



# Thread Tensions – All Machines

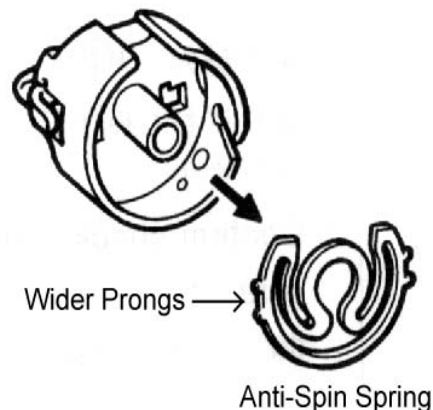
For Technical Assistance Please Call Toll Free 1-877-4BROTHER

Below are items related to thread tensions and tension problems as found on Brother embroidery equipment. They are listed in the order that they most often occur. Use this form only as a guide. Following this guideline will help with proper tension adjustments to reduce puckering of the fabric and reduce thread breaks. For best results, use genuine Brother parts.

## 1. Anti – Spin Spring for Bobbin Case

### ▪ What is it for?

Also called the “No Backlash Spring”. It is used to keep the bobbin from spinning after the take-up lever has pulled the stitch tight. If allowed to spin this would cause the bobbin thread to be thrown out of the groove in the bobbin causing a very loose tension as the machine starts up again. Some may say they are not required on embroidery machines, but with the speeds achieved on Brother embroidery machines today, they do make a difference. Running the machine with out one may not cause an immediate problem, but they do make a difference and are needed in these types of machines with jumbo bobbins. It is strongly recommend when replacing one, to replace it with a Brother Anti-Spin Spring p/n#S35583001, which comes in the Brother bobbin case assembly p/n#S35584001.

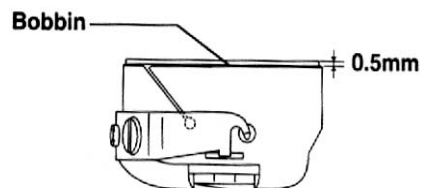


### ▪ When do you check it?

At installation of machine and at every bobbin change.

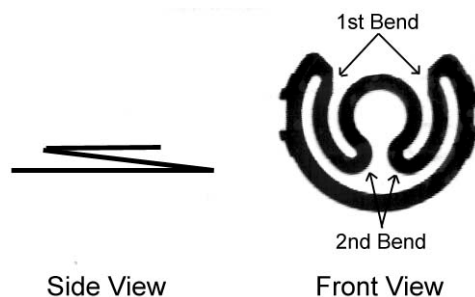
### ▪ How do you check it?

Install a brand new bobbin, (for the correct weight), in the bobbin case. Hold bobbin case level with open side up or lay upside down on a table. The bobbin should be .5mm above the top of the bobbin case. I recommend the pre-wound, with two cardboard sides that have a serration on the flat surface of the cardboard. This helps slow down the bobbin when in machine.



### • How do you adjust it?

Remove the spring by taking it out with a small slotted screwdriver. Note how you took the anti-spin spring out of the bobbin case to adjust it, as it will only go back in properly one way. You will need to bend the spring in two places so that the spring will be even against the bobbin as illustrated. Re-insert the spring and recheck your adjustment. Try to make it as even as possible all the way around the bobbin case. You may need to repeat this procedure a few times until it is correct.





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## 2. Bobbin Case Tension

- **What is it for?**

To keep under thread tension constant, works with top thread to form a proper stitch.

- **When do you check it?**

At install and at every bobbin change. When tensions are believed to be the problem, **ALWAYS** check and adjust bobbin first if necessary. The bobbin tension will change over time due to lint build up underneath its tension spring.

- **When do you clean it?**

Clean the bobbin case when you can no longer get enough tension on the bobbin. For example, when the adjustment screw is turned all the way down or the bobbin tension becomes erratic.

- **How do you clean it?**

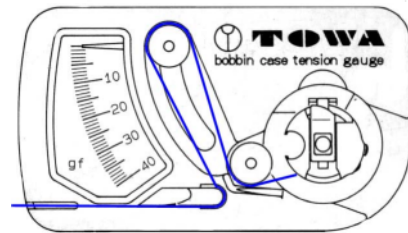
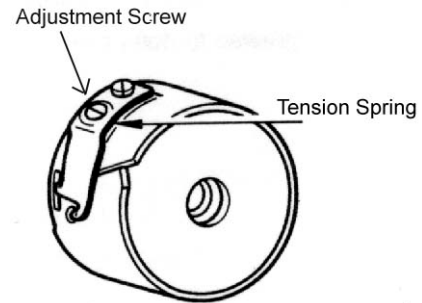
Loosen the adjustment screw until the spring lifts off the bobbin case about 1mm. You may want to do this over a table just in case you loosen the screw too much and it falls out. It will make it easier to find. Then using the corner of a piece of backing, rub underneath the spring to remove any lint buildup. Then adjust by retightening the screw and recheck your tension.

- **How do you adjust it?**

One of the most accurate ways to check the bobbin tension is with a bobbin tension gauge. The gauge will take into account the pressure of the anti-spin spring while setting the tension. Adjust the bobbin tension after adjusting the anti-spin spring and cleaning under the bobbin tension spring on the bobbin case. You will not need a full bobbin to check the tension when using the gauge.

When inserting the bobbin into the bobbin case it should spin clockwise when viewed from the backside. Insert the bobbin into the gauge and adjust the tension between 15-30 grams with 22 grams being ideal. Read the tension of the gauge while pulling the bobbin thread slowly out away from the gauge. Do not pull too fast or too slow as these are not realistic speeds of the bobbin. It is important to pull the thread smooth and steady to get a good reading. If you see the needle on the gauge jumping up and down, there could be a problem with the sides of the bobbin itself. The cardboard could be bent over or the bobbin could have been wound incorrectly. If you see the needle on the gauge jumping up and down, the machine will have erratic tensions looking tensions of the backside of the garment as well. Discard or fix that bobbin if possible. You will want the bobbin thread to come off bobbin as smoothly as possible.

**Checking without** a bobbin tension gauge. First clean under the tension spring on the bobbin case, and then insert a new bobbin. Hold the end of the bobbin thread up and find the point at which the tension spring will hold the weight of the new bobbin and the case. Adjust the tension spring to let the bobbin and case start sliding down the thread by its own weight. This method is not meant to replace the use of a gauge, but to get you close to proper tensions if you do not have one. You may need to further tighten the adjustment screw if the bobbin thread is showing on the topside of the fabric while sewing.



Part # BTG3





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## 3. Main Tensioners

- **What are they for?**

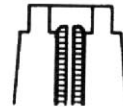
Main upper thread tension control of machine.

- **When do you adjust them?**

At install, then only after bobbin has been cleaned and adjusted first. Run a tension test first, if you are still having trouble check the thread path and rethread the complete path for the troublesome needle or change out the needle.

- **How do you adjust them?**

At installation and for any tension problems after the bobbin has been adjusted as well as testing for proper tensions. A good starting point is when the top of the black screw located inside the white tension knob is flush with the start of the screw threads inside the tension knob, then turn the knob clockwise (tighten) two more turns. For looping problems, turn knob clockwise (tighten) no more than one half turn at a time. If you have to turn the knob more than two to three turns, then there may be something else that needs to be checked. For bobbin thread showing on top, turn the knob counter clockwise (loosen) one half turn at a time. Again if you have to turn the knob more than two to three turns, then there may be something else that needs to be checked.



## 4. Pre-tensioners

- **What are they for?**

To provide enough tension so that the thread turns the thread break sensor wheels.

- **When do you adjust them?**

At install, after removing & cleaning them, and also as a last resort along with Thread Tree Tensioners for individual needle tail lengths during trims.

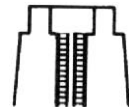
- **How do you adjust them?**

- **Plastic Knob Type**

Adjust by turning the knob until the top of the silver screw inside the knob, is even with the step inside the knob where the screw threads start.

- **Metal Knob Type**

Screw the knob down until the top of the knob is even with the slot in the stud.



## 5. Thread Tree Tensioners

- **What are they for?**

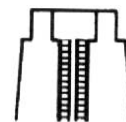
To take the looseness out of the thread between the thread stand to the tension base on the machine head.

- **When do you adjust them?**

At install, after removing & cleaning them and as a last resort along with pretensioners for individual needle tail lengths.

- **How do you adjust them?**

Adjust by turning the knob until the top of the silver screw inside the knob, is even with the step inside the knob where the screw threads start. If you have long tails, adjusting for individual needle tail lengths by tightening the white knob one full turn, then test trim to view outcome. If the tails are too short then loosen knob one full turn and test trim to view outcome of adjustment.





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## 6. Check Springs

- **What are they for?**

To help keep the slackness out of the thread as the take-up lever is moving into position to tighten the stitch.

- **When do you adjust them?**

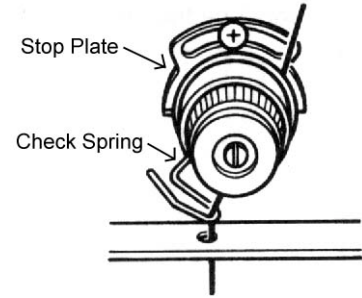
Looping problems, or for thread that may slip off the main rotary tension disk.

- **How do you adjust them?**

With the thread off of the check spring, use a flat tip screwdriver to turn the black screw inside the main tension control knob counterclockwise (loosen) until the check spring comes off of the silver metal stop plate along the left side of the main control knob.

Then turn the screw clockwise (tighten) until the spring just touches the stop plate, and continue turning approximately 1/8 to 1/4 turns, further clockwise (tighten). This would be the normal position of the check spring.

If you have a looping problem that could not be solved by any other means, the silver stop plate could be adjusted by loosening the phillips screw above main tension control knob and rotating the silver stop plate clockwise until the space on the right side of the phillips screw looked to be larger than space on the left. This would mean that the check spring will have to travel further to get to the stop plate, make sure the check spring is readjusted to match as described above.



## 7. Thread Path

- **What is it for?**

The thread path lines the thread up for proper functions of all mechanisms in the thread path and is also another form of thread tension, and thread tension problems.

- **When do you check it?**

If the machine was sewing correctly and you just started having a problem on a needle.

- **How do you adjust it?**

Remove the thread completely out of thread path. Rethread completely, and as you are threading it, keep pulling on it as you go through the eyelets and other guides to see if tension has changed dramatically. If at any point you feel a difference in tension, look at that area just threaded closely. You may have to use some fine abrasive cord, through the eyelet or around the wheel to polish up the area having the problem. The take-up lever eyelet is one of the main areas of thread guide tension problems. The surface of the eyelet may be come tarnished from metallic thread or the environment, causing a dramatic increase in tension. Try the abrasive cord here or even some silicone spray in the eyelet. Make sure that the thread is wrapped two turns clockwise around thread break sensor wheel. It can be wrapped more if a technician feels it would help. It should also flow smoothly as it comes off the wheel. When the thread is going around the main rotary tension disk, the thread should be wrapped around the groove of the disk one and one half turns clockwise. If the metal disk does not rotate smoothly during the sew off, remove it, and clean the metal wheel, sometimes placing a little bit of baby powder on the three pieces of felt helps.



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## 8. Other Notes

- All the above notes, suggestions, recommendations, solutions, etc. are all just guidelines to setting tensions and correcting tension problems. The first thing to always do is to look for the obvious. For example, if you are having “FALSE THREAD BREAKS”. Look at the thread break sensor of your machine. Is it turning or moving properly? Usually you will find that if its not functioning. You must find out why it does not move. On rotary thread break sensors; if the tension is to light coming from the top of it, the loop of thread around the wheel cannot grasp the wheel tight enough to turn it. You may find the problem by examining the area just before the wheel. Usually found is lint or dust under the plate, that the thread is slides under. If too much lint has accumulated in that are, it will not apply enough tension on the thread. On the newer style pretensioners with the white knob, spring and two tension disks the thread is suppose to pass between the disks to the left. Sometimes these disks look parallel, but need to be straightened.
- The next thing to do is set bobbin tension. The bobbin is used with every needle. All bobbins are not wound exactly the same. As a precaution, you may want to check your bobbin tension when replacing the bobbin. When sewing hats, the lint from some hats fall into the bobbin causing the tension to change, even after a few hats, so check and clean the bobbin case often when sewing hats. Clean the bobbin tension spring, set the anti-spin spring and try again.
- Now that the bobbin is set to an exact tension you can adjust the top tensions. This is easy to do once the bobbin has been set. Sew out the bobbin tension test most of you should have. Which is nine or twelve different color letters, depending on the amount of needles your machine has. This could be a letter “H” sewn out at 1”and add plenty of pull comp to make them wide. Or the “I” test also with plenty of pull comp to be wide. After sewing this, look at the bottom of sew out to determine proper tensions. Ideally, you should see the white streak of bobbin as wide as the two outer streaks of thread 1/3, 1/3, 1/3. Anything close is acceptable. If all the needles are the same width, but the bobbin streak is thinner, you can adjust the bobbin by loosening it, then all the streaks will become wider on the next sew off. But by doing this, you have changed your bobbin tension to a lighter setting. You could change each individual top main tensioner instead by tightening each of them one turn clockwise, which will cause the bobbin streak to become wider on the next sew off. Take a good look before adjusting too much and if the bottom of your sewing is not picture perfect adjust to the best of your ability.
- To review... Step 1. Look for the obvious  
 Step 2. Adjust the bobbin case  
 Step 3. Check the thread path  
 Step 4. Check the pretensioners  
 Step 5. Adjust the main tension