



## INSTALLATION, OPERATION & MAINTENANCE MANUAL

# Thermocode Series 4



**Models: 53S, 53M, 53L,**

With

Series 3 Power Supply Unit

## Series 3 Power Supply Unit

*Designed and manufactured by:*

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There are three manuals covering the Thermocode Series 4 (TC4) printer system:

- 1 This manual covers the Installation, Operation and Maintenance, warranty of the printer.
- 2 The TC4 Touch Screen and Software operation instructions of the printer.
- 3 The Series 3 Power Supply Manual covers an overview of the components and connections of the power supply (PSU).

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### **Standard Warranty Terms and Conditions**

Open Date thermal transfer printers carry a twelve (12) month return to base (at our discretion) warranty, with the exception of the following parts (where fitted):-

- Thermal Printhead.
- Lower roller (rubber roller)
- Cassette springs and belts.
- Cassette rubber drive roller.
- Print base rubber or lower roller assembly.

#### **Static electricity**

Warning, static electricity may damage the printer or printhead. On many film type installations, the material produces static electricity which may cause printer problems or printhead failure. Open Date does not accept any warranty claims for damage to the printer or printhead caused by static electricity.

If you are in doubt about your installation please contact your Open Date, or your supplier.

#### **Printhead warranty**

The printhead assembly (ASY762199 or ASY762200) carries a 50 kilometres or 12 months warranty which ever is the soonest. Should the printhead fail during this period, the replacement printhead will carry the balance of the existing warranty.

Refer to the ribbon specifications sheet, check the correct width of thermal transfer ribbon is being used and has the appropriate silicone back coating to protect the printhead.

The printhead warranty will not be valid if:-

- The full width ribbon is not being used. This will be apparent by excessive wear on the edges of the printhead.
- Mechanical damage is apparent from abuse.
- The spy chip board has been removed or damaged in any way.
- Cleaning procedures have not been followed.
- Installation and maintenance procedures are not correct.
- The print base used is not as specified .
- The printhead angle has not been set up correctly.
- Static electricity is found.
- Recommended Open Date ribbon is not being used.
- Printing substrate or ribbon is found to be abrasive.
- Operating temperature is outside of the range 0°C to 60°C.

We reserve the right to charge for components replaced during the warranty period which are damaged due to any of the above conditions not being followed or met.

#### **Printhead Spy Chip**

Contained within the printhead assembly is a small microchip this is programmed when the head is first assembled and tested to retain the following information:-

- Printhead resistance value (Ohms).
- Printhead width (Dots).
- Printhead serial number.
- Printhead data lines.
- Programmed factory date.
- Printhead angle.

During printer start up the spy chip is read by the software to determine the width of printhead. The software then automatically adjusts the resistance value to compensate for the correct print burn calculations. Whilst printing the spy chip continually records the print distance achieved during the life of the printhead.

Recorded printhead data can be viewed through the Series 4 Touch Screen

## **IMPORTANT SAFETY INSTRUCTIONS**

1. Read these instructions carefully. Follow all warnings and instructions marked on the product.
2. Always disconnect the printer and Power Supply Unit (PSU) from the mains electrical supply before attempting to clean or service the product.
3. Never operate the printer, unless it is installed within the mounting frame supplied. When installed correctly, the gap between the printer and print base should be nominally 1mm.
4. Do not use the product near water. Never spill liquid of any kind on to the product.
5. Do not place this product on an unstable stand, table or machine. It may fall causing serious injury to the operator or damage to the product.
6. Never insert objects of any kind into this product through any openings or gaps as they may touch dangerous voltage points or short circuit parts that could result in fire or electric shock.
7. This product should only be connected to the type of electrical supply as indicated on the label located on the rear of the power supply.
8. Ensure that the printer connection cable is fully secured to the printer and power supply with the screws supplied. Failure to do this will result in the machine not being properly earthed.
9. Use only the power cable supplied with the product. The cable supplied is three core, utilising one wire as a grounding conductor. This must be connected to a suitable earth point at the electrical supply. This is a safety feature. If any doubt arises in trying to connect the power cable, please contact the manufacturer or the agent who supplied the product.
10. Do not allow anything to rest on the power cable. Do not locate the product where people could walk on the cable.
11. If an extension cable is used with this product, make sure that the total ampere ratings of the equipment plugged into the extension cable does not exceed the extension cable ampere rating. Also make sure that the total rating does not exceed the fuse rating.
12. Do not service this product yourself as opening or removing guards may expose you to dangerous voltages, major burns and other risks. Refer all servicing to qualified personnel.
13. Do not attempt to use to use this product in areas where explosive gases or substances are present.
14. Under the following conditions always disconnect the electrical supply and refer to a qualified service engineer.
  - a. If the power cable is damaged or frayed.
  - b. If the printer connection cables are damaged in any way.
  - c. If liquid has been spilled into the product has been exposed to water.
  - d. If the product does not operate normally when the operating instructions are followed.
15. Adjust only those controls covered by these instructions. Improper adjustment could result in permanent damage, requiring qualified technicians to restore the product to normal operating conditions.
16. Do not touch the printer, PSU, or power supply with wet or moist hands.
17. Do not use the printer without thermal transfer ribbon as the printhead is likely to become damaged.

## Introduction

- This manual describes the basic installation, operation and maintenance of Thermocode Series 4 printers.
- Print formats are designed using a mix of onboard and external computers running appropriate software then downloaded to the printer.
- The Touch Screen is used to select and modify pre-stored formats, variables and printer parameters.
- The mechanical adjustments that can be made to the printer are minimal. Normally the printer is installed in a standard frame which sets the correct clearance from the print pad. To ensure proper printer operation the correct detailed dimensions must be obtained from Open Date when constructing custom frames or mountings.

### Product Overview

The following components are supplied ready for installation.

1 Thermocode Series 4 printer, complete with ribbon cassette.

1 Power supply unit type Series 3.

1 Touch Screen display.

1 Power supply interconnection lead 1.5 metres long (also available in 3, 5 or 6 metre lengths).

1 Roll of thermal transfer ribbon, to suit printer (wax/resin quality).

1 Printer manual (complete with CD or USB containing printer firmware and fonts)

1 Printhead cleaning kit consisting of 50 printhead cleaning wipes (Isopropyl alcohol)

1 Serial programming lead (3 metres long, 9 way "D" connector).

1 Print pad, to suit printer.

### Optional Extras

Standard or custom designed mounting frame.

Codesoft Premier package, (Windows design software) with Codesoft installation manual.

RecoverMode software backup program (allows customer to back up all printer data).

### Printer Technical Information

- Maximum print area.
- Printhead resolution - 12 dots per mm (300 dots per inch).
- 69.0 Megabytes memory for storing fonts, graphics and custom designed print formats.
- Single direction printing.
- Print designs are stored along with all parameters, allowing quick access for printing.
- Automatic updating of printer memory when editing formats.
- Automatic selection of supply voltage from 100 to 240Vac, 50/60Hz, single phase.
- Real Time/Date printing with specified offsets if required.
- Sequential numbering and Barcode printing.
- All text, graphics, lines and boxes can be printed in all four orientations (0, 90, 180, 270 degrees).

### Print Base Rubber Specifications

Hardness: - "40 - 50 Shore A" Silicone Rubber. (Colour mid blue)

Thickness: - 4.75mm Silicone Rubber bonded to 4.75mm thick Aluminium sheet.

(Minimum 2.0 thickness)

Flatness: - Supplied with ground surface finish, -0.03mm to +0.03mm as per printhead heater specification.

## Installation Procedure

### **IMPORTANT**

**To minimise risk of personal injury and avoid damage to equipment before starting installation:**

- **Read the safety information in this manual (page 2).**
  - **Ensure that the parent machine is switched off and securely isolated from the mains supply.**
  - **Make all electrical connections after the equipment is mounted and secured.**
  - **Do not apply power to printer or parent machine until connections have been checked**
1. Install the Thermocode Series 4 printer in the mounting frame, ensuring that the orientation for the application and clearance between the printer and print base rubber is correct. ***Consult Open Date before using a non-standard frame or mounting.***
  2. Connect the printer and power supply using the interconnection lead supplied. The lead has been specifically designed, so it cannot be fitted incorrectly. Ensure that the plugs and sockets are inserted fully before tightening the fixing screws.
  3. As a minimum, each installation must have an automatic trigger signal\* from the parent machine, sent at the point in the process where a print is desired. This signal can be:
    - A process controlled relay within the parent machine (voltage free)
    - A process controlled 24 Volt pulsed output signal .
    - A stand-alone micro switch.
    - A stand-alone PNP / NPN sensor suited to the process / substrate (e.g; proximity, colour mark, contrast)
  4. Care must be taken when using print trigger signals not under control of the parent machine to prevent unexpected / false triggering that could damage the printer or associated equipment.
  5. Up to three interface relays are available in the PSU to allow printer status to be communicated to the parent machine or external equipment such as beacons & sounders. See Touch Screen user instruction manual.

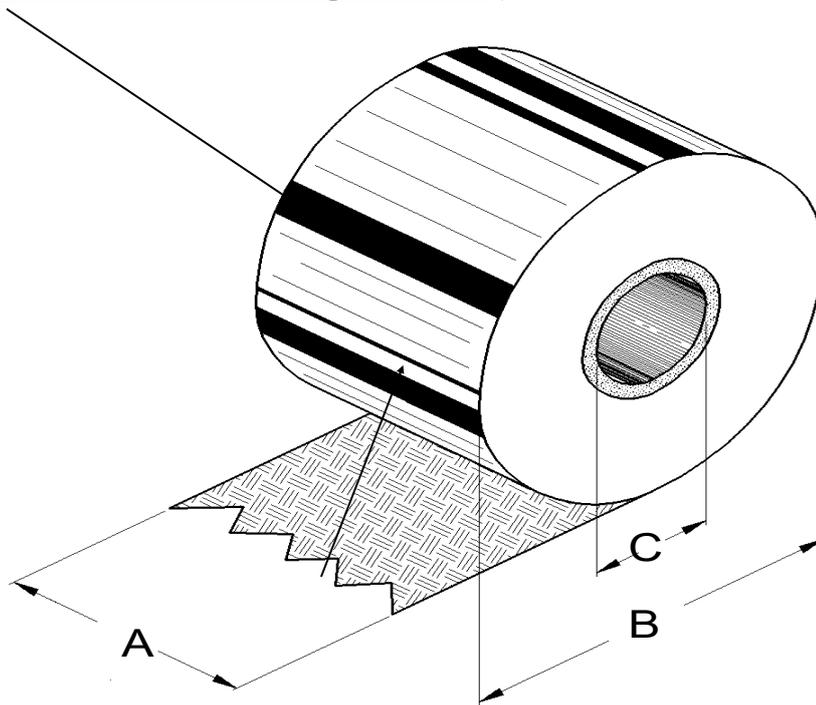
### **\*NOTE!**

By default printing occurs immediately on receiving a print trigger signal. The response time to print trigger signals can be delayed using the menu on the Touch Screen display. See Touch Screen User Instructions.

## Thermal Ribbon Specifications

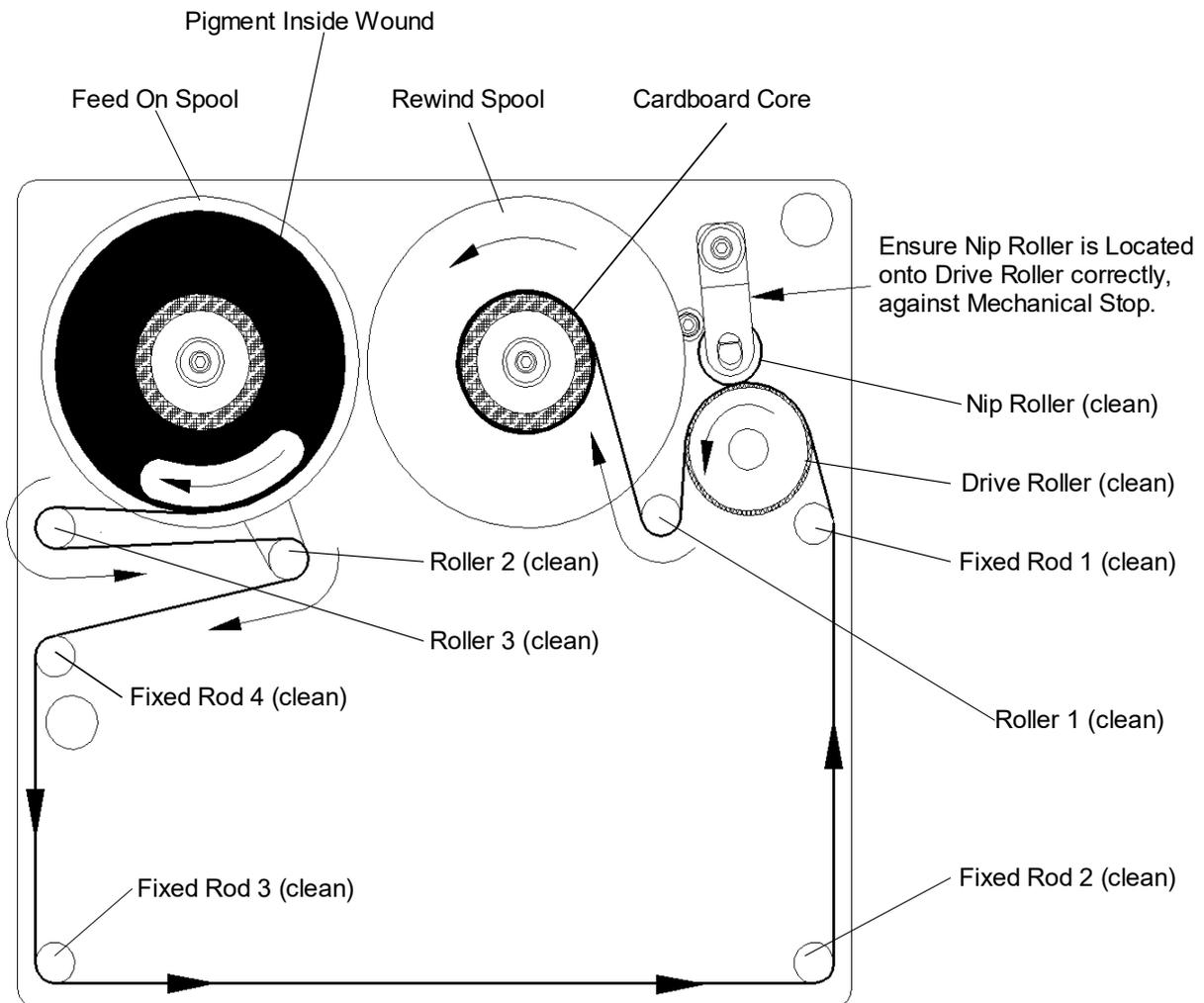
Printer	A (width)	B (max)	C	Core
53S	55	65	25.4	Cardboard
53M	55	80	25.4	Cardboard
53L	55	80	25.4	Cardboard

Silicone based "Back Coating" Outside (Low coefficient of friction:  $K_d < 0.2$ )



## Ribbon Threading Diagrams - 53S

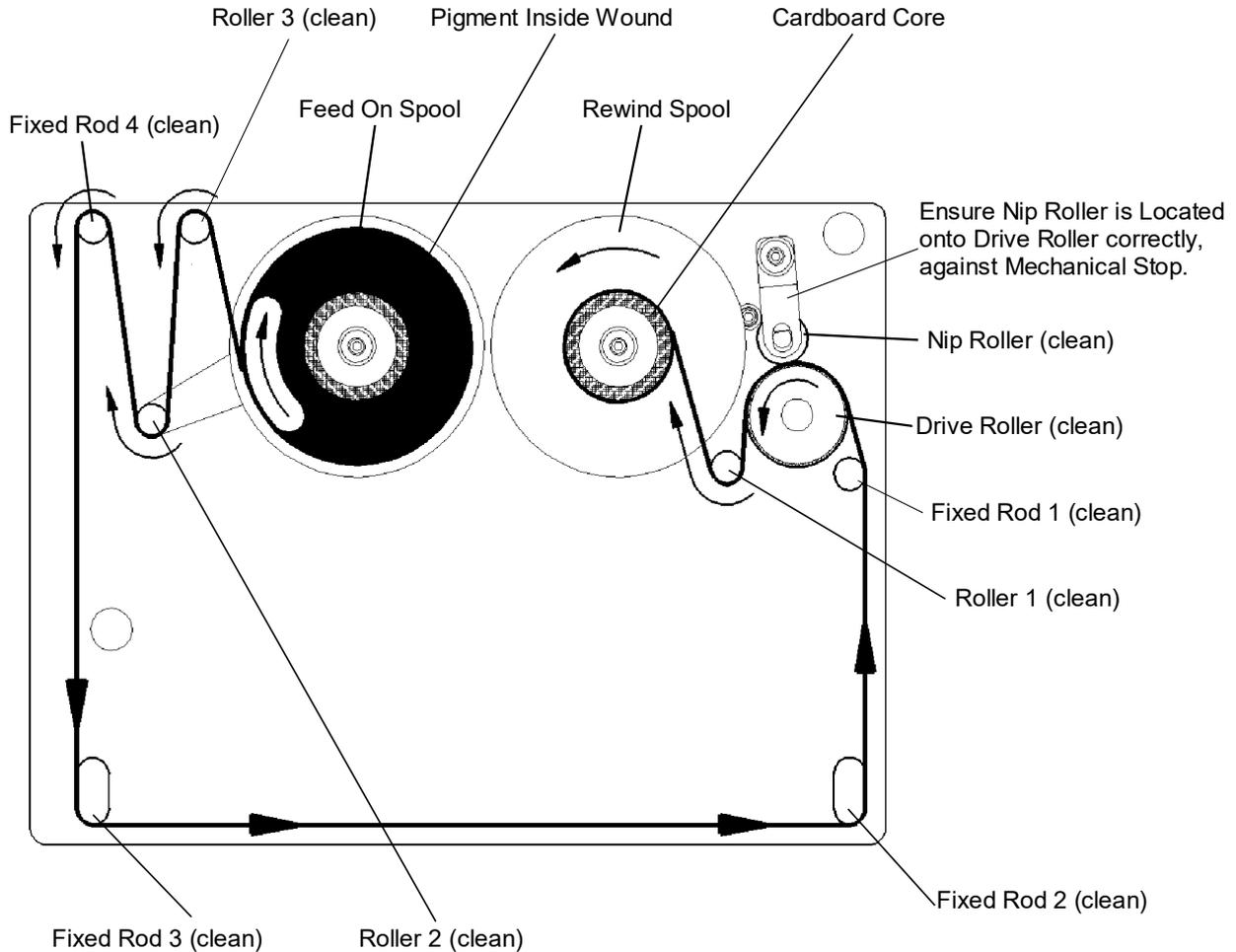
### Fitting A New Ribbon



1. Remove used ribbon & cardboard core from the rewind spool and dispose off correctly.
2. Remove the empty cardboard core from the feed-on spool and refit to the rewind spool.
3. Clean all the following Rollers & Rods to remove any residue that has built up. (Use Isopropanol)
  - Nip Roller (1 off)
  - Drive Rubber Roller (1 off)
  - Fixed Rods (4 off)
  - Rollers (3 off).
4. Fit new reel of Foil, ensuring that the direction of take off is correct.
5. Thread up foil as diagram above, and fix to empty cardboard core on rewind spool with selotape.
6. Engage Nip Roller to Drive roller assembly.
7. Wind on a few turns of the drive roller to ensure the foil is tracking and tensioned correctly.

## Ribbon Threading Diagrams - 53M, 53L, Models

### Fitting A New Ribbon



1. Remove used ribbon & cardboard core from the rewind spool and dispose off correctly.
2. Remove the empty cardboard core from the feed-on spool and refit to the rewind spool.
3. Clean all the following Rollers & Rods to remove any residue that has built up. (Use Isopropanol)
  - Nip Roller (1 off)
  - Drive Rubber Roller (1 off)
  - Fixed Rods (4 off)
  - Rollers (3 off).
4. Fit new reel of Foil, ensuring that the direction of take off is correct.
5. Thread up foil as diagram above, and fix to empty cardboard core on rewind spool with selotape.
6. Engage Nip Roller to Drive roller assembly.
7. Wind on a few turns of the drive roller to ensure the foil is tracking and tensioned correctly.

## Printhead Cleaning

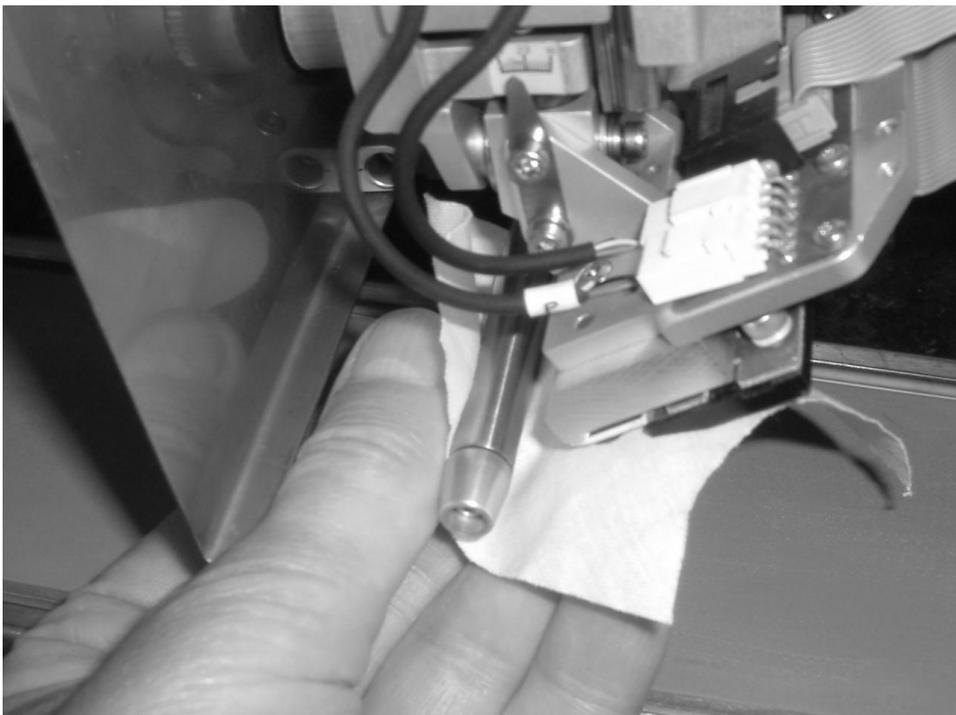
The most common cause of print quality problems is a dirty printhead. It is recommended that it is cleaned daily or if not then at very least, every time a new roll of ribbon is loaded. Ribbon magazine rollers a guide posts should be cleaned at the same time.

### Procedure

1. Use a clean, dry paintbrush to brush out any particles of ribbon and ribbon residue.
2. With a new, unused printhead cleaning wipes (Isopropyl alcohol) clean the underside of the printhead.



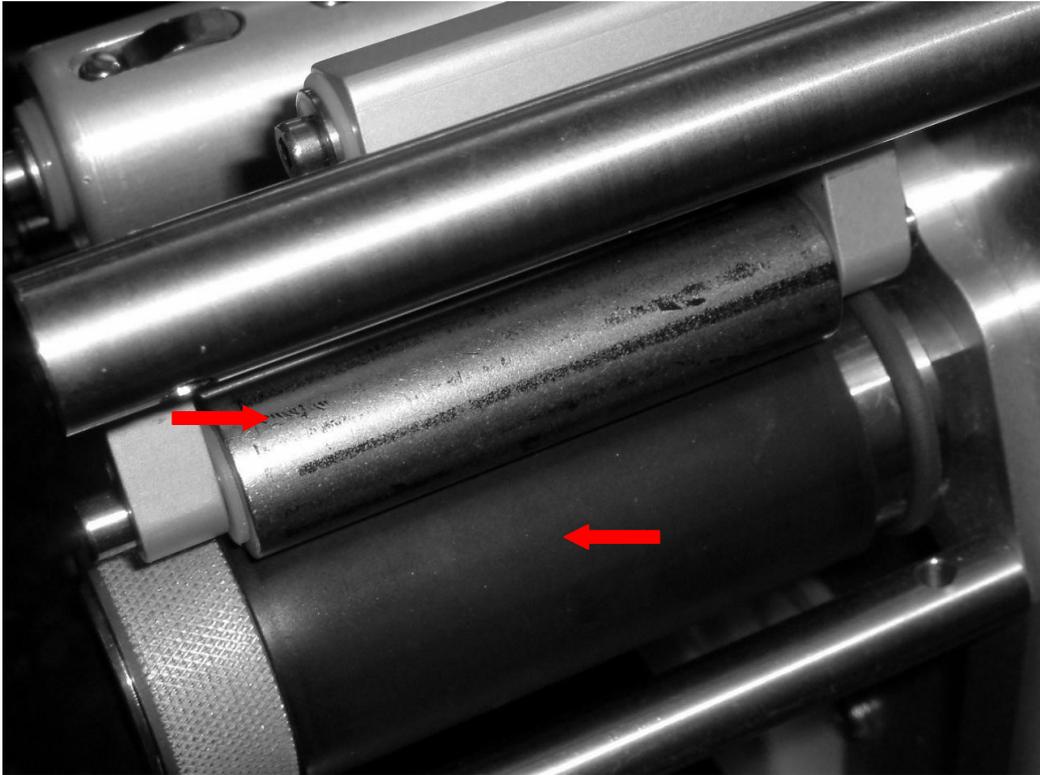
3. Clean the bottom roller.



4. Also clean the print pad.

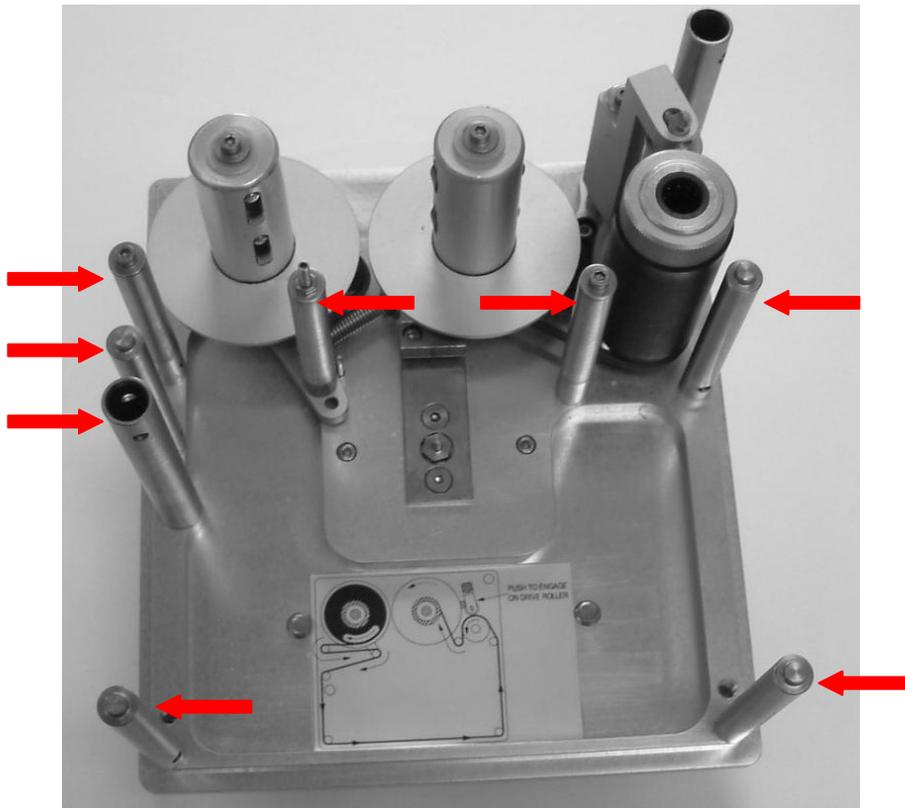
### Ribbon Magazine Cleaning

5. Clean the nip roller and bottom black roller as indicated.



6. Inspect the bottom black roller for any damage. Change if damaged.

7. Clean all the shafts indicated.



## **Fault Finding**

### **Ribbon Indexing Not Enough (Overlapping Prints)**

- Q. Cardboard core does not fit the rewind spool correctly, or is missing?**  
A. Fit correct cardboard core, ensure it is located on the spring clips correctly.
- Q. Foil not attached to cardboard core correctly?**  
A. Use adhesive tape to attach the ribbon to the cardboard core, and wind on a few turns.
- Q. Cassette rollers, Printhead rollers or Printhead assembly are dirty, through build up of wax/resin residue?**  
A. Clean cassette and Printhead as described in maintenance section.
- Q. Brake belt on cassette is damaged, worn or dirty?**  
A. Renew brake belt.
- Q. Tension arm spring tension on brake belt not set correctly?**  
A. Adjust belt brake correctly, when functioning correctly the tension arm should be about 6mm from the stop pin.

### **Ribbon Indexing Excessive**

- Q. The format design has a space before printing any characters?**  
A. Change the format design so there is only 1mm from the "X" datum to the first characters to be printed.
- Q. Foil may be sticking to Substrate being printed, and being pulled along?**  
A. Adjust the Printhead position from the substrate, possibly the clearance is insufficient and the foil is being indexed along with the substrate. Service Engineer may be required.

### **Ribbon Breaking or Perforated**

- Q. Cassette rollers, Printhead rollers or Printhead assembly are dirty, through build up of wax/resin residue?**  
A. Clean cassette and Printhead as described in maintenance section.
- Q. Foil may be sticking to Substrate being printed, and being pulled along?**  
A. Adjust the Printhead position from the substrate, possibly the clearance is insufficient and the foil is being indexed along with the substrate. Service Engineer may be required.
- Q. Temperature "BURN" values may be set to high for the substrate being printed?**  
A. Reduce "BURN" values of format to achieve acceptable print quality.
- Q. Foil indexing problems, prints overlapping each other, weakening the ribbon?**  
A. See Thermocode Series 4 Touch Screen manual.

## **Fault Finding (Continued)**

### **Ribbon Tracking on Cassette**

- Q. Cassette rollers, Printhead rollers or Printhead Assembly are dirty, through build up of wax/resin residue?**  
A. Clean cassette and Printhead as described in maintenance section.
- Q. Foil may be sticking to Substrate being printed, and being pulled to one side?**  
A. Adjust the Printhead position from the substrate, possibly the clearance is insufficient and the foil is being indexed along with the substrate. Service Engineer may be required.
- Q. Cassette may have been dropped, damaging tracking rods or tension arm?**  
A. Call for Service Engineer or send back to manufacturer for checking.

### **Print Quality Problems**

- Q. Print not consistent over printed area?**  
A. Ribbon not compatible with substrate.
- Q. Temperature, burn settings too low?**  
A. Low printing temperatures can give the effect of the edges of characters appearing faint or ragged.
- Q. Damaged or dirty print base?**  
A. Clean and check for any imperfections. Normal Thermocode Series 2 print bases are 45-50 shore hardness rubber, which is bonded to an aluminium backing sheet and then ground. Flatness of this pad is very important, on some labelling machines if the backing web is not aligned correctly it will cut into the print base or actually miss-shape it due to the tension of the backing web.
- Q. Printer not correctly mounted in frame, printer frame not manufactured to correct dimensions, clearance under printer excessive?**  
A. See Standard Frame measurements drawings at the end of this manual.
- Q. Printhead dirty or Pixels burnt out?**  
A. Clean Printhead and test print on plain fax paper to confirm Printhead condition.
- Q. Ribbon Indexing not enough, ribbon tracking on magazine, causing creasing, ribbon perforated or broken?**  
A. See previous page.
- Q. Ribbon foil INK Coating inconsistent?**  
A. Check and replace ribbon.

### **Clearing Printer Error Messages**

All errors that occur within the printer are shown and reported on the Touch Screen.  
To view the actual error and remedy, please see Series 4 Touch Screen manual.

**Thermocode Intermittent Printer Diagnostics - sheet 1**

FAULT DESCRIPTION	REMEDY / ACTION
Error message on start up	<ol style="list-style-type: none"> <li>1. Remove the magazine, and then replace it.</li> <li>2. Replace display curly cable.</li> <li>3. Replace display.</li> <li>4. Replace processor board and re-program.</li> </ol>
Error on start up	<ol style="list-style-type: none"> <li>1. Check 10 way ribbon connections, each end.</li> <li>2. Contact your Supplier, to fix the Printhead problem.</li> </ol>
Printhead temperature. (Head Cold Fault)	Change the wider ribbon cable between the printhead and processor board.
No display on the Touch Screen.	Check the fuse within power supply. (Series 3 PSU Manual)
Printhead LED, not working. (Power Supply)	Check the fuse within power supply (Series 3 PSU Manual)
Printing wavy barcodes.	<ol style="list-style-type: none"> <li>1. Brake arm loose on brake on brake lever.</li> <li>2. Retaining washer loose or missing from foil rollers.</li> <li>3. Increase the Print height above the substrate.</li> </ol>
Ribbon tracking (movement to one side)	<ol style="list-style-type: none"> <li>1. Check brake is not set to tight.</li> <li>2. Check brake arm is not loose.</li> <li>3. Check any foil guides are not loose or bent.</li> <li>4. Check Printhead is levelling correctly.</li> </ol>
Broken ribbon sensor.	Check the brake arm is not loose, and passes through the sensor correctly.

**Thermocode Intermittent Printer Diagnostics - sheet 2**

FAULT DESCRIPTION	REMEDY / ACTION
No power to printer / No voltage to power supply	<ol style="list-style-type: none"> <li>1. Check fuses in mains plug and power supply.</li> <li>2. Check supply voltage is at source.</li> <li>3. Check all the fuses in power supply.</li> <li>4. Check all electrical connections are correct.</li> </ol>
Ribbon broken.	<ol style="list-style-type: none"> <li>1. Replace ribbon.</li> <li>2. Check brake tension on cassette.</li> <li>3. Replace or repair thermal ribbon.</li> </ol>
Low foil warning.	Replace thermal ribbon on printer.
Count completed.	<ol style="list-style-type: none"> <li>1. Select another format.</li> <li>2. See Touch Screen Manual</li> </ol>
No format name displayed on screen.	<ol style="list-style-type: none"> <li>1. Format has been de-selected.</li> <li>2. Select a new format.</li> </ol>
No font loaded to printer, for format selected.	<ol style="list-style-type: none"> <li>1. Load the font to printer and select the format again.</li> <li>2. Load a different format that has printer fonts.</li> <li>3. Check which fonts have been loaded to printer, by interrogating with the "Codesoft" software</li> </ol>
Print on line, awaiting print signal.	Normal condition
Pressure switch fault.	<ol style="list-style-type: none"> <li>1. Check the mounting frame is not open.</li> <li>2. Check the gap between printer and print base.</li> <li>3. Check sensor assembly has not come loose.</li> <li>4. Check wire crimps and connections.</li> <li>5. Check LED on sensor activates correctly.</li> <li>6. Check print base rubber is not damaged or missing.</li> <li>7. Check pressure setting within format parameters.</li> </ol>
Vertical home sensor fault.	<ol style="list-style-type: none"> <li>1. Check sensor assembly has not come loose.</li> <li>2. Check wire crimps and connections.</li> <li>3. Check LED on sensor activates correctly.</li> </ol>
Printhead Thermistor fault / disconnected	<ol style="list-style-type: none"> <li>1. Check ribbon cables are fitted correctly to printhead and interconnect PCB.</li> <li>2. Faulty printhead, replace.</li> </ol>

**Print Speed & Burn Modifications within Software****Software Advantages**

- Longer Printhead Life (lower initial power settings).
- Improved Quality of Print (even density of image).
- Automatic burn adjustment at different speeds (speed compensation).

**Automatic Speed Compensation**

The software allows the user to change print speed of a format without the need to adjust the burn values.

The speed compensation chart below gives a guide as to the maximum and proposed values for printing onto various materials using different thermal transfer ribbons.

**Speed Compensation Chart**

Use the values below to configure the print format ready for printing. The values are only a gen-

Description	Value
Print speed	100mm/sec
Maximum burn value (nominal)	303μsec
Polyethylene type material (wax/resin foil)	180μsec
Polyester type material (wax/resin foil)	200μsec
Label type material (wax/resin foil)	240μsec
Polyethylene type material (resin foil)	200μsec
Polyester type material (resin foil)	220μsec
Label type material (resin foil)	260μsec
Thermal label (direct thermal)	200μsec

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