

## Adjusting The Thread Tension

Thread tension is one of the most critical elements of machine performance. In order to form a stitch correctly and ensure quality sewing, the amount of tension or drag placed on both the upper thread and the lower thread must be precise and balanced.

Think of the stitch process as a tug-of-war between the upper and lower threads. The desire is that neither overpowers the other. Too much tension on the upper thread, (or too little on the bobbin thread) will result in bobbin thread being pulled up from below, such that it's visible in along the edges of the area being stitched. Too little tension on the top (or too much on the bobbin thread) leads to loops forming in the area being stitched.

For the beginner, setting thread tensions can be a frustrating chore, as adjustments will have to be made periodically depending upon sewing conditions.

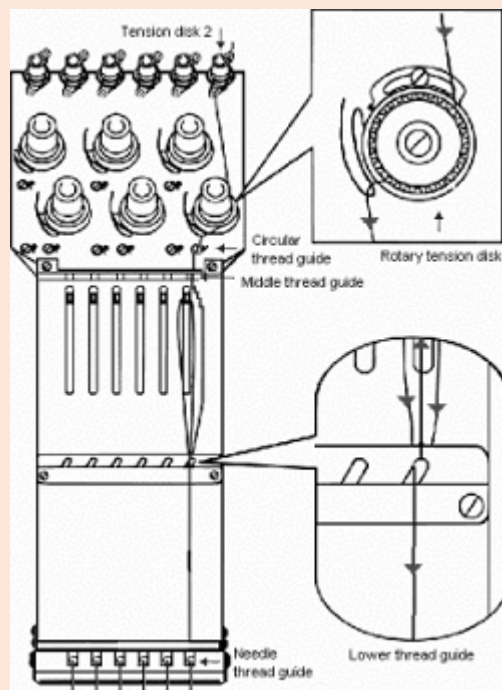


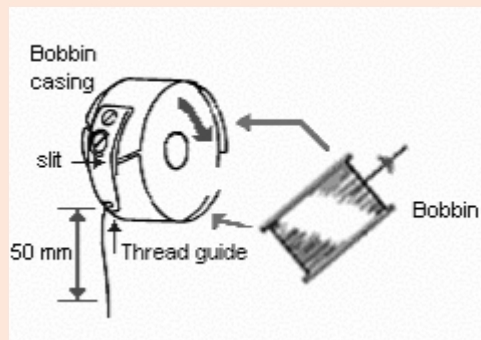
Diagram of the Upper Thread Path

### **Setting The Upper Thread Tension (Using the Tajima Tension Gauge)**

Each time you install a new cone of thread, you must check the tension for that specific thread. Also, you may need to make some adjustments for different types of garments being sewn.

1. *Pickup the **thread tension gauge** and hold it so that you can clearly see the numbers.*
2. *Verify the gauge is set to Zero. If not, turn the middle knob near the hook end of the gauge to unlock the gauge adjustment knob. Turn the inner knob until the red line is at the zero point. Adjust the middle knob to lock the adjustment knob in place.*

3. *Hook the desired thread with the end of the tension gauge*
4. *Gently pull the gauge away from the machine with the numbers facing up. Pull no further than 2 feet.*
5. *The tension should read:*
6. *100 - 130 grams for rayon thread*
7. *110 – 150 grams for polyester thread*
8. *If the upper thread is too loose adjust the #1 Tension Set and the Rotary Tensioner by twisting the control knobs in a Clockwise direction, which will increase the amount of tension. Recheck with the gauge.*
9. *If the upper thread is tight, adjust the #1 Tension Set and the Rotary Tensioner by twisting the control knobs in a counterclockwise direction, which will decrease the amount of tension. Recheck with the gauge.*



**Bobbin and Case Diagram**

### **Setting The Bobbin (Lower Thread) Tension**

Each time you install a new bobbin, you must check its tension. Also, you may need to make some adjustments for different types of garments being sewn. In addition, the last 10% of a bobbin thread tends to have a rapidly changing degree of tension, so it's acceptable to discard the bobbin before it completely runs out, in order to avoid this problem.

*Though an optional bobbin tension gauge can be purchased for your machine, the tension can be accurately set using what's known as the "drop test." Perform the following steps to learn this simple process:*

1. *Remove the bobbin case from the rotary hook.*
2. *Unwind the bobbin thread from the pigtail, but do not remove it from under the thread tension spring.*
3. *Place the bobbin case, with the bobbin installed, in the palm of one hand. With the other hand grasp the end of the bobbin thread, and gently pull out about 12 inches of thread.*
4. *Gently lift up and suspend the bobbin case above the palm of your hand.*
5. *The bobbin should not drop, but remain suspended in the air about an inch above your hand.*
6. *Gently bob your wrist (hand holding the bobbin thread) and check that the bobbin drops a few inches then stops.*

7. *If the bobbin does not drop, then the tension is too tight. Adjust the tension screw (the larger one) on the **tension spring** (clip) counterclockwise to reduce the bobbin tension. If the bobbin drops freely, then the tension is too loose. Adjust the tension screw clockwise to increase it to increase the bobbin tension.*
8. *Wrap the bobbin thread back around the pigtail and install the bobbin case into the rotary hook.*

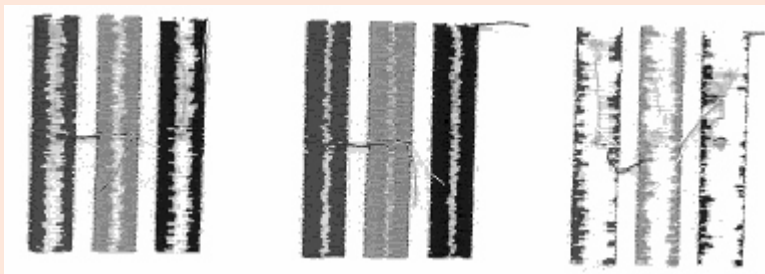
NOTE: IF dirt builds up under the Thread Tension Clip/Spring on the bobbin case, it will cause the tension to be too loose, no matter how much the screw is tightened. Each time you change out the bobbin, you should inspect and clean the bobbin case.

### **Testing The Tension Setting – The FOX Test**

Once you have adjusted both the Upper and Lower Tensions, you should perform the FOX test. This involves sewing the word FOX in 1” tall, block letters on a test sample of fabric. Upon completion, examine the backside of the embroidery. You should see three parallel sections of thread, from left to right across each column as follows – Upper/Lower/Upper – in even thirds. (This is also referred to as the “thirds” test.)

If there is more Lower Thread visible than upper thread, then the upper thread tension is too tight or the lower thread tension is too loose.

If there is more Upper Thread visible than Lower Thread, then the Upper Thread Tension is too loose, or the Lower thread Tension is too tight.



FOX Test Diagrams

Referencing the diagrams above, the sample of the left illustrates the desired tension. The sample in the middle doesn't have enough bobbin thread showing, while the one on the right has too much bobbin showing.