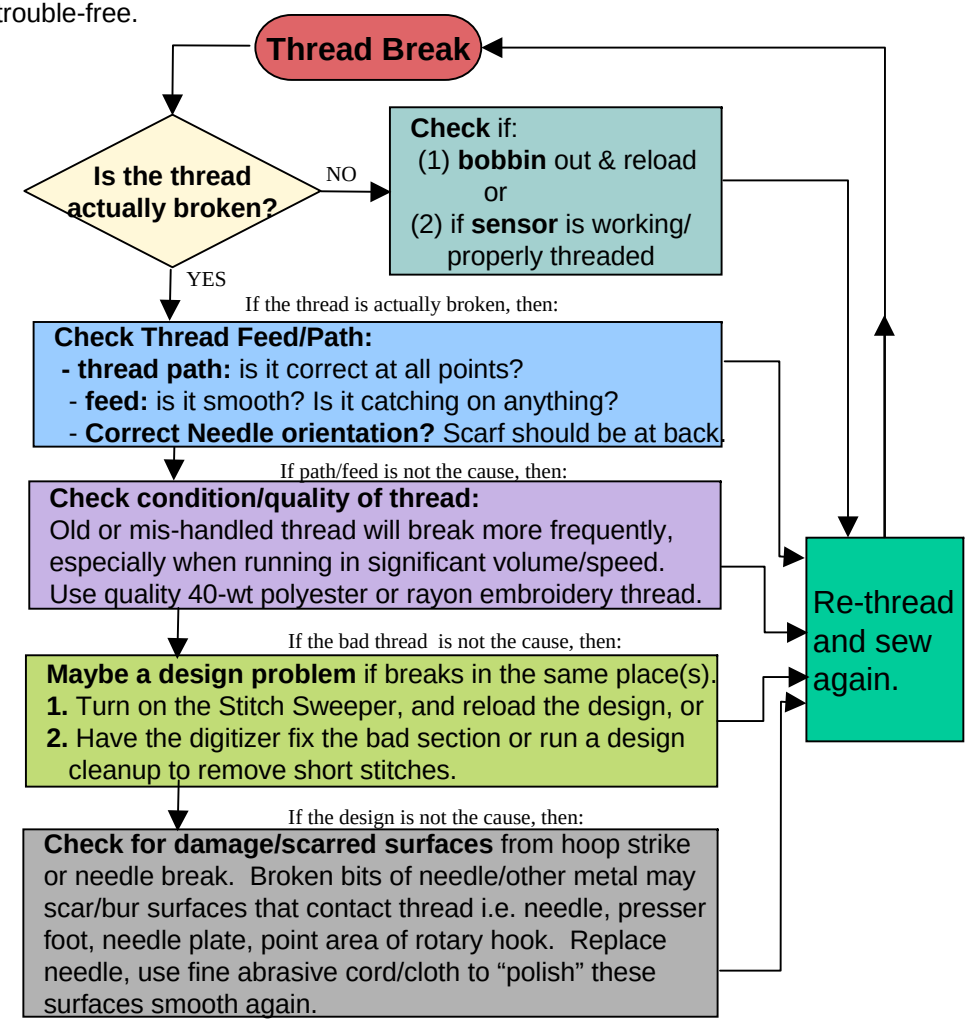
Training:
HAPPY HCD-1501 Operations & Maintenance

Chapter 4: Troubleshooting and Maintenance

Updated April 15, 2010: Added error code list

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

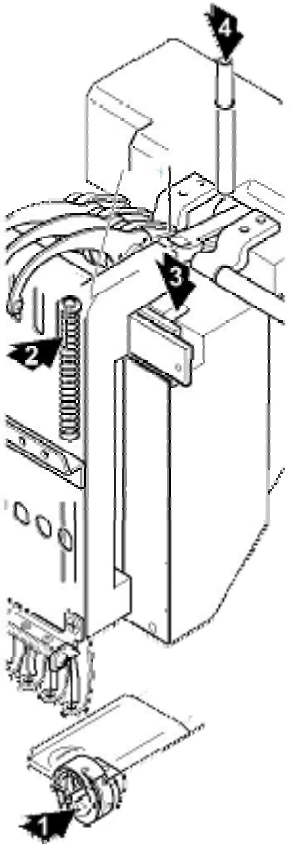
Sometimes less-obvious causes may contribute. These regular maintenance steps will further reduce causes for thread break:

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**

  Be sure to use only white sewing machine oil. There are 2 oiling schedules based on how frequently the machine is used, as shown on the right.

  - **Every 8 hours** (or more if used heavily) – 1 drop of oil on the "race" of the hook as shown as point **(1)**

  - **Every 40 hours** (as shown in diagram on the right)

    (2) needle bars: 1 drop on each, through the springs.

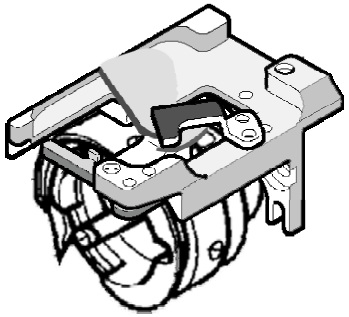
    NOTE: for points 3, and 4, move head to Needle 1.

    (3) "cup" cut-out marked in yellow on machine

    (4) "tube" for upper shaft

- **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, which in turn reduces thread breaks & other sewing problems. Remove the needle plate when doing this 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

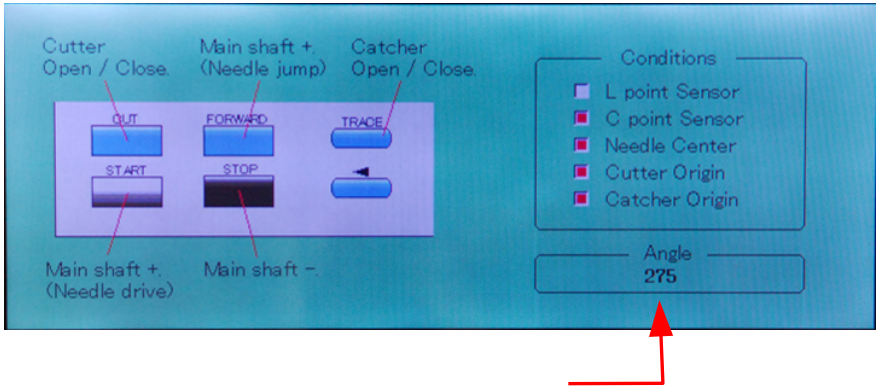
The rotary hook is responsible for catching the top thread and creating a loop around the bobbin thread in order to form a stitch. To catch the top thread, the point of the rotary hook must arrive at a precise *moment* and *distance* to the needle (timing and clearance). When the timing and clearance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

Remove the needle plate with an offset screwdriver as shown above.

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 seven (7).** Do this using the ◄ ► keys on the control panel
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.** Do this by pressing **MENU,** navigating to the second page of menu items. Choose **OTHER**, arrow down to MAINTENANCE and press **SET**. The screen on the right appears. As the diagram indicates, press or tap the START button to slowly turn the main shaft until you see the needle start 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.



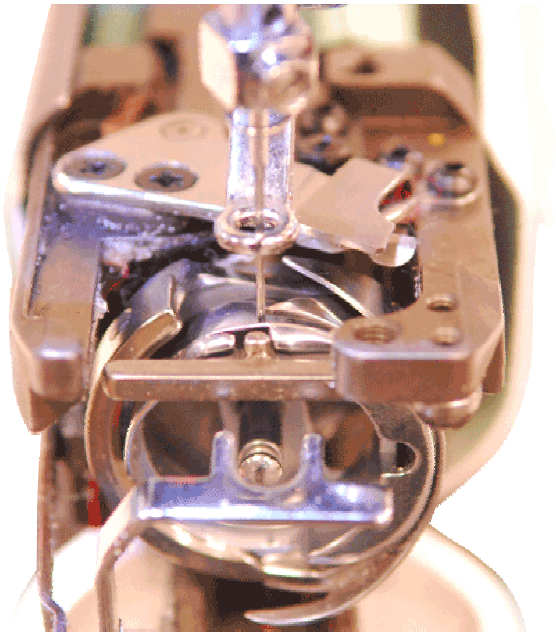
The indicated shaft position here is only approximate.

Advanced Maintenance/Repair: Hook Timing

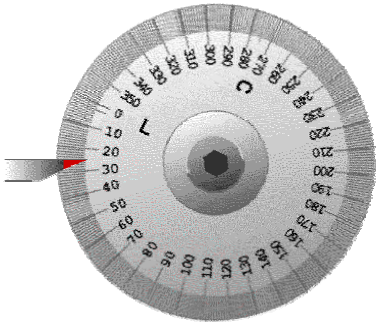
Inspecting Rotary Hook Timing and Clearance *(continued)*

6. Inspect TIMING & CLEARANCE at THIS point. (25 degrees) based on the illustrations below.

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.

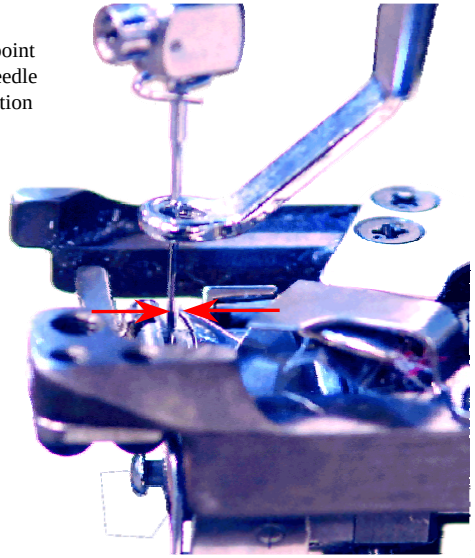


HOOK-NEEDLE CLEARANCE (front-back) at 25 degrees: From the side of the machine, the point of the rotary hook should be approximately 0.1-0.15mm from the back of the needle (about the thickness of a business card). If the point is either touching or too far from the needle, the machine is not set correctly and will require adjustment.



Timing for HCD-1501 is at 25 degrees.

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

To Adjust Rotary Hook Timing

It is important that all owners learn to inspect rotary hook timing, but the actual adjustment requires some precision and skill, and should not be attempted if you do not feel comfortable doing this. If in doubt, consult appropriate support staff before continuing.

1. **Prepare the Machine.** Do this by completing steps 1-7 on page 6 of this chapter.

2. **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. To access each of these screws, use the *start* and *stop* keys to turn the rotary hook clockwise or counterclockwise (or turning the wheel manually with the 3mm T-handle). Try to loosen the screws only just enough to break the rotary hook loose on the shaft.

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.

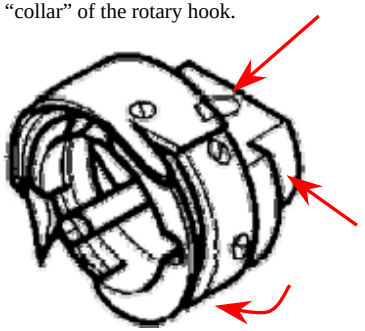
Helpful Hints

- Have a helper hold the timing wheel at 25 degrees with the T-handle wrench as you make your adjustments and tighten the screws.

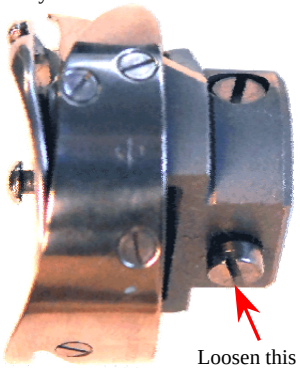
- Tighten each screw just enough to snug the hook back on the shaft, then re-check the timing, then tighten each screw further. Tighten all screws as firmly as you can manage!

- 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 set screws are located along the rear "collar" of the rotary hook.



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



Loosen this screw first before the other 2.

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

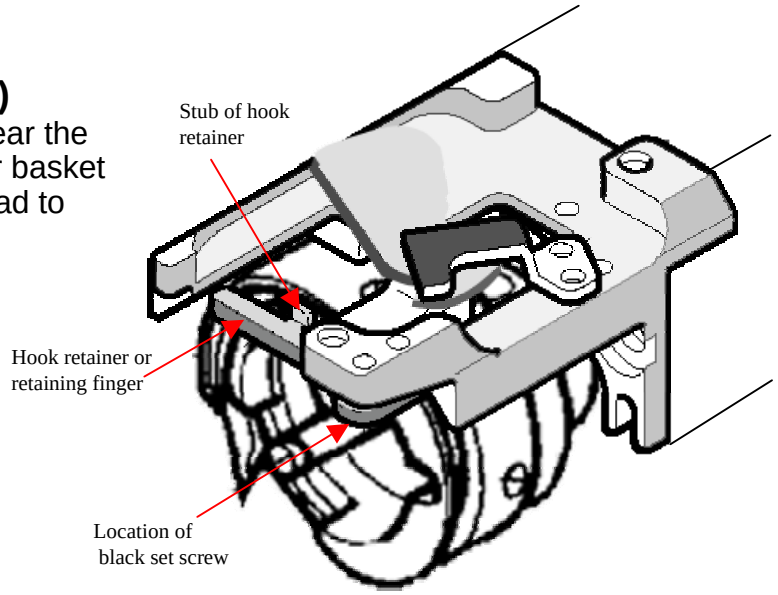
Follow this short procedure to adjust the hook retainer:

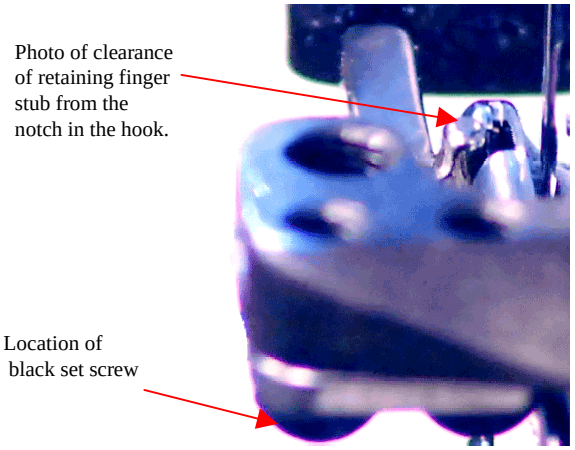
1. **Remove the needle plate.** Do this by loosening each of the two (2) flathead screws with an offset screwdriver.

2. **Loosen the set 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

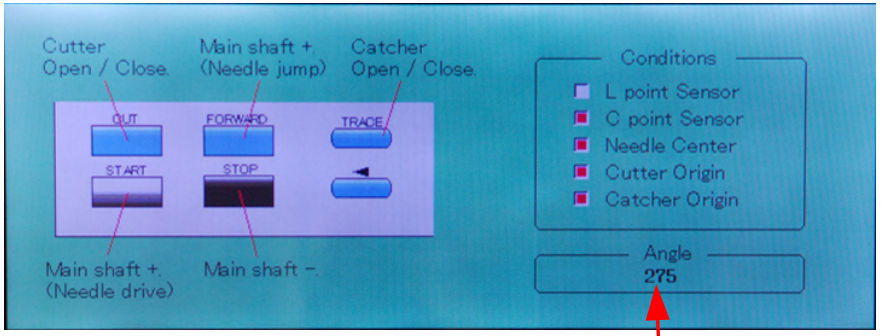
Advanced Maintenance: Presser Foot

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 **MENU**, navigating to the second page of menu items. Choose **OTHER**, arrow down to **MAINTENANCE** and press **SET**. The screen on the right appears. As the diagram indicates, press or tap the START button to slowly turn the main shaft until you see the needle start 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)



The indicated shaft position here is only approximate.

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.

Advanced Maintenance: Presser Foot

Adjusting Presser Foot Height

Follow this procedure:

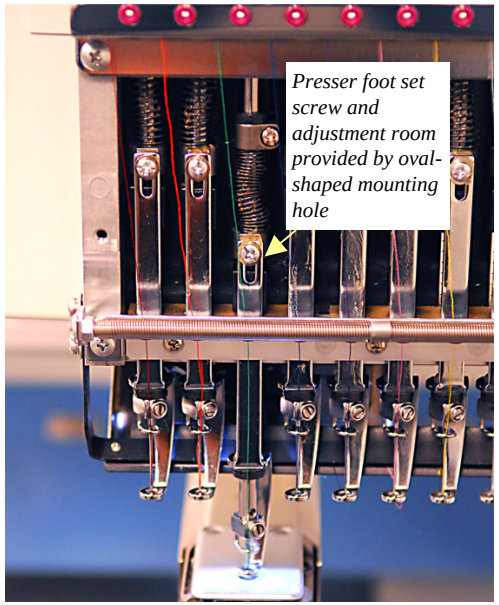
1. **Prepare the machine**. Do this by completing steps 1-4 on the previous page.

2. **Remove the lower faceplate.** Remove the 2 Phillips screws on either side of the faceplate, then slide the faceplate off to either side.

3. **Loosen the set screw.** This is the phillips-type screw that fastens the pressure foot to the needle bar. Do not remove the screw – loosen just barely enough so that the presser foot can be adjusted.

4. **Adjust.** The pressure foot is attached to the set screw with an oval shaped hole. Slide the pressure foot up or down until the clearance measures approximately 1.2mm.

5. **Re-tighten the set screw.**



Advanced Maintenance: Needle Depth

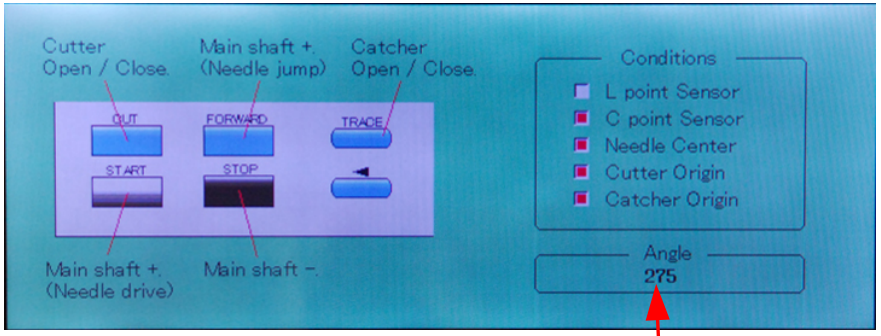
Inspecting Needle Depth

Follow this procedure to check proper needle depth:

1. **Turn the machine on.** Then press the *Set* button.

2. **Remove the bobbin case.**

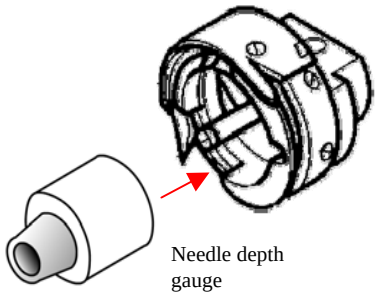
2. **Engage the needle.** Do this by pressing **MENU**, navigating to the second page of menu items. Choose **OTHER**, arrow down to **MAINTENANCE** and press **SET**. The screen on the right appears. As the diagram indicates, press or tap the START button to slowly turn the main shaft until you see the needle start 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 5 degrees.)



The indicated shaft position here is only approximate.

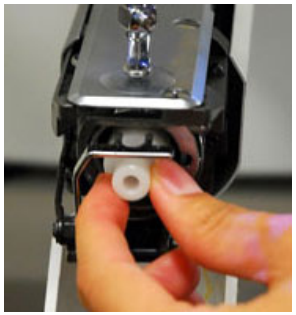
4. **Turn the shaft to 5 degrees manually** with your 3mm hex wrench.

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.



Needle depth gauge

Photo of needle depth gauge in use



Advanced Maintenance: Needle, Presser Foot depth

Adjusting Needle Depth

Follow this procedure:

1. **Prepare the machine**. Do this by completing steps 1-8 on the previous page.
2. **Remove the lower faceplate** by removing the 2 phillips-type screws on either side of the faceplate.
3. **Loosen the upper needle bar boss.** Do NOT loosen the lower needle bar boss.
4. **Move needle bar to correct depth.** Continue to adjust until the needle lightly scratches the gauge.
5. **Tighten the upper needle bar boss.** Make certain to aim the needle forward to its original position before tightening.

(above) You can remove the lower faceplate by removing the 2 Phillips screws on either side. Caution: do not over-tighten these screws when replacing.

(Left) with the lower plate removed, the needle bar boss screw is easily accessible for adjustment.

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.
014	Fan Alarm	Cooling fan problem	Note: There are 2 cooling fans that must be checked
015	Inverter Trip	Caused most frequently by uneven or inadequate AC power to the machine. Also may be main shaft motor overload, short, trouble w/main shaft drive unit or other main shaft motor related abnormality.	Cut power and turn main shaft by hand. If turns normally, power on again. Check inverter for Error. Should be set at 0.0. Also check power coming into machine. Experience has shown that this is triggered by inadequate or irregular voltage (I.e. fewer than 110v) coming from the AC outlet.
016	X-carriage 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-carriage 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.
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.	Turn needle bar selector knob to until head is properly positioned at current needle position (check red alignment mark on knob with that on machine body).

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.	Try selecting a different needle with the manual needle selection knob, then try again with the arrow buttons on the control panel until the error clears itself. If not, follow the procedure in the maintenance manual to reset the needle select potentiometer.
030	Slow-speed mismatch	Improper speed adjustment at low speed. Speed does not decrease below 100rpm at low speed.	Re-initialized the speed/inverter: From the main (drive) screen, press MENU, go to the 2nd page of options, choose “Other” then SPEED, and follow the prompts. Main shaft will turn slowly to full speed then stop.
050	C point sensor	Main shaft is stopped in a position other than "C" point (270 degrees)	Press SET. Then choose “AUTO”. The machine will to attempt to return the shaft to to 270. If the error recurs, choose “MANUAL” and turn the shaft back to 270 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
060	X Limit	Current design exceeds allowed width and/or or design position is positioned too far to left or right of center.	Return the frame to within the allowed sewing area using the 4 blue arrow keys around the SET button.
061	Y Limit	Current design exceeds allowed height and/or or design position is positioned too far to above or below center.	Return the frame to within the allowed sewing area using the 4 blue arrow keys around the SET button.
066	Frame Drive	Frame movement did not complete when returning to origin.	Re-start machine to try to clear the error. On failure contact service.
067	Position Data	Error in embroidery frame position data.	Check for dirt / clogging of the position sensor. Power down and power up again. If error recurs, contact service.
068	Position Set	Unable to read embroidery frame sensor position.	See error code 067
069	Position Entry	Unable to read embroidery frame sensor entry.	See error code 067
070	Safety sensor	Safety sensor has detected obstruction. Feature implemented only with optional safety sensor installed.	Clear area in front of safety sensor and press ESC.
090	Miss Reception	Corruption/mis-read of design data during design transfer	Attempt again. If repeats, try a different cable (LAN or USB), a shorter cable, or different com speed (serial cable only)
091	Failure to send	Time out error: 10 seconds has elapsed without reception of design data	See error 090.
103	Data Format	Machine has failed to automatically detect the format of the design being read.	Check design, re-create or fix data if possible, then try to read again.
104	Miss Function	Timing error in reading pattern data	See error 103
105	Dual Function	Data error: 1 stitch has 2 functions	Re-load design

Error Code List and Measures page 4

Code	Error	Description	Resolution/Remarks
106	No Function	Distance between read start point and design start point too great	Re-check quality of design data
108	Improper read	Error has occurred while reading design	Try to read/transfer pattern into the machine again.
110	Memory full	During design read/transfer, machine memory has become full	Delete unnecessary designs from the Pattern menu, then try to load design again into machine
111	Change over	Design being read has exceeded the 99 maximum allowed color changes	Edit design in digitizing /editing software and try to transfer again.
112	Data Error	Data of the selected pattern in memory appears corrupt	Delete the design from the PATTERN screen and re-load again.
114	ID over	Limit of maximum allowable designs has been reached	Delete unnecessary designs from the PATTERN screen
116	Not found ID	Specific pattern does not exist.	Reload design into machine
118	Trace data over	Over 1024 stitches of trace data were created while reading pattern data	Set max stitch length of embroidery area of pattern data to less than 2M x 2M size)
120	Memory error	Unable to read contents of memory	Boot machine into Maintenance mode (press MENU while powering on) and select option to clear memory
130	Card error	Memory card cannot be read properly	Re-boot machine and try to read again. On failure contact service.
131	Card no ready	Memory card not properly set in flash drive port	Re-insert flash drive (CF or USB) into port and try to read again. On failure, verify condition of Flash drive by testing on another PC or machine port
132	Write protect	Memory card/ floppy write protect setting is on	Turn off write protect on card or floppy disk in question
133	Bad card	Memory card faulty or of wrong format	Move any data off memory card temporarily and re-format to FAT32 if greater than 1Gb in size, then re-save data again and attempt to read again. On failure, try different memory card

Error Code List and Measures page 5

Code	Error	Description	Resolution/Remarks
134	Disk unit	Trouble with disk drive unit	Power down, then power on again after 10 seconds. On failure, contact service.
140	Entry Over	Maximum number of designs has been reached.	Delete unnecessary designs from memory in the Pattern screen.
141	Not found name	Designated design not found	Memory card corrupt or incompatible. See error code 133.
142	Disk full	Design memory capacity is full.	Delete unnecessary designs from memory in the Pattern screen.
143	Multi name	Multiple names detected when reading design	Change design name or overwrite design by saving again on top of it. Failing that, try a different disk or memory card
190	Cut blade	Moving knife has failed to return to its at-rest position under the fixed knife.	Troubleshoot as follows: 1. See if thread has actually been cut. If not, cut thread manually, clear thread debris and manually return moving knife to the closed position.
193	Catcher	Upper thread hook (catcher) has failed to return to its retracted (closed) position after a trim.	This is most often caused by failure to trim rather than an error with the catcher. Cut thread if not cut and attempt to manually return catcher to its home (retracted) position.
215	Frm. Drive err	Frame movement did not complete during a normal movement	Contact service if this occurs frequently
217	Frm. Drive data	Frame movement data is “loose”	Contact service if this occurs frequently.
220	Calendar stop	Calendar has not been set up correctly.	Power down machine and power on again. Go to Menu..Other… Calendar and properly set calendar. If problem recurs frequently, CPU board assembly may need replacement. Contact service.
221	Battery low	Low voltage battery low on CPU board.	Battery likely drained if machine has not been powered on for extended period of time. Power on machine to see if battery recharges. On failure, contact service.
222	Calendar Data	Incorrect calendar data	Set calendar date/time correctly. If problem occurs frequently, CPU board assembly may need to be replaced. Contact service.