



Training:

HAPPY HCH-701 Operations & Maintenance

Chapter 4: Troubleshooting and Maintenance

– Basic Troubleshooting/ Sewing Interruptions

- Handling Sewing Interruptions: Thread breaks, hoop strikes, *page 2*
needle breaks, birdnests
- Troubleshooting thread breaks *page 3*

– Maintenance and Upkeep

- Cleaning the rotary hook area *page 4*
- Oiling: daily and weekly schedules

– Advanced Maintenance/Repair Techniques

- Rotary hook timing *page 5*
- Hook retainer adjustment *page 8*
- Setting/adjusting presser foot height *page 9*
- Setting needle depth *page 11*
- Error Code list and measures

Updated September 18, 2013

Recovering From Sewing Interruptions

Your machine remembers the last-sewn stitch and position after most sewing interruptions, including thread breaks, hoop strikes, or shut-down. As long as the garment remains hooped, there is a good chance you can resume sewing once you've fixed the problem. Note: Sudden power loss or emergency shut-down may result in slight mis-alignment.

General Steps for Recovering from Sewing Interruptions

1. **Fix the problem.** Repair thread break/ replace needle, clear any blockage of thread or broken needle. Check that the bobbin and needle are re-threaded properly.
2. **Verify sewing position.** If the current needle does not appear to be over the correct position to resume sewing, press  frame select /position button, then press the "Current Position" If the sewing arm has been moved off the current sewing position, the carriage should return to this position now; otherwise it will not move. The stitch counter should also now reflect the current sewing position.
3. **Back up if necessary.** To prevent gaps, go to the position controls  and adjust the sewing position until satisfied.
4. **Press *START* to resume sewing.**

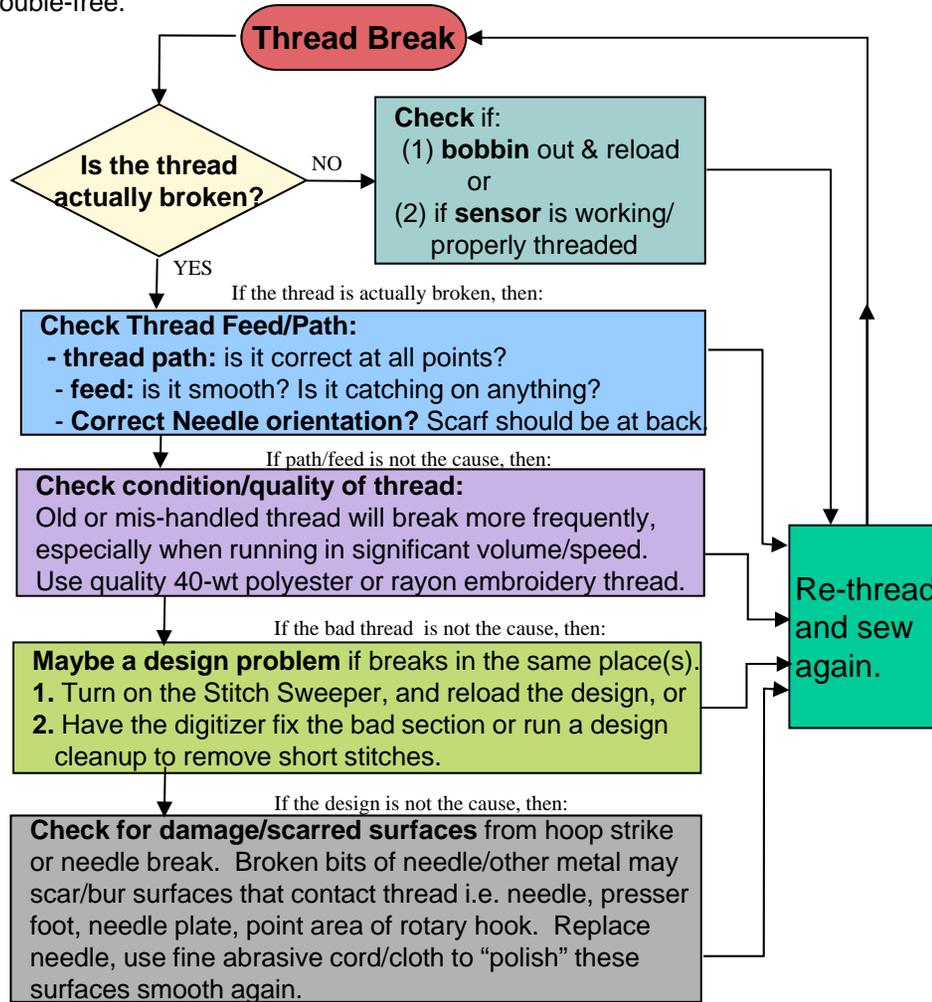
If the Garment Has Become Mis-Aligned

If you find the machine is slightly off-alignment when resuming sewing, follow this procedure:

1. **Make note of the current sewing position (stitch#).** At this point, also make a mental note (best-guess) of how far off the sewing position is, and in what direction.
2. **Return to the design Origin position.** Do this by pressing the  key, then  to return to origin (beginning of the design).
3. **Adjust the position of the hoop** using the arrow keys based on your guess in step 1.
4. **Return to the stitch # of the last-sewn position** by pressing  in the drive screen, and use the controls in the resulting screen to jump to the desired position.
5. **Test-sew or trace to verify before resuming sewing.** If you're still slightly off, repeat steps 1-4 above.

Basic Troubleshooting: Thread Breaks

We've listed the most common causes for thread breaks are listed in a flowchart below, in order of frequency. Learn this checklist to keep your machine sewing trouble-free.



Thread Breaks: Other Causes

Sometimes less-obvious causes may contribute. These regular maintenance steps will further reduce causes for thread break:

Keep Hook Area Clean

Over time, lint, bits of thread and other debris + oil combine in the rotary hook area to coat important sewing surfaces and interfere with sewing. Clean this area from time to time (more if you run your machine hard) with compressed air and/or a spray cleaner such as Hook Wash.

Improper Thread Tension

Over-tight AND over-loose tension either at the bobbin or the upper thread contribute indirectly to thread breaks.

Rotary Hook Timing

If you've eliminated the most common causes, check to see if the rotary hook may have slipped slightly out of time. Read more on rotary hook timing, its significance, how to check and adjust later on in this chapter.

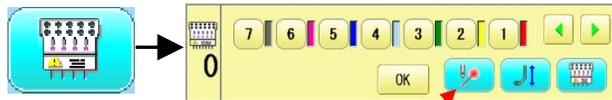
General Maintenance and Upkeep

- Oiling: Use only white sewing machine oil**

There are 2 oiling schedules based on how frequently the machine is used:

- **Daily** (or more if used heavily) – 1 drop of oil on the “race” of the hook as shown on the right. Every 2-3 bobbin changes if sewing nonstop. Every 4-5 bobbin changes for light-duty sewing.
- **Every 40 hours** (as shown in the lower 2 photos on the right)

- (a) **needle bars:** Place 1 drop on the side of each of the 7 needle bars (4 can be seen in the photo, middle right).
- (b) **“cup”** cut-out marked in yellow on the machine, as shown by the red arrow in the photo, lower right. To expose this “cup”, move the head so that the laser pointer is over the needle plate as shown below.



Press to select the laser pointer.



Place 1 drop on this ridge.



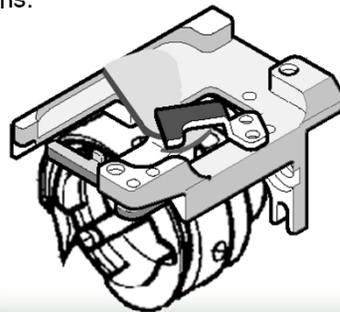
In this photo, the tops of needle bars 1-4 are visible (tip of yellow arrows)



Place 2-3 drops of oil here every 40 hours

- Cleaning**

Clean the rotary hook area on a regular basis (especially with regular use) using solvent and compressed air. Helps prevent buildup of debris/oily film from lint/dust and oil spray. Reduces thread breaks & other sewing problems. Remove the needle plate first to get better access for cleaning.

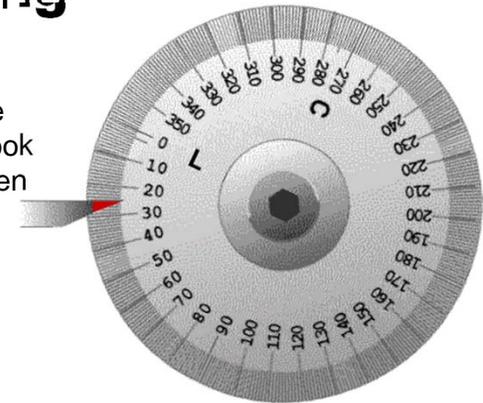


Removing the needle plate exposes more of the rotary hook area for more-thorough cleaning.

Advanced Maintenance/Repair: Hook Timing

Rotary Hook Timing

The rotary hook is responsible for catching the top thread and creating a loop around the bobbin thread in order to form a stitch. To catch the top thread, the point of the rotary hook must arrive at a precise *moment* and *distance* to the needle (timing and clearance). When the timing and clearance are out of adjustment, the machine will generally experience missed stitches, looping, thread breaks and needle breaks.

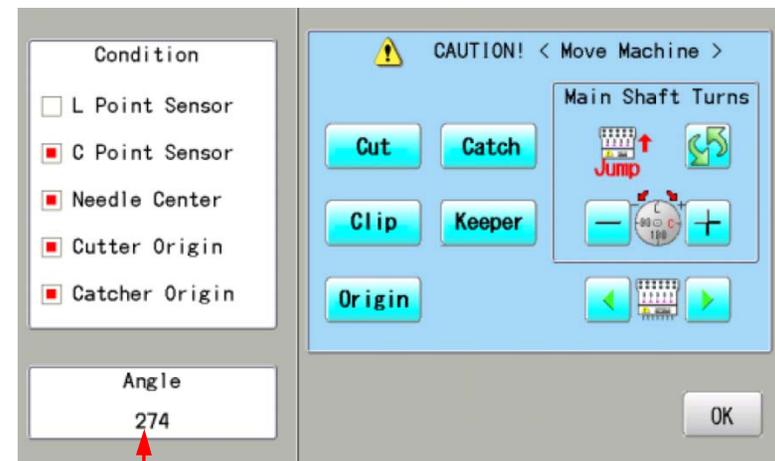


Timing for HCH-701 is at 25 degrees.

Checking Rotary Hook Timing and Clearance

If you suspect that your rotary hook timing is off, you can check this by following these steps:

1. **Power the machine on** and allow it to continue to the main drive screen.
2. **Select needle six (6).**
3. **Remove the needle plate and bobbin case .** Do this by loosening each of the two (2) flathead screws with an offset screwdriver (provided in the machine’s toolkit)
3. **Remove the bobbin case.**
4. **Engage the needle.** Go to the main menu, press **OTHER**, then press **MAINTENANCE**. The screen on the right appears. Press the double green arrow to toggle from **JUMP** to **DRIVE** mode. Press the **+** to slowly turn the main shaft until the needle starts to come down. Continue until the Angle indicator is as close to 25 degrees as possible. (note: the Angle shown is only approximate – you only need to get somewhat close to 25 degrees)
5. **Turn shaft to 25 degrees by hand.** Do this with a 3mm hex wrench. Remove the 2 small round black rubber caps at the rear of the machine and turn the dial exactly to 25.



The indicated shaft position here is only approximate.

Advanced Maintenance/Repair: Hook Timing

Checking Rotary Hook Timing and Clearance (*continued*)

TIMING (left-right) at 25 degrees:

Viewing the hook assembly from the front of the machine, the point of the rotary hook should be hidden behind the needle.

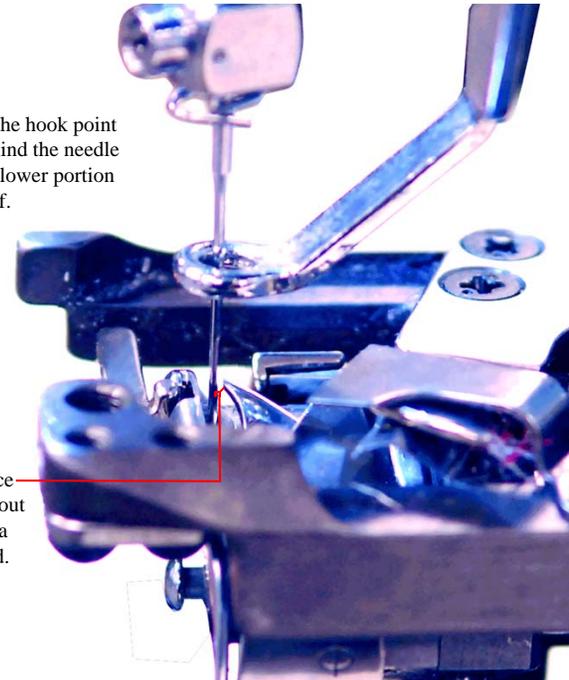


HOOK-NEEDLE CLEARANCE (front-back) at 25 degrees:

From the side of the machine, the point of the rotary hook should be approximately 0.1-0.15mm from the back of the needle (about the thickness of a business card). If the point is either touching or too far from the needle, the machine is not set correctly and will require adjustment.

Note that the hook point passes behind the needle across the lower portion of the scarf.

This clearance should be about the width of a business card.



Advanced Maintenance/Repair: Hook Timing

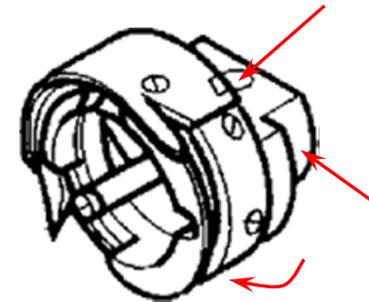
Adjusting Rotary Hook Timing

- 1. Loosen the Rotary Hook.** Do this by loosening each of the three (3) set screws that attach the rotary hook to the rotary hook shaft. Start with the larger screw on the milled flat spot of the hook's neck (lower right). **Loosen screws just enough to break the hook loose on the shaft.** Turn the wheel as necessary to access each screw from either side.
- 3. Reset the dial to 25 degrees.** Check that the needle is lowered into the rotary hook basket once more and that the main shaft dial is set 25 degrees. Adjust the main shaft as necessary by hand at rear of the machine.
- 4. Move hook and tighten screws.** Adjust the timing and clearance simultaneously according to the diagrams on the previous page. Tighten screws carefully. **If necessary, have an assistant hold the main shaft exactly at 25 degrees while positioning and tightening.**

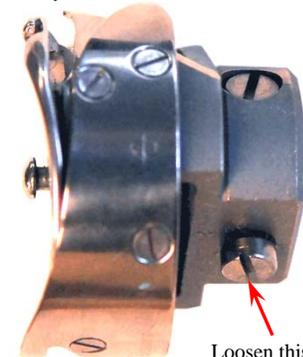
Helpful Hints

- Have a helper hold the timing wheel at 25 degrees with the T-handle wrench as you make your adjustments and tighten the screws.
- Tighten each screw just enough to snug the hook back on the shaft, then re-check the timing, then tighten each screw further. Tighten all screws as firmly as you can manage. When practicing, re-check constantly as each screw is tightened.
- Use a quality flat-tip screwdriver with a wide grip to help you apply enough torque to secure the rotary hook tightly on the shaft.

(3/4 view) 3 set screws are located along the rear "collar" of the rotary hook.



(side view) Turn the hook as necessary for easy access with a screwdriver.



Loosen this screw first before the other 2.

Mechanical Procedures: Hook Retainer Adjustment

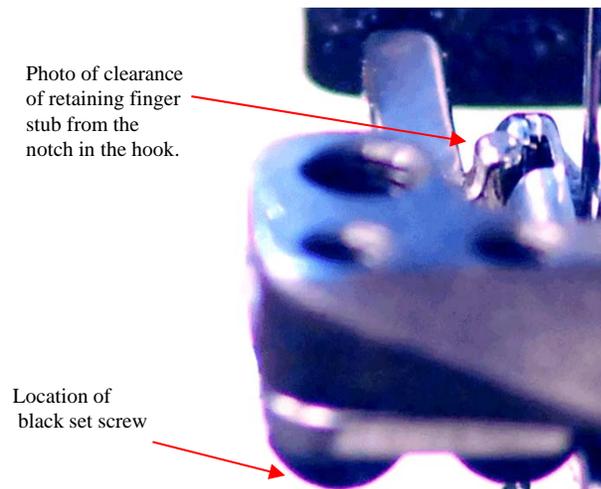
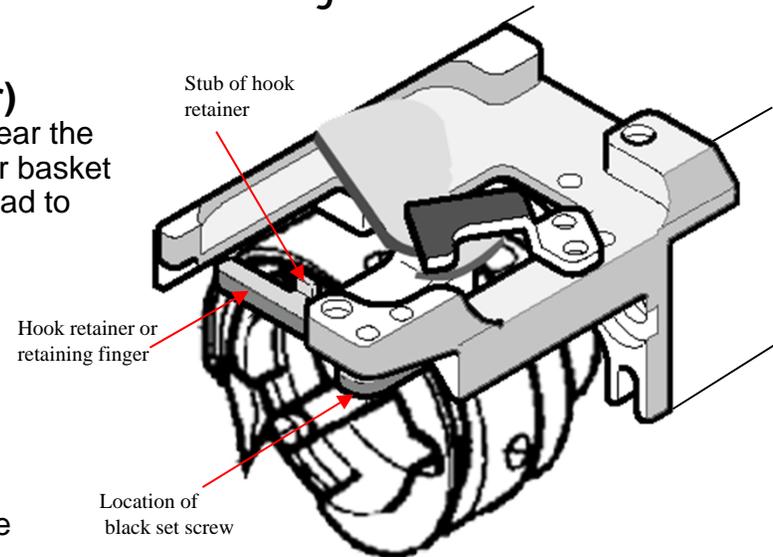
About the Hook Retainer (also called retaining finger)

The hook retainer is located at the front of the rotary hook, near the top of the bobbin case. It is responsible for keeping the inner basket and bobbin case from spinning freely, while still allowing thread to pass across the front of the rotary hook.

Adjusting the Hook Retainer

Follow this short procedure to adjust the hook retainer:

1. **Remove the needle plate.** Do this by loosening each of the two (2) flathead screws with an offset screwdriver.
2. **Loosen the black screw.** But do not remove. This will be the small button head hex screw toward the right corner, facing downward.
3. **Move the retainer.** Looking downward, set the stub located at the center of the retainer to approximately 0.8mm from the back edge of the rotary hook basket; or about halfway into the basket. The photo on the lower right shows a retaining finger close-up with proper clearance.
4. **Tighten Screw.** And check that the inner basket of the rotary hook does not rotate freely.



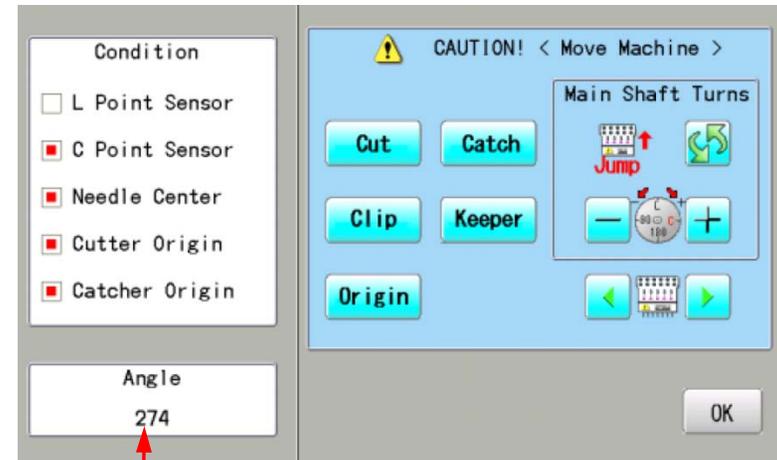
Side view, retaining finger

Advanced Maintenance/Repair: Presser Foot

Inspecting Presser Foot Height

Follow this procedure to check proper presser foot height:

1. **Turn the machine on.** Then press the *Set* button.
2. **Engage the needle.** Do this by pressing the menu button, then **OTHER**, then **MAINTENANCE**. The screen on the right appears. Press the double-green arrow button to toggle from **JUMP** to **DRIVE** mode. Then, press the **+** to slowly turn the main shaft until the needle starts to come down. Continue until the Angle indicator is as close to 0 (zero) degrees as possible. (note: the Angle shown is approximate – you only need to get somewhat close to zero)
3. **Turn the shaft to 0 degrees by hand.** Do this with a 3mm hex wrench from the reverse side of the machine.
4. **Check the clearance.** The distance between the plate and pressure foot should be approximately 1.2mm, or slightly less than the width of a dime.



The indicated shaft position here is only approximate.



Advanced Maintenance/Repair: Presser Foot

Adjusting Presser Foot Depth

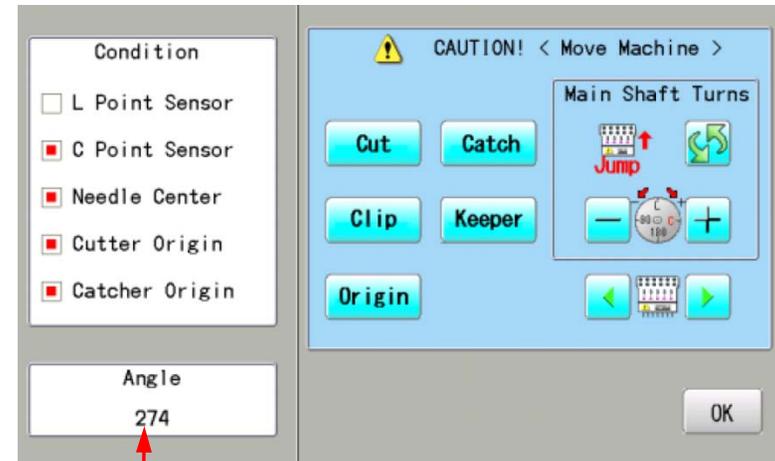
1. **Take note of the adjustment needed** by completing steps 1-3 on previous page.
2. **Remove the front cover faceplate** by removing the set screws on either side of the sewing head.
3. **Loosen the set screw of the presser foot needing adjustment.**
4. **Adjust presser foot height up or down** within the allowable travel of the oval-shaped “window” that the set screw sits in until the foot is at the correct depth.
5. **Re-tighten the set screw for the presser foot.**

Advanced Maintenance: Needle Depth

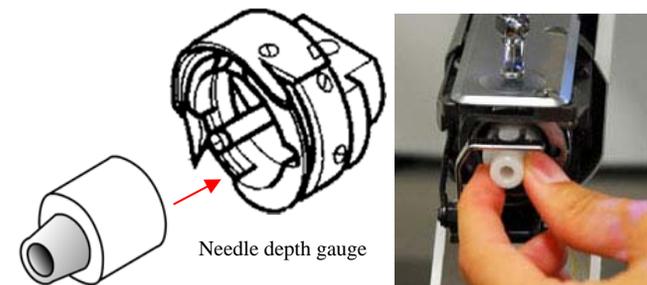
Inspecting Needle Depth

Follow this procedure to check proper needle depth:

1. **Turn the machine on.** Then press the *Set* button.
2. **Remove the bobbin case.**
2. **Engage the needle.** Do this by pressing the menu button, then **OTHER**, then **MAINTENANCE**. The screen on the right appears. Press the double-green arrow button to toggle from **JUMP** to **DRIVE** mode. Then, press the **+** to slowly turn the main shaft until the needle starts to come down. Continue until the Angle indicator is as close to 5 degrees as possible. (note: the Angle shown is approximate– you only need to get somewhat close to the 5 degree mark.)
4. **Turn the shaft to 5 degrees manually** with your 3mm hex wrench.
8. **Check needle depth.** Do this by inserting the plastic depth gauge into the rotary hook as shown on the right. The tip of the needle should lightly scratch the surface of the gauge.



The indicated shaft position here is only approximate.





Advanced Maintenance: Needle Depth

Adjusting Needle Depth

1. **Take note of the adjustment needed** by completing steps 1-3 on previous page.
2. **Remove the front cover faceplate** by removing the set screws on either side of the sewing head.
3. **Remove the bobbin case and bring the presser foot down.**
4. **Pull the needle bar down until it locks** and turn the upper shaft to 5 degrees.
5. **Loosen the set screw holding the lower needle bar boss "B".**
6. **Insert needle depth gauge** in the spindle of the rotary hook.
7. **Adjust needle bar height up or down** so that the needle point just touches the side of the gauge.
8. **Set needle stop block to approx. 30 degrees to the right.**
9. **Re-tighten the set screw for the needle bar boss** carefully, ensuring the height set in step (7) above is not thrown off during the process. In doing so, ensure a precise 25.3 mm gap between the upper and lower boss assemblies on the needle bar.



Error Code List and Measures *page 1*

Code	Error	Description	Resolution/Remarks
001	Circuit Board	Abnormality detected in control circuit board	Power down machine and, after 10 seconds, power on again.
002	Power Source	Power failure or abnormal voltage.	Power down machine and, after 10 seconds, power on again.
004	System Memory	System memory fault	Power down machine and, after 10 seconds, power on again.
015	Inverter Trip	Not applicable on this machine.	Not applicable on this machine.
016	X-assembly alarm	X-motor-related trouble, i.e. x-motor overload, short circuit, problem with motor drive unit	Power off machine, test pantograph movement manually. Check for any abnormality throughout full range of motion. If none found, power on and test. May need to check PMD (pulse motor driver)
017	Y-assembly alarm	Y-motor-related trouble, i.e. Y-motor overload, short circuit, problem with motor drive unit	Power off machine, test pantograph movement manually. Check for any abnormality throughout full range of motion. If none found, power on and test. May need to check PMD (pulse motor driver)
018	Main shaft error	Main shaft will not turn.	Currently, check for "birdnesting" at the rotary hook or any other blockage preventing main shaft from turning through its full rotation. If unable to rotate freely through 360 degrees, check for possible boss jam (usually upper needle bar boss disengaged). Contact service as needed.
020	Needle detect	Machine not detecting current needle # correctly, or needle bar selection unit is off its stop position. Trouble with position-detecting circuit board.	Restart the machine. Upon re-start and pressing the NEXT button, the machine should perform a self-check and re-calibrate the needle numbers and positions.



Error Code List and Measures *page 2*

Code	Error	Description	Resolution/Remarks
021	Needle move	Motor for needle bar selection unit has stopped partway through its path.	Follow same procedure listed for error 020
022	Needle move	Head unable to move due to malfunction of thread take-up lever or trouble of position-detecting circuit board	Follow same procedure listed for error 020
024	Needle Center	Needle bar stop position is off-center; needle bar stop position is out of place.	Follow same procedure listed for error 020
025	Needle over	Needle # out of range of actual needles on given machine.	Follow same procedure listed for error 020
026	Needle differ	Mismatch between actual selected needle position and needle number showing in the control panel.	Follow same procedure listed for error 020
030	Slow-speed mismatch	Improper speed adjustment at low speed. Speed does not decrease below 100rpm at low speed.	Perform automatic speed re-set: (1) Choose "OTHER" from the main menu, then select "SPEED". After warning, machine will turn main shaft slowly from stop to max speed (needle does not engage).
050	C point sensor	Main shaft is stopped in a position other than "C" point (270 degrees)	Press SET and choose the AUTO option to allow machine to attempt to clear this error on its own. Barring that, choose "MANUAL" and turn the shaft back to 275 degrees.
051	L Sensor	Timing detection board fault, or marred photo-sensor. Malfunction of "Lowest needle position" sensor on detection circuit board.	Check to see if photo sensor is clean or if the slit plate contacts sensor. Also check rotary hook area for bird-nesting and clear thread/blockage as necessary.
052	C Sensor	Timing board detection fault, or marred photo-sensor. Malfunction of "Color change position" sensor on timing detection circuit board.	Check to see if photo sensor is clean or if the slit plate contacts sensor. Also check rotary hook area for bird-nesting and clear thread/blockage as necessary.



Error Code List and Measures *page 3*

Code	Error	Description	Resolution/Remarks
055	Safety Cover	Not applicable on this machine.	Not applicable on this machine.
060	X Limit	Current design exceeds allowed width and/or or design position is positioned too far to left or right of center.	Check to make sure current pattern is digitized center-center. Re-check design position and size against currently-selected hoop and re-adjust as necessary.
061	Y Limit	Current design exceeds allowed height and/or or design position is positioned too far to above or below center.	Check to make sure current pattern is digitized center-center. Re-check design position and size against currently-selected hoop and re-adjust as necessary.
090	Miss reception	Not implemented	Not implemented
091	Failure to send	Not implemented	Not implemented
093	Data format	Machine unable to determine data format of design	Verify that design is in .dst, .tap, or .exp format and attempt to re-send and/or reload.
104	Miss function	Corruption/mis-read of design data	Re-transfer design again into machine and try again.
105	Dual function	Corruption/mis-read of design data	Re-load design again into memory
108	Improper read	Not implemented	Not implemented
110	Memory full	During design transfer, memory has filled to capacity	Delete unnecessary patterns from machine memory and try again.
111	Change Over	Color change mis-match	Design exceeds maximum # of 99 color changes or color change data is corrupt. Simplify or re-load design.
112	Data error	Data error in design	Re-load design
114	Id over	# of patterns in control panel memory has exceeded the maximum of 99	Delete unnecessary patterns from machine memory and try again.



Error Code List and Measures *page 4*

Code	Error	Description	Resolution/Remarks
118	Trace data over	Not applicable to this machine.	Not applicable to this machine.
120	Memory error	Fault in retaining contents of pattern memory	If this occurs frequently, it is likely that CPU is faulty. Enter maintenance mode and run memory clear function to test memory and clear all data. Re-set machine system and speed, then try re-loading design again.
130	Card error	Incapable of disposing of memory card continuously	Re-seat memory stick and try again. Failing the above, power off machine, power on again and re-try. You can also try re-formatting the memory stick (use FAT32 format). If not, try a different memory stick to help verify that the stick itself is the problem.
131	Card not ready	Card not set	Same procedure as error code 130
133	Bad card	Not implemented	Same procedure as error code 130
141	Not found name	Designated pattern not found	Re-connect memory stick into PC and re-save design again.
190	Cut blade	Thread cut knife is not at stop position	Look for bird's nest or other obstruction to moving knife. Clean out throat /needle plate and rotary hook area. Perform thread cut to attempt to clear.
193	Catcher	Upper thread hook (catcher) is not able to return to its fully-retracted position. Limit switch is detecting that the position is not "OFF".	Check if not trimming properly. If thread is cut, ensure that catcher has returned to position, selecting either auto or manual. If so, cut and return thread catch hook to retracted position. If problem recurs, troubleshoot position of thread holder, which may mis-guide the upper thread hook and cause it to miss the thread.