
5. SELF-DIAGNOSIS FUNCTION

5.1 INTRODUCTION

These pages deal with the hidden diagnostic functions of the Inkjet Printer. These hidden diagnostics are mainly intended for examining boards and determining mechanical and firmware adjustment parameters. These functions are incorporated into the printer firmware but they are not disclosed to end users. They are enabled by applying power to the printer while holding down several special panel keys. It is not possible to access the hidden diagnostic functions from the normal printer mode. Updated firmware adjustment parameters can be registered by exiting diagnostic mode or by switching off the power. Firmware adjustment parameters are also registered when there is a serious MOE failure error on adjustment. The printer will be reset on exiting diagnostic mode. Diagnostic functions are as follows.

Table1: Hidden diagnostic functions

Item	Details
Examination	Verification of RAM capacity, version, panel, sensors, encoders, fans, history and waveform
Adjustment	Manufacturing processes, adjustments on head replacement and adjustments to media feed system
Cleaning	Mode specified cleaning
Test Printing	Head nozzle verification printing, adjustment parameters
Parameters	Initialization, updating
Aging	Carriage motor, media feed, cutter, maintenance unit, head

5.2 PREPARATION

Before you can use the self-diagnostic function, you should make the machine ready and display the self-diagnosis menu.

5.2.1 Preparation on machine

Before starting up the self-diagnosis function, perform following preparations.

(1) Setting printing media



Notes :

- The system will not revert to normal mode even if there is no key entry for three minutes.
- Roll media is set automatically.
- Panel keys that can be operated are [CANCEL] and the keys for menu display (Menu Up and Down, Back, Value+ and -, ENTER)
- To terminate self-diagnostics, switch off the power.
- To feed media, press [MENU] while holding down the [Shift] key when the Diagnostics Menu is displayed.

(2) Connecting power cable

Connect the power cable to the machine's inlet assembly and insert the plug into the outlet.



Notes :

- Do not connect three or more power plugs to the outlet.

5.2.2 Starting up

To use the self-diagnosis function, you should first display the self-diagnosis menu on the operation panel. The self-diagnosis menu is completely independent of the normal operation mode and self-diagnosis display mode. To call up the self-diagnosis menu, follow the steps below.

Step 1 : If the system is in the operation mode or the self-diagnosis menu mode, press the [POWER] key to power off the unit.

- The power is turned off.

Step 2 : Press and hold the [Head Cleaning] key, [Menu Display] key, and [Shift] key simultaneously. While holding down these keys, press the [POWER] key.

- The system will enter the self-diagnosis mode and display the self-diagnosis menu.

5.3 EXAMINATION

This is intended for board checking. X and Y excitation is not turned on by selecting “Examination” from the Diagnostics Menu.

The X and Y excitation condition will be preserved as it is at the time you select an item to be examined. Items to be examined are as follows.

Item	Details
Memory Capacity	Check memory capacity
Version	Programs, Backup parameters, DIP Switches
Panel	Keys, LCD, LEDs, Buzzer
Sensors	XF, XR, Covers, Levers, Origin, Ink out, No cartridge, Special cartridge, Media edge, Thermistor, Waste fluid tank
Encoders	X-axis (media feed), Y-axis (carriage)
Fans	Check on/off
Network	Initializing, None, Error, Initialization Error, Initialization OK
History	Maintenance, Major failure
Head Waveform	Check head drive waveform (No function)

5.3.1 Memory Capacity

This procedure is used to check the capacity of the memory on board. When this item is selected, the memory capacity is displayed on the panel or terminal.

EXAM: Memory Capacity

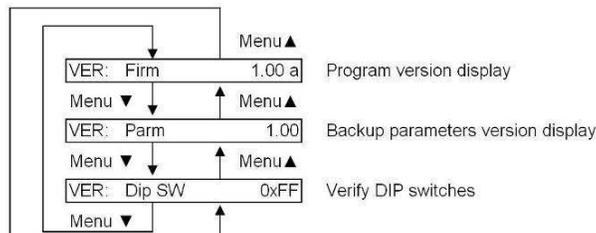
Memory Capacity: 8Mb

Press [ENTER] to shift to “Exam: Version” or [BACK] to shift to “EXAM: Memory Capacity”

5.3.2 Version

This procedure is used to confirm the firmware version (program, backup parameters) and DIP switch settings (On: 0, Off: 1, switch 1 is Lsb, 8 is Msb). These are shown separately on the panel or all together on the terminal.

EXAM: Version



Notes :

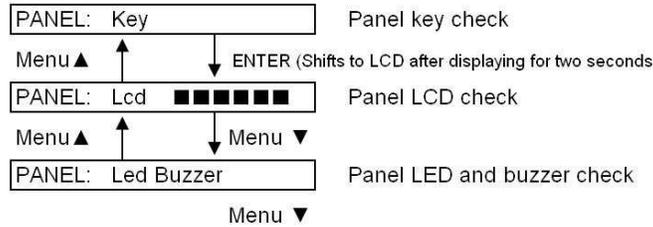
- DIP Switch 1 On : 0 x 02
- DIP Switch 2 On : 0 x 01

Press [ENTER] to shift to “Exam: Panel” or [BACK] to shift to “EXAM: Version”

5.3.3 Panel

This procedure is used to check panel keys, LCD, LEDs and buzzer.

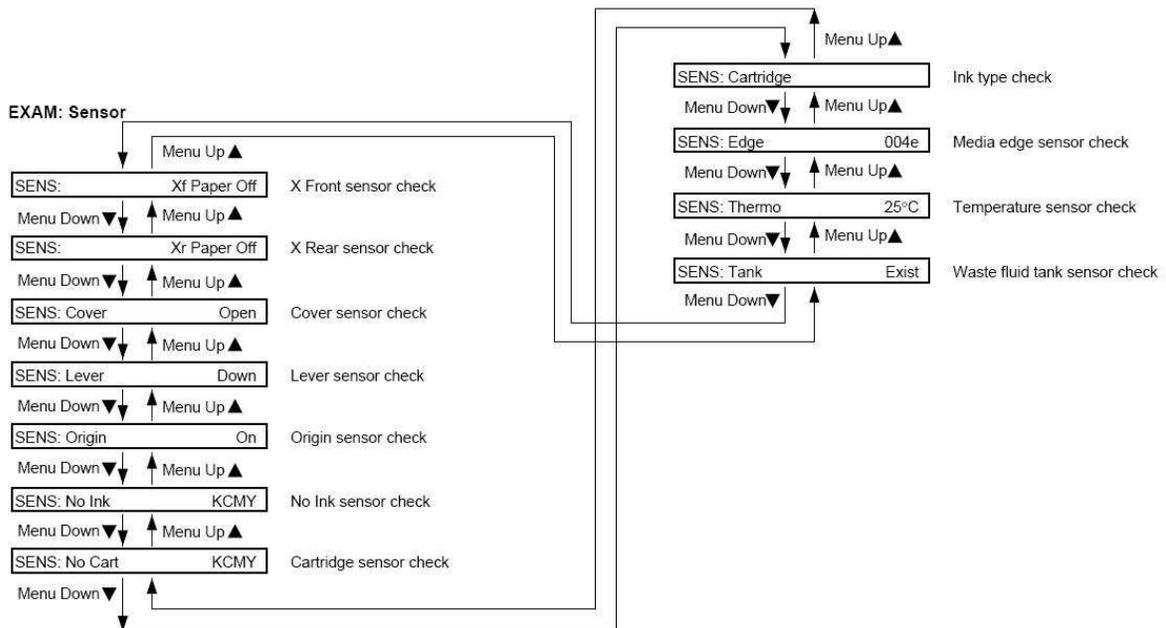
EXAM: Panel



Press [ENTER] to shift to “Exam: Sensor” or [BACK] to shift to “EXAM: Panel”

5.3.4 Sensors

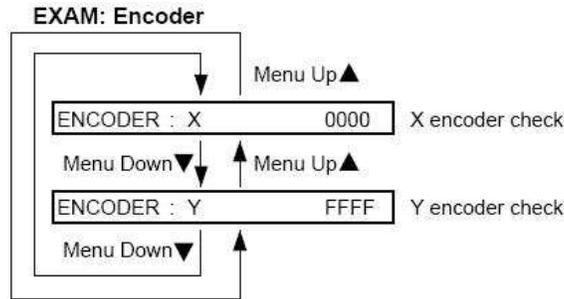
This procedure is used for checking, from displays on panel or terminal, the status of sensors for XF (the X Front Sensor), XR (the X Rear Sensor), cover, lever, origin, no ink (K, M, C, Y), cartridge (K, M, C, Y), special cartridge, media edge sensor level, head thermistor value and whether or not the waste fluid tank is present.



No Cart. means No Cartridge and applies to No Ink or No Cartridge. Color is expressed by an alphabetical letter. Cartridge indicates the Special Cartridge sensor. Press [ENTER] to shift to [EXAM: Encoder] or [Back] to shift to [EXAM: Sensor].

5.3.5 Encoders

This procedure is used to verify the values of X-axis (media feed) and Y-axis (carriage) from displays on the panel or the terminal.



Press [ENTER] to shift to “EXAM: Fan” or [Back] to shift to “EXAM: Encoder”.

5.3.6 Fans

This procedure is used to verify that the fans are working by turning them on and off.

EXAM: Fan

- Fan goes off 10 seconds after starting
- Displayed for 5 seconds after fan has gone off

Panel keys are ignored during fan on/off display. 5 seconds after displaying Fan Off, the display will shift to “EXAM: Fan”.

5.3.7 Ethernet Board

This procedure is used to verify the initialization of Ethernet board data.

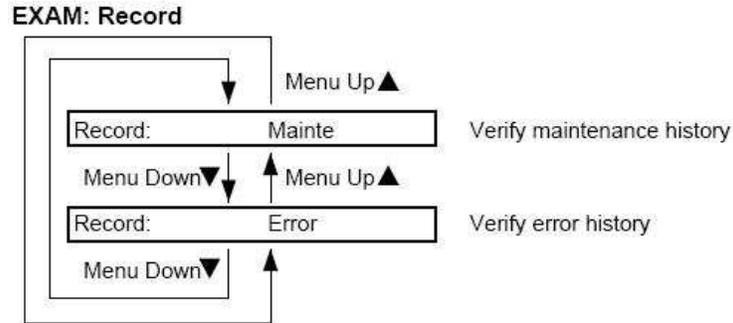
EXAM: Network Board

- Ethernet board initialization is in progress. Wait until the next message is displayed.
- There is no Ethernet board.
- The Ethernet board is wrong.
- An error has occurred during initialization of the Ethernet board.
- Ethernet board has been initialized.

After confirming the status of initialization of the Ethernet Board from the messages shown above, press [ENTER] to move to “EXAM: Record”

5.3.8 History

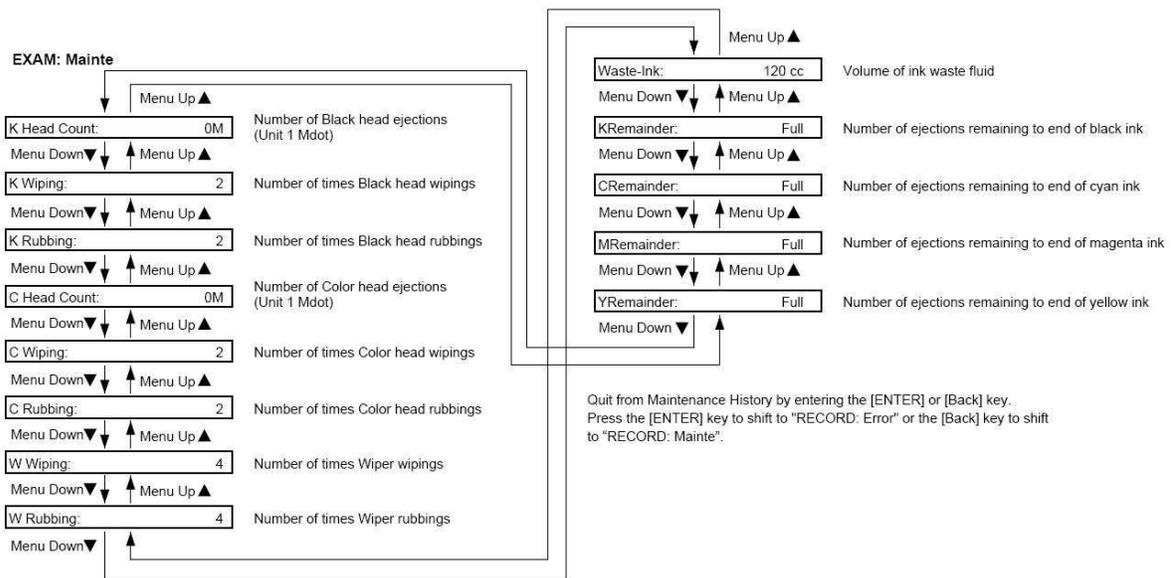
This procedure is used to verify the history of maintenance (head ejection count and numbers of wipings and rubbings, the numbers of wipings and rubbings with the wiper, volume of waste fluid, and the amount of ink remaining) and serious failures (MOE type). Operations for the selection of history items are shown below.



If [Back] is pressed while the History menu is displayed, the display will shift to “EXAM: Record”.

Maintenance History

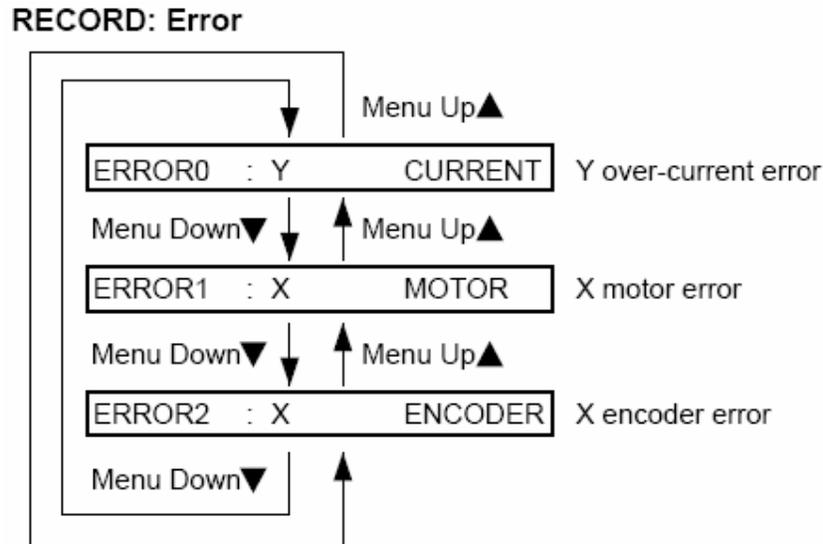
Panel and Terminal displays are shown below.



Quit from Maintenance History by entering the [ENTER] or [Back] key. Press the [ENTER] key to shift to "RECORD: Error" or the [Back] key to shift to "RECORD: Mainte".

[Serious Failure History]

This procedure is used to verify the history of serious failures.
 CPU Errors are not included in the serious failure history.
 The history displays a maximum of seven events. Panel displays are shown below.



Quit from Maintenance History by entering the [ENTER] or [BACK] key. Press the [ENTER] key to shift to "RECORD: Mainte" or the [BACK] key to shift to "RECORD: Error"

5.3.9 Head Waveform

No function

5.4 ADJUSTMENT

This procedure is used for correcting media feed and printing position. This is done by mechanical adjustments (head tilt) and firmware parameter adjustments. If this item is selected when X and Y excitations are off, the X and Y excitations will be turned on and the initialization sequence will be carried out. Items for adjustment are listed in Table 2-1. All these procedures are implemented during production.

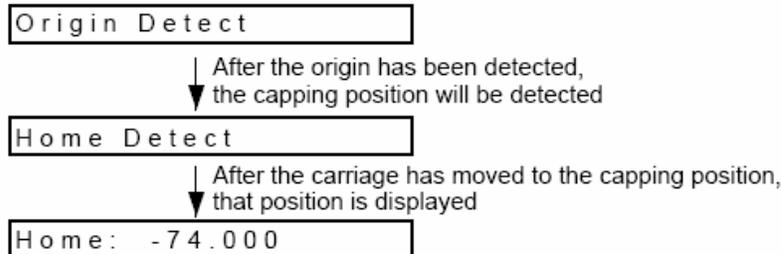
When the head is replaced, head cleaning (followed by switching off and replacing the head), head rank input, ink filling and print positioning are implemented. CW adjustment, reciprocal printing positioning and zone delay compensation are carried out when the printing position is to be corrected after a change of media type. If media feed is off, the media feed distance is compensated.

Item	Details
Capping Position Adjustment	To adjust capping position parameters in the firmware
Skew Verification	To use sensor results to check for media skew
Head Rank Input	To enter a specific value for a specific head and fill inks
Head Nozzle Verification	After filling inks, to check head nozzle ejection by print results
Black Head Tilt Verification	To check head tilt by printing (mechanical adjustment)
Colour Head Tilt Verification	To check head tilt by printing (mechanical adjustment)
Repeatability Printing Positioning	To align reciprocal printing position by printing
CW Adjustment	To align the shafts of the two heads by printing and adjust left margin
Flush Pointer Adjustment	To adjust the position for flushing into the flushing box
Media Feed Distance Compensation	To print a line in the X direction and enter its distance (X resolution adjustment)
XF-XR Sensor Distance	To measure the distance XF and XR sensors with cut media
XF, Cutter-to-Head Distance	To adjust top and bottom margins
Test Print	To check head nozzles and adjust parameters (enter serial numbers)
Head Cleaning	Done after manufacturing and before head replacement

5.4.1 Adjusting the capping position

This procedure is used for aligning the capping position correctly by adjusting the capping position parameters in the firmware. When this item is selected, the printer carries out the home position detection sequence and then automatically pushes the carriage against the maintenance unit to detect the carriage position at that time. The position displayed is the distance from the home position flag.

AJST: Home



Press [ENTER] to update the capping positions and move to “AJST: Measure High”, press [Back] to move to “AJST: Home” without updating the capping position.