



*Training:*

## *HAPPY HCS-1201 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.

- 1. Sewing Checklist** **2**
  - 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**
  - About tension
  - The test design and what it does
  - Sewing the design

Updated Feb 5, 2010: simplified into quick checklist and most current knowledge on tensioning. Shows current firmware shots from 1.14

**1. Sewing Checklist**

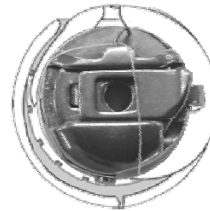
**2. Tension Test**

# 1. Sewing Checklist

## Thread Check: Upper and Lower thread.

### – *Bobbin thread:*

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

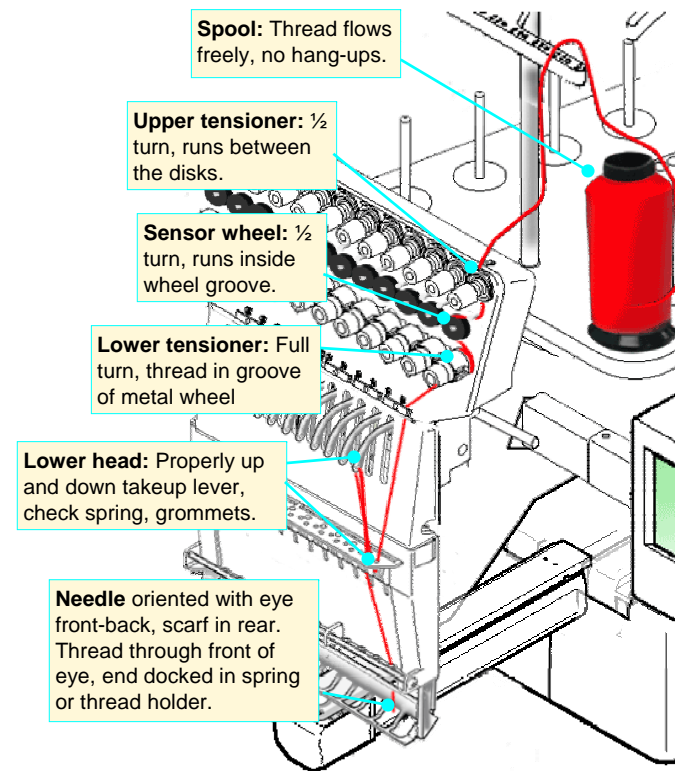


Insert bobbin case **FULLY** into hook.

### – *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.



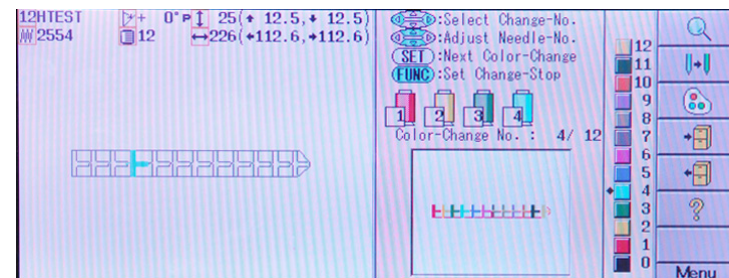
# 1. Sewing Checklist

## Design Check: Upper and Lower thread.

### – Needle Screen: Color sequence is set?

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

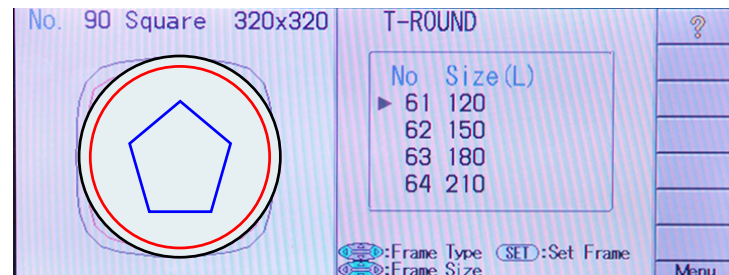
- (Optional) Color palette matches actual thread colors on each needle (ensures accurate design preview)
- Needle number assigned to every color block? (For blocks with unassigned needle # (value="0"), machine will stop sewing and prompt for a color.)



### – Frame Screen: Positioned in a selected hoop?

Referencing the diagram on the right on the Frame screen,

- Has the hoop been selected that matches the actual hoop that will be used?
- Is the design outline (in blue) inside the red safety line?
- Has a trace been run?



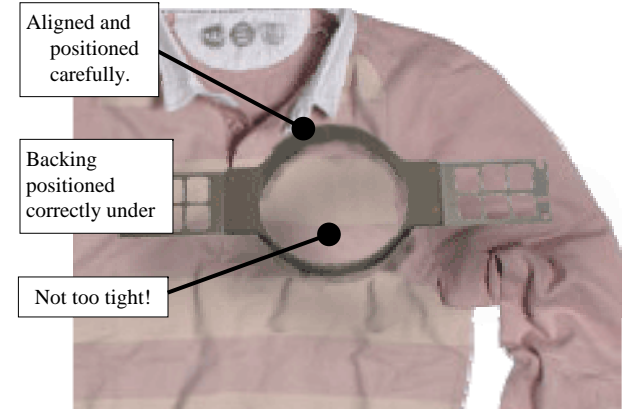
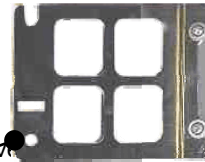
# 1. Sewing Checklist

## Garment: Hooping and Loading on the Machine

### – Hooping

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

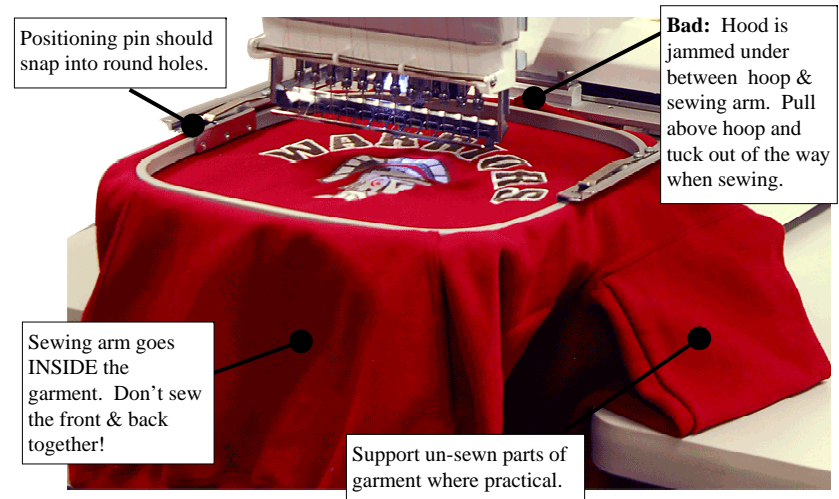
- **Hoop:** Use the smallest that fits the design size.
- **Backing/Stabilizer:** Choose the right type. Should be large enough to overlap edges of hoop under the garment.
- **Alignment and position:** If the hoop isn't aligned on the garment, it won't sew straight!
- **Round holes at bottom:** Make sure hoop is on the shirt so that round 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 the Garment & Hoop

Referencing the diagram on the right on the Frame screen,

- **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.



**1. Sewing Checklist**

**2. Tension Test**

# 1. Sewing Checklist

## Sewing Your Design

### – *Speed*

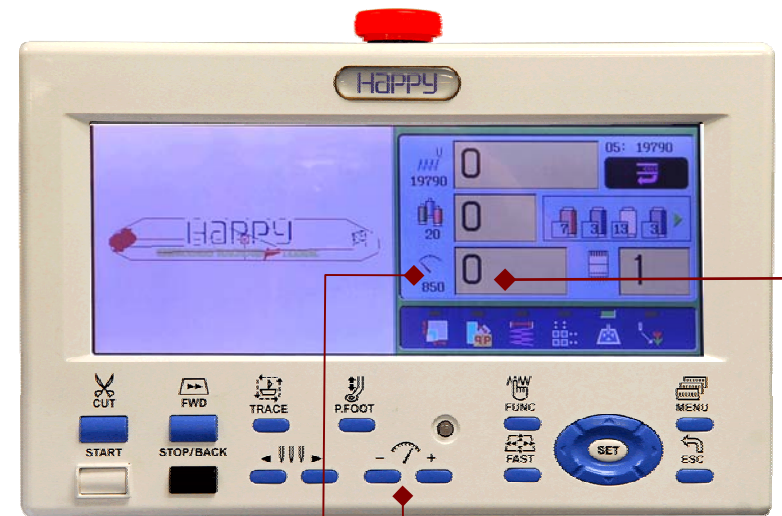
Here are some rules to determine sewing speed:

- **Do not sew at top speed all the time.** Higher speeds put greater tension on threads increasing thread break risk and degrading sewing quality slightly.
- **Strike a balance between** high speed and vibration/noise. The steadier the table the machine is on, the faster you can go.

### – *Watch it sew.*

A lot can be learned from watching the first few runs of a garment sew. Watch for:

- **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.

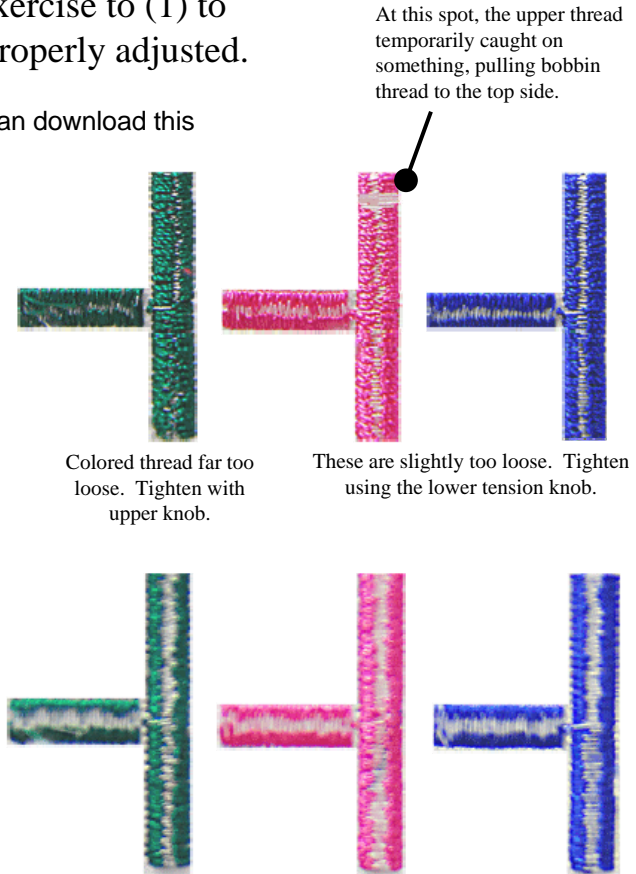
**Actual speed** indicated here depends on length of current stitches being sewn. Stitches longer than 3mm will sew at less than top speed allowed.

1. Set-up Checklist  
**2. Tension Test**

## 2. Upper Tension Test and Adjustment

A useful example is to sew a tension test, which not only walks you through the complete process of sewing a job, but also accomplishes the task of helping you adjust the tension on the upper (colored) thread. 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 "HTest12" into your control panel. You can download this from [www.happyemb.com](http://www.happyemb.com) in the Service section.
2. **Ensure that the bobbin tension** has been set correctly using the drop test. (review Chapter 2 page 5 – "Bobbin Loading and Tension")
3. **Set the color sequence** In the Needle screen to 1, 2 ,3 ....etc to 12
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 consisten: that 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.** Whichever knob needs to be tightened or loosened, make several turns to tighten or loosen.



Colored thread far too loose. Tighten with upper knob.

These are slightly too loose. Tighten using the lower tension knob.

On re-sewing, these 3 sample colors look a lot better.