

Adjusting the Rotary Hook Timing using the RhAT

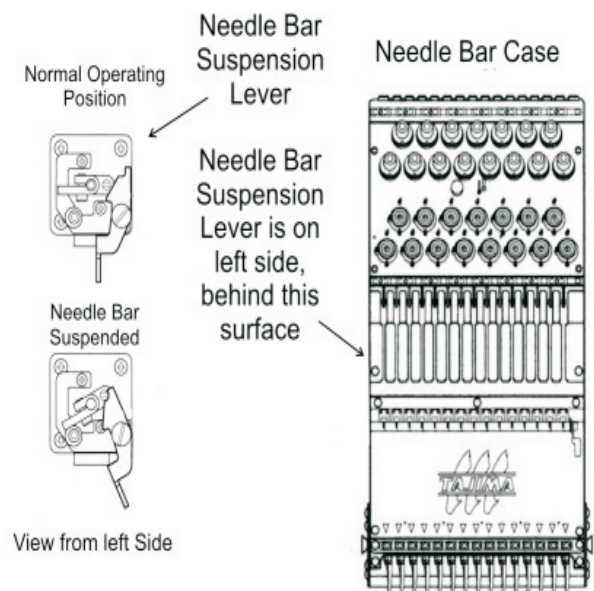
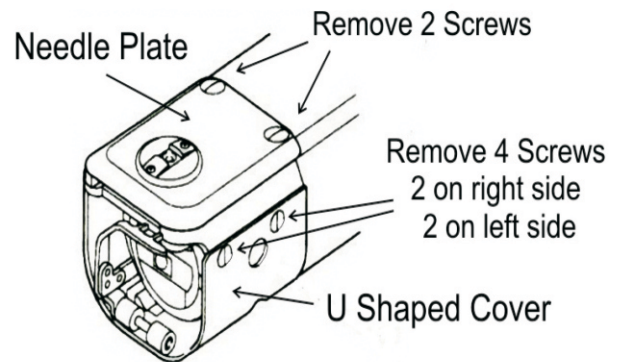
To use the RhAT, the main shaft of the machine must be able to be rotated to the setting position, either mechanically or electronically, while the needle bar is disengaged and free to be lowered independently. If you can turn your machine's main shaft manually without the needle bar moving, you should be able to use the RhAT.

Many of the larger and multiple head Tajima and SWF machines have a Needle Bar Suspension Lever.

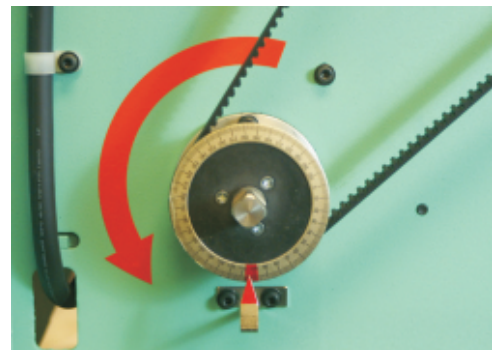
The following instructions use references to the parts for a Tajima TFMX machine. Your machine may be different and the parts for your machine may have different names.

Remove two screws and the Needle Plate (this may also be called the Throat Plate). Remove four screws and the U Shaped Cover from the lower arm of the machine.

Pull the **Needle Bar Suspension Lever to the front**, disengaging the Reciprocator. Turn off power to the machine.



The Degree Wheel for the main shaft should be in the red zone. The picture on the right shows the degree wheel with the end cover removed. You do not need to remove this cover to use the RhAT.

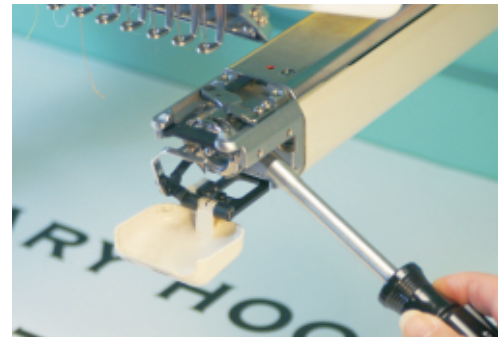


Remove the Bobbin.

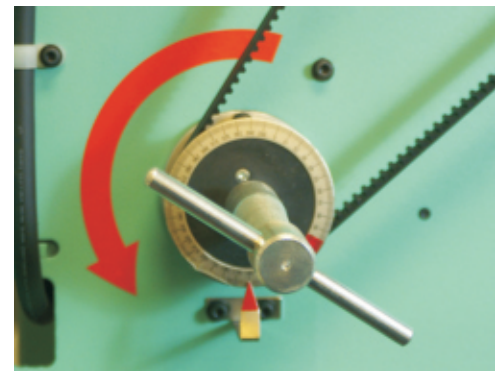
There are three screws securing the Rotary Hook to its shaft. Two are recessed and one protrudes.



With the degree wheel for the main shaft still in the Red Zone, you can loosen one of the recessed screws from the right side of the arm.



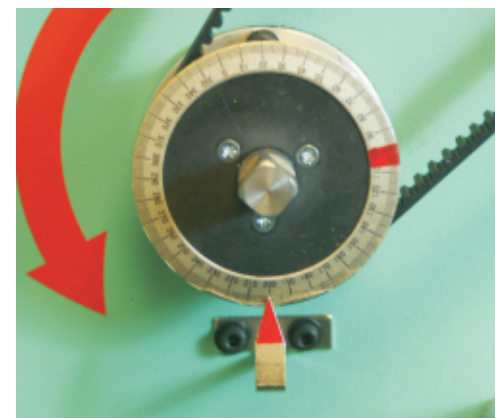
Rotate the Main Shaft using your T-Handle in the correct direction (counterclock-wise on the TMFX) until the pointer is at 160 degrees.



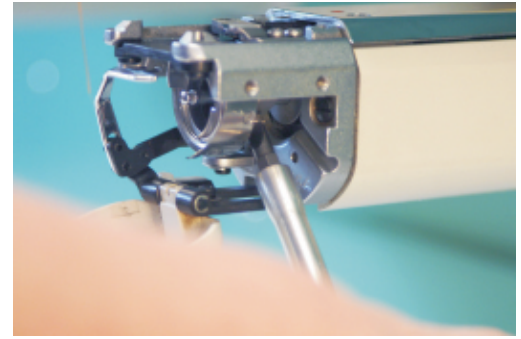
VERIFY that the Needle Bar is not moving while the shaft is rotating. Rotating the Main Shaft while the Needle Bar is connected to the Main Shaft can damage your machine if a RhAT tool is installed in the machine.

At 160 degrees, you can loosen the other recessed screw in the Rotary Hook.

Rotate the degree wheel to 201 degrees for the Tajima. If your manufacturer recommends a different setting point, use that point. Make sure you do not turn the main shaft backward. If you go past the 201 degree mark, go another full turn. Rotating the shaft backwards will induce slack into the gears and affect the timing of the Rotary Hook.



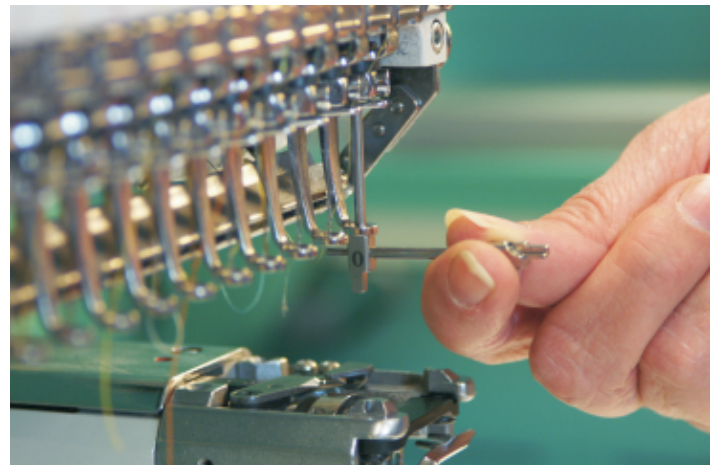
With the Degree Wheel at 201 degrees, you can now loosen the protruding screw on the Rotary Hook. The Rotary Hook should now be free to rotate and slide on it's shaft.



RHAT Tool Box



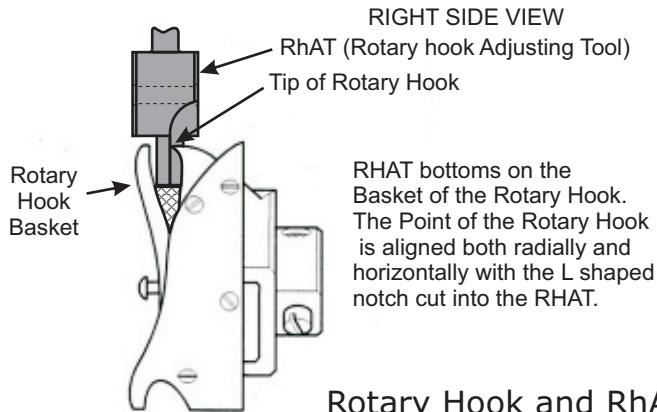
Remove the needle that is currently in position over the Lower Arm. Replace it with one of the RhAT tools. There is a hole through each of the RhAT Tools. Stick the small end of another RhAT Tool into the hole in the RhAT tool that is being loaded and use it to align the RhAT tool as shown in the picture. The number for the RhAT Tool being used for adjustment should be facing the left side of the machine. Proper alignment is important. The tool needs to be square to the frame of the machine.



There are 5 RhAT tools in the set. You should start your adjustments with RhAT 0. The RhAT 0 will provide an adjustment setting in the middle of the recommended gap for most machines. The +1 RhAT adds approximately .002" to the gap and the +2 RhAT will add .004", usually the maximum recommended gap. The -1 RhAT will narrow the gap by about .002" from that provided by RhAT 0 and the -2 by about .004". The gap provided by using -2 corresponds to the smallest recommended gap.



The RhAT Adjusting Tool Set includes a small spring clamp. You will need to use the spring clamp to hold the Needle Bar down. With your left hand, pull the needle Bar down while you rotate the Rotary Hook into position.



RHAT bottoms on the Basket of the Rotary Hook. The Point of the Rotary Hook is aligned both radially and horizontally with the L shaped notch cut into the RhAT.

Rotary Hook and RhAT tool shown off machine.



Guide the point of the Rotary Hook into the slot on the back of the RhAT adjusting tool. The bottom of the RhAT Tool should be able to rest on the Basket (which normally holds the bobbin) of the Rotary Hook. See illustration above. With the RhAT bottomed out on the basket, use the spring clamp to hold the Needle Bar down.



With both hands now free, you can rotate the Rotary Hook counter clockwise while sliding it forward so the point of the Rotary Hook is nestled into the slot at the on the back of the RhAT.



Verify that the arm of the bobbin support is still nestled into the slot on the front of basket (the inner part of the Rotary Hook).



Be careful to NOT EXERT pressure that will deflect the RhAt and/or the Needle Bar. If you see the RhAt or the Needle Bar shift or deflect, either to the left or forward, you are pushing to hard and your adjustment will be wrong. While holding the Rotary Hook in position with your left hand, tighten the protruding screw on the Rotary Hook. This may take practice. CHECK YOUR WORK.

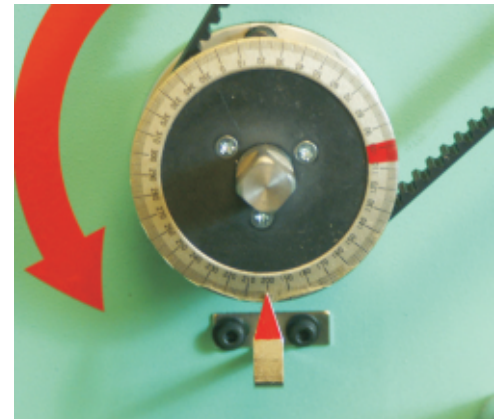


If properly adjusted, you should be able to make the RhAt and the Needle Bar deflect by gently rotating the Rotary Hook counterclockwise or by pulling it forward. Even a slight pressure on the Rotary Hook. should just make it move. When you release the Rotary Hook, it should return to a free position. AGAIN, THIS MAY TAKE PRACTICE. It is a lot easier to attain a repeatable correct result using the RhAT than it is to attempt to hit a two dimensional spot (radially and laterally) in space while you are only estimating the clearance required for the gap.

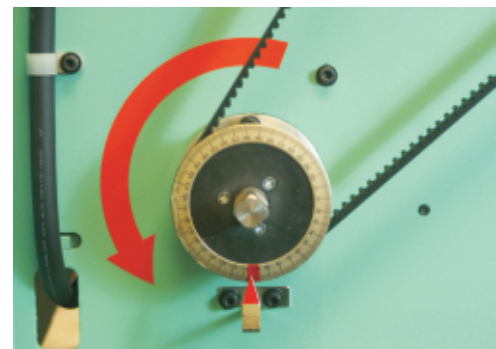
Remove the Clamp and allow the Needle Bar to retract.

Remove the RhAT.

Rotate the Main Shaft to 160 degrees. Tighten the one accessible recessed screw on the Rotary Hook.

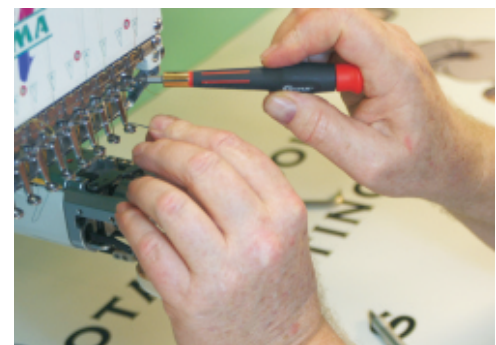


Rotate the main shaft to the Red Zone. Tighten the other recessed screw.



Replace the needle in the needle bar. Make sure the needle is aligned.

An easy way to get the needle into position is by using an old needle. Stick the old needle's point in the new needle's eye and use it to hold the needle up in the needle bar while tightening it. This should get you close.



Included in the RhAT set is a cylindrical magnet. Use it to verify that the grooves in all of your needles are aligned. Each needle has a groove ground or formed in it's face, a slot for the thread to ride in.

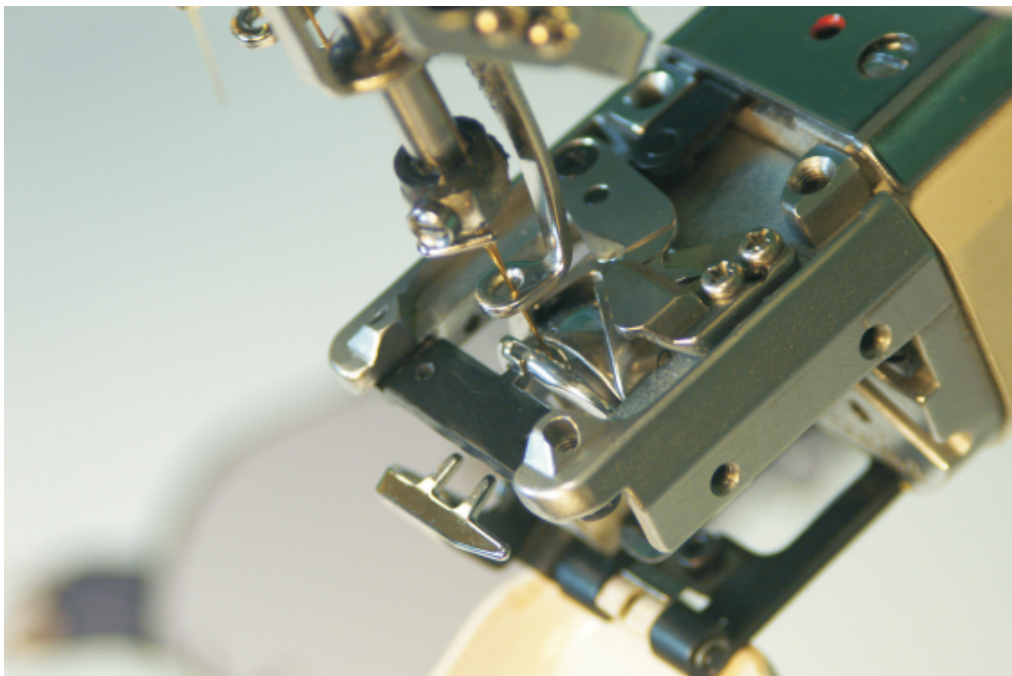


Place the magnet on the front of each needle across this groove and it will indicate whether it is straight or not. If it is at an angle, correct it. A rotated needle will cause frayed and broken thread, as it will affect the timing and clearance of the Rotary Hook. Check your needles whenever you change them.



Move the Needle Bar Suspension Lever to the rear. Rotate the main shaft until 201 degrees is displayed on the Degree Wheel. The needle should have descended and started back up.

CHECK YOUR WORK. The point of the Rotary Hook should be directly behind the needle. The gap should be just large enough for a thread to go through. A gap that is too wide will cause looping and missed stitches. A gap that is too narrow will result in numerous thread breaks. That is why there are five tools included with the set.



Reinstall the U Shaped Cover and the Needle Plate. Replace the bobbin. Rotate the Main Shaft back into the Red Zone. Restart the Machine.

Do a trial sewout. An embroidery design is available from our "Using the RhAT" page that will let you check the sewing condition for all your needles on each head. It stitches in every direction and runs both a Tatami fill and a Satin stitch for every needle.



While taking the photos for this pdf, we reset both rotary hooks. The results of that sewout are as shown, first time on both heads, tight stitches. There were no broken threads during the sewouts. We used RhAT tool +1, as we have found that we sometimes break needles on 6 panel caps when stitching over a Tatami fill (see the blurb on the home page). Your machine may run best when adjusted with a different RhAT tool.



These sewouts were done with a combination of Neon and Rayon thread from three manufacturers. They were stitched on two layers of backing.

It is a good practice to take your sewouts, record the date, the head number and the RhAT tool # that was used on the back. Then you have something to compare it with if something has changed.

The thread should be tight on top and only have about 1/3 of the bobbin thread showing underneath. If some colors or needles sew better than others, check your tensions. You should invest in a Upper Thread Tension Gage and use it whenever you change threads. Tension should always be the first thing to check when loose stitching is encountered.

The RhAT tool set will also allow you to fine tune the radial position of the Rotary Hook. Keep a record of which RhAT tool you used and on which head. Record the degrees it was set at. If the rotation is off by a few degrees after (the rotary hook arrives late behind the scarf of the needle) the stitches may be loose and the quality of the embroidery will be poor. If the rotation is off by a few degrees before (the rotary hook arrives early before the loop is fully formed), the stitching may be tight but the machine may miss or fail to make stitches.

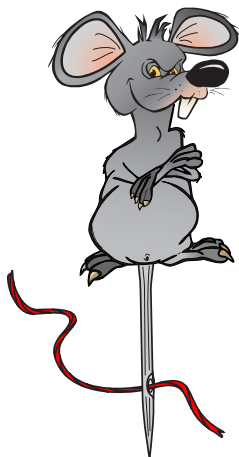
Under no circumstances shall RhAT.com or Hogwild Imprints, Inc., it's principals or owners be held responsible for injury to technicians or operators, to machines, equipment, garments and apparel, either while using the RhAT tools or after using it to make adjustments to your machine.

The RhAT tools have been made to facilitate a mechanical adjustment to the position of the Rotary Hook(s) radial and axial positions only. The RhAT tools must be removed from the machine before the machine is put under power.

Operation of the machine under power with the RhAT tool installed will almost assuredly cause damage to the machine and/or personnel.

The RhAT tools cannot compensate for a machine that has excessive wear and needs repair. Use of the RhAT tools will not eliminate all thread and needle breaks. There are many causes for thread and needle breaks and poor stitch quality. The RhAT tools only provide assistance in setting the Rotary Hook Timing and Gap.

To use the RhAT tools, the hole in the presser foot needs to be larger than .105" diameter, the same size as many of the plastic ink cartridges in a cheap ball point pen.



NOTICE for New Tajima Owners

Tajima has recently made a running change to the diameter of the hole in the presser feet on **some** machines. It was 3mm and has now been reduced to 2mm, which is smaller than the diameter of the shank on the RhAT tools (both the Original and the Universal). The current replacement part for the new presser feet is the old part with the 3mm hole.

If you want to use the RhAT tool on these machines, you can replace one presser foot on each head (typically on needle #1) with the old style. Or you could enlarge the hole in one of your presser feet, but care needs to be used to avoid any burrs or sharp edges that could cause damage to apparel.