



Training:

HAPPY HCD-1501 Operations & Maintenance

Chapter 3: Sewing Checklist and Tension Test

This chapter provides a simplified quick-start checklist for sewing a design, and performing a key adjustment: checking upper and lower tension.

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|--|----------|
| 1. Sewing Checklist | 2 |
| <ul style="list-style-type: none">• Thread check: Upper and Bobbin thread• Design check: color sequence, size, position, selected hoop• Garment: hooping and loading onto the machine• Final precaution: trace, checking clearance• Sewing: Setting speed, what to check during sewing | |
| 2. Tension Test | 6 |
| <ul style="list-style-type: none">• About tension• The test design and what it does• Sewing the design | |

Updated May 21, 2010: simplified into quick checklist and most current knowledge on tensioning. Shows current screen shots from firmware 1.24

Sewing Checklist

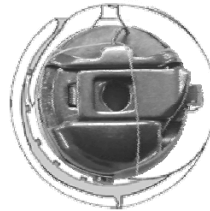
1. Sewing Checklist

2. Tension Test

Thread Check: Upper and Lower thread.

– *Bobbin thread:*

- Properly threaded?
- Tension checked OK?
- Inserted fully into the hook basket?
- Rotary hook door **CLOSED**



Insert bobbin case **FULLY** into hook.

– *Upper thread:*

Referencing the diagram on the right,

- **Are all the colors needed for the design fully threaded?**
- **No loose threads hanging anywhere** (docked in holder spring or in holder behind needle)
- **Thread feeds smoothly without catching** when test pulled through the needle.
- **Needles oriented properly:** eye front-back, scarf facing the rear.

Thread Spool: Ensure that the thread flows freely, no hang-ups.

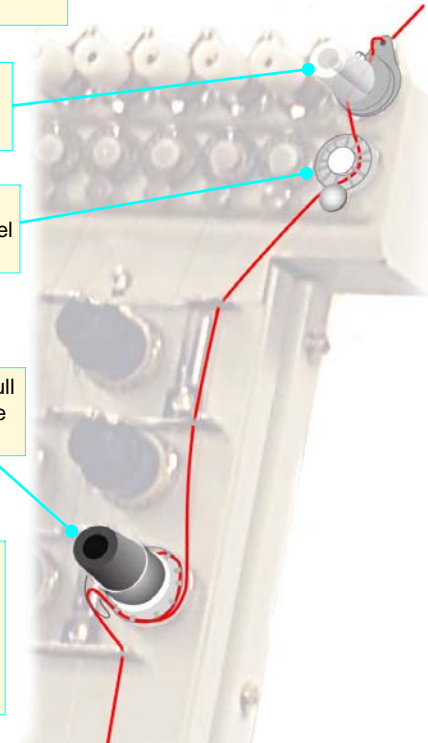
Upper tensioner: ½ turn, runs between the disks.

Sensor wheel: ½ turn, runs inside wheel groove.

Lower tensioner: Full turn, thread in groove of metal wheel

Lower head: Route thread properly up and down the takeup lever, check spring, grommets and guides.

Needle oriented with eye front-back, scarf in rear. Thread through front of eye, end docked in spring or thread holder.



Sewing Checklist

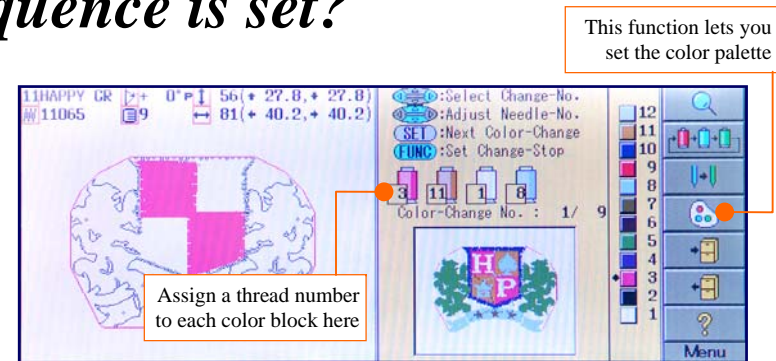
- 1. Sewing Checklist
- 2. Tension Test

Design Check: Upper and Lower thread.

– Needle Screen: Is the Color sequence is set?

Refer to the image of the Needle (color setup) screen shown on the right:

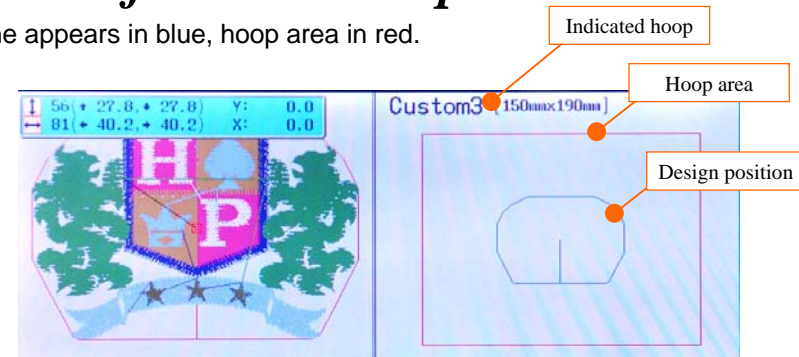
- **(Optional) Color palette matches actual thread colors on each needle** (ensures accurate design preview)
- **Needle number assigned to every color block?** (For blocks with unassigned needle # (value="0"), machine will stop sewing and prompt for a color.)



– Main Screen: Check design position & fit in the hoop.

Return to the main screen. Press the FF key, and the design outline appears in blue, hoop area in red.

- **Be sure the indicated hoop is correct** (this is selected in the the Frame screen)
- **Check that the blue design outline fits inside the red outline.** If not, you'll probably need a larger hoop!
- **Adjust the position if needed** using the blue arrow keys, then press SET.
- **Always TRACE the design** as a last check if not sure.



Sewing Checklist

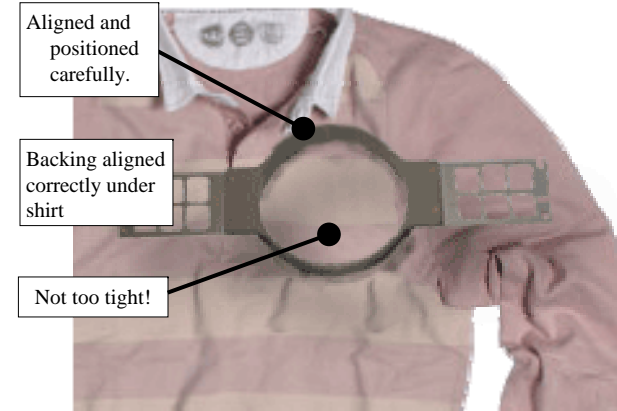
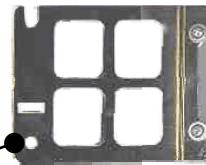
- 1. Sewing Checklist
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Garment: Hooping and Loading on the Machine

– Hooping

Refer to the image of the Needle (color setup) screen shown on the right:

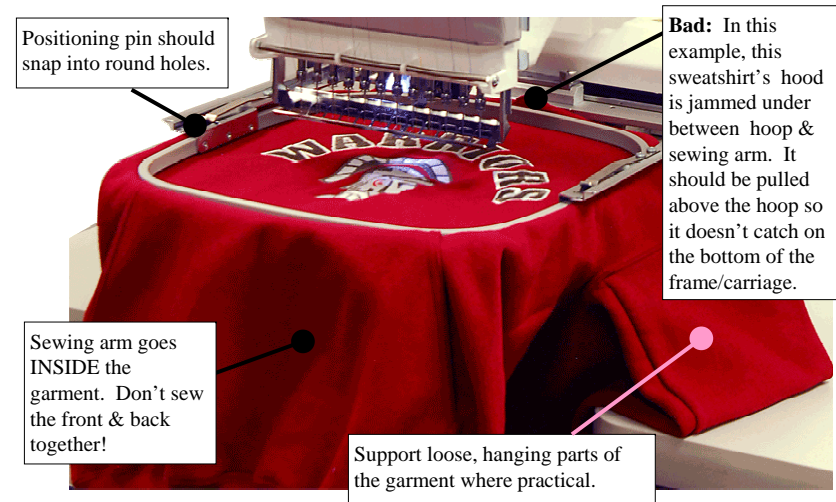
- **Hoop:** Use the smallest that fits the design size.
- **Backing/Stabilizer:** Choose the right type. Should be large enough to overlap edges of hoop under the garment.
- **Alignment and position:** If the hoop isn't aligned on the garment, it won't sew straight!
- **Round holes at bottom:** Make sure hoop is on the shirt so the round holes are towards the operator. Opposite end is towards machine.
- **Tight but not too tight!** Garment and backing should have no slack or wrinkles inside hoop. Adjustment screw tightened enough to hold garment in hoop while sewing, but no more.



– Loading onto the Machine

Referencing the diagram on the right,

- **Positioning pins on arm** must snap into round holes on end of hoop to prevent unhooping during sewing.
- **Sewing arm goes INSIDE the garment, not UNDER,** or machine will sew front and back of garment together!
- **Loose items tucked out of the way.** (sleeves, straps, etc)
- **Heavy items supported where possible** to prevent item from falling out of hoop. Sleeves, and body can rest on table or chair underneath or to the side of machine if needed. Reinforce hoop with clamps or tape if needed.



Sewing Checklist

- 1. Sewing Checklist
- 2. Tension Test

Sewing Your Design

– *Selecting a Sewing Speed*

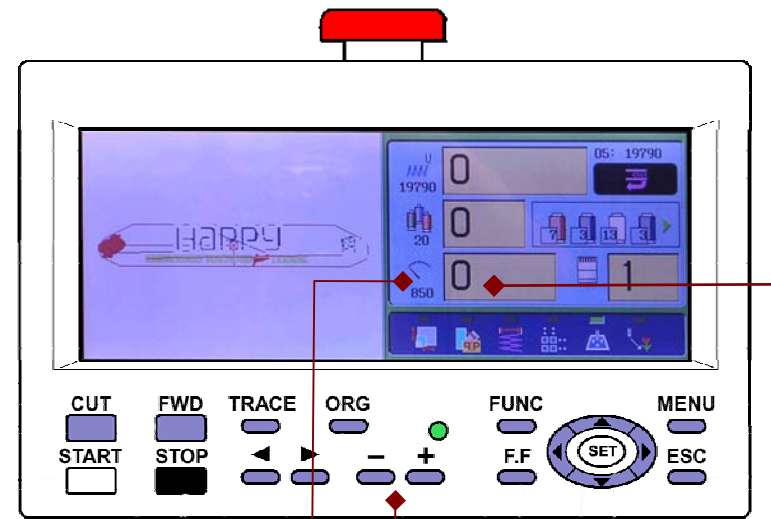
Here are some rules to determine sewing speed:

- **Not so fast!** Higher speeds increase peak tensions & risk, of thread break. Embroidery also sews tighter. Only sew at top speed when absolutely necessary.
- **Strike a balance between** high speed and vibration/noise. Steadier tables/mounting surfaces can help minimize vibration and allow higher sewing speeds.

– *Watch it sew.*

Maximize production and minimize problems by watching the first few copies of a design sew. Watch for the following:

- **Efficient digitizing** – are there a lot of unnecessary color changes and trims eliminated? Was the design created in the most efficient sequence? Does it tend to break thread in certain spots?
- **Quality of the sew-out** – quality problems can be fixed with adjustments to tension, hooping, or editing back in software.
- **Garment behavior during sewing:** Does the garment move freely throughout the sewout, or does it get caught anywhere? Does it stay firmly in the hoop or does it slip? Does it wrinkle or shift as stitches are applied to it?



Speed control – adjusts max allowable sewing speed up to 1200spm.

Actual speed indicated here depends on length of current stitches being sewn. Stitches longer than 3mm will sew at less than top speed allowed.

1. Set-up Checklist

2. Tension Test

Upper Tension Test and Adjustment

Upper tension is one of the most important adjustments you can make to maximize sewing quality and minimize problems. A good tension test design at the very least samples all of the threads, in satin stitching, in several directions. Follow the steps in this exercise to (1) to sew the design, then (2) adjust tension accordingly until tension is properly adjusted.

1. **Transfer the tension test design** called "hstest15" into your control panel. You can download this from www.happyemb.com in the support section.
2. **Ensure that the bobbin tension** has been set correctly using the drop test. (review Chapter 2– "Bobbin Loading and Tension")
3. **Set the color sequence** In the Needle screen to 1, 2 ,3etc to 15
4. **Hoop an ideal fabric** (2 layers of cutaway backing is usually good enough)
5. **Sew a sample** on the 32 cm square hoop.
6. **Examine the results by looking at the reverse side.** Check each satin sample to ensure there is a white strip of bobbin thread 25%-33% in the center. Then, if:
 - **Bobbin strip is very thin or non-existent: that thread is very loose.** Tighten using the upper tension knob for that needle.
 - **Bobbin strip is a little thin but consistent: thread is slightly loose.** Tighten using the upper tension knob for that needle.
 - **Bobbin strip is wide to a large degree, some of it being pulled around to the front: That thread is very tight.** Loosen using the upper tension knob for that needle.
 - **Bobbin strip is only slightly wide:** The thread is slightly over-tight. Loosen using the lower tensioning knob for that thread.
7. **Note: Make big adjustments.** When tightening or loosening, make several full turns in either direction (turning the knob just a few clicks in either direction will not make any difference in tension.)

