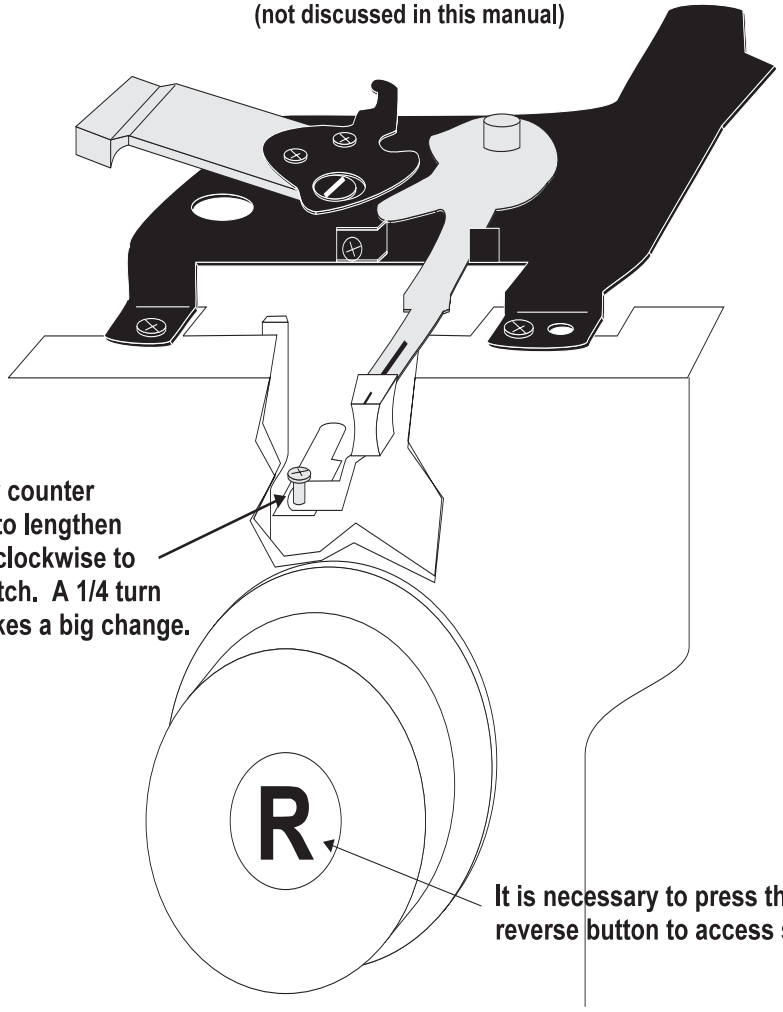


5. *How does the thread stand go together?*

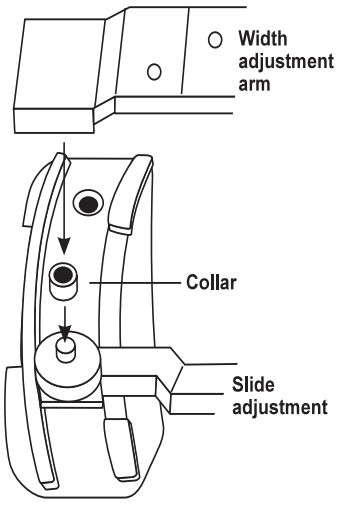
6. *When sewing zippers, bias binding tape or other spongy materials, the stitch on the underside of the fabric is loose.*
This is most likely a problem because of too much presser foot pressure or not enough upper tension. Try decreasing foot pressure by popping the pressure adjustment plugger out by pushing down on the outside ring. To increase upper tension try double wrapping the thread (see page 9).



Feed Dog Length Adjustment Screw
(not discussed in this manual)

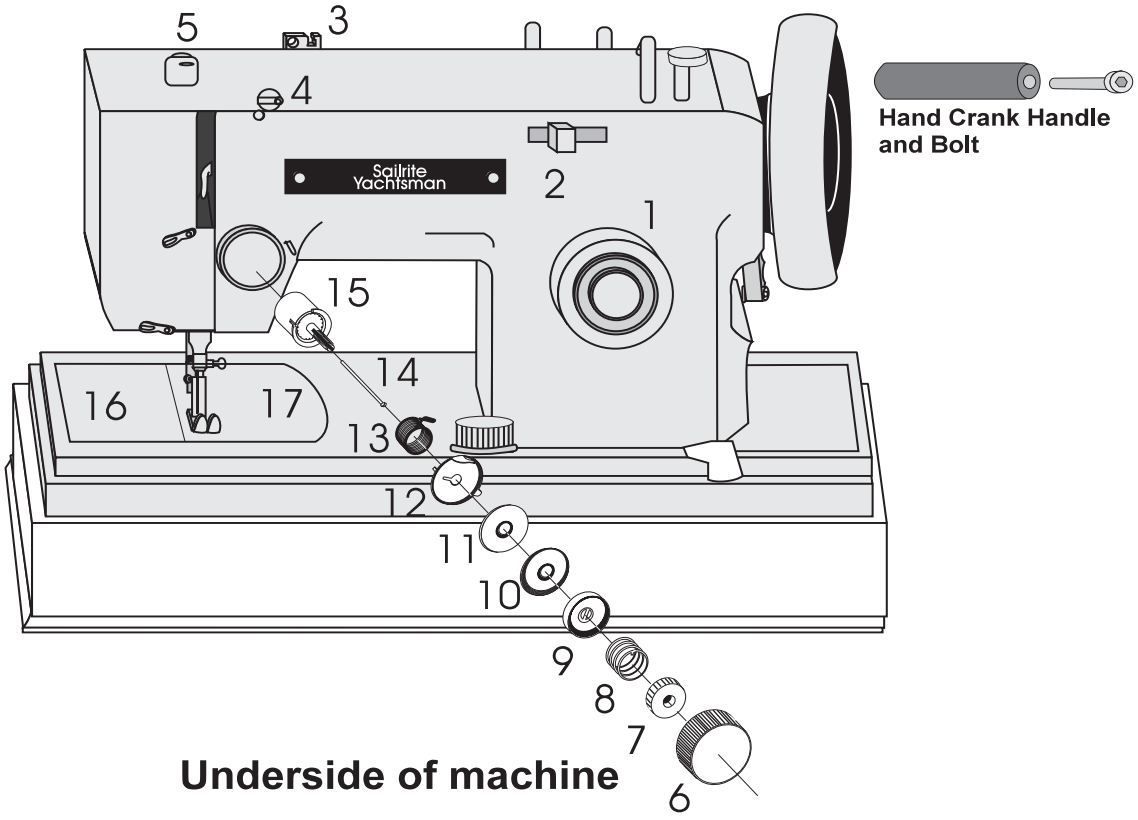


Stitch Width Adjustment
(Located inside top of machine)

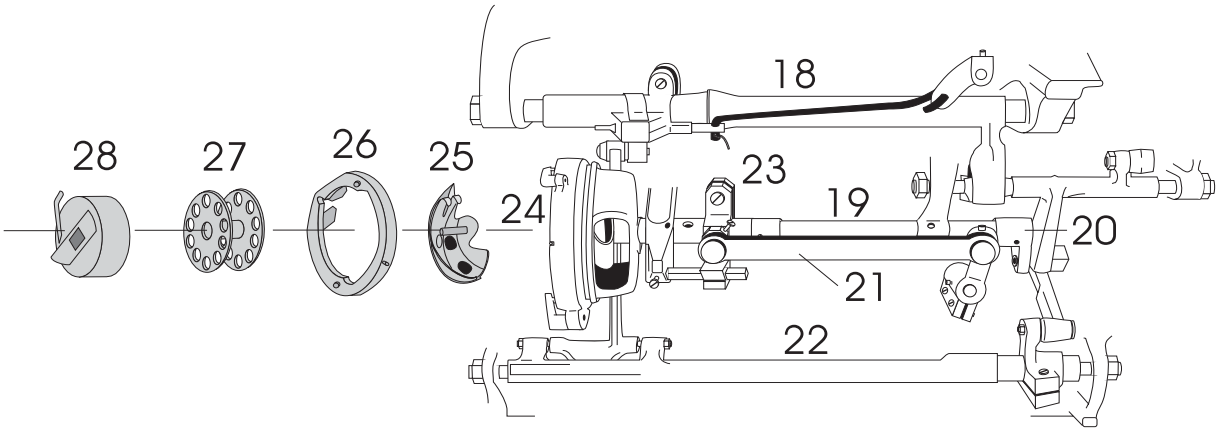


If you encounter problems with this adjustment, check to make sure these three parts are in alignment

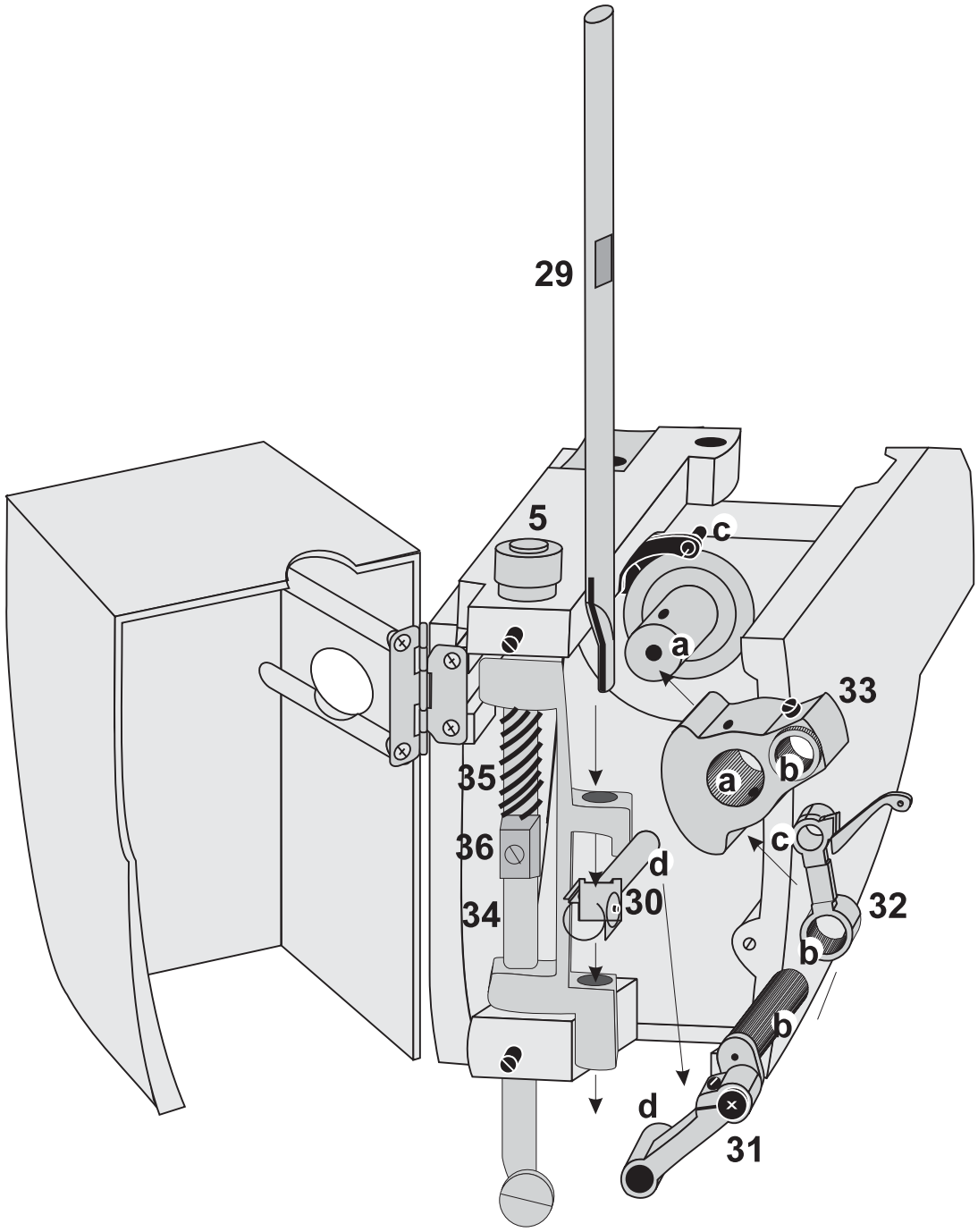
MACHINE PARTS



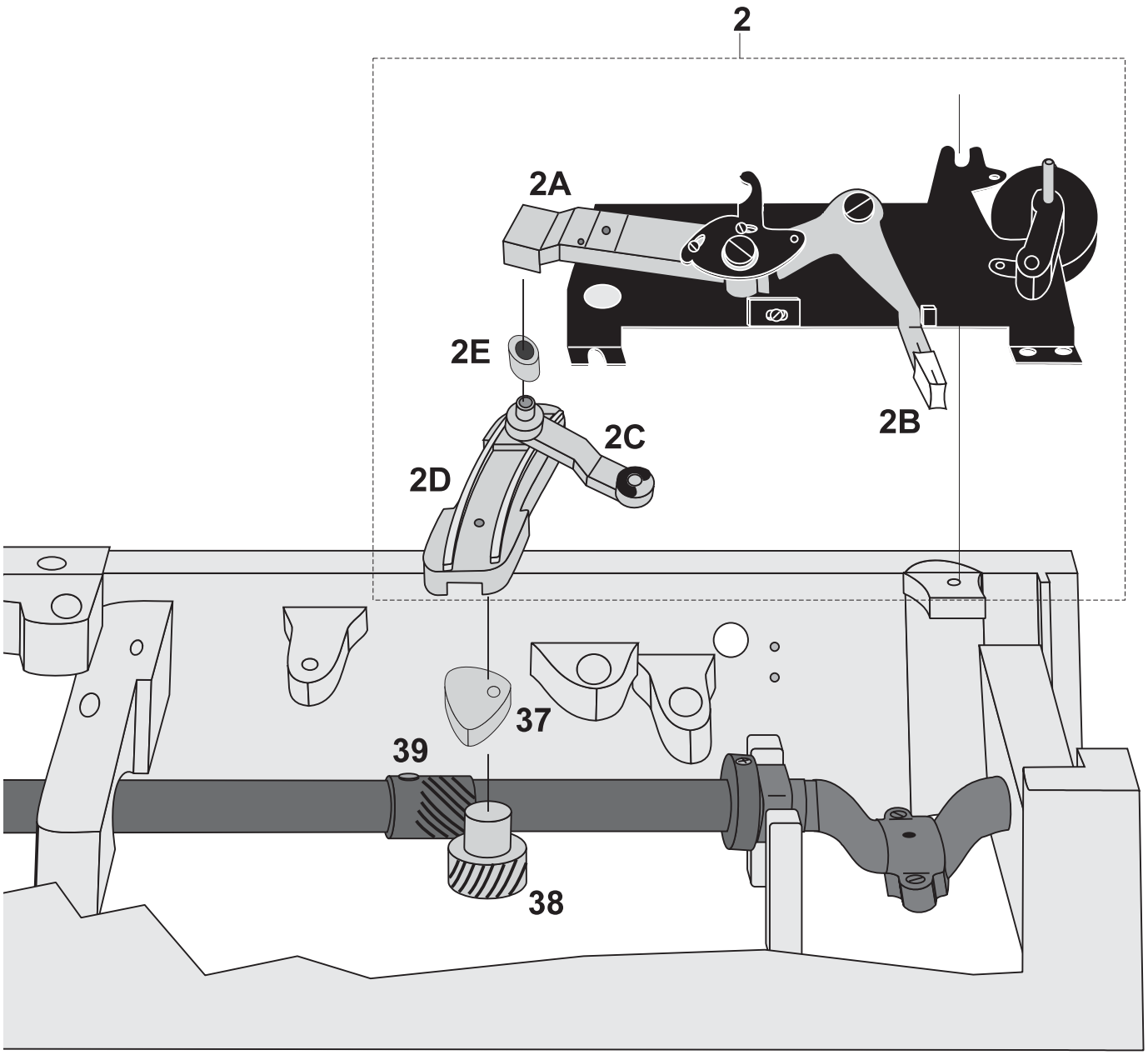
Underside of machine



1 Stitch Length Control / Reverse Button
2 Stitch Width Control
3 Thread Guide
4 Bobbin Winding Tensioner / Thread Guide
5 Darner
6 Tension Control Knob
7 Tension Control Nut
8 Tension Spring
9 Tension Disc Washer
10 Front Tension Disc
11 Back Tension Disc
12 Tension Locking Plate
13 Take-up Spring
14 Tension Release Pin
15 Tension Assembly Stud
16 Slide Plate
17 Throat Plate
18 Feed Dog Height Rock Shaft
19 Main Shaft
20 Main Shaft Rotation Arm
21 Main Shaft Stabilizer
22 Feed Dog Rock Arm
23 Shuttle Assembly Adjustment Clamp (Timing)
24 Shuttle Assembly
25 Hook Assembly
26 Shuttle Assembly Cover Plate
27 Bobbin
28 Bobbin Case



29 Needle Bar
30 Needle Bar Pillow Block
31 Needle Crank Arm
32 Take-up Arm Lever
33 Counter Balancer
34 Presser Foot Bar
35 Heavy-duty Spring
36 Presser Foot Pillow Block



37 Zigzag Drive Cam
38 Zigzag Drive Gear
39 Helical Gear

2A Stitch Width Slide Arm
2B Stitch Width Adjustment Lever
2C Slide
2D Slide Plate

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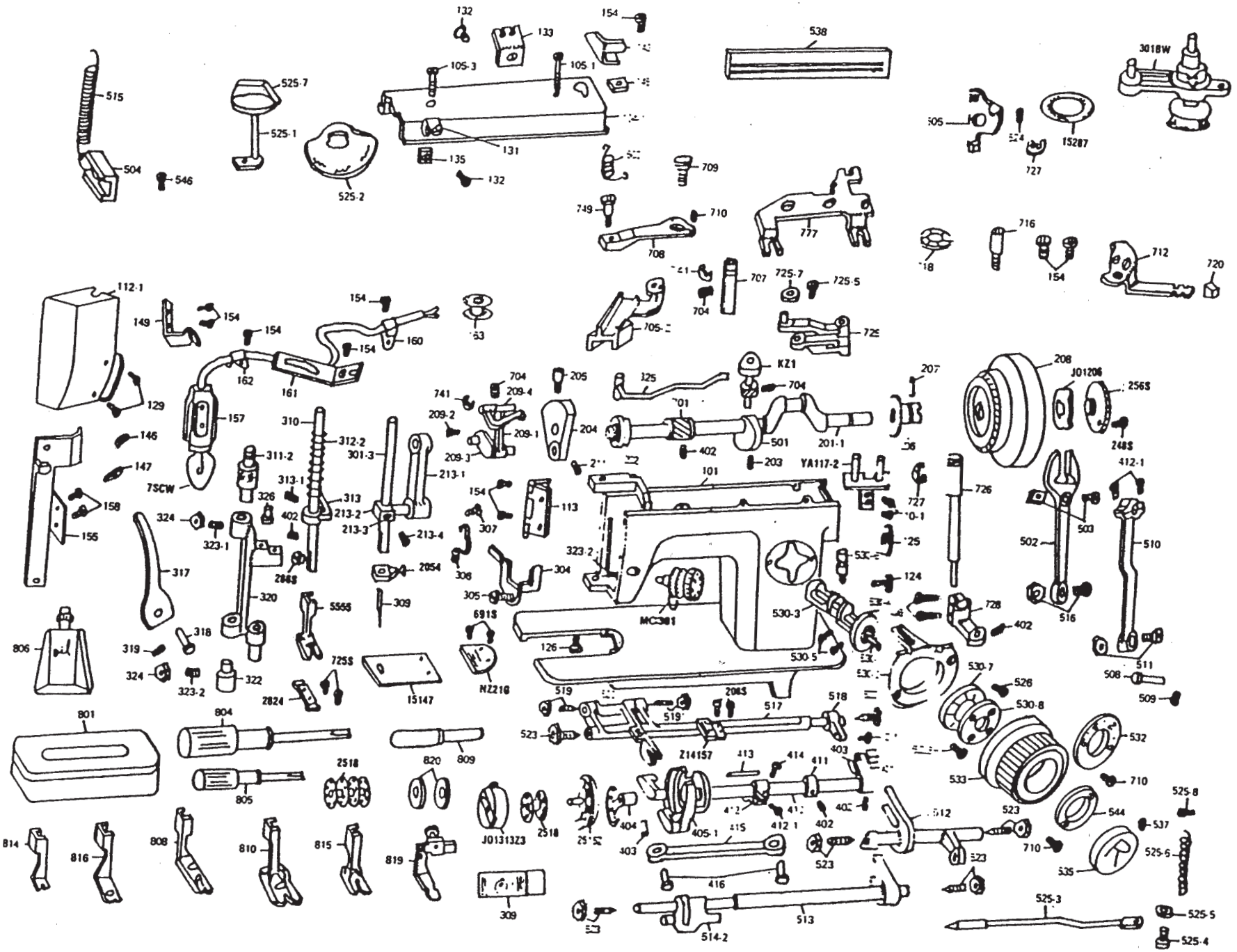
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